ABSTRACT

Objectives There is strong evidence of a relationship between psychosocial job stressors and mental health at the population level. There has been no longitudinal research on whether the experience of job stressors is also associated with greater mental health service use. We seek to fill this gap.

Methods The Household Income Labour Dynamics in Australia survey cohort was used to assess the relationship between exposure to self-reported psychosocial job quality and reporting attendance at a mental health professional during the past 12 months. We adjusted for time-varying and time-invariant confounders. The study was conducted in 2009 and 2013.

Results In the random effects logistic regression model, increasing exposure to psychosocial job stressors was associated with an increased odds of mental health service use after adjustment (one stressor: OR 1.26, 95% CI 1.01 to 1.56; two stressors: OR 1.33, 95% CI 1.02 to 1.73; three stressors: OR 1.82, 95% CI 1.28 to 2.57). However, once the between person effects were controlled in a fixed effects model, the within-person association between change in job stressors and change in mental health service use was estimated to be close to zero and not significant.

Conclusions More work is needed to understand the relationship between job stressors and service use. However, when taken with past findings on job stressors and mental health, these findings highlight the importance of considering policy and clinical practice responses to adverse working contexts.

For many people with mental health problems, seeing a mental health professional is an important step in improving their symptomology.1 2 Yet, at a population level, there is an acknowledged gap between the experience of mental health problems and use of services.3 Research suggests that barriers and enablers of service use reflect demographic (eg, education, gender, age, ethnicity), economic (eg, income and wealth) and individual (eg, individual beliefs about healthcare services, presence of illness) factors.4–6 In high-income contexts, research has suggested that factors such as being female, having high education and income, reporting a long-term health condition and being unemployed are characteristics associated with greater likelihood of attending a health professional for a mental health problem.7–9 Structural factors such as employment and income have also been shown to have an influence on mental health.10–12 Of particular relevance to the current article is the influence of the working environment, including psychosocial job stressors such as low job control, high job demands and high levels of job insecurity. There is a substantial body of research showing that job stressors are prospectively associated with a range of common mental disorders.13–14 A past review across nine cohort studies demonstrated an elevated relative odds of depressive disorder in relation to high demands (OR 1.31, 95% CI 1.08 to 1.59), low control (OR 1.20, 95% CI 1.08 to 1.39) and low social support (OR 1.44, 95% CI 1.24 to 1.68).15 More recent reviews have continued to support the association between psychosocial job stressors and poor mental health.16–18

While there has been some research on psychosocial job stressors and general health services,19 there has been less research on mental health service use. This is important considering the most effective evidence-based approach to reducing mental health symptoms is treatment from mental health professionals providing pharmacological and/or psychosocial treatments.20–23 Acknowledging that the use of medications is a different construct than mental health service use, this body of research still implies a relationship between job stressor exposures and attendance on mental health.24–29 Of particular relevance to the current article is the influence of the working environment, including psychosocial job stressors such as low job control, high job demands and high levels of job insecurity. There is a substantial body of research showing that job stressors are prospectively associated with a range of common mental disorders.30–31 A past review across nine cohort studies demonstrated an elevated relative odds of depressive disorder in relation to high demands (OR 1.31, 95% CI 1.08 to 1.59), low control (OR 1.20, 95% CI 1.08 to 1.39) and low social support (OR 1.44, 95% CI 1.24 to 1.68).32 More recent reviews have continued to support the association between psychosocial job stressors and poor mental health.33–35

What is already known about this subject?

► There is good evidence that job stressors are associated with common mental disorders in the employed population.

► There is a lack of understanding of whether the experience of these stressors also prompts greater mental health service use.

What are the new findings?

► Results suggest those with job stressors had higher service use, but this association attenuated once person-specific factors were considered.

How might this impact on policy or clinical practice in the foreseeable future?

► More work is needed to understand how individual factors interact with those in working environment to influence mental health service use.

Key messages

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For many people with mental health problems, seeing a mental health professional is an important step in improving their symptomology.1 2 Yet, at a population level, there is an acknowledged gap between the experience of mental health problems and use of services.3 Research suggests that barriers and enablers of service use reflect demographic (eg, education, gender, age, ethnicity), economic (eg, income and wealth) and individual (eg, individual beliefs about healthcare services, presence of illness) factors.4–6 In high-income contexts, research has suggested that factors such as being female, having high education and income, reporting a long-term health condition and being unemployed are characteristics associated with greater likelihood of attending a health professional for a mental health problem.7–9 Structural factors such as employment and income have also been shown to have an influence on mental health.10–12 Of particular relevance to the current article is the influence of the working environment, including psychosocial job stressors such as low job control, high job demands and high levels of job insecurity. There is a substantial body of research showing that job stressors are prospectively associated with a range of common mental disorders.13–14 A past review across nine cohort studies demonstrated an elevated relative odds of depressive disorder in relation to high demands (OR 1.31, 95% CI 1.08 to 1.59), low control (OR 1.20, 95% CI 1.08 to 1.39) and low social support (OR 1.44, 95% CI 1.24 to 1.68).15 More recent reviews have continued to support the association between psychosocial job stressors and poor mental health.16–18

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at healthcare professionals, given people taking psychotropic medications have these prescribed by a (general or specialist) physician.

