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ORIGINAL RESEARCH

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Does education matter? Income inequality and mental health among young adult men

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Abstract

The impacts of income and education on mental health have been understudied among young adult men. This study aims to explore the association between income and depression among young adult men, to examine how educational attainment influences depression, and to investigate how educational attainment moderates the relationship between income and depression among young adult men. We used the National Longitudinal Survey of Youth 79 for Children and Young Adults (NLSY79 CY). A total of 1084 young adult men were selected for the final sample. The PROCESS macro 3.4 for Statistical Product and Service Solutions was used for analysis. Both income and educational attainment were negatively related to depression among young adult men. We found a significant interaction effect, indicating that educational attainment moderated the relationship between income and depression among young adult men. The effect of educational attainment on depression was greater for young adult men who earned a lower income compared to those who earned a higher income. Job training programs and other employment assistance should be provided to young adult men to help them to gain employment and job security, as well as to indirectly reduce their levels of depression. Increased access to higher education may also help men attain higher-paying jobs, which may buffer against depression. We suggest that men who have not received higher education receive access to job training programs and programs for job searching and career development to bolster their earnings potential, which thus may reduce depression.

Keywords

Education; Income; Depression; Young adult men

1. Introduction

The literature on depression has revealed consistent gender differences in prevalence, with men experiencing depression at lower rates than women [1–3]. In the 2020 National Survey on Drug Use and Health, the prevalence of major depressive episodes among men was 6.2%, compared to 10.5% for women [2]. In the National Health Interview Survey, 15.0% of male participants reported depression symptoms in the past week, compared to 21.8% of women [3, 4]. Overall, prevalence rates for depression among men have ranged from 5.0% to 15.0%, but samples differed by the time period assessed, and studies with longer time frames often show higher prevalence rates, so they cannot be directly compared [1–3, 5, 6].

In several studies, income has been inversely associated with men's depression [5, 7–11]. According to the U.S. Centers for Disease Control and Prevention (CDC), 15.8% of adults in families with incomes below the U.S. Federal Poverty Line (FPL) ($21,960 per year for a family of three in 2021) had depression, compared to 3.5% of adults in families with incomes above the U.S. FPL, and this pattern was consistent for men and women [5, 12]. Men with incomes at or above 400% of the U.S. FPL also had lower levels of depression (2.3%) than men or women in any other income group [5]. Inversely, men with an income less than 100% of the U.S. FPL had the highest rate of depression among men (20.8%), compared to 6.1% of men with incomes between 200% and 400% of the U.S. FPL and 7.3% of men with incomes between 100% and 200% of the U.S. FPL [5]. Longitudinal data has also revealed an inverse association between men's depressive symptoms and their future income [7–9]; for each one-point increase in depressive symptoms, men's future income decreased by 22%, and this association was three times stronger for men than for women [7].

Attaining a higher level of education may also be inversely associated with depression symptoms, perhaps it allows people access to more economic resources and social capital that lessen their risk for depression [13–18]. Male participants in the National Longitudinal Study of Youth-79 who attained any level of higher education had lower odds of depression at age 40 than those who had not [14]. In a sample of European adults, participants who attained less than a primary education had the highest prevalence of depression (45%),

while those who attained tertiary or higher education had the lowest prevalence of depression (19%) [13]. In most countries, these findings were true for men and women, but in Central and Eastern Europe, education was only significantly associated with depression levels among men [13]. Further, in a sample of monozygotic twins, twins with a college degree had significantly fewer depressive symptoms than twins who had not completed high school [16]. Researchers have also determined that while higher educational attainment lessened the risk for later depression, higher depression also negatively affects later educational attainment [18].

