



The trajectory of negative mood and depressive symptoms over two decades



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ABSTRACT

Objective: Research aimed at understanding the temporal characteristics of depressive symptoms and negative mood in an older female population is lacking, despite the relationship between the two factors being well established. The aim of this study was to examine the characteristics of negative mood scores and depressive symptom scores in a longitudinal sample of women transitioning from mid-life to late life.

Study design: This study was a longitudinal assessment of variables drawn from an epidemiological prospective study of women's healthy ageing. Scores were analysed using General Linear Mixed Models.

Main outcome measures: Negative mood scores derived from the Affectometer 2 were assessed at 11 time points spanning 20 years. Depressive symptom scores were assessed using the Centre for Epidemiological Studies Depression Scale (CESD), administered in 2002, 2004 and 2012.

Results: Mean negative mood scores reduced significantly between 1992 and 2012, as did mean CESD scores between 2002 and 2012. Mean negative mood scores reduced by 0.007 for each year of increasing age. For depressive symptoms, a reduction in mean score of 0.15 was found for each year of increase in age.

Conclusion: Depressive symptom scores and negative mood scores decreased significantly over time.

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1. Introduction

The core feature of depressive disorder, and one of the two prerequisite symptoms to receive a formal diagnosis, is the presence of negative mood [1]. Research examining negative mood as a facet of personality has consistently shown a link between mood state and psychopathology [2], and negative mood has been shown to be a consistent risk factor for developing a Major Depressive Disorder (MDD) across the life-span [2,3]. While most standardised assessments of depressive symptoms include a single item related to negative mood, examination of negative mood using a specific measure with several components specific to assessing affect provides a more comprehensive measure. An examination of the longitudinal characteristics of depressive symptoms, including a separate assessment of negative mood as an independent factor is lacking.

Studies specifically examining negative mood have shown that adults report a decline in negative mood as they age [4,5]. In a longitudinal analysis exploring mood characteristics in both sexes, negative mood scores were found to decrease steadily to the age of 60, where they continued to decrease at a much slower rate [5]. Studies that have examined the incidence of depressive symptoms across the life span have provided inconclusive results, with some showing an increase across age groups and others a decrease [4,6–10]. Cross-sectional studies generally report either a decline with age, or a curvilinear relationship with higher rates reported in old age or very old age [10–12]. When assessing depressive symptoms, standardised measures include a range of physiological and somatic symptoms in addition to negative mood [13,14]. These measures can be impacted by cohort characteristics, such as age, or cultural background [14]. Measures used to assess younger adult populations may not be appropriate for older adults who are likely to be diagnosed with comorbid physical illness which may inflate scores of somatic items on depressive symptom scales [15], making the assessment of negative mood as an independent factor particularly important.

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Prevalence rates of depression have consistently been demonstrated to be higher in women, with gender differences in lifetime prevalence for a female to male ratio ranging from 2:1 [16,17] to 4:1 [18]. This gender difference is consistently reported when considering hospital admissions, population studies, suicide attempts or the prescription of anti-depressant medication [19,20]. Given the consistent finding of gender differences between men and women, a separate assessment of the characteristics of depressive symptoms in these populations is warranted.

In order to examine the temporal characteristics of negative mood and depressive symptoms over time, a longitudinal analysis comparing these factors in a cohort of female participants is needed. In the current analysis mood scores for women transitioning from mid-life to late-life were examined. It was hypothesised that both negative mood and depressive symptoms would reduce over time. The specific goals of the study were to 1) examine the course of negative mood across the twenty year span of the study and, 2) to compare depressive symptom prevalence across the latter ten years of the study.

2. Method

Data for this study was drawn from the Women's Healthy Ageing Project, an ongoing, longitudinal epidemiological study examining women's healthy ageing [21]. The study, which commenced in 1991 as the Melbourne Women's Midlife Health Project, spans twenty years and examines biological, lifestyle and health factors. Measures specific to the assessment of depressive symptoms were introduced in 2002 and were readministered in 2004 and 2012. Analysis of baseline statistics for those who remained in the study in 2012 ($n=252$) and those who dropped out since the baseline assessment point in 1991 ($n=186$) was conducted. Additional longitudinal analysis was performed using data from 168 women from the larger WHAP cohort who provided complete CESD scores in 2002, 2004 and 2012, and 151 women who provided data at all time points on the Affectometer 2.