In this paper, we assess the influence of the psychosocial job stressors on mental health service use. Based on the literature reviewed above, a likely conceptual pathway supposes that psychosocial job stressors lead to increased distress, which in turn increases the likelihood of seeking treatment from a mental health professional. Recognising the likely influence of stable person-related (eg, personality, parental history of illness, gender, ethnicity) and time varying influences on mental health service use, we aim to control for these in the current research using longitudinal regression approaches. Our key question is: Controlling for both time varying and time invariant confounders, what is the influence of psychosocial job quality on mental health service use?

**METHODS**

**Data source**

The Household, Income and Labour Dynamics in Australia (HILDA) survey is a longitudinal, nationally representative study of Australian households, established in 2001. It collects detailed information annually from over 13,000 individuals within over 7,000 households. The initial wave of the survey began with a large national probability sample of Australian households occupying private dwellings. 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-completion questionnaire. The participation rate at wave 1 was 66% and interviews sought in each wave with all persons in sample households aged 15 years or older. Additional persons have been added to the sample as a result of changes in household composition. Inclusion of these new households is the main way the HILDA survey maintains sample representativeness. Furthermore, a top-up sample of 2000 people was added to the cohort in 2011 to allow better representation of the Australian population using the same methodology as the original sample. As described below, our variables of interest were collected in only a limited number of these waves. Because of this, the study years were confined to 2009 and 2013. The flow into the sample can be seen in figure 1.

**Outcome variable**

The main outcome measure was a binary variable representing service use from a mental health provider in the past 12 months (mental health service use). This was ascertained using the stem question: ‘During the last 12 months, have you seen any of these types of healthcare providers about your health?’ The participant was then presented with a large print show card displaying a number of health professionals including a mental health professional such as a psychiatrist or psychologist. These data were collected in 2009 and 2013.

**Exposure variable**

A multidimensional measure of psychosocial job quality was constructed from four distinct perceived job stressors: control, demands and complexity, job insecurity and unfair pay. Full details of the construction and validation of the job quality measure are presented elsewhere. In brief, factor analysis and structural equation modelling identified three separate factors, which were labelled: 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. The individual scales were associated with more widely used measures of job demands and control, and other employment conditions such as casual status, hours worked and shift work. Each factor was dichotomised at the 75th quartile to identify those experiencing the greatest adversity and the composite measure constructed by summing the number of adverse psychosocial job conditions (high job demands and complexity, low job control, high job insecurity and unfair pay). Because of the small number of respondents reporting all four job adversities in a single year/wave, this composite scale was top-coded at three and, thus, produced four categories ranging from optimal jobs to three or more psychosocial adversities (poorest quality jobs). In this study, we treat the overall index as a four-level categorical variable, scored from no psychosocial job stressors (0) to three or more stressors (3).
Confounders
We considered variables that could plausibly be considered as confounders for both reporting psychosocial job stressors and mental health service use. Confounders included gender (male or female), age (16–24, 25–29, 30–34, 35–44, 45–54 and 55–64 years), education (<year 12 [high school], high school, diploma or certificate, bachelors degree, postgraduate), household structure (couple without children, couple with children, lone parent with children, lone person and other), country of birth (Australia, English speaking, other country) and weekly household income (equalised) in quintiles. Previous research we have conducted suggests that occupational gender ratio (eg, the proportion of males to females employed in an occupation) is a predictor of treatment for a mental health problem. Other research also suggests differences in psychosocial working conditions by occupational gender ratio. Hence, occupational gender ratio was also considered as a possible confounder. We constructed a measure of whether an occupation was male dominated, female dominated or gender-neutral based on the 2006 census population level statistics from the Australian Bureau of Statistics. We made the decision not to adjust for baseline mental health because of the concern that this might in fact be on the causal pathway between the experience of psychosocial job stressors and treatment seeking for a mental health problem. However, we did conduct a sensitivity analysis controlling for long-term mental health problems (yes/no) and long-term health conditions (yes/no) (discussed below).