It has been well-established in the literature that men with higher educational attainment earn higher incomes than those who have completed less schooling [17, 19, 20]. Adult men in the U.S. earned $3365 more per year for each additional year of education they had attained, and this increased to $4450 when only full-time employed men were considered [17]. Over their lifetime, U.S. men with bachelor's degrees and men with graduate degrees will earn approximately $900,000 and $1.5 million more than men with a high school diploma, respectively [20]. Across all the Organisation for Economic Co-operation and Development (OECD) countries, adults with a bachelor's degree earn 44% more than high school graduates, while those with a master's or doctoral degree earn 91% more on average [19].

A few studies have examined men's depression in the context of both income and educational attainment [7, 21, 22]. In the Young Finns study, researchers examined men's educational attainment as a covariate for the relationship between income and depression, and the relationship between income and depression remained significant after controlling for educational attainment and parental socioeconomic status (SES) [7]. Moreover, in the National Longitudinal Survey of Youth-79, a 100% increase in income was associated with a 10% reduction in depression symptoms [22]. The effect of education on depression was highest for men with incomes above the median [22]. However, Add Health data revealed that the effect of educational attainment on depression was stronger for people with lower incomes [21]. The small number of studies examining these relationships and the mixed results from the studies that have been conducted demonstrate the need for further research in this area.

Although there have been a large body of studies showing that income inequality and SES greatly influence mental health [5, 14], the impacts of income and education on mental health have been understudied among young adult men. Generally, depression is more prevalent among women than men [2, 3], so men's depression has been given less attention in the literature. However, as the labor market has become more competitive, young adult men have more trouble finding a job and earning a livable wage-particularly in the context of the Coronavirus disease 2019 (COVID-19) pandemic [23]—which may lead to poor psychological well-being. Additionally, educational attainment affects the relationship between income and depression, as men with higher education are more likely to be employed in high-paying jobs than those with less education. Therefore, this study aims to (1) explore the association between income and depression among young adult men; (2) examine how educational attainment influences depression among young adult men; and (3) investigate how educational attainment moderates the relationship between income and depression among young adult men.

2. Methods

2.1 Data and sample

We utilized the National Longitudinal Survey of Youth 79 for Children and Young Adults (NLSY79 CY) dataset, administered by the U.S. Department of Labor, to analyze how income inequality may influence men's depression. Participants in the NLSY79 CY are the biological children of mothers who participated in the National Longitudinal Survey of Youth 1979 (NLSY79), which is a national representative sample of American adults. The survey was administered via computer assisted personal interviewing (CAPI) and included questions about participants' financial resources and physical and mental health. Participants in the NLSY79 CY survey were interviewed biennially from 1994 to 2018. For this analysis, the latest wave of NLSY79 CY data collected in 2018 was utilized. As we focused on men's health for this study, women (about 50% of all participants) were excluded from this study. Further, given that the current study targeted adult men, only men aged 18 years and older were included in the sample. Additionally, men who were not interviewed or who declined to report their levels of depression were not considered in the current study. In total, 1084 young adult men were selected for the final sample.

2.2 Measures

2.2.1 Depression

The Center for Epidemiologic Studies Depression Scale (CES-D) was utilized to measure men's depression [24]. A short-version of the CES-D scale with eleven questions was used, which utilized a four-point Likert-type scale. Participants reported how frequently they felt depressed, from rarely or none of the time to most or all the time. Some of the eleven items used to measure depression included: "My appetite was poor; I felt I could not shake of the blues, even with help from family or friends; (and) I had troubles keeping my mind on what I was doing" [24]. One item that measured happiness was reverse coded. The value of each response from zero to four was summed for analysis, with higher scores representing higher levels of depression.

2.2.2 Income

Participants reported their income from sources including wages, salary, commission or tips from all jobs, service in the military, their own farm, and/or their own business or practice. The value of income from all sources was summed to calculate participants' total income. Participants' total income represents their average annual income before deductions for taxes. Income was top-coded to conceal identifiable personal information among the participants in the highest income group. Further, utilizing the mean income of all participants, participants were categorized into a lower income group (below the mean) and a higher income group (above the mean) for analysis.

TABLE 1. Descriptive Statistics for Variables.

