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Gender and the association between mental disorders and disability

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Abstract

Background—Prior data, especially population data, on gender differences in the association between mental disorders and disability are very sparse and therefore earlier conclusions that women with mental disorders are more disabled than men may be premature. The aim of this study was to determine whether gender moderates the associations between 30 day mood, anxiety and substance use disorders and self-reported 30 day disability in five domains of functioning, in a general population sample.

Methods—Nationally representative face-to-face household survey of New Zealanders (n=7435) aged 16 years and older, with a response rate of 73.3%. Mental disorders were measured with the Composite International Diagnostic Interview (CIDI 3.0). Health-related disability was measured in all participants with a version of the World Health Organisation Disability Assessment Schedule (WHODAS-II).

Results—Men with either mood or anxiety disorders (aggregated into one category) reported significantly more Role, Social and Cognitive disability than did women with those disorders. There were no gender differences in the associations between mental disorders and the Mobility or Self-Care disability domains, nor were there gender differences in the associations between substance use disorders and any disability domain.

Limitations—The temporal direction of the association between mental disorders and disability is unknown. Disability is measured by self-report only, which is affected by insight.

Conclusions—Men with emotional disorders experience disproportionately greater role, social and cognitive disability than women with these disorders. More needs to be understood about how to engage and retain men in mental disorder treatment.

Keywords

Gender; Disability; Emotional disorders

1. Introduction

At the population level it is clear that women experience greater disability burden from mental disorders because of their higher prevalence of depression and anxiety disorders

Conflicts of Interest

Neither Kate Scott nor Sunny Collings have any conflicts of interest.

(Kessler et al., 1993; Seedat et al., 2009). What is not clear, however, is whether among men and women with mood or anxiety disorders, there is a gender difference in the disability experienced (either in type, or degree). This information is important for clinicians and for policy and planning purposes in relation to both mental health and disability services (Kennedy et al., 1997). A decade ago a strong statement was made about the lack of data on this question: “attention to consideration of gender in the context of mental disorders and disability has been wholly inadequate” (Kennedy et al., 1997). Little has changed in the interim as there are still only a handful of studies providing relevant data. Clinical studies have generally found that women report greater impairment (Kornstein et al., 1995) (Lyness et al., 1993), but the one general population study we are aware of found no gender differences in home or work-related disability in people with depression and found depressed men more impaired in leisure activities (Breslin et al., 2006). Despite the relative lack of data, a 2003 review on this topic concluded that “women with depression experience higher levels of disability than do men with depression” (Cook, 2003). We consider that conclusion to be premature, based as it was on a small number of mostly clinical studies, some of which included only female participants and not all of which were published.

The present study comes from a general population survey (The New Zealand Mental Health Survey: NZMHS) that assessed DSM-IV mental disorders together with health-related disability in multiple domains and the presence of chronic physical conditions. A particular advantage of the NZMHS with respect to this topic is that the size of the sample allows us to use 30 day mental disorder prevalence, matching the disability assessment timeframe, rather than the 12 month prevalence usually used. Our objectives in this paper are: 1) to report the gender-specific associations between 30 day mood, anxiety and substance use disorders and five disability domains, controlling for covariates including physical condition comorbidity; and 2) to test for an interaction of gender with mental disorders in the association with each disability outcome.

2. Methods

2.1. Survey Sample

Te Rau Hinengaro: The New Zealand Mental Health Survey 2003/4 was a nationally representative household survey involving face-to-face interviews with 12,992 adults aged 16 and over. Interviews were conducted by professional lay interviewers from October 2003 to December 2004 with a response rate of 73.3%. Written informed consent was obtained from all participants and ethics review and approval was obtained from the 14 New Zealand regional ethics committees. Internal sub-sampling was used to reduce respondent burden by dividing the interview into two parts. Part 1 included the core diagnostic assessment of mood disorders, alcohol use disorders and most of the anxiety disorders. Part 2 included the remainder of mental disorders and additional information relevant to a wide range of survey aims, including assessment of generic disability and chronic physical conditions. All respondents completed Part 1. All Part 1 respondents who met criteria for any mental disorder and a probability sample of other respondents were administered Part 2. The Part 2 respondents (n=7,435) were weighted by the inverse of their probability of selection for Part 2 of the interview to adjust for differential sampling. A more detailed description of the survey methods is provided elsewhere (Wells et al., 2006) (Oakley Browne et al., 2006a).

