Psychosocial job quality and mental health among young workers: a fixed-effects regression analysis using 13 waves of annual data
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There has been limited research on the experience of young people entering into work. Our study indicates that younger workers may experience a decline in mental health, unless they are entering into a job characterized by high psychosocial work qualities. This suggests that promoting high-quality psychosocial work for younger workers will protect and promote their mental health.

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Key terms: fixed-effects regression; job quality; longitudinal study; mental health; mental ill-health; mental well-being; psychosocial; psychosocial job quality; psychosocial working condition; young worker

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Objectives  Entry into employment may be a time when a young person’s well-being and mental health is challenged. Specifically, we examined the difference in mental health when a young person was “not in the labor force” (NILF) (ie, non-working activity such as participating in education) compared to being in a job with varying levels of psychosocial quality.

Method  The data source for this study was the Household Income and Labor Dynamics in Australia (HILDA) study, and the sample included 10 534 young people (aged ≤30 years). We used longitudinal fixed-effects regression to investigate within-person changes in mental health comparing circumstances where individuals were NILF to when they were employed in jobs of varying psychosocial quality.

Results  Compared to when individuals were not in the labor force, results suggest a statistically significant decline in mental health when young people were employed in jobs with poor psychosocial working conditions and an improvement in mental health when they were employed in jobs with optimal psychosocial working conditions. Our results were robust to various sensitivity tests, including adjustment for life events and the lagged effects of mental health and job stressors.

Conclusions  If causal, the results suggest that improving the psychosocial quality of work for younger workers will protect and promote their wellbeing, and may reduce the likelihood of mental health problems later on.

Key terms  longitudinal study; mental ill-health; mental well-being; psychosocial working condition.

Adolescence and early adulthood is the peak age of onset for many mental disorders, with 75% of lifetime cases of mental illness having their first onset by age 24 (1). However, people in this age group are less likely than others to seek professional help (2). This is problematic because early-age onset of mental disorder is associated with a longer duration of untreated illness and poorer long-term outcomes (3).

The development of a mental health problem also impairs participation in the labor force (4). However, evidence suggests that this relationship is likely to be bidirectional, whereby not participating in work contributes to mental health problems and vice versa (5). Across all age groups, research is also emerging that poor quality employment is worse for mental health than having no job at all (6, 7). Thus, poor quality jobs may damage mental health even to the extent that a person may leave employment all together, while high quality jobs may promote mental health and wellbeing as well as workforce engagement. High quality work promotes positive interactions with others (colleagues, supervisors, etc) and skill development and learning, as well providing benefits such as pay and security (8). These factors have been found to be associated with greater job satisfaction among young workers, which in turn, is related to a reduced likelihood of them leaving the workforce (9).

Currently, young people in Australia aged 15–24 years comprise about 30% of all employed persons (10), with a proportion of these people also studying, and being employed in part time and casual work. Younger workers may face a number of challenges when entering the workforce (11). A recent study analyzing the Household Income and Labor Dynamics in Australia (HILDA) cohort showed that younger workers consistently report lower job control than their older counterparts (12). Earlier working population-based studies have also shown higher...
prevalence of job strain (low control jobs with high psychological demands), higher prevalence of unwanted sexual advances at work, and higher prevalence of casual and temporary employment among younger workers (13–16). Other studies have shown that young workers are particularly vulnerable to bullying and conflict with supervisors and colleagues (17) and perceive greater inequity in their treatment at work compared to other workers (18). There is also some evidence that the adverse employment circumstances young people find themselves in are associated with the risk of depression or anxiety (19). Further, early adversities experienced at work may have negative effects on well-being and depressive symptoms years after they are experienced (20). Conversely, positive early experiences at work can present an opportunity for young people to develop resilience and the ability to adapt to challenges at work (20, 21). As mentioned above, positive experiences in the workplace – such as support from colleagues and supervisors and the opportunity for skill development and learning – have been found to predict greater retention of young people in the workforce (9).

Recently, we published an article using an existing longitudinal data source showing that the relationship between job stressors and mental health is mainly contemporaneous (22). In the present article, we specifically focus on young workers in the same cohort to examine the impact of young people’s entry into paid work on their mental health. We were specifically interested in the difference in mental health when a person moved into a job with a poor psychosocial work environment, and the difference in mental health when a person moved into a job with a poor psychosocial work environment.

