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Predictors of mental health in post-menopausal women: Results from the Australian healthy aging of women study



Charllotte Seib^{a,*}, Debra Anderson^a, Kathryn Lee^b, Janice Humphreys^b

^a Institute of Health and Biomedical Innovation, Queensland University of Technology, Queensland, Australia

^b School of Nursing, University of California San Francisco, USA

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ABSTRACT

Objective: To examine the extent to which socio-demographics, modifiable lifestyle, and physical health status influence the mental health of post-menopausal Australian women.

Methods: Cross-sectional data on health status, chronic disease and modifiable lifestyle factors were collected from a random cross-section of 340 women aged 60–70 years, residing in Queensland, Australia. Structural equation modeling (SEM) was used to measure the effect of a range of socio-demographic characteristics, modifiable lifestyle factors, and health markers (self-reported physical health, history of chronic illness) on the latent construct of mental health status. Mental health was evaluated using the Medical Outcomes Study Short Form 12 (SF-12[®]) and Center for Epidemiologic Studies Depression Scale (CES-D).

Results: The model was a good fit for the data ($\chi^2 = 4.582$, $df = 3$, $p = 0.205$) suggesting that mental health is negatively correlated with sleep disturbance ($\beta = -0.612$, $p < 0.001$), and a history of depression ($\beta = -0.141$, $p = 0.024$). While mental health was associated with poor sleep, it was not correlated with most lifestyle factors (BMI, alcohol consumption, or cigarette smoking) or socio-demographics like age, income or employment category and they were removed from the final model.

Conclusion: Research suggests that it is important to engage in a range of health promoting behaviors to preserve good health. We found that predictors of current mental health status included sleep disturbance, and past mental health problems, while socio-demographics and modifiable lifestyle had little impact. It may be however, that these factors influenced other variables associated with the mental health of post-menopausal women, and these relationships warrant further investigation.

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1. Introduction

Decrements in mental health are associated with a wide variety of factors. Indeed, reduced mental health has been associated with adversity and social disadvantage [1,2], female gender [2], limited social support [3,4], aging [5], and adverse life experiences [6–8], although, the exact mechanisms behind these changes may be difficult to determine. When considering the women's mental health, it is likely that women experience multiple and repeated 'risk' factors for reduced mental health like higher rates of poverty, sexual discrimination and more negative life events [2].

First, socio-demographic factors and life experiences have been linked to diminished mental health. For example, low income and corresponding poverty [9,10], increased levels of

stress, negative early life experiences [9,10], social isolation [4], unemployment [11], decreased availability of food sources and corresponding nutritional deficits, and lack of transportation [12] have all been correlated with diminutions in mental health status.

Reductions in mental health have also been attributed to modifiable lifestyle factors including sleep disturbance [13,14], cigarette smoking [15], physical inactivity [16], and being overweight or obese [17]. Other studies however, have failed to find relationships between mental health and lifestyle behaviors, body weight, or health service utilization [15]. Further, in an American study, Stunkard, Faith, and Allison (2003) reported that because of the increasingly prevalence of both obesity and depression, some co-occurrence is expected [18]. They suggest the relationship between obesity and depression is complex and is best understood within a 'moderator–mediator' framework which explores the influence of moderating (subgroups) and mediating (pathways) factors on the relationship between these conditions [18].

Reduced mental health is also often associated with reductions in perceived physical health status [19] and having one or

* Corresponding author at: School of Nursing, Queensland University of Technology, Victoria Park Road, Kelvin Grove, Queensland, 4059, Australia.
Tel.: +61 73138 8209; fax: +61 7 3138 3814.

E-mail address: c.seib@qut.edu.au (C. Seib).

more chronic illnesses [20]. Indeed, authors have suggested that chronic illness and functional disability are linked with mental decline [20,21], although chronic illness is more likely to occur in the presence of physical inactivity, smoking, poor diet, and sleep disturbance [13,14,20,21].

Clearly, a wealth of literature has explored determinants of mental health. Current evidence suggests that poor mental health in women may be influenced by a variety of factors including socio-demographic characteristics, lifestyle, stressful life experiences, poor sleep quality, and socio-economic disadvantage. However, the extent to which these variables influence mental health may be difficult to determine and, at times, is contradictory. Furthermore, as women age they are likely to face a variety of pressures from work commitments [22], family commitments like caring for husbands, parents and grandchildren [23] and responsibility for running a household [23]. At the same time women may also be adjusting to changes in their own health and functioning [24]. The purpose of this study was to examine the relative influence of socio-demographic characteristics, modifiable lifestyle factors, and self-reported health status on the mental health status (depressive symptoms and compromised function related to mental health) in post-menopausal women from Queensland, Australia.