2.2. Measures

Mental Disorders were assessed with the World Mental Health-Composite International Diagnostic Interview (WMH-CIDI), now the CIDI 3.0 (Kessler and Ustun, 2004). This fully-structured interview ascertains lifetime prevalence of disorder (disorder occurring at any age up to the age at interview) plus recency of episodes or symptoms, from which 12

month and 30 day prevalence are derived. All disorders were assessed using the definitions and criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (APA, 1994). CIDI organic exclusion rules were imposed. The 30 day mental disorders included in this paper were grouped and include *any mood disorder* (major depressive disorder, dysthymia, bipolar disorder); *any anxiety disorder* (panic disorder, agoraphobia, specific phobia, social phobia, obsessive compulsive disorder, post-traumatic stress disorder, generalized anxiety disorder); *any mood or anxiety disorder* (any disorder from either group, also referred to as emotional disorders); *any substance use disorder* (alcohol abuse and dependence, drug abuse and dependence).

Disability was assessed with the World Mental Health (WMH) Surveys version of the WHODAS-II (Von Korff et al., 2008) administered to all Part 2 participants. The WHODAS-II is based on a conceptual model of disability that synthesizes the medical and social models of disability: the International Classification of Functioning, Disability and Health (ICF) (WHO, 2001). The WMH-WHODAS-II asks about *health-related* disability in the past 30 days in five domains:

- Role impairment (*Role*): four items measuring the number of days the participant was completely unable to work or carry out their normal activities, or had to cut back on the amount or quality of activity, or had to apply extreme effort to perform at their usual level.
- Getting along with others (*Social*): five items measuring difficulties in starting and maintaining conversation, dealing with unknown people, forming and maintaining friendships, controlling emotions around people.
- Understanding and communicating (*Cognitive*): four items recording difficulties with concentration, understanding, memory or learning.
- Self-care (*Self-care*): three items recording difficulties with washing the body, getting dressed, staying by oneself for a few days.
- Getting around (*Mobility*): three items measuring difficulties with standing for at least 30 minutes, moving around inside the house and walking distances of about one kilometre.

All domains were scored on a 0–100 scale with higher scores representing greater disability. The Role score was calculated as follows: $[(1.0 * \text{days out of role} + 0.5 * \text{days cut down} + 0.25 * \text{days cut back on quality} + 0.25 * \text{days it took extreme effort}) / 30] * 100$. The remaining four domains were scored using a formula that weighted the number of days the individual reported disability out of the past 30 by the severity of disability reported in a given domain. These four domains differed from the Role domain in that they were prefaced by a filter question about whether there was a time in the past 30 days when health-related problems caused difficulties with domain-specific activities. All disability domain score distributions were heavily skewed with the majority of the population scoring zero. The proportion scoring zero varied by domain, but was substantially higher for the four domains with the filter question.

Sociodemographic correlates included age at interview, self-defined ethnicity (Maori, Pacific, Other), educational qualifications and equivalized household income. Educational qualifications were assessed using the 2001 census questions about school and post-school qualifications. A modification of the revised Jensen equivalence scale for household income (Jensen, 1988) was used account for the number of adults and the number of children in the household.

Chronic physical conditions were assessed using a checklist adapted from the US Health Interview Schedule. Respondents were asked: “*Have you ever had...arthritis or rheumatism; chronic back or neck problems; frequent or severe headaches; any other chronic pain; seasonal allergies like hay fever; a stroke; a heart attack*”. They were then asked: “*Did a doctor or other health professional ever tell you that you had... heart disease; high blood pressure; asthma; tuberculosis; any other chronic lung disease (like COPD or emphysema); diabetes or high blood sugar; an ulcer in the stomach or intestine; HIV infection or AIDs; epilepsy or seizures; cancer*”.

2.3. Statistical Analysis

Estimates were weighted to take into account the probability of selection; to adjust for intentional oversampling of Maori and Pacific peoples; to adjust for non-response; and to post-stratify by age, sex and ethnicity to the 2001 census population. Cross-tabulations estimated the percent with any disability (a non-zero score) in each domain for males and females among those with 30 day mental disorders. Multiple logistic regression models were developed for each disability domain to estimate the odds of disability among those with, relative to those without, a disorder in one of the mental disorder groups. These models adjusted for age, ethnicity, educational attainment, household income and chronic physical conditions (any condition). Models were first run including gender as a covariate and an interaction term for gender and the mental disorder group. The significance of interactions was determined with Wald F tests. Subsequent models assessing the association between that mental disorder group and the disability domain were run separately for men and women.

