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Title	Job characteristics and mental health for older workers
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Publication date	2017-06-01
Original Citation	McCarthy, V. J. C., Cronly, J., Perry, I. J. (2017) 'Job characteristics and mental health for older workers', Occupational Medicine, 67, pp. 394-400. doi:10.1093/occmed/kqx066
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1093/occmed/kqx066
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Download date	2026-11-06 19:12:01
Item downloaded from	https://hdl.handle.net/10468/6366

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Job Characteristics and Mental Health for Older Workers

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Abstract

Background: Adverse job characteristics have been linked with increased incidence of depression and anxiety in working populations. However, the association between job characteristics and mental health, in an older working population while controlling for personality traits, is less well known.

Aims: In this study we examine the association between job characteristics (job demands and job control) and mental health (depression and anxiety) for older workers while controlling for personality traits.

Methods: A sample of workers (*n*=1025) aged 50-69 years old were recruited from a primary healthcare clinic in Southern Ireland. Job characteristics were measured using the Copenhagen Psychosocial Questionnaire; demands (quantitative and cognitive) and control (influence at work and possibilities for development). Personality traits were measured using the Ten-Item Personality Inventory, depression was measured using the Center for Epidemiological Depression Scale and anxiety was measured using the Hospital Anxiety and Depression Scale. Descriptive analysis, simple and multiple linear regression analyses were conducted.

Results:

Multiple linear regression analysis showed job characteristics, in particular, job demands to be significant positive predictors of symptoms of depression and anxiety. The inverse was

true for job control variables and symptoms of depression. Neither possibilities for development nor influence at work were associated with symptoms of anxiety.

Conclusion: Our findings indicate that despite potential confounders, higher demands at work can impact the worker's mental health negatively. Reducing job demands and encouraging role development many benefit the mental health of older workers.

Key words: Anxiety; depression; job characteristics; mental health; older workers; personality traits

Introduction:

The mental health of older workers, specifically those 50-years and older is gaining attention. A common and practical policy response to changing demographics has been to attempt to increase work force participation in the older population, thereby reducing the ratio of retired to employed individuals (1). If policies attempting to increase workforce participation among the older population are to be implemented care is needed to ensure the mental health of older workers is preserved as they approach and exceed the traditional retirement age of 65 years. A number of studies have indicated that job characteristics can impact on depression and/or anxiety in working populations (2-7), but the relationship between job characteristics and mental health in older workers is under-researched.

Depression in older populations is of increasing concern to healthcare professionals and policy makers as it affects patient quality of life and increases healthcare costs (8). There have been mixed findings in relation to the effect of employment status on the mental health of older populations (50+ year olds) (1); some studies have indicated that those who remain in employment enjoy better mental health (8), other studies reveal no significant association (9), while others have suggested that retirees have better mental health than those who remain in the workforce (10). These findings may reflect methodological differences in populations, measures and definitions, but may also indicate that the relationship between remaining in employment and mental wellbeing is confounded by additional factors. For example, socioeconomic status, age and gender may play an important role, and the timing and reasons for retirement may be crucial (1, 10). Furthermore, it is likely that the characteristics of the job and the personality of the individual impact this relationship and may determine whether remaining in employment later in life is beneficial or detrimental to an individual's well-being.

Within working populations, poor job characteristics (such as overcommitment, high job demands and/or low job control) have been linked to depression and/or anxiety symptoms (3, 6, 7, 11, 12). It has been noted, however, that these results may be influenced by reporting bias, and that negative affectivity could impact upon how individuals rate their job characteristics (3, 13). For example, participants experiencing depression and/or anxiety may be more likely to rate their jobs as highly demanding. Studies have addressed this potential bias by adopting a longitudinal design, controlling for negative affectivity or using external measures of job characteristics (3, 4, 14). These studies have indicated that poor job characteristics are not only associated with, but are in fact, predictors of symptoms of depression and/or anxiety (3, 4). It is likely therefore that job characteristics also play an important role in predicting depression and/or anxiety in older populations.