**Hypotheses**

We hypothesized that young persons (≤30 years) in jobs with high psychosocial job quality will have an improvement in mental health compared to when they are not in employment, while young persons in work with poor psychosocial job quality will experience a decline in mental health compared to when they are not in employment. A cut-off of 30 years of age was chosen given that young people may be undertaking tertiary education well into their mid or late 20s.

**Methods**

**Data source**

The HILDA survey is a longitudinal, nationally representative study of Australian households established in 2001, with 13 years of data currently available for analysis. The first wave collected detailed information from >13 000 individuals within >7000 households (23). The response rate to wave 1 was 66% (23). The survey covers a range of dimensions including social, demographic, health, and economic conditions using a combination of face-to-face interviews with trained interviewers and a self-reporting questionnaire. Although data are collected on each member of the household, interviews are only conducted with those >15 years of age.

The initial wave of the survey began with a large national probability sample of Australian households occupying private dwellings (23). Interviews were sought in later waves with all persons in sample households who had attained 15 years of age. Additional persons have been added to the sample as a result of changes in household composition with a top-up sample of 2000 people added to the cohort in 2011 to allow better representation of the Australian population using the same methodology as the original sample (ie, a three-stage area-based design) (24). The response rates for new respondents who join the HILDA survey are >70% and the (wave-to-wave) retention rate for respondents who continue in the survey is >90% (23). The Australian Department of Social Services approved this study.

The analytic sample can be seen in figure 1. We first selected people <30 years of age only. Following this, people who had information on mental health and psychosocial job quality and other covariates were selected (described further below).

**Outcome variable: mental health**

The Mental Component Summary (MCS) of the Short Form 36 (SF-36) measure was used as the primary outcome measure. The SF-36 is a widely used self-completion measure of health status and has been validated for use in the Australian population and to detect within-person change over time (25). The MCS score represents a summary measure of mental health and well-being constructed from the eight subscales but with strongest factor loadings on the mental health, vitality, and emotional and social role functioning scales (25). Thus, this is an integrated measure of overall mental health, rather than a scale measuring clinical factors. The SF-36 in the HILDA survey has been shown to be psychometrically sound, with good internal consistency, discriminant validity, and high reliability (25). The mean score on the MCS in HILDA was approximately 49.8, with a standard deviation (SD) of 10.3. Higher scores represent better mental health. The range of the MCS is 1–100, with 100 representing optimal functioning. All of the SF-36 scales demonstrated acceptable internal consistency, with Cronbach’s alpha ranging from 0.82 (mental and general health) to 0.93 (physical functioning). These reliability scores are similar to those reported in previous Australian research (25).
Main exposure variable: psychosocial job quality

A multidimensional measure of psychosocial job quality was constructed using the measures of psychosocial job characteristics available in the HILDA survey (job control, job demands and complexity, job insecurity, and unfair pay). Full details of the construction and validation of the job quality measure are presented elsewhere (6, 26, 27) and the measure is strongly related to widely used measures of job demands and control (6). In brief, factor analysis and structural equation modelling identified three separate factors: job demands and complexity (three items); job control (three items); and perceived job security (three items). An additional single item assessing whether respondents considered that they were paid fairly for their efforts at work was included as a fourth factor measuring an important aspect of the effort–reward imbalance model (28). The individual scales were associated with more widely used measures of job demands and control (6). In brief, factor analysis and structural equation modelling identified three separate factors: job demands and complexity (three items); job control (three items); and perceived job security (three items). An additional single item assessing whether respondents considered that they were paid fairly for their efforts at work was included as a fourth factor measuring an important aspect of the effort–reward imbalance model (28).

Information on other covariates
10 534 people
39 761 observations

Other covariates

We include time-varying potential confounders in regression models and descriptive tables: age (measured continuously); highest level of education (postgraduate, bachelor, certificate or diploma, year 12, less than year 12); presence of disability or long term health condition (yes/no) and household structure (couple or single adult residing with dependents, couple without dependents, single person without dependents, and a group or multiple person household), and household equalized income. Household equalized household income is an indicator of the economic resources available to a standardized household. Values are centered around the mean income per year, and divided by AUS$10 000. We also considered the following life events as possible risk factors for changes in mental health in sensitivity analysis: separated from spouse; got married/got back together with spouse; self/close family member went to jail; birth/pregnancy; death of a close friend/relative or family member/spouse or child.