Analysis
As we had two periods of exposure (2009 and 2013), most participants were included in the analytic sample twice. To account for this, we conducted a random effects longitudinal logistic regression model with persons-specific clustering. We conducted both unadjusted (only the exposure and the outcome) and adjusted models (which also adjusted for all listed confounders). The coefficients produced from random effects models represent a weighted average of the estimates due to the within-person and between-person effects. In our case, the random effects coefficients for the effects of the psychosocial job quality index on treatment represent a combination of the relationship observed when we look at psychosocial job quality index and treatment across (or between) different people and the relationship occurring within persons (eg, changes in both psychosocial job quality index and treatment within the same person over time). When all unobserved effects (eg, person-specific effects not already controlled for) are independent from all explanatory variables in all time periods, both the between and within effects from the random effects models will be approximately equal and the combined random effects estimates provide causally robust estimates. However, if this does not hold then the between-person relationship observed will be bias by these unobserved person-specific effects which will in turn bias the random effects estimates. In this case, the within-person relationship by itself is likely to provide a more causally robust estimate of the relationship. The within-person relationship can be estimated through a linear fixed effects regression, and we additionally examined a logistic fixed effects approach as a sensitivity analysis to the random effects model. However, estimating a fixed effects regression in a logistic framework creates additional problems which we discuss below.

Following the estimation of the logistic random effects models, we calculated average marginal effects of psychosocial job stressors on the predicted probability of service use. Coefficients were converted to percentage point increases associated with the different number of psychosocial job stressors. Again, we conducted both unadjusted (exposure and outcome only) and adjusted models (also incorporating confounders). This allows the average absolute magnitude of the effect on service use to be calculated and enables us to compare the results of the logistic analysis to the results found in models discussed below. Incorporating fixed effects within a logistic framework when the number of observations for each individual is small can be problematic due to the incidental parameter problem and the issue of perfect predictions. The incidental parameter problem is due the fixed effect for each individual being estimated based on very few observations which introduces a small sample bias which then transfers over to bias the estimated impact due to the exposure. And while a conditional logistic model overcomes the incidental parameter issue by first eliminating (conditioning out) the fixed effects, individuals with no change in their outcome are excluded due to the perfect prediction issue (bringing into question the representativeness of those included) and it is impossible to estimate average marginal effects from such a model. So instead we revert to using a linear probability model with fixed effects (with robust standard errors (SEs)), which bypasses these issues but still provides a good approximation of the average marginal effect of job stressors on health service use. This allows us to examine the within-person changes in service use in relation to changes in job stressors, while also controlling for stable (unmeasured) person-related factors that may influence reporting of both the exposure and the outcome. We also estimated a random effects linear probability model to compare with the average marginal effects generated from the random effects logistic model to confirm that these produce similar results. Coefficients were converted to percentage point increases at different levels of the psychosocial job stressors (treated as categorical and referenced at 0). We then conducted a sensitivity analysing assessing the effect of a reported long-term mental illness where a person also reported they needed help or support. All models were adjusted for confounders. We also conducted an analysis examining the possible effect of long-term mental health problems (either physical or mental) on job stressors and mental health service use. No survey weights were used in the analysis.

RESULTS
Table 1 shows the mental health service use by levels of the psychosocial job quality index across both included waves. As can be seen, a greater proportion of people report seeing a mental health professional as the number of reported psychosocial job stressors increase. A description of the sample can be seen in table 2.

In the random effects logistic model, increasing exposure to psychosocial job stressors was associated with an increased

| Psychosocial job quality | No stressors (%) | One stressor (%) | Two stressors (%) | Three stressors (%) | Total (%) |
|-------------------------|-----------------|-----------------|------------------|---------------------|-----------|
| Total sample            |                 |                 |                  |                     |           |
| No                      | 95.4            | 94.3            | 93.7             | 91.8                | 94.30     |
| Yes                     | 4.6             | 5.7             | 6.3              | 8.2                 | 5.70      |
| Total (observations)    | 4199            | 7871            | 2903             | 1031                | 16,004    |
odds of mental health service use (relative to no stressors: one stressor: OR 1.26, 95% CI 1.01 to 1.56; two stressors: OR 1.33, 95% CI 1.02 to 1.73; three stressors: OR 1.82, 95% CI 1.28 to 2.57) after adjustment (table 3). From these, we estimated the implied average marginal effects of psychosocial job stressors on the predicted probability of service use. Compared with those reporting no stressors, respondents reporting one job stressor showed a 0.91 absolute per cent increase in service use (95% CI 0.07 to 1.75). Those reporting two stressors had 1.15% greater rate of service use (95% CI 0.08 to 2.24) while those reporting three job stressors showed 2.66% greater use of mental health services compared with those reporting no job stressors (95% CI 0.06 to 4.36).