Personality traits may confound the relationship between job characteristics and depression and/or anxiety symptoms (15, 16). For example, certain personality traits may act as protective factors in challenging work environments or, alternatively, may exacerbate the effects of negative job characteristics (17). Although admittedly difficult to conceptualise, delineate and measure, personality traits are often categorised as 'The Big-Five': extraversion, agreeableness, conscientiousness, emotional stability and openness to experiences. Lower scores on three of these five traits, extraversion, conscientiousness and emotional stability, have been linked to depression and anxiety symptoms, and are thought to influence both the onset and the course of mental illnesses (18, 19). Although the 'Big-Five' personality traits were initially believed to remain stable throughout the life course, recent research has indicated they may be subject to change in older age, and in particular, extraversion, agreeableness and openness to new experiences may decline (20). This is of importance when examining job characteristics for older workers in relation to their mental

health due to the fact that personality traits can influence worker's perception of their job (15). As personality traits may mediate the relationship between job characteristics and depression, it is important to examine the relationship between job characteristics, personality traits and mental health outcomes in the older population, who may be more vulnerable to the negative effects of poor job characteristics as they near or exceed retirement age.

The aim of this paper is twofold. Firstly, to examine the association between job characteristics - job demands (quantitative demands and cognitive demands) and job control (influence at work and possibilities for development) with depression, and secondly to examine these job characteristics with anxiety. Any confounding effects personality traits have on identified associations between job characteristics and mental health will be examined. The two main purposes are therefore (a) to determine if high job demands are associated with higher levels of depression and anxiety while taking personality traits into account, and (b) to determine if high job control is associated with lower levels of depression and anxiety while taking personality traits into account. It was hypothesised that i) older workers with higher levels of job demands will have higher levels of depression and higher levels of anxiety regardless of personality traits, and that ii) older workers with higher levels of job control will have lower levels of depression and lower levels of anxiety regardless of personality traits.

Methods

This is a cross-sectional study where Irish men and women (50-69 year olds) were sampled from a large primary healthcare clinic in North Cork, Ireland (21). A total of 2047 participants (67% response rate) were recruited into the study after being randomly sampled

from a list of currently registered patients (seen within the last three years). Written informed consent was acquired from all participants prior to the study. Ethical approval for the study was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals, Cork, Ireland.

Self-reported work status was recorded for all the participants. Only current workers, in paid employment (52%, *n*=1025 of the sample) were included in the analysis for the purpose of this paper. Those who were retired (30% *n*=605), engaged in household labour (12% *n*=234) or unemployed (6% *n*=111) were excluded.

The Center for Epidemiological Studies – Depression Scale (CES-D) (22) was used to assess the presence of depressive symptoms. This 20-item scale measured symptoms experienced in the week prior to completing the questionnaire. Items were rated on a 4-point scale ranging from 1 (rarely/none of the time) to 4 (all of the time). The range of possible scores was 0-60 with a higher score indicating the presence of more symptoms. The score was the sum of the 20 items but if more than four items were unanswered, the score was not computed. Cronbach's alpha for the CES-D was 0.83.

The anxiety component of the Hospital Anxiety and Depression Scale (HADS) (23) was used to assess anxiety symptoms. It was composed of 7-items rated on a 4-point scale ranging from 0-3 giving a possible range of 0-21 where a higher score indicated higher symptoms occurrence. The anxiety score was not calculated if more than one item was missing. Cronbach's alpha for the HADS was 0.78.

The Copenhagen Psychosocial Questionnaire (COPSOQ) (24) was used to measure the perceived job characteristics of paid workers. Four scales from the COPSOQ were used to determine the demands and control experienced by the worker. The demands scales included quantitative demands and cognitive demands, and the control; influence at work

and possibilities for development. Each of the four scales was a composite of four items with a theoretical range of 0-100. An average score for each scale was calculated when at least half of the items were completed. A high score indicated high demands (quantitative and cognitive) and high control (influence at work and possibilities for development). Cronbach's alpha (α) for the individual scales were; quantitative demands α=0.72, cognitive demands α=0.78, influence at work α=0.81 and possibilities for development α=0.82.

The Ten-Item Personality Inventory (TIPI) (25) measured five personality dimensions; two items per dimension. The dimensions were Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness to Experience. Each of the 10 items were rated on a 7-point scale with 1 being disagree strongly to 7 agree strongly. The theoretical range of the TIPI was 0-70 with the individual dimensions having a theoretical range of 0-14. Cronbach's alpha for the individual dimensions ranged from 0.28-0.47.