Analytical approach

Longitudinal linear fixed-effects regression models were used to estimate the association between psychosocial job quality (exposure) and mental health (outcome). Fixed effect models show that MCS for the $i$th of $N$ individuals is predicted by time-varying psychosocial job quality (optimal, 1 adversity, 2 adversities, $\geq 3$ adversities, compared to the reference NILF) ($\beta_1$JobQuality$_{it}$) and time-varying covariate ($X_{it}$). In equation A, $\mu_i$ refers to the unit-specific error term (eg, person-specific error term) that differs between persons, whereas $\epsilon_{it}$ is the error term associated with all regression models (eg, varies across individuals and over time) (30, 31). The term $\mu_i$ is included in the formula because it allows researchers to explicitly state that the persons-units are a source of error and controlled in the model as well as normal sources of error that vary across time and person ($\epsilon_{it}$).

Equation A. Fixed-effect model

$MCS_{it} = \beta_0 + \beta_1$JobQuality$_{it} + \beta_2X_{it} + \mu_i + \epsilon_{it}$

Fixed-effect analysis takes the mean of the observations when a person was “exposed” to NILF (eg, the years when a person was not employed) over time, and compares these the mean of observations when a person was employed in poor/good psychosocial job quality (poorest quality jobs). This measure has been used in other studies on mental health (6), physical health (26), and sickness absence (29). Our reference category was “not in the labor force” (NILF). Undertaking education was the main reason for being NILF in the sample.

Figure 1. Analytic sample.
over time. Hence, these models provide an indication of within-person effects, where each individual acts as their own control and estimates are not confounded by personal, demographic and environmental factors that do not change over time (time-invariant) (32). Fixed-effects models are particularly useful where time-invariant confounding is likely to cause bias in causal estimates. For example, both mental health and perceived psychosocial working conditions may be affected by within-person factors such as personality, early childhood experiences, or medical history (each of which are time invariant in the analyses conducted). As mentioned above, we controlled for time-varying (or variant) confounding in equation A by including a number of relevant covariates (age, household structure, health status, and education) in the fixed-effects models. Each variable in the analysis was available from 2001–2013.

With respect to the time between exposure and outcome, psychosocial job quality and mental health were analysed in the same year. This is based on evidence from a previous panel study of four annual waves showing that changes in job stressors were associated with changes in mental health over a one-year time frame (33) as well as previous analyses in the HILDA dataset showing that most of the effect of job stressors on scaled measures of mental health was contemporaneous (22, 34).

We conducted a sensitivity analysis excluding those who were still in part- or full-time education. The rationale for this was that those who were still studying while also working may be less psychologically invested in their jobs than those not studying, and thus be less exposed to or concerned about what was happening in the workplace. We then conducted a sensitivity analysis including life events as possible confounders as well a further analysis assessing the relationship between each of the four psychosocial job stressors in the psychosocial job quality scale with mental health. This provided information about the extent to which results were driven by specific job stressors. Last, we assessed the impact of lagged mental health and job stressors on mental health using an Arellano-Bond model. As we have previously described (22), this model uses the first-difference model and applies a generalized method of moments (GMM) estimator where earlier lagged values of the explanatory and outcome variables are used as instrumental variables for the lagged change in the outcome variable. Analysis was conducted using Stata 14.1 (StataCorp, College Station, TX, USA).