Results for the other variables in the model (table 3) indicate that females had greater odds of seeing a mental health professional than males, while those employed in male-dominated occupations were less likely to seek treatment than those in gender neutral occupations. Older persons were less likely to see mental health professionals compared with younger persons. Compared with couples without children, those persons living alone (either with or without children) or in ‘multiperson’ households were more likely to attend mental health professionals. Couples with children were less likely to report seeing

### Table 2 Sample description at baseline

| Psychosocial job quality | Analytic sample % (n=16004) |
|--------------------------|-------------------------------|
| No stressors             | 26.24                         |
| One stressor             | 49.18                         |
| Two stressors            | 18.14                         |
| Three stressors          | 6.44                          |
| Occupational gender ratio|                               |
| Gender equal             | 22.32                         |
| Female dominated         | 35.61                         |
| Male dominated           | 42.07                         |
| Age group (years)        |                               |
| 16–24                    | 15.84                         |
| 25–34                    | 21.36                         |
| 35–44                    | 23.13                         |
| 45–54                    | 24.92                         |
| 55–64                    | 14.75                         |
| Household structure      |                               |
| Couple without children  | 25.72                         |
| Couple with children     | 48.76                         |
| Lone parent with child   | 7.39                          |
| Lone persons             | 13.82                         |
| Multiple persons         | 4.31                          |
| Education                |                               |
| Postgraduate             | 12.28                         |
| Bachelor                 | 17.22                         |
| Diploma or certificate   | 34.12                         |
| High school              | 17.13                         |
| Below high school        | 19.25                         |
| Country of birth         |                               |
| Australia                | 80.97                         |
| English speaking         | 8.74                          |
| Other country            | 10.29                         |
| Weekly income            |                               |
| Lowest                   | 3.22                          |
| 2                        | 9.21                          |
| 3                        | 20.04                         |
| 4                        | 30.29                         |
| Highest                  | 37.23                         |

### Table 3 Unadjusted and adjusted random logistic models, psychosocial job quality on mental health service use, HILDA 2009 and 2013, people=11039, observations=16004

|                        | Unadjusted | Adjusted |
|------------------------|------------|----------|
|                        | OR 95% U and L CI | P value | OR 95% U and L CI | P value |
| Psychosocial job quality|            |          |          |          |
| No stressors           | 1          | 1        | 1        | 1        |
| One stressor           | 1.28 1.03 to 1.59 | 0.026 | 1.26 1.01 to 1.56 | 0.037 |
| Two stressors          | 1.43 1.10 to 1.86 | 0.008 | 1.33 1.02 to 1.73 | 0.034 |
| Three stressors        | 2.00 1.42 to 2.83 | <0.001 | 1.82 1.28 to 2.57 | 0.001 |
| Occupational gender ratio|          |          |          |          |
| Gender equal           | 1          | 1        | 1        | 1        |
| Female dominated       | 0.99 0.79 to 1.23 | 0.92 | 0.83 0.66 to 1.05 | 0.124 |
| Male dominated         | 0.54 0.43 to 0.69 | <0.001 | 0.68 0.53 to 0.86 | 0.002 |
| Gender                 |            |          |          |          |
| Male                   | 1          | 1        | 1        | 1        |
| Female                 | 2.21 1.83 to 2.67 | <0.001 | 1.88 1.52 to 2.34 | <0.001 |
| Age group (years)      |            |          |          |          |
| 16–24                  | 1          | 1        | 1        | 1        |
| 25–34                  | 0.95 0.73 to 1.25 | 0.717 | 0.89 0.67 to 1.18 | 0.43 |
| 35–44                  | 0.99 0.76 to 1.31 | 1.000 | 1.10 0.82 to 1.47 | 0.527 |
| 45–54                  | 0.77 0.59 to 1.01 | 0.063 | 0.80 0.60 to 1.06 | 0.118 |
| 55–64                  | 0.39 0.27 to 0.55 | <0.001 | 0.36 0.25 to 0.53 | <0.001 |
| Household structure    |            |          |          |          |
| Couple without children| 1          | – 1      | 1        | – 1      |
| Couple with children   | 0.79 0.64 to 0.99 | 0.039 | 0.72 0.57 to 0.92 | 0.007 |
| Lone parent with child | 1.8 1.29 to 2.51 | <0.001 | 1.42 1.01 to 2.00 | 0.044 |
| Lone persons           | 1.78 1.37 to 2.33 | <0.001 | 1.68 1.28 to 2.21 | <0.001 |
| Multiple persons       | 1.32 0.86 to 2.02 | 0.202 | 1.23 0.80 to 1.88 | 0.353 |
| Education              |            |          |          |          |
| Postgraduate           | 1          | 1        | 1        | 1        |
| Bachelor               | 0.82 0.60 to 1.11 | 0.206 | 0.76 0.56 to 1.02 | 0.07 |
| Diploma or certificate | 0.64 0.48 to 0.84 | 0.001 | 0.66 0.50 to 0.88 | 0.004 |
| High school            | 0.70 0.51 to 0.95 | 0.023 | 0.60 0.43 to 0.83 | 0.002 |
| Below high school      | 0.41 0.29 to 0.57 | <0.001 | 0.42 0.30 to 0.59 | <0.001 |
| Country of birth       |            |          |          |          |
| Australia              | 1          | 1        | 1        | 1        |
| English speaking       | 0.89 0.65 to 1.23 | 0.497 | 0.99 0.72 to 1.36 | 0.96 |
| Other country          | 0.6 0.43 to 0.83 | 0.002 | 0.57 0.41 to 0.79 | 0.001 |
| Weekly income          |            |          |          |          |
| Lowest                 | 1          | 1        | 1        | 1        |
| 2                      | 0.74 0.45 to 1.24 | 0.251 | 0.79 0.47 to 1.31 | 0.352 |
| 3                      | 0.65 0.40 to 1.04 | 0.070 | 0.68 0.42 to 1.09 | 0.105 |
| 4                      | 0.63 0.40 to 1.01 | 0.053 | 0.68 0.43 to 1.08 | 0.100 |
| Highest                | 0.70 0.44 to 1.10 | 0.121 | 0.68 0.43 to 1.09 | 0.109 |