Age, sex and education were also included in the analyses due to their associations with the variables of interest. Age was used as a continuous variable in the regression analysis. Education was based on highest level of schooling completed, namely primary, secondary or tertiary education. For the purpose of the regression analysis, education was dummy coded into two variables.

Data were analysed using Predictive Analytics Software - PASW™ (IMB, Armonk, NY, USA). Descriptive statistics were performed to present a profile of the sample, and chi-square and independent samples *t*-test analysis were conducted to compare males and females in relation to their socio-demographic factors, symptoms of depression and anxiety, job characteristics and personality traits (Table 1). A series of simple linear regression models were built to investigate the relationship between each of the four independent variables (quantitative demands, cognitive demands, influence at work and possibilities for

development) and depression and anxiety (separately) (Model 1; Table 2 (depression) and Table 3 (anxiety)). Then, a number of separate multiple linear regression models were built in order to ascertain how well each job characteristic predicted symptoms of depression and symptoms of anxiety. Firstly, for symptoms of depression, age, sex and education were entered in Model 2 for each of the four job characteristic variables (separately). Personality traits were entered into Model 3 and Model 4 included all the variables entered simultaneously with all four job characteristics (Table 2). These models were replicated for symptoms of anxiety (Table 3).

Results

Table 1 shows the mean scores for symptoms of depression and anxiety in the complete sample and gender stratified. Significant differences were seen for males and females in relation to scores for depression and anxiety, with females having higher mean scores on both measures. Scores for the job characteristic variables were higher for males with cognitive demands, and control at work significantly higher. Personality traits showed higher emotional stability in males but higher agreeableness in females.

<Insert Table 1 here>

Table 2 shows the results for the univariate and multiple linear regression analysis conducted for symptoms of depression. Model 1 shows the association for each of the job characteristics (separately) and depression. Quantitative demands were a significant positive predictor of depression (Beta=0.21, $p<0.001$) where the two job control variables were significant negative predictors of depression (influence at work Beta=-0.16, $p<0.001$, possibilities for development Beta=-0.14, $p<0.001$). Associations for job characteristics and depression did not change significantly when adjusted for age, sex and education in Model 2. Further

adjustment for personality traits in Model 3 resulted in the loss of significance for possibilities for development but cognitive demands became a significant positive predictor of depression (B=0.07, p<0.05). All job characteristic variables were independently significant in Model 4 with the job demands variables being significant positive predictors of depression and job control variables significant negative predictors of depression. Quantitative demands had the highest unique contribution of the job characteristics variables in the model (Beta=0.12). The model was significant overall [F(13,825)=25.17, p<0.001] and the total variance in depression explained by the model was 27%.

<Insert Table 2 here>

Table 3 shows the results for the univariate and multiple linear regression analysis conducted for symptoms of anxiety. Model 1 shows the association for each of the job characteristics (separately) and anxiety. Quantitative demands were a significant positive predictor (Beta=0.20, p<0.001) where job control variables were significant negative predictors of anxiety (influence at work Beta=-0.11, p<0.01, possibilities for development Beta=-0.09, p<0.01). Model 2 evaluated the association for each of the job characteristics and anxiety while adjusting for age, sex and education. Significance was lost for influence at work but maintained for quantitative demands and possibilities for development. With further adjustment for personality traits in Model 3, cognitive demands became a positive significant predictor for explaining symptoms of anxiety where possibilities for development was no longer statistically significant. Model 4 evaluated the effects of all variables. The job demands variables were significant positive predictors of symptoms of anxiety independent of all other variables. The model was significant overall [F(13,804)=31.70, p<0.001] and the total variance in anxiety explained by the model was 33%.

<Insert Table 3 here>

Discussion:

This study set out to examine the relationship between job characteristics and mental health, whilst accounting for personality traits. Our results showed consistently that an increase in the level of job demands was associated with increased levels of depression and anxiety regardless of personality traits or sociodemographic factors. Conversely, and as expected, an increase in job control (influence at work and possibilities for development) was related to lower levels of depression. However, no significant association was found for job control and lower levels of anxiety (null hypothesis accepted).