**Results**

Table 1 describes the frequency of persons and observations in each of the employment states while table 2 shows the key demographics of the sample. We include summary measures from each individual’s first and last contributed waves (not necessarily same calendar years) in HILDA to describe how the sample changes over time. The average age at the entry to the study was 20.5 years, and the average age at the last recorded observation was 24 years. The income in the initial wave was approximately AUSS36 500, and this rose to approximately AUSS44 000 in the final wave. There were equal numbers of men and women in the sample, and this remained consistent over time. Household structure changed over time, with an increase in couple and single-person households. This probably reflects the shift from young people living with their family (“couple with children”) to on their own or with others. There was an increase in the proportion of people employed from 60.6% to 71.6%, and a corresponding reduction in those who were NILF, falling from 29% to 20%. Of those who were employed, there was an increase in permanent jobs (45% to 55%) and a decrease in casual jobs (42% to 30%). Those in high-skill occupations also increased (21% to 28%). Participants in the sample were slightly more likely to move into optimal (no adversities such as low control, high demands, low security, and unfair pay) work (26% to 27%) and less likely to move into work with adversities over the course of the study. For the entire sample, education levels increased over time, with the proportion of observations reporting a certificate/diploma rising from 18% to 25%, and bachelor degrees from 10% to 15%. The presence of long-term health conditions/disability was relatively stable, with only a 0.7% increase in final waves reporting the presence of a health issue.

Table 3 shows descriptive results for overall mean levels of mental health associated with different employment states (average of all contributed waves in that state) and, among the employed, the overall mean score of mental health associated with being in jobs with different levels of psychosocial job stressors. Overall, the greatest disparities in mental health were found in relation to psychosocial job quality. Compared to those employed in jobs with optimal psychosocial working conditions, people working in a job with ≥3 adversities report levels of mental health close to six points lower. It should be noted that this descriptive analysis pools

| Not in the labor force | People | Observations |
|------------------------|--------|--------------|
| Psychosocial job quality | 11 189 |
| (number of adversities) | 5018  |   |
| 0                      | 4247  | 8393 |
| 1                      | 7624  | 18 627 |
| 2                      | 4227  | 7082 |
| ≥3                     | 1800  | 2449 |

Table 1. Frequency of NILF (“not in the labor force”) and employment by psychosocial job quality, people, and observations. The sample only included those aged ≤30 years.
Psychosocial job quality and mental health in young workers

Table 4 shows the results of the longitudinal fixed-effects (within-persons) regression analyses, where we compared the average effects of being out of the labor force (eg, in education) to employment in jobs with optimal versus suboptimal psychosocial working conditions. The multivariate results show that, compared to when they are not in work (eg, education or the period just following school), being in optimal employment is associated with a slight improvement in mental health within persons. In comparison, there is a stepwise decrease in mental health when a person was employed in a job with ≥2 adversities. There was no statistical significant difference for individuals who moved from not being in the labor force to jobs with 1 adversity.

Results also show a slight decrease in mental health as people aged closer to 30 years (the upper age limit of the sample) and for those living without a partner or in a mixed household (eg, with those that are not family) compared to living as part of a couple. Those without long-term health conditions had significantly better mental health compared to when they reported a long-term health condition.

We conducted a further analysis removing those who were still studying while also working and found similar effects (supplementary table A, www.sjweh.fi/index.php?page=data-repository). Another analysis excluding NILF waves showed a clearer stepwise pattern between declining psychosocial job quality and declining mental health (supplementary table B, www.sjweh.fi/index.php?page=data-repository). Our sensitivity analysis including life events as possible confounders did not influence the relationship between employment and mental health (supplementary table C, www.sjweh.fi/index.php?page=data-repository).

Please note that the sample is smaller (5240 people, 17 861 observations) than in the models in the paper proper due to the restrictions necessary to perform this analytic procedure, limiting generalizability and power. This likely explains the fact that some of the results fall out of significance. Although, we would note that all the results are in the same direction. As can be seen, there is a small effect of lagged mental health. Further analysis revealed that job insecurity (coefficient -1.43, 95% CI -1.69– -1.17, P<0.001) was associated with the greatest decline in mental health for young people, followed by low fairness of pay (coefficient-1.17, 95% CI -1.42– -0.92, P=0.001), high job demands (coefficient -0.48, 95% CI -0.73– -0.23, P<0.001), and low job control (coefficient -0.77, 95% CI -1.02– -0.51, P<0.001).
Discussion

We observed declines in mental health for people in jobs with ≥2 psychosocial adversities (low control, high demands, low security, and unfair pay) compared to when individuals were not in the labor force, while young people entering into high psychosocial quality work had a modest improvement in mental health. Put another way, these results indicate that young people working in poor psychosocial quality jobs may experience a small but statistically significant decline in mental health relative to when they were not in the labor force, but when in jobs with high psychosocial job quality, they experience an improvement in mental health. This suggests that promoting high quality psychosocial work for younger workers will protect and promote their well-being and may reduce the likelihood of later mental health problems, particularly if this sets the young person up for a working life characterized by good psychosocial quality jobs.