95% U and L CI, upper and lower CIs at 95% significance; p value, statistical significance at 95%. HILDA, Household, Income and Labour Dynamics in Australia. Adjusted models also control for year.
Table 4  Adjusted fixed and random effects OLS models, % increase in service use in response to psychosocial job quality, HILDA 2009 and 2013, people=11 039, observations=16004

| Psichosocial job quality | Fixed effects OLS | Random effects OLS |
|-------------------------|-------------------|-------------------|
|                         | % increase | 95% U and L CI | P value | % increase | 95% U and L CI | P value |
| No stressors            | 0         |                  |         | 0          |                  |         |
| One stressor            | −0.56     | −2.04 to 0.92   | 0.457   | 0.83       | 0.00 to 1.66    | 0.050   |
| Two stressors           | −1.31     | −3.29 to 0.68   | 0.197   | 1.08       | −0.02 to −2.18  | 0.054   |
| Three stressors         | −0.44     | −3.79 to 2.92   | 0.798   | 2.63       | 0.84 to 4.42    | 0.004   |
| Occupational gender ratio |          |                  |         |            |                  |         |
| Gender equal            | 0         |                  |         | 0          |                  |         |
| Female dominated        | −1.06     | −3.87 to 1.74   | 0.457   | −0.90      | −2.05 to 0.25   | 0.125   |
| Male dominated          | 1.76      | −0.92 to 4.43   | 0.198   | −1.49      | −2.53 to −0.45  | 0.005   |
| Gender                  |            |                  |         |            |                  |         |
| Male                    | 0         |                  |         | 0          |                  |         |
| Female                  | 2.81      | 1.89 to 3.7     | <0.001  |            |                  |         |
| Age group (years)       |            |                  |         |            |                  |         |
| 16–24                   | 0         |                  |         | 0          |                  |         |
| 25–34                   | 0.4       | −2.91 to 3.7    | 0.815   | −0.51      | −1.82 to 0.81   | 0.450   |
| 35–44                   | −0.65     | −5.32 to 4.02   | 0.786   | 0.36       | −1.01 to 1.73   | 0.607   |
| 45–54                   | −0.58     | −6.35 to 5.19   | 0.844   | −0.98      | −2.26 to 0.29   | 0.131   |
| 55–64                   | −2.05     | −8.79 to 4.68   | 0.550   | −3.54      | −4.86 to −2.22  | <0.001  |
| Household structure     |            |                  |         |            |                  |         |
| Couple without children | 0         |                  |         | 0          |                  |         |
| Couple with children    | −0.97     | −2.94 to 1.00   | 0.234   | −1.41      | −2.35 to −0.46  | 0.004   |
| Lone parent with child  | 1.15      | −3.5 to 5.81    | 0.627   | 1.80       | −0.01 to 3.61   | 0.052   |
| Lone persons            | 1.88      | −1.37 to 5.13   | 0.258   | 2.53       | 1.14 to 3.93    | 0.000   |
| Multiple persons        | 2.61      | −1.65 to 6.86   | 0.229   | 0.82       | −1.21 to 2.85   | 0.429   |
| Education               |            |                  |         |            |                  |         |
| Postgraduate            | 0         |                  |         | 0          |                  |         |
| Bachelor                | 2.24      | −5.33 to 9.82   | 0.562   | −1.33      | −2.88 to 0.21   | 0.091   |
| Diploma or certificate  | −1.2      | −9.86 to 7.46   | 0.786   | −1.98      | −3.38 to −0.58  | 0.005   |
| High school             | −2.64     | −11.64 to 6.35  | 0.565   | −2.38      | −3.96 to −0.8   | 0.003   |
| Below high school       | −4.78     | −14.56 to 5.01  | 0.338   | −3.76      | −5.24 to −2.27  | <0.001  |
| Country of birth        |            |                  |         |            |                  |         |
| Australia               | 0         |                  |         | 0          |                  |         |
| English speaking        | −0.11     | −1.42 to 1.21   | 0.873   |            |                  |         |
| Other country           | −2.29     | −3.39 to −1.19  | <0.001  |            |                  |         |
| Weekly income           |            |                  |         |            |                  |         |
| Lowest                  | 0         |                  |         | 0          |                  |         |
| 2                       | 2.08      | −3.43 to 7.59   | 0.459   | −1.16      | −3.85 to 1.53   | 0.399   |
| 3                       | 3.35      | −1.94 to 8.64   | 0.214   | −1.83      | −4.35 to 0.69   | 0.155   |
| 4                       | 3.15      | −2.22 to 8.51   | 0.251   | −1.89      | −4.38 to 0.6    | 0.136   |
| Highest                 | 3.63      | −1.86 to 9.12   | 0.195   | −1.91      | −4.41 to 0.6    | 0.136   |