Variable	% or mean (SD)
Depression	4.79 (5.39)
Income	3.21 (3.13)
Education (higher education)	29.2%
Age	27.50 (6.66)
Marriage	21.9%
Race/ethnicity	
Whites	50.2%
Blacks	29.0%
Hispanics	20.8%

Note: The real values of income should be multiplied by 10,000. SD: Standard Deviation.

TABLE 2. Regression Results of Unstandardized Coefficients (standard error).

Predicting Men's Depression				
Variables	Depression		95% CI	
(Constant)	4.00 (0.76)		Lower	Upper
Income	−0.36 (0.09)	**	−0.53	−0.18
Educational attainment	−2.51 (0.59)	***	−3.67	−1.34
Age	0.10 (0.03)	**	0.04	0.16
Marriage	−1.32 (0.47)	**	−2.23	−0.41
Black	−0.63 (0.42)		−1.46	0.20
Hispanics	−0.06 (0.45)		−0.94	0.82
Interaction effect	0.27 (0.12)	*	0.04	0.50

*Note. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.*
Note. CI = Confidence Interval.

2.2.3 Educational attainment

Participants indicated their level of educational attainment from one of nine options. According to their response, dichotomous categories were created to indicate whether they had received higher education. Men who indicated they had completed an associate, bachelor, master, doctoral or professional degree were categorized into the higher education group, while men who indicated that they had received no degree, a General Educational Development (GED) or a high school diploma were categorized into the non-higher education group.

2.2.4 Control variables

Age, marital status, and race/ethnicity were controlled for in this study. Marital status was categorized dichotomously (married and not married). Three race/ethnicity categories were also considered: White/Caucasian, African American/Black, and Hispanic/Latino.

2.3 Analysis Strategy

We employed the PROCESS macro 3.4 for Statistical Product and Service Solutions (SPSS) to identify the moderating effect of educational attainment on the relationship between income and depression among young adult men. Preacher and Hayes developed a bootstrap method, which we used for analysis [25, 26]. According to their guidelines, the data was analyzed based on five-thousand iterations of the bootstrapping procedure, and we utilized 95% confidence intervals. The regression equation used in this study is as follows: $(Y = a_0 + a_2W) + (a_1 + a_3W)X + r$, where W indicates a moderator to account for the strength of the association between income and depression depending on another variable.

3. Results

Descriptive statistics are reported in Table 1. Participants' average depression score and income were 4.79 and $32,169, respectively. More than a quarter of participants (29.2%) received higher education. The mean age of participants was 27.5 years old, and about 22% of participants were married. For race and ethnicity, 50.2% of participants were White, 29.0% were Black/African American, and 20.8% were Hispanic/Latino.

In Table 2, both income and educational attainment were negatively related to depression among young adult men ($\beta = -0.36$, $p < 0.01$; $\beta = -2.51$, $p < 0.001$). For demographics, older age was positively associated with depression ($\beta = 0.10$, $p < 0.01$), and marital status was significantly related to depression ($\beta = -1.32$, $p < 0.01$). There was no significant relationship across racial and ethnic groups. We found a signif-