As the MCS of the SF-36 is not a clinical measure, it is difficult to draw conclusions regarding clinical significance. However, we would note that a difference of three points on one of the most dominant subscales (the 5-item Mental Health Inventory [MHI], which primarily assesses symptoms of depression and anxiety) has been suggested to reflect a minimally important difference (34) and a difference of four or more on the unstandardized scale has been characterized as indicating a moderately clinically significant effect (35). The MHI has reasonable validity and is an effective screening instrument for mood disorders or severe depressive symptomatology in the general population (36–39). The difference across levels of psychosocial job quality observed in our study was relatively small (2–3 points). Nevertheless, when combined with the observed stepwise dose–response by levels of psychosocial job quality, this suggests a causal relationship between psychosocial job quality and mental health among young workers.

There is limited quantitative research internationally with which to compare our findings on the experience of young people going into paid work. One of few we were able to find was a Swiss study on young adults entering the workforce after vocational training into five different occupational groups (21). Results suggest the factors that contributed to well-being among younger workers included improved job control and feeling appreciated at work (21). Data from the Queensland-based Young Workers Advisory Service (YWAS) in 2007 showed that young workers frequently seek help from the YWAS for three main reasons: (i) low level of pay and conditions (pay/remuneration); (ii) a high level of precariousness in employment (dismissal/redundancy), and; (iii) a high level of vulnerability to exploitation (employment conditions) (18). Two further areas of concern included the low quality of many young workers’ jobs (including their lack of access to training and skills upgrading) and workplace bullying, which constituted one-fifth of all
employment-related concerns reported to YWAS. These findings are consistent with previous research showing that jobs with high job strain (low control combined with high demands) have an adverse effect on job-related learning (40) as well as our previous research that younger workers have lower levels of job control than their older counterparts (12).

Our research also extends previous Australian research on psychosocial job quality and mental health (6, 41), in particular strengthening causal inference with the fixed-effects approach. Our research has also demonstrated the importance of psychosocial job quality for the mental health of young workers. Using the US National Longitudinal Survey of Youth (NLSY), Zimmerman et al (42) has shown that jobs with higher "social and occupational status" are associated with lower depressive symptoms for young employed males, while physically uncomfortable or dangerous jobs are associated with more depressive symptoms for young women. Other studies have highlighted the importance of psychosocial job quality on the wellbeing on young people over the course of their working life (43).

There are a number of factors that need to be taken into consideration in assessing these results. First, our outcome and exposure variables are self-reported; thus there is a possibility for dependent misclassification (common method variance), whereby errors in the exposure and outcome are correlated; to the extent the drivers of dependent misclassification (such as negative affect) are time invariant, they will be controlled for by the fixed-effects approach. In addition to the stressors contributing to the job quality measure used in this study, there are many other important psychosocial aspects of the work environment that were not included that could also have an influence on mental health (eg, social support and bullying at work), suggesting our findings provides a conservative estimate of the influence of workplace psychosocial stressors on mental health. We were also not able to ascertain other potential confounders, such as the young person's role in their household, so we could not accurately measure their living arrangements or capture the transition from living at home with parents to living with others, which is another potentially important influence on mental health.

As exposure to psychosocial job quality and mental health were modelled contemporaneously in our models (measured in the same wave), we acknowledge the potential for reverse causality (ie, poor mental health could influence psychosocial job quality). Previous research assessing the potential for reverse causation between job demands and control and mental health has found some evidence for reciprocal causal relationships between work characteristics and mental health, but the effects of work characteristics on mental health were causally dominant (32). Recent research we have conducted also suggests that the relationship between job stressors and mental health in mainly contemporaneous (22). The sensitivity analysis including lagged effects suggested results in the same direction as the main tables reported in the manuscript (albeit being non-significant). Finally, there may be differences in the relationship between job quality and mental health by gender, and thus we would suggest this as an area of future research.