% increase, % increase in service use in response to one point increase in job stressors; 95% U and L CI, upper and lower CIs at 95% significance; p value, statistical significance at 95%. HILDA, Household, Income and Labour Dynamics in Australia. Adjusted models also control for year.

mental health professionals. There was a noticeable gradient in education, with lower levels of education associated with lower odds of service use than those with the highest levels of educational attainment. Compared with those respondents born in Australia, migrants had lower odds of attending a mental health professional. The second panel of table 4 show that a random effects model using ordinary least squares (OLS) linear probability approach produced consistent results to the average marginal effects from the random effects logistic model. Results of the (adjusted) linear probability fixed effects model, however, indicate that once we remove the between-person association there was no estimated effect of psychosocial job stressors on mental health service use, with all the coefficients being small and insignificant (table 4). The unadjusted coefficients of the linear probability fixed effects were not markedly different from the adjusted results (available on request). We also estimated this model using a logistic regression fixed effects approach (while also acknowledging the likely problems with this, discussed above). Results were similar to those shown in table 4, but the sample size was markedly smaller (406 people, 812 observations).

Our analyses regarding the relationship between psychosocial job quality and service use while also controlling for a reported long-term mental illness and long-term health conditions can be seen in online supplementary table 1. As can be seen, a long-term mental illness and long-term health conditions were associated...
with greater service use in random effects models. Results for the main exposure and confounders are of similar magnitude but coefficient reduce in size.

DISCUSSION

The findings of this paper provide evidence of an association between psychosocial job quality and mental health service use. Those in poorer quality jobs are more likely to report mental health service use. However, the modelling approach adopted shows that this relationship between psychosocial job stressors and mental health service use is likely to be influenced by between-person differences on characteristics such as gender, personality and stable levels of mental health. There is both methodological and conceptual explanations for these results, as explained below.

Models of healthcare access (including Andersen’s Behavioural Model of Health Service Use4–6) suggest that an individual’s decision to seek help from health providers involves a complex set of predisposing (eg, demographic, social structural and individual beliefs about healthcare services) and enabling factors (eg, income and wealth, access and availability).4–6 The current paper adds to this literature by demonstrating the role of psychosocial job stressors on mental health service use, which appears to be largely driven by between-person differences, at least in the Australian context. It is possible that certain groups of people are selected into jobs characterised by a poor psychosocial working environment and that these persons are also those likely to seek treatment from a mental health professional. Our results also control for a number of other important demographic predictors of service use, including occupational gender ratio, gender, age, household structure, education and migrant status.