After investigating interactions between gender and each mental disorder group in the association with each disability domain, we ran additional analyses checking whether results were altered by adjustment for mental disorder comorbidity. For example, we checked whether the interaction of gender with any mood disorder in the association with role disability was still significant after adjustment for gender differences in comorbid disorders (anxiety and substance use). As the results were essentially unchanged by adjustment for comorbidity, we have provided the results from the simpler models here. Taylor series linearization (Shah, 1998) was used to approximate the variance of estimates using SUDAAN 9.0.1 (Research Triangle Institute, 1999) to adjust for the complex sampling design. Associations are considered statistically significant at $p < 0.05$.

3. Results

3.1. Percent with any disability by mental disorder and gender

The unadjusted percents and number with disability (a non-zero score) in each domain among those with and without mental disorders, stratified by gender, are shown in Table 1. The fairly small proportions reporting health-related disability can be seen in the total population row, which averages disability across those with and without mental disorders. This shows percents ranging from a high of 27.6% for males and 34.3% for females in the Role domain down to around 3% for males and females in the Self-Care domain. Disability is reported by much higher proportions of those with mental disorders, in particular those with mood disorders, with most of those with any mood disorder (78.2% of males and 68.6% of females) reporting Role disability and a third to a half of people with mood disorders reporting Social and Cognitive disability, respectively.

3.2. Adjusted odds of disability by mental disorder and gender

Tables 2 and 3 present the adjusted odds of disability for each domain among those with mental disorders (relative to those without) for men and women, plus the results of

the gender interaction tests. Men with a 30 day mood disorder have ten times (OR: 10.34) the odds of reporting Role disability relative to men without a mood disorder. Women with a mood disorder have four times (4.36) the odds of reporting Role disability relative to women without a mood disorder. This apparent gender difference is confirmed by the significant ($p=0.015$) interaction between gender and any mood disorder in the association with Role disability. A similar gender pattern is evident for the association between mood disorder and the Social and Cognitive disability domains, but it does not reach statistical significance. No gender pattern is evident for the association of mood disorders with the two disability domains shown in Table 3 (Self-care and Mobility).

In a similar pattern to that occurring with mood disorders, men with anxiety disorders also report more Role, Social and Cognitive disability than women, though this gender difference does not reach statistical significance in any domain. However, when mood and anxiety disorders are aggregated, men with any emotional (mood or anxiety) disorder report significantly more Role, Social and Cognitive disability than women with either of those disorders. Once again, this gender pattern is confined to the domains shown in Table 2. There are no significant gender differences in the associations between substance use disorders and disability.

The higher likelihood of men with emotional disorders to report disability relative to women with emotional disorders contrasts with the tendency for women without mental disorders to report more disability than men without mental disorders (shown in the No Disorder row in Tables 1–3). This gender difference reaches statistical significance in the Role domain, with trends towards significance for the Social and Cognitive domains.

4. Discussion

In what we believe to be the first comprehensive general population study of gender patterning in associations between mental disorders and disability, we found that for the disability domains most sensitive to the effects of mental disorders (Role, Social and Cognitive), men with either mood or anxiety disorders reported more disability than women with those disorders. The opposite was the case among people without mental disorders, where women were more likely to report Role, Social and Cognitive disability than men (though the gender difference was only statistically significant for the Role domain). These gender differences were not evident for substance use disorders, nor were they evident for the Mobility and Self-Care disability domains.

These results contrast with prior studies on this topic which have tended to find depressed women reporting more disability than depressed men (Cook, 2003; Kornstein et al., 1995; Lyness et al., 1993). This contrast may reflect sampling bias in the earlier clinical studies. Our results are somewhat more consistent with the one prior population study we are aware of, (Breslin et al., 2006) which found no gender differences in home or work limitations but did find depressed men reporting more disability in leisure activities than depressed women. The limited measures of both disability and depression in that study, together with the 12 month timeframe of the depressive disorder measure, may have made it less sensitive to gender differences.

We cannot concur then with earlier conclusions that “women's disproportionate experience of depression is accompanied by disproportionately higher levels of disability” (Cook, 2003). Our study does not explain why men with emotional disorders might experience greater disability than women, but we note that prior analyses of these data found that women with mental disorders were more likely to seek treatment than men (Oakley Browne et al., 2006b). It may be that these higher levels of treatment, together with other factors

such as women's greater intimate and informal social ties, (Umberson et al., 1996) help ameliorate the disability associated with emotional disorders. Another possibility is that the different primary roles of men and women have implications for how much their role performance is affected by the mental disorders they experience. However, when we did some post-hoc analysis to explore this possibility by confining the analysis to men and women in employment, the significant gender interaction in the association between mood disorder and role disability not only remained but strengthened slightly (data not shown, available on request). Further research focussed specifically on explicating the gender differences in the impact of mental disorders is required.