2. Materials and methods

2.1. Sample

In 2001, women aged 50–60 were selected at random from the Queensland electoral roll (and followed up in 2006 and 2011). Recruitment strategies and response rates are detailed in several earlier papers [25–27]. This paper presents cross-sectional data from the 343 women, currently aged 60–70 years, who are continuing to participate in the Australian Healthy Aging of Women (HOW) study in 2011.

Multiple retention strategies have been used to retain women in the study although around 224 women (40%) dropped out between 2006 and 2011. More specifically, 8 women died during the intervening period, 53 women withdrew their consent, and 168 women were lost to follow-up. To assess attrition, responders and non-responders were compared across a number of socio-demographic characteristics (age, identifying as Aboriginal or Torres Strait Islander, country of birth, highest educational attainment, employment status and income). Employment status was the only characteristic that distinguished the two groups; non-responders were more likely to report being permanently ill or unable to work (8%) and less likely to be retired (19%) than women who continued to participate in the 2011 survey (2% and 29% respectively; $\chi^2 = 15.3$, $df = 5$, $p = 0.009$).

2.2. Measures

Quantitative data were collected using a structured self-completed questionnaire. The survey instrument included items on socio-demographics, modifiable lifestyle factors, chronic illness and health-related quality of life (using the SF-12).

2.2.1. Mental health

In order to assess the various aspects of mental health in post-menopausal people, two outcome measures were used: the Mental Component Summary Score (MCS) from the Medical Outcomes Study Short Form 12 (SF-12[®]) [28] and the Center for Epidemiologic Studies Depression Scale (CES-D) [29], both of which have been used in a variety of population in a variety of locales. The SF-12 has demonstrated good reliability and validity in previous research [28,30], and is scored using standard scoring procedure [31], with 100 being the best possible score (indicating better self-reported

health status) and zero being the worst possible score (indicating poor self-reported health status).

The CES-D is a 20-item instrument that measures depressed mood or affect [29] and includes one item about sleep. The CES-D has been shown to be reliable and valid for use in the general population [29], clinical populations [32] and in older people. Items are summed with higher scores indicating more depressive symptoms, scores of between 16 and 26 suggest mild depression and scores of ≥ 27 suggest major depression [33].

The CES-D and MCS were moderately correlated ($r = 0.521$, $p < 0.001$) suggesting that although related, the instruments be measuring different aspects of mental health. This is supported by Prince (1998) who reported that the SF12 is a global measure of functional outcomes related to mental health, while the CES-D provides an estimate of frequency of symptoms associated with recent depressed mood [34]. Further, as aging is frequently associated with decrements in physical health [19], increased rates of chronic illness [20], functional decline and worse mental health [20,21], it was theorized that the inclusion of both measures would provide a more comprehensive exploration of mental health status.

Past history of depression and/or anxiety may be a significant predictor of current mental health status. As a potentially important covariate, this variable was included by summing the number of women who reported previous diagnosed with an anxiety disorder and/or depression (scores 0–2).

2.2.2. Physical health and chronic illness

Physical health was measured using the SF-12[®] Physical Health Component Summary Score (PCS) and was summed using the standard scoring procedure [31]. Chronic illness in women was measured by summing the number of chronic conditions per person. Women were asked to self-report whether they had ever been diagnosed with any of the following conditions: ischemic heart disease; stroke; breast cancer; non-insulin dependent diabetes mellitus [35].

2.2.3. Modifiable lifestyle factors

The modifiable lifestyle factors evaluated in this study included BMI [36], physical activity, dietary intake, alcohol intake, caffeine consumption, smoking status [27] and sleep [37]. BMI was calculated and grouped according to the WHO International Classification of adult weight [36] with scores < 18.5 being underweight, scores between 18.5 and 24.9 being normal weight range, scores between 25.0 and 29.9 being overweight and scores ≥ 30 being obese. Alcohol and tobacco use were measured using standard questions about the amount and frequency of current patterns of consumption [38] while physical activity was evaluated by asking women about the frequency of exercise in the past month [27].

Sleep disturbance was measured using the 21-item General Sleep Disturbance Scale (GSDD) which assesses subjective sleep over the past 7 days [37]. A total score and seven subscales (sleep onset; sleep maintenance; quality of sleep; quantity of sleep; early waking; daytime sleepiness, and self-medication to assist sleeping) are all calculated [37]. The instrument has demonstrated good internal consistency in a variety of population groups including new mothers (Cronbach alpha = 0.88) [39]. The total GSDD is scored by summing items, with higher scores indicating more frequent sleep disturbance (scores range from 0 to 147).

2.3. Conceptual model

In order to predict the factors correlated with reduced mental health, specifically related to increased depressive symptoms and compromised function related to mental health, the following theoretical model was developed (see Fig. 1). This model hypothesizes that mental health is influenced by (1) socio-demographic

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