Fixed effects approaches suggested no relationship between psychosocial job stressors and service use. Low power may explain the lack of evidence to reject the null in the fixed effects linear probability results. However, it is important to note that the direction of coefficients in these models go in the opposite direction from the random effects models. Another explanation is that there is a different temporal relationship between job stressors and mental health service use than between job stressors and mental health. For example, it is possible that the decision to seek and attend treatment in response to job stressors may take a longer time than effects of job stressors on mental health (where past evidence suggests that there is a strong contemporaneous relationship). A further explanation is that job stressors may act as a barrier to service use, in that those in poor quality jobs may not have the time or flexibility to seek treatment. We would recommend more research on these possibilities.

The limitations of this paper include the fact that we were not able to assess help-seeking from other non-designated mental health providers, such as general practitioners. General practitioners are the most commonly sought providers for mental health problems in Australia.17 This is likely due to the fact that they are often the first professional contacted to provide referrals to more specialist mental health, such as psychologists or psychiatrists. Thus, our outcome represented a relatively specific aspect of the mental health system and this selectivity may have acted to reduce our associations towards the null. However, we note that the prevalence of help-seeking from mental health professionals in our sample was similar to that reported in the general population.17 Another limitation is that our outcome was self-reported service use. Hence, it was possible that there was some misclassification because people may not have recalled their service use accurately and hence it is difficult to assess whether this would have increased or decreased our observed effects size. It is also worth noting that our outcome was relatively blunt in terms of the fact that we were not able to examine the number of times a person may have received treatment. Other limitations include the lack of power in the fixed effects analyses (evident in the large CIs), which represented a more restrictive test of the within-person relationship between psychosocial job stressors and service use. This resulted in a less statistical power to detect an actual effect. Another limitation is that those who were excluded from the analytic sample were more likely to come from countries other than Australia, have a lower education and were less likely to seek treatment for a mental health problem. The exclusion of these people reduces the generalisability of the study. It is also important to acknowledge the modest participation rate in the first wave of the study.

In conclusion, our study suggests that use of mental health services does not temporally reflect variability in exposure to psychosocial job stressors. Thus, in this paper, the relationship between psychosocial job stressors and mental health service use is likely to be largely driven by differences between people. This suggests the need for attention to wider inequalities in working conditions and on demographic and structural factors that may promote help-seeking behaviours and timely access to services. At the same time, we would recommend the need for greater policy and programme attention to reducing job stressors, which are increasingly recognised as a significant determinant of mental health in the working population.

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REFERENCES
1 Hofmann SG, Smits JA. Cognitive-behavioral therapy for adult anxiety disorders: a meta-analysis of randomized placebo-controlled trials. J Clin Psychiatry 2008;69:621–32.
2 Linde K, Sigtermann K, Kriston L, et al. Effectiveness of psychological treatments for depressive disorders in primary care: systematic review and meta-analysis. Ann Fam Med 2015;13:56–68.
3 Wang PS, Lane M, Olsson M, et al. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005;62:629–40.
4 Andersen R, Newman JF. Societal and Individual Determinants of Medical Care Utilization in the United States. Milbank Q 2005;83:Online-only.
5 Babitsch B, Kohl D, von Lengerke T. Re-revisiting andersen’s behavioural model of health services use: A systematic review of studies from 1998-2011. Psychsoc Med 2012;9.
6 Andersen RM. Revisiting the behavioral model and access to medical care: does it matter?. *J Health Soc Behav* 1995;36:1–10.

7 Bijl RV, Ravelli A. Psychiatric morbidity, service use, and need for care in the general population: results of The Netherlands Mental Health Survey and Incidence Study. *Am J Public Health* 2000;90:602–7.

8 Wang PS, Berglund P, Olsson M, et al. Failure and delay in initial treatment contact after first onset of mental disorders in the national morbidity survey replication. *Arch Gen Psychiatry* 2005;62:603–13.

9 Wood N, Dann B, Hardy R, et al. Childhood socioeconomic position and adult mental wellbeing: Evidence from four British birth cohort studies. *PLoS One* 2012;12:e0185798.

10 Gilman SE. Review: there is marked socioeconomic inequality in persistent depression. *Evid Based Ment Health* 2003;6:75.

11 Eaton WW, Muntaner C, Borasso G, et al. Socioeconomic status and depressive syndrome: the role of inter- and intra-generational mobility, government assistance, and work environment. *J Health Soc Behav* 2001;42:277–94.

12 Lorant V, Deliège D, Eaton W, et al. Socioeconomic inequalities in depression: a meta-analysis. *Am J Epidemiol* 2003;157:98–112.