In stating these limitations, there were a number of strengths in this study. These included the ability to examine the relationships between psychosocial working conditions and mental health over time using a large representative national sample. We were able to use a previously validated measure of psychosocial job quality. The fixed-effects analytical approach allowed us to examine causally-robust within-person associations controlling for both measured and unmeasured time-invariant confounders that may have otherwise biased results even though the estimates obtained, strictly speaking, are generalizable only to those participants reporting changes in exposure over their contributed waves (and not to the entire source population). Our study provides a novel contribution to research as it is among the first to assess the relationships between employment, mental health, and psychosocial quality of jobs among young Australian workers. Specifically, this paper simultaneously assesses both the potential harmful aspects of working conditions, as well as the benefits of good quality work for mental health.

Work can provide many benefits to life satisfaction, well-being, and the development of resilience, including the promotion of self-efficacy and self-esteem, a sense of structure and meaning, the development of social connections, support to extend family and neighborhood networks, and the provision of income (44). Having a healthier workforce also holds the potential to result in better productivity outcomes for employers, and lower reliance on social welfare. Thus, promoting high quality psychosocial work for younger workers acts to protect and enhance their well-being, and may subsequently reduce the likelihood of later mental health problems, particularly if this sets the young person up for a working life characterized by good psychosocial quality jobs. This involves a combination of reducing the presence of psychosocial job stressors at the same time as promoting the positive aspects of work (44). Addressing both these factors is recognized as the most integrated and long-term beneficial way of improving workplace mental health.

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Competing interests
The authors declare no conflicts of interest.

References
1. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. Arch Gen Psychiatry. 2005;62(6):593–602. https://doi.org/10.1001/archpsyc.62.6.593.
2. Burgess PM, Pirkis JE, Slade TN, Johnston AK, Meadows GN, Gunn JM. Service Use for Mental Health Problems: Findings from the 2007 National Survey of Mental Health and Wellbeing. Aust N Z J Psychiatry. 2009;43(7):615–23.
3. McGorry PD, Purcell R, Goldstone S, Amminger GP. Age of onset and timing of treatment for mental and substance use disorders: implications for preventive intervention strategies and models of care. Curr Opin Psychiatry. 2011;24(4):301–6. https://doi.org/10.1097/YCO.0b013e3283477a09.
4. Butterworth P, Leach L, Pirkis J, Kelaher M. Poor mental health influences risk and duration of unemployment: a prospective study. Soc Psychiatry Psychiatr Epidemiol. 2012;47(6):1013–21. https://doi.org/10.1007/s00127-011-0409-1.
5. Paul KI, Moser K. Unemployment impairs mental health: Meta-analyses. J Vocat Behav. 2009;74(3):264–82. https://doi.org/10.1016/j.jvb.2009.01.001.
6. Butterworth P, Leach LS, Strazdins L, Olesen SC, Rodgers B, Broom DH. The psychosocial quality of work determines whether employment has benefits for mental health: results from a longitudinal national household panel survey. Occup Environ Med. 2011;68(11):806–12. https://doi.org/10.1136/oem.2010.059030.
7. Broom DH, D’Souza RM, Strazdins L, Butterworth P, Parslow R, Rodgers B. The lesser evil: Bad jobs or unemployment? A survey of mid-aged Australians. Soc Sci Med. 2006;63(3):575–86. https://doi.org/10.1016/j.socscimed.2006.02.003.
8. Jones W, Haslam R, Haslam C. How do people differentiate between jobs: and how do they define a good job? Work. 2012;41 Suppl 1:818–21.
9. Taris AW, van der Velde EG, Feij JA, van Gastel JHM. Young Adults in their First Job: The Role of Organizational Factors in Determining Job Satisfaction and Turnover. J Youth Adolesc. 1992;4(1):51–71. https://doi.org/10.1008/02673843.1992.9747723.
10. ABS. Labour Force, Australia, Apr 2015. Cat. No. 6202.0. Canberra: Australian Bureau of Statistics; 2015.
11. Vuolo M, Staff S, Mortimer JT. Weathering the Great Recession: Psychological and Behavioral Trajectories in the Transition From School to Work. Dev Psychol. 2012;48(6):1759–73. https://doi.org/10.1037/a0026047.
12. LaMontagne AD, Knijacki L, Kavanagh AM, Bentley R. Psychosocial working conditions in a representative sample of working Australians 2001–2008: an analysis of changes in inequalities over time. Occup Environ Med. 2013;70(9):639–47. https://doi.org/10.1136/oemed-2012-101171.
13. LaMontagne AD, Keegel T, Vallance D, Ostry A, Wolfe R. Job strain - attributable depression in a sample of working Australians: assessing the contribution to health inequalities. BMC public health. 2008;8:181. https://doi.org/10.1186/1471-2458-8-181.
14. LaMontagne AD, Smith PM, Louie AM, Quinlan M, Ostry A, Shoveller J. Psychosocial and other working conditions: Variation by employment arrangement in a sample of working Australians. Am J Ind Med. 2012;55(2):93–106. https://doi.org/10.1002/ajim.21038.
15. LaMontagne AD, Smith PM, Louie AM, Quinlan M, Shoveller J, Ostry AS. Unwanted sexual advances at work: variations by employment arrangement in a sample of working Australians. Aust NZ J Publ Heal. Apr 2009;33(2):173–9. https://doi.org/10.1111/j.1753-6405.2009.00366.x.
16. Louie AM, Ostry A, Quinlan M, Keegel TG, Shoveller J, LaMontagne AD. Empirical study of employment arrangements and precariousness in Australia. Industrial Relations. 2006;61(3):465–89. https://doi.org/10.7202/014186ar.
17. Frone MR. Interpersonal conflict at work and psychological outcomes: testing a model among young workers. J Occup Health Psychol. Apr 2000;5(2):246–55. https://doi.org/10.1037/1076-8998.5.2.246.
18. McDonald P, Bailey J, Oliver D, Pini B. Compounding Vulnerability? Young Workers’ Employment Concerns and the Anticipated Impact of the WorkChoices Act. Australian Bulletin of Labour. 2007;33(1):60–88.
19. Melchior M, Caspi A, Milne BJ, Danese A, Poulton R, Moffitt TE. Work stress precipitates depression and anxiety in young, working women and men. Psych Med. 2007;37(8):1119–29.
20. Mortimer JT, Staff J. Early work as a source of developmental discontinuity during the transition to adulthood. Dev Psychopathol. 2004;16:1047–70. https://doi.org/10.1017/S0954579404040131.
21. Semmer N, Tschan F. Young adults entering the workforce in Switzerland: Working conditions and well-being. In:
Kriesi H, Farago P, Kohli M, Zarin-Nejad M, eds. Contemporary Switzerland: Revisiting the special case. New York: Palgrave Macmillan; 2005:163–89. https://doi.org/10.1057/9780230523586_8.