Even without knowing the cause, the nature of these gender differences in mental disorder-related disability has two important implications. First, it is a useful corrective to the commonly held view that women “over-report” disability. This idea has been proposed as one possible explanation for the greater reporting of disability and morbidity by women in the general population (all women, not just women with mental disorders) (Macintyre et al., 1999; Merrill et al., 1997). As Macintyre et al. note, the hypothesis that women over-report disability and morbidity has persisted despite a lack of compelling evidence. The results of this study offer further evidence against it.

The second set of implications is clinical and policy-related. From a clinical perspective, primary care is important, because most mental disorders are treated in that context (Bushnell, 2004), and general practitioners rely on functioning as well as symptom patterns when making diagnosis and treatment decisions (Collings and the MaGPIe research group, 2005). Recent evidence suggests that men are less likely to have positive attitudes to mental health help-seeking, and this reduces service use (Ten Have et al., 2010). General practitioners need to be aware that focussed enquiry about men's functioning in role, social and cognitive domains may yield important information contributing to a diagnosis of depression or anxiety. Given that male patients may be less willing to discuss or acknowledge emotional issues, attention to functioning may be useful as a focus for discussions about the benefits of beginning and adhering to treatment. However, as men attend primary care less frequently than women, consideration should be given to raising the profile of common mental disorders and the effectiveness of treatment in workplaces, especially those that employ large numbers of men. Again, focusing on functioning rather than emotional symptoms may make the issue more acceptable and accessible to some men. From a policy perspective, efforts have either focussed on women or been gender-blind. The evidence from this study suggests that a more systematic and assertive focus on men is overdue for humanitarian, social and economic reasons.

There are several limitations to this study. The temporal direction of the association between disability and mental disorders is unknown. However, the fact that the observed gender differences occur only in relation to those disability domains more sensitive to the effects of mental disorders suggests that they represent gender differences in the disabling effect of mental disorders. Another limitation is that although this survey achieved a good response rate (73.3%) for surveys of its type, people with mental disorders may be over-represented among those refusing to take part and the sampling frame did not include people in institutions, both factors making it possible that people with severe mental disorders may be under-represented. A further limitation is that the WMH-WHODAS-II reflects self-reported disability only and the validity of the measure depends on the individual having some insight into their mental disorder symptoms and the extent of their impact, especially for the four domains that were preceded by a filter question about the existence of health-related disability.

It is also a limitation that the skewed nature of the disability data necessitated the use of logistic regression, which uses a multiplicative scale rather than an additive scale to assess interaction effects. The underlying model of how risk factors might combine is additive (Ahlbom and Alfredsson, 2005) and the interaction of risk factors should preferably be assessed as a departure from additivity not multiplicativity (Ahlbom and Alfredsson, 2005; Andersson et al., 2005). Although it can be possible to adapt logistic regression to assess interactions on an additive scale, (Scott et al., 2009) it was not possible to do so in this case. Several of the gender interactions that were close to significance in these analyses would probably have been significant had linear regression been used, which means these results should be considered conservative.

These limitations should be balanced against the study's strengths: a large enough sample to be able to examine disability in relation to 30 day mental disorders; the capacity to control for chronic physical conditions; diagnostic measures of a range of mental disorders; a comprehensive measure of disability and a nationally representative general population sample with a good response rate. Probably because of these strengths, this is the first study to find that it is in fact men rather than women with emotional disorders who experience disproportionately greater role, social and cognitive disability. This runs counter to prior assertions and therefore needs to be drawn to the attention of clinicians and policy-makers.

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Table 1

Number and percent with disability (non-zero score) in each WMH-WHODAS-II domain, among those with and without mental disorders, by gender [/]