Previously scholars have found job characteristics to be associated with mental ill-health in longitudinal and cross-sectional studies using population based samples and specific occupational groups (5-7, 12). Nevertheless, poor job characteristics were not always found to be associated with depression when sociodemographic factors were accounted for (26). The association between job control and mental health is unclear. Our findings indicate that higher levels of job control predicted lower levels of depressive symptoms regardless of personality traits. However, the same was not true for anxiety symptoms. This is similar to previous work but not entirely consistent (5, 12). Previous researchers used an alternative measure for job characteristics, the Job Content Questionnaire (JCQ) (27), which has distinct similarities to the COPSOQ. The JCQ incorporates sub-scales such as skill discretion (similar to possibilities for development) and decision authority (similar to influence at work). Our findings indicate that high job control was a predictor of lower levels of depression as Mark and Smith (12) found for skill discretion. Cadieux and Marchand (5) found some support for high decision authority being a predictor of good mental health but the opposite was true for skill utilisation (discretion). There may be some explanation for the difference in our findings. Firstly, Cadieux and

Marchand (5) measured nonspecific psychological distress whereas we used scales which are noted for their psychometric properties in terms of measuring depression (22) and anxiety (28). Secondly, we controlled for personality traits which have been found to be associated with mental health impairment (11). Our final model explained 27% of the variance for depression and 33% of the variance for anxiety. Job characteristics alone explained 9% of the variance for symptoms of depression and 6% for symptoms of anxiety. This contribution of occupational factors to depression and anxiety is in line with other data (5) and demonstrates an important association between the demands at work and mental ill-health in particular. Personality traits, such as, extraversion, agreeableness and openness to new experiences may decrease with age (20) as previously discussed and we found extraversion in particular to be protective for mental ill-health (data not shown). With the reduction in these protective factors, our older workers may become more vulnerable to depression and anxiety. Follow-up with this cohort is underway as this is an important consideration particularly in view of our ageing population and lengthening retirement ages.

Our paper has some limitations. Firstly, personality traits can be measured by a number of instruments however these tend to be lengthy and burdensome to the participant. Shorter scales such as the TIPI which has demonstrated convergent and discriminant validity, and test-retest reliability (25) may have the benefits of increasing response rates and decreasing participant burden. However, they may also demonstrate reduced psychometric properties as was evident from our Cronbach's alpha results.

It is possible that symptoms of depression and/or anxiety lead to a bias in reporting of job characteristics, in that participants with high levels of depression or anxiety may perceive their work environments more negatively (28). Non-work factors, such as marital status, did not alter the associations found in our sample (data not presented) but, data such

as household income were not collected and this may be an important limitation to our study. It must be acknowledged that both depression and anxiety are associated with a complex array of interrelated and intricate factors, which cannot all be captured in this study alone. A causal relationship between job characteristics and depression/anxiety could not been established due to the cross-sectional nature of the data. Longitudinal data is currently being generated by this study and it is hoped that analysis on these data will provide insights into the direction of these relationships and reveal any age effects in the association.

Our sample only included those who are currently registered with the primary healthcare clinic, thus potentially omitting healthy workers (not registered with the clinic) and potentially including those with more ill-health. Further, the healthy worker effect may have resulted in only healthier people who are currently employed (and currently registered with the clinic) being included in our analysis. Nonetheless, our paper included a representative sample of heterogeneous older workers, providing evidence on the relationship between job characteristics and mental health while controlling for personality traits. Job characteristics were measured using a validated instrument, responsive to today's work environment, which drew on previous job characteristic questionnaires and incorporated measurements dictated by relevant theories on psychosocial work characteristics.

In conclusion, older workers with higher levels of job demands were more likely to have higher levels of depression and anxiety regardless of their personality traits and sociodemographic factors. Further, those with higher levels of control showed lower levels of depression. It is important for employers to recognise the potential effects of job characteristics on mental health. Reducing job demands may improve the older worker's

experience and allowing role development and influence over work practices can potentially benefit mental health, particularly levels of depression.

Key points:

- Older workers with higher levels of job demands have higher levels of depression and anxiety.
- It is important for employers to recognise the potential positive and/or negative effects of job characteristics on mental health.
- Allowing older workers to develop their work role may have beneficial effects on their mental health.

Funding: This work was supported by the HRB Centre for Health & Diet Research [Grant Ref.HRC/2007/13]

Conflicts of Interest: The authors declare that they have no conflict of interest.