13 Bonde JP. Psychosocial factors at work and risk of depression: a systematic review of the epidemiological evidence. *Occup Environ Med* 2008;65:438–45.

14 Niedhammer I, Malard L, Chatte G. Occupational factors and subsequent major depressive and generalized anxiety disorders in the prospective French national SIP study. *BMC Public Health* 2015;15:200.

15 Theorell T, Hammarström A, Arosson G, et al. A systematic review including meta-analysis of work environment and depressive symptoms. *BMC Public Health* 2015;15:738.

16 Rugulies R, Aust B, Madsen IE. Effort-reward imbalance at work and risk of depressive disorders: A systematic review and meta-analysis of prospective cohort studies. *Scand J Work Environ Health* 2017;43:294–306.

17 Azagba S, Sharaf MF. Psychosocial working conditions and the utilization of health care services. *BMC Public Health* 2011;11:642.

18 Pampallona S, Bollini P, Tibaldi G, et al. Combining pharmacotherapy and psychosocial intervention in the treatment of depressive disorders in adults: a meta-analysis. *J Clin Psychiatry* 2009;70:1219–29.

19 Cuijpers P, Dekker J, Hollon SD, et al. Adding psychotherapy to pharmacotherapy in the treatment of depressive disorders in adults: a meta-analysis. *J Clin Psychiatry* 2009;70:1219–29.

20 Kouwenen M, Mänty M, Lallukka T, et al. Changes in psychosocial and physical working conditions and psychotropic medication in ageing public sector employees: a record-linkage follow-up study. *BMJ Open* 2017;7:e015573.

21 Laaksonen M, Lallukka T, Lahelma E, et al. Working conditions and psychotropic medication: a prospective cohort study. *Soc Psychiatry Psychiatr Epidemiol* 2012;47:663–70.

22 Thielen K, Nygaard E, Rugulies R, et al. Job stress and the use of antidepressant medicine: a 3.5-year follow-up study among Danish employees. *Occup Environ Med* 2011;68:205–10.

23 Virtanen M, Honttonen T, Kivimäki M, et al. Work stress, mental health and antidepressant medication findings from the Health 2000 Study. *J Affect Disorder* 2007;98:189–97.

24 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, 2013.

25 Watson N. Methodology for the HILDA top-up sample. *Hilda Project Technical Paper Series No 1/11*. Melbourne: Melbourne Institute of Applied Economic and Social Research, 2011.

26 Butcherworth P, Leach LS, Rodgers B, et al. Psychosocial job adversity and health in Australia: analysis of data from the HILDA Survey. *Aust N Z J Public Health* 2011;35:564–71.

27 Butcherworth P, Leach LS, Strafzins L, et al. 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;68:806–12.

28 Leach J, Rodgers B, Butcherworth P, et al. Deriving an evidence-based measure of job quality from the HILDA survey. *Australian Social Policy* 2010:9:67–86.

29 Siegrist J, Starke D, Chandola T, et al. The measurement of effort-reward imbalance at work: European comparisons. *Soc Sci Med* 2004;58:1483–99.

30 Milner A, Scovelle AJ, King T. Treatment-seeking differences for mental health problems in male- and non-male-dominated occupations: evidence from the HILDA cohort. *Epidemiol Psychiatr Sci* 2018:1–8.

31 Milner A, King T, LaMontagne AD, et al. Men’s work, Women’s work, and mental health: A longitudinal investigation of the relationship between the gender composition of occupations and mental health. *Soc Sci Med* 2018:204:16–22.

32 ABS. 2006 Census - Labour Force. Occupation 06 (AnzScO) (Occ06P) - 2 Digit by Sex Male/Female (SeXP) Counting: Persons, Place of Usual Residence. 2006. viewed 1 April 2017.

33 Wooldridge J. Random effects models: In Wooldridge J, ed. *Introductory Econometrics: A Modern Approach*. 4th Edition. Mason, OH, USa: South-Western Cengage Learning, 2009:489–92.

34 Neyman J, Scott EL. Consistent estimates based on partially consistent observations. *Econometrica* 1948:16:1–3232.

35 Maddala GS. Limited-dependent and qualitative variables in econometrics: Cambridge (Cambridgeshire), New York: Cambridge University Press, 1983.

36 Chamberlain G. Analysis of Covariance with Qualitative Data. *Rev Econ Stud* 1980;47:225–38.

37 AIHW. Mental health services in Australia: Medicare-subsidised mental health-related services. *AIHW, 2016. https://mhsa.aihw.gov.au/services/medicare/.*