22. Milner A, Aitken Z, Kavanagh A, LaMontagne AD, Petrie D. Persistent and contemporaneous effects of job stressors on mental health: a study testing multiple analytic approaches across 13 waves of annually collected cohort data. Occup Environ Med. 2016;73(11):787–93. https://doi.org/10.1136/oemed-2016-103762.

23. Wilkins R. Families, Incomes and Jobs, Volume 8: A Statistical Report on Waves 1 to 10 of the Household, Income and Labour Dynamics in Australia Survey. Melbourne: Melbourne Institute of Applied Economic and Social Research Faculty of Business and Economics; 2013.

24. Watson N. Methodology for the HILDA top-up sample. Hilda Project Technical Paper Series No 1/11. Melbourne: Melbourne Institute; 2011.

25. Butterworth P, Crosier T. The validity of the SF-36 in an Australian National Household Survey: demonstrating the applicability of the Household Income and Labour Dynamics in Australia (HILDA) Survey to examination of health inequalities. BMC public health. 2004;4(1):44. https://doi.org/10.1186/1471-2458-4-44.

26. Butterworth P, Leach LS, Rodgers B, Broom DH, Olesen SC, Strazdins L. Psychosocial job adversity and health in Australia: analysis of data from the HILDA Survey. Aust NZ J Publ Heal. 2011;35(6):564–71. https://doi.org/10.1111/j.1753-6405.2011.00771.x.

27. Leach L, Rodgers B, Butterworth P, Strazdins L. Deriving an evidence-based measure of job quality from the HILDA survey. Australian Social Policy. 2010;9:67–86.