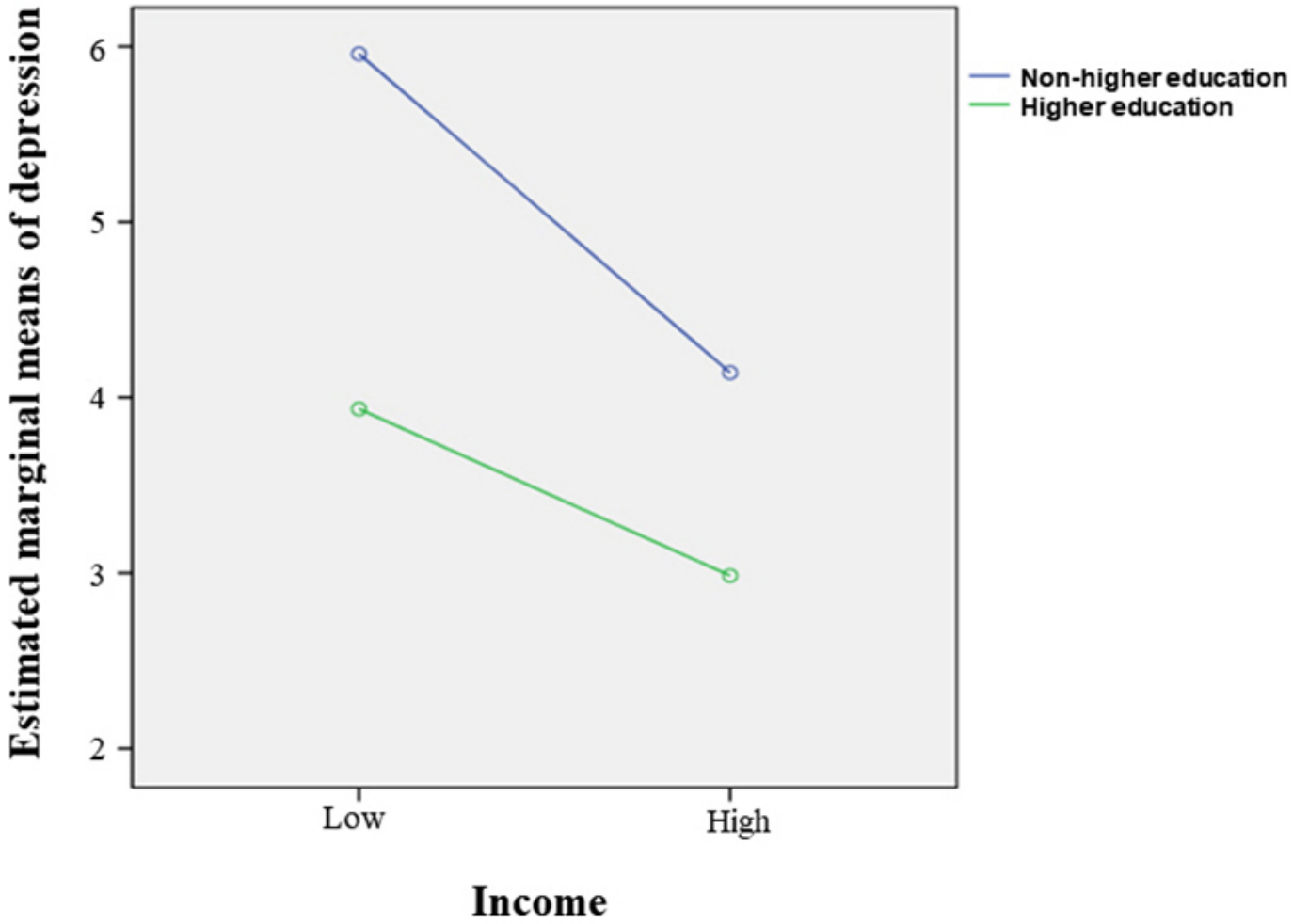

FIGURE 1. Income and education on men's depression.

icant interaction effect, indicating that educational attainment moderated the relationship between income and depression among young adult men ($\beta = 0.27, p < 0.05$). Fig. 1 shows the interaction effect. As we used the mean value of income to divide young adults into two groups (a lower income group and a higher income group), the lower income group indicates those with a below average income, while the higher income group includes those with an above average income. Regardless of higher education status, income greatly influenced young adult men's depression. In other words, regardless of education level, young adult men who earned a lower income reported higher levels of depression compared to those who earned a higher income. However, there was a differential effect of income on depression between young adult men with higher education and those who did not receive higher education. Among young adult men earning a lower income, those with higher education showed lower levels of depression compared to those without higher education (5.96 for the non-higher education group *vs.* 3.93 for the higher education group). The results were the same for the higher income groups. However, the effect of educational attainment on depression was greater for men who earned a lower income compared to those who earned a higher income (a 2.02 difference in depression score for the lower income group *vs.* a 1.15 difference in depression score for the higher income group).