30 day DSM-IV mental disorders	Role		Social		Cognitive		Self-Care		Mobility	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
	n	n	n	n	n	n	n	n	n	n
	%	%	%	%	%	%	%	%	%	%
	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
Any mood disorder	89	154	36	73	55	105	14	26	35	76
	78.2	68.6	33.5	30.1	48.7	45.5	11.5	10.4	30.1	28.6
	67.9, 85.8	60.9, 75.5	23.1, 45.8	23.7, 38.5	37.4, 60.0	37.4, 53.9	5.6, 22.1	6.3, 16.8	20.1, 42.4	22.2, 36.0
Any anxiety disorder	192	487	71	175	124	290	39	87	96	259
	54.0	52.2	19.5	17.7	33.1	31.3	13.2	8.2	24.5	25.8
	46.6, 61.3	48.1, 56.3	14.1, 26.4	14.9, 21.1	26.8, 40.1	27.5, 35.3	8.7, 19.6	6.3, 10.6	18.9, 31.2	22.4, 29.5
Any substance use disorder	74	47	17	18	37	35	15	7	35	18
	58.6	68.2	16.4	20.1	29.5	45.5	11.9	7.7	28.0	28.3
	46.6, 69.7	53.1, 80.3	9, 28.0	10.5, 34.9	20.4, 40.5	30.6, 61.4	6.4, 21	2.5, 21.1	19.0, 39.1	14.8, 47.4
No disorder	709	1147	126	218	256	440	83	113	372	542
	23.9	31.3	3.7	5.8	7.7	11.4	2.7	2.5	12.8	14.5
	21.7, 26.3	28.8, 33.9	2.9, 4.8	4.8, 7.0	6.6, 9.1	9.9, 13.1	2.0, 3.6	1.9, 3.4	11.1, 14.7	12.8, 16.4
Total population	999	1723	221	423	427	784	135	209	505	840
	26.7	34.3	5.1	7.4	9.9	14.2	3.5	3.2	13.7	16.0
	24.5, 29.0	32.0, 36.7	3.9, 5.9	6.4, 8.4	8.7, 11.3	12.7, 15.8	2.7, 4.4	2.6, 4.0	12.1, 15.6	14.4, 17.8

[/] All Ns are unweighted sample observations; all other estimates are weighted, but not adjusted for covariates.

All percents are bolded for clarity.

Table 2

Adjusted ¹ odds ² of reporting disability (non-zero score) in the Role, Social and Cognitive WMH-WHODAS-II domains, among those with and without mental disorders, by gender.

30 day DSM-IV mental disorders	Role				Social				Cognitive			
	Males		Females		Males		Females		Males		Females	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Any mood disorder	10.34	6.02, 17.78	4.36	2.95, 6.43	10.16	5.81, 17.77	5.76	3.76, 8.82	8.26	5.02, 13.58	4.95	3.31, 7.41
Any anxiety disorder	3.06	2.22, 4.20	2.10	1.71, 2.57	5.26	3.29, 8.40	2.79	2.05, 3.80	4.49	3.11, 6.49	2.81	2.20, 3.60
Any mood or anxiety disorder	3.58	2.66, 4.82	2.29	1.88, 2.79	6.03	3.88, 9.37	2.89	2.14, 3.92	5.05	3.59, 7.11	2.94	2.30, 3.75
Any substance use disorder	3.82	2.26, 6.45	3.38	1.75, 6.54	3.38	1.59, 7.18	1.86	0.80, 4.31	3.00	1.77, 5.06	3.10	1.47, 6.55
No disorder	0.29	0.22, 0.38	0.44	0.36, 0.54	0.18	0.12, 0.28	0.36	0.26, 0.48	0.22	0.16, 0.30	0.33	0.26, 0.42

¹ Adjusted for age, ethnicity, educational attainment, equivalised household income, chronic physical conditions.

² Reference groups for mood, anxiety or substance use groups are those without the specified mental disorder; reference group for any mood or anxiety disorder is those with neither disorder; reference group for no disorder is those with any disorder.

All odds ratios are **bolded for clarity**.

Table 3

Adjusted ^a odds ^b of reporting disability (non-zero score) in the Self-Care and Mobility WMH-WHODAS-II domains, among those with and without mental disorders, by gender.

30 day DSM-IV mental disorders	Self-Care				Mobility			
	Males		Females		Males		Females	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Any mood disorder	3.50	1.60, 7.65	3.50	1.82, 6.73	3.01	1.70, 5.33	2.31	1.57, 3.41
Any anxiety disorder	4.91	2.67, 9.02	3.42	2.47, 5.14	2.07	1.39, 3.10	2.10	1.65, 2.67
Any mood or anxiety disorder	4.45	2.47, 8.00	3.32	2.21, 4.98	2.11	1.45, 3.07	2.10	1.66, 2.67
Any substance use disorder	4.12	1.99, 8.53	2.51	0.71, 8.76	2.89	1.64, 5.09	2.52	1.08, 5.90
No disorder	0.22	0.12, 0.39	0.30	0.20, 0.45	0.47	0.33, 0.67	0.46	0.36, 0.58

^a Adjusted for age, ethnicity, educational attainment, equivalised household income, chronic physical conditions.

^b Reference groups for mood, anxiety or substance use groups are those without the specified mental disorder; reference group for any mood or anxiety disorder is those with neither disorder; reference group for no disorder is those with any disorder.

All odds ratios are bolded for clarity.