



## Background

Employment status and working conditions are powerful determinants of adult male health [1–3], and are therefore

relationship between psychosocial working conditions and mental health problems, we present analyses relating psychosocial job quality to global subjective wellbeing, and include analyses relating psychosocial job quality to a measure of mental ill-health for direct comparison. This contributes to the need to better understand the determinants of worker wellbeing [16], including comparison of the similarities and differences in the relationships between work characteristics and the complementary domains of wellbeing and ill-health.

## Methods

### Design and sample

Ten to Men is a national cohort study of Australian males [28, 29]. Wave 1 data collection took place from October 2013 to July 2014, resulting in detailed information being provided by 15,988 males aged 10–55 living in close to 14,000 households. Wave 2 data collection has begun and was completed in June 2016. The response fraction at Wave 1 was 35 % of confirmed in-scope males.

The cohort was recruited via a stratified, multi-stage, cluster random sampling strategy that involved approaching eligible males residing in private dwellings, with separate cluster samples drawn from regional strata to ensure over sampling of males from regional areas. All private dwellings in sampled areas were enumerated and all males within the target age range in those dwellings were invited to participate. Interviewers collected household-level information including details of all males in the household regardless of whether they were participating or not. All participants provided informed written consent. Data were collected by personal interview for males aged 10–14, and self-complete paper hard copy questionnaire for males aged 15 years and older. The questionnaires covered a range of dimensions including social, demographic, health and economic conditions [29]. The analyses presented in this paper are restricted to males aged 18–55 at baseline as these participants would have had the opportunity to complete secondary education and to participate in the labour market. The Human Research Ethics Committee at the University of Melbourne approved the pilot studies and the main



reported the presence of a disability or long term health condition (5.1 %). The majority of the sample had completed year 12, or high school/secondary education (61.4 %). Many had trade qualifications (27.5 %) or some university degree (29.5 %).

Table 3 presents descriptive data on employment and working conditions for working participants. The majority of these males were employed in permanent jobs

(69.9 %), and the largest group was in a high occupational skill level (38.4 %). Almost one in 10 respondents were working in more than one job (9.8 %), and there was a high prevalence of long working hours (>40/week) when all jobs were included (49.9 %), and a similarly high

response relationship was qualitatively similar to the results from the analysis included for direct comparison purposes: psychosocial job quality and mental health. While it has been previously established that mental health, and health in general, is a determinant of global and work-specific wellbeing, less is known about how similar or different their relationships with job stressors might be [15, 16, 37].

The mental health outcome analysis was also included for validation purposes. The psychosocial job quality index was developed and has been tested in relation to health outcomes in only one cohort study thus far: the Household Income and Labour Dynamics in Australia (HILDA) study [10, 11]. Our Ten to Men results are consistent with HILDA results which showed a dose–

response relationship between the psychosocial job quality index and mental health [11, 33] (as well as physical health [11] and sickness absence [12]).

There is growing policy and practice interest in worker wellbeing, as distinct from worker ill-health. This includes the possibility of including wellbeing measures in worker health policy and conducting quantitative risk assessments of wellbeing in relation to various determinants in similar way, for example, to risk assessments conducted for occupational cancer risks in relation to asbestos or benzene exposures [16]. Our results suggest that for this measure of wellbeing, quantitatively assessing wellbeing levels in relation to combined exposures to adverse working conditions is feasible, should such results be replicated for psychosocial and other occupational

Table 5 Subjective wellbeing and mental health: Multivariate regression models with overall psychosocial job quality indicator, working males, Wave 1 of the Ten to Men cohort

Overall job quality	Model 3 Personal Wellbeing Index			Model 4 SF-12 Mental Health		
	Coef.	[95 % CI]		Coef.	[95 % CI]	
Optimal				ref		
1 adversity	-4.14	-4.84	-3.45	-1.65	-2.04	-1.26
2 adversities	-8.90	-9.73	-8.06	-3.52	-3.99	-3.05
Poorest quality jobs	-13.00	-14.21	-11.77	-5.64	-6.34	-4.93
Occupational Skill level						
High	ref			ref		
Medium	-2.03	-2.84	-1.22	0.29	-0.17	0.75
Low	-3.46	-4.36	-2.56	0.42	-0.09	0.93
Employment arrangements						
Permanent	ref			ref		
Casual/temporary	-0.59	-1.67	0.48	0.27	-0.34	0.876
Fixed term	-0.82	-2.36	0.73	-0.62	-1.50	0.25
Self employed	0.61	-0.25	1.46	-0.67	-1.15	-0.19
Hours worked in main job						
up to 40 h	ref			ref		
over 40 h	1.59	0.98	2.21	0.20	-0.15	0.55
Disability						
No	ref			ref		
Yes	-9.84	-11.23	-8.44	-5.97	-6.77	-5.17
Completed year 12						
Not completed year 12	ref			ref		
Completed year 12	0.44	-0.29	1.17	-0.17	-0.58	0.24
Highest qualification after school						
No other qualification	ref			ref		
Trade qualification	2.17	1.28	3.05	0.58	0.08	1.08
Non university degree	0.19	-0.76	1.15	-0.48	-1.02	0.06
University degree	1.56	0.58	2.54	-0.26	-0.81	0.30
Other	-3.00	-6.61	0.62	-0.80	-2.85	1.25

exposures in prospective studies. The differences observed across the range of psychosocial job quality observed were on the order of  $\frac{1}{2}$  standard deviation for each of the two outcome measures, which is generally acknowledged as a minimum clinically important difference [38]. The effect sizes for each outcome, in more concrete terms, were on a par with the presence of a disability or long-term health condition (Table 5). Further, the sample mean PWI score of 70.33 is lower than the Australian normative range for males of between 73.0 and 76.5 [39]; a 13 point lower mean PWI for those reporting the worst psychosocial job quality puts those respondents below 60 on the PWI scale, indicating a high risk of mental health problems.

The study of psychosocial working conditions in relation to wellbeing, as a complement to health outcomes,

warrants further study. The qualitatively similar associations between psychosocial job quality and the two outcomes suggests that the PWI and SF-12 mental health overlap as constructs to some extent, as has been shown for other mental wellbeing and illness outcomes (as outlined in the Introduction section). However, there were notable differences in association patterns for some covariates. For example, occupational skill level differed in both direction and significance in relation to PWI and SF-12 mental health, with a strong step-wise negative association between PWI and decreasing skill level versus a non-significant positive association with SF-12 mental health. The relationships between psychosocial job quality and positive mental health/wellbeing and ill-mental health also require longitudinal study for validation of

the results presented here as well as further understanding of the relationships between the wellbeing and illness outcomes. A recent longitudinal analysis, for example, showed that positive mental health buffered the adverse impacts of job stress on ill-mental health [40]. Future research will need to consider the potential for complex interactions between psychosocial job stressors, wellbeing and illness outcomes.

The results presented in this paper are also limited in various ways. Most importantly, our analyses are limited by their cross-sectional nature and by residual confounding. Further, while Ten to Men is a national sample, it is