4. Discussion

Using a nationally representative sample of young adult men in the United States, this study examined the association between income and depression among young adult men and investigated how educational attainment influenced the relationship. Men's income differences were related to depression, and we found an interaction effect indicating that educational attainment significantly moderated the relationship between men's income and depression.

This study's findings support previous research on the inverse association between income and depression [7–12]. It is well established that individuals with a higher SES and/or more economic resources are less likely to be depressed compared to those who have fewer. However, compared to women's mental health and psychological well-being, less attention has been given to men's mental health, perhaps because women are more likely to report depression than are men. Further, as the labor market has become more competitive and unstable since the financial crisis of 2007–2008 and the COVID-19 pandemic, and thus men have faced more challenges to employment [23], men may not be satisfied with their current salary, in that it may not be enough to meet their basic needs and sustain an adequate quality of life. As more young adult men do not have a high-paying job or earn lower incomes,

men in the labor market are perhaps more likely to suffer from depression. Along with the difficulties associated with earning a lower income, income inequality has expanded over time [27, 28], and although our study utilized data from 2018, the prevalence of depression among adult men has only increased since the onset of the COVID-19 pandemic in 2019–2020 [29, 30]. Thus, depending on the economic environment, men can also frequently feel depressed because of income differences.

This study also confirmed that men's educational attainment was inversely related to depression, which is consistent with previous research [13, 14, 16–18]. However, a large body of studies have primarily addressed the relationship among adult women. The current study sheds light on men's mental health and the influence of men's educational attainment on depression. Generally, individuals who have attained a post-high school degree have better opportunities to gain a high-paying job with job security than those with a high school degree or below [17, 20]. Education is helpful to develop skills, knowledge and social capital that makes an individual more competitive in labor force, thus leading to fewer mental health problems, which is supported by our study's findings [14, 16, 17]. Thus, it is necessary to emphasize the importance of the effect of higher education on depression among adult men.

Moreover, we found an interaction effect that indicated that young adult men's educational attainment moderated the association between their income and experience of depression. We found that young adult men who received higher education were less likely to be depressed, regardless of whether they earned a lower or higher income, compared to men without higher education. This implies that men who did not receive higher education and who also earn a low wage might feel they have no hope or chance for upward mobility, resulting in higher levels of depression. Further, men who earned a higher income but who did not attain higher education also reported greater depression than men who earned a higher income but had received higher education. It is possible that men without higher education may experience some amount of bias or underestimation of their abilities in the workplace due to their lack of traditional higher education, even if they are earning a higher-than-average salary. Given that the effect of income on depression is greater for men without higher education, education should be provided to young men about opportunities for trade schools or apprenticeship programs, for example, which may lead to high paying jobs even without traditional higher education. In addition, we suggest that men who did not receive higher education have access to job training programs and programs for job search and career development to bolster their earnings potential, which thus may reduce depression.

5. Conclusions

The current study contributes to better understanding men's depression and how income influences depression. In this study, given that young adult men with higher incomes were less likely to suffer from depression, job training programs and other assistance to obtain employment should be provided to young adult men to help them gain employment and job security as well as, indirectly, reduce their levels of depression. Given that higher education is a typical next step after high school graduation, young men should be encouraged to receive higher education, ideally through grant or low-interest-rate loans to make education access easier and more equitable for all. Increased access to higher education may help men attain a higher-paying job, which may buffer against depression. Job-related programs and assistance for job search and career development, particularly related to careers for people without traditional higher education, are critical to men without higher education because their income more significantly influences depression levels as compared to men who have attained higher education.

AVAILABILITY OF DATA AND MATERIALS

The data presented in this study are available on reasonable request from the corresponding author.

AUTHOR CONTRIBUTIONS

JL—Study Design, Data Analysis. JL and JA—Writing Original Draft. JL and JA—Manuscript Review and Editing. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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