28. Siegrist J, Starke D, Chandola T, et al. The measurement of effort–reward imbalance at work: European comparisons. Soc Sci & Med. 2004;58(8):1483–99. https://doi.org/10.1016/S0277-9536(03)00351-4.

29. Milner A, Butterworth P, Bentley R, Kavanagh AM, LaMontagne AD. Sickness absence and psychosocial job quality: an analysis from a longitudinal survey of working Australians, 2005-2012. Am J Epidemiol. 2015;181(10):781–8. https://doi.org/10.1093/aje/kwu355.

30. StataCorp. Xreg — Fixed-, between-, and random-effects and population-averaged linear models. In: Release 14. Statistical Software. College Station, TX: StataCorp LP; 2014: 405.

31. Wooldridge JM. Advanced panel data methods. In: Introductory Econometrics: A Modern Approach. Mason, OH: South-Western Cengage Learning; 2009: 481.

32. Gunasekara FI, Richardson K, Carter K, Blakely T. Fixed effects analysis of repeated measures data. Int J Epidemiol. Feb 2014;43(1):264–9. https://doi.org/10.1093/ije/dyt221.

33. de Lange A, Taris T, Kompier M, Houtman I, Bongers P. Effects of stable and changing demand-control histories on worker health. Scand J Work Environ Health. 2002;28(2):94–108. https://doi.org/10.5271/sjweh.653.

34. Bentley RJ, Knijjckl AM, Kavanagh AM, LaMontagne AD. Do changes in job control influence mental health? A longitudinal fixed-effects regression analysis of an Australian national sample. American J Epidemiol. 2015;182(4):328-34. https://doi.org/10.1093/aje/kwv046.

35. Ware, JE, Jr. SF-36 health survey update. Spine. 2000; 25:3130–9. https://doi.org/10.1097/00007632-200012150-00008.

36. Contopoulous-Ioannidis, DG, Kargourni, A, Kouri, I & Ioannidis, JPA. Reporting and interpretation of SF-36 outcomes in randomised trials: systematic review. BMJ. 2009;338:a3006. https://doi.org/10.1136/bmj.a3006.

37. Rumpf, HJ, Meyer, C, Hapke, U & John, U. Screening for mental health: validity of the MHI-5 using DSM-IV Axis I psychiatric disorders as gold standard. Psychiatry Res. 2001;105:243–53. https://doi.org/10.1016/S0165-1781(01)00329-8.

38. Yamazaki, S, Fukuhara, S & Green, J. Usefulness of five-item and three-item Mental Health Inventories to screen for depressive symptoms in the general population of Japan. Health and Quality of Life Outcomes. 2005;3:48. https://doi.org/10.1186/1477-7525-3-48.

39. Gill, SC, Butterworth, P, Rodgers, B, Anstey, KJ, Villamil, E & Melzer, D. Mental health and the timing of men’s retirement. Soc Psychiatry Psychiatr Epidemiol. 2006;41:515–22. https://doi.org/10.1007/s00127-006-0064-0.

40. Taris TW, Feij JA. Learning and strain among newcomers: a three-wave study on the effects of job demands and job control. J Psychol. 2004;138(6):543–62. https://doi.org/10.3200/JRLP.138.6.543-563.

41. Broom DH, D’Souza RM, Strazdins L, Butterworth P, Parslow R, Rodgers B. The lesser evil: bad jobs or unemployment? A survey of mid-aged Australians. Soc Sci Med 2006;63(3):575–86. https://doi.org/10.1016/j.socscimed.2006.02.003.

42. Zimmerman FJ, Christakis DA, Vander Stoep A. Tinker, tailor, soldier, patient: work attributes and depression disparities among young adults Soc Sci Med. 2004;58(10):1889–901. https://doi.org/10.1016/S0277-9536(03)00410-6.

43. Lubbers R, Loughlin C, Zweig D. Young workers’ job self-efficacy and affect: Pathways to health and performance. J Vocat Behav 2005;67(2):199–214. https://doi.org/10.1016/j.jvb.2004.03.002.

44. LaMontagne AD, Martin A, Page KM, Reaveley NJ, Noblet A, Milner A, Keegel T, Smith PM. Workplace mental health: developing an integrated intervention approach. BMC Psychiatry. 2014;14. https://doi.org/10.1186/1471-244x-14-131.

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