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Table 1: Descriptive analysis, chi-square, Independent samples *t*-tests for socio-demographic, depression (CESD), anxiety (HADS) and job characteristics (quantitative and cognitive demands, influence at work and possibility for development) of the sample and stratified by gender (*n*=1025)

	Range	Total Sample (*n*=1025)	Males (*n*=542)	Females (*n*=483)	*p*-value
Age *M*(SD)	50-69	57.8(8.3)	57.8(4.8)	57.8(4.9)	NS
Education *n*(%)					<0.01
Primary		170(18%)	116(23%)	54(12%)	
Secondary		507(52%)	282(54%)	225(50%)	
Tertiary		290(30%)	121(23%)	169(38%)	
Depression *M*(SD)	0-48	8.3(6.9)	7.8(6.7)	8.9(7.2)	<0.05
Anxiety *M*(SD)	0-20	4.0(3.2)	3.6(3.1)	4.5(3.2)	<0.01
Quantitative Demands *M*(SD)	0-100	35.9(20.3)	36.8(20.0)	34.8(20.6)	NS
Cognitive Demands *M*(SD)	0-100	59.7(24.2)	63.3(23.4)	55.8(24.5)	<0.01
Influence at Work *M*(SD)	0-100	55.5(29.0)	61.9(28.3)	48.5(28.0)	<0.01
Possibilities for Development *M*(SD)	0-100	66.1(23.4)	71.2(20.8)	60.4(24.8)	<0.01
TIPI Score *M*(SD)	0-70	49.0(11.2)	48.5(11.4)	49.5(11.1)	NS
Extraversion *M*(SD)	1-14	8.1(3.0)	8.0(3.0)	8.3(3.1)	NS
Agreeableness *M*(SD)	1-14	10.9(2.7)	10.6(2.6)	11.3(2.6)	<0.01
Conscientiousness *M*(SD)	1-14	11.3(2.7)	11.2(2.7)	11.4(2.7)	NS

Emotional Stability *M*(SD)	1-14	9.8(3.0)	10.1(3.0)	9.4(2.9)	<0.01
Openness *M*(SD)	1-14	9.9(2.7)	9.9(2.7)	10.0(2.7)	NS

M= Mean

SD= Standard Deviation

Table 2: Univariate and multiple linear regression analysis showing associations between Job Characteristics and Depression (CESD), *n*=1,025

	Model 1		Model 2		Model 3		Model 4	
	β	Adjusted R^2	β	Adjusted R^2	β	Adjusted R^2	β	Adjusted R^2
Quantitative Demands	0.21***	0.04	0.21***	0.05	0.13***	0.27	0.12***	0.27
Cognitive Demands	0.04	0.001	0.04	0.01	0.07*	0.26	0.08*	
Influence at Work	-0.16***	0.03	-0.14***	0.03	-0.10**	0.26	-0.08*	
Possibilities for Development	-0.14***	0.02	-0.15***	0.03	-0.06	0.25	-0.08*	

Model 1 = Univariate analysis
Model 2 = Adjusted for age, sex and education
Model 3 = Adjusted for age, sex, education and personality traits
Model 4 = All job characteristics included in addition to age, sex, education and personality traits
*p<0.05, **p<0.01, *** p<0.001

Table 3: Univariate and multiple linear regression analysis showing associations between Job Characteristics and Anxiety (HADS), *n*=1,025

	Model 1		Model 2		Model 3		Model 4	
	β	Adjusted R^2	β	Adjusted R^2	β	Adjusted R^2	β	Adjusted R^2
Quantitative Demands	0.20***	0.04	0.20***	0.08	0.11***	0.33	0.10**	0.33
Cognitive Demands	0.05	0.002	0.06	0.05	0.07*	0.32	0.09*	
Influence at Work	-0.11**	0.01	-0.06	0.05	-0.01	0.31	0.004	
Possibilities for Development	-0.09**	0.01	-0.08*	0.05	-0.01	0.31	-0.07	

Model 1 = Univariate analysis
Model 2 = Adjusted for age, sex and education
Model 3 = Adjusted for age, sex, education and personality traits
Model 4 = All job characteristics included in addition to age, sex, education and personality traits
*p<0.05, **p<0.01, *** p<0.001