At each point of contact the study has been approved by the Human Research Ethics Committee of the University of Melbourne. All procedures and ethical standards are in accordance with those outlined by the National Health and Medical Research Council. All women have provided informed written consent for each time point in which they have participated. The reporting and analysis of this study followed the principles of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) initiative.

2.1. Participants

During initial recruitment in 1990 Australian women aged between 45 and 55 years and living in Melbourne were contacted via random digit dialling by the Ray Morgan Centre [22]. Telephone numbers were drawn randomly from the Melbourne White Pages telephone directory. After the study was explained to each participant they were invited to complete a twenty minute telephone interview conducted by a trained interviewer [22]. Of those contacted 2001 women agreed to participate in the cross-sectional survey, a response rate of 71%. These 2001 women comprised a randomly selected, cross-sectional population based cohort, reflecting real world morbidity and mortality rates. Of the 2001 participants in the cross sectional cohort 779 women met criteria for inclusion into the longitudinal phase of the study. Inclusion criteria comprised: being premenopausal, having an intact uterus, having at least one ovary and not being on the contraceptive pill [23]. Of the eligible 779 women 438 (56%) completed the interview and represent the baseline cohort of the longitudinal study. The 438

participants differed significantly to the 341 non-participants in the following areas: they reported better health than women of the same age; were more likely to be in paid employment; they had more than 12 years of education; a greater number had a pap smear; they exercised at least once a week and, they were more likely to have undergone dilation and curettage [23]. By the ninth year of follow up, representing completion of phase 1, 88% of this original longitudinal cohort remained in the study. Those who dropped out between 1993 and 1999 were significantly less likely to be married or living with a partner or to exercise at least once a week [23].

2.2. Data collection

2.2.1. Negative mood score – Affectometer 2

The Negative Mood sub-scale of the Affectometer 2 was administered at each time point spanning the twenty years. The original 96 items used for the Affectometer-1 were empirically selected from a candidate pool of 435 adjectives and sentences [24]. To develop the Affectometer 2 the authors studied the items and imposed 10 mnemonic categories representing “qualities of happiness” which included Confluence, Optimism, Self Esteem, Self-Efficacy, Social Support, Social Interest, Freedom, Energy, Cheerfulness and Thought Clarity [25]. From these categories 10 negative adjectives and 10 positive adjectives were determined and formed the Positive Mood and Negative Mood sub scales, with the average score of the two subscales representing a general Wellbeing score [25]. The ten negative adjectives included in the Negative Mood sub-scale were used in this examination: lonely; helpless; impatient; depressed; hopeless; withdrawn; discontented; confused; tense, and insignificant [25]. Participants were asked to rate how much they had experienced that feeling in the last week on a four point scale from “most of the time” (3) to “hardly ever” (0). The mean score of the summed items was used to reflect total negative mood score and ranged between 0 and 3, with higher scores reflecting a greater experience of negative mood. Kammann and Flett [25] reported high reliability for the measure with an alpha of 0.95. The Negative Mood score originally published by Kammann and Flett using a 5 point Likert scale correlated 0.83 with the Beck Depression Inventory (short form). The 4 point scale used by WHAP demonstrated similar distributional characteristics and degree of intercorrelation to the original scale [23]. High correlation has been shown between the Negative Mood Scale and the Centre for Epidemiological Studies Depression Scale (CESD) in the WHAP sample ($r=0.57$, $p<0.01$) [23] as well as the original Negative Affect subscale and the BDI, (0.83) [25].

2.2.2. Depressive symptom scale – Centre for Epidemiological Depression Scale (brief version)

The CES-D-Brief is a self-report scale specifically designed to be used in epidemiological studies to assess the presence of clinical and non-clinical symptoms of depression in the general population. The CESD Brief includes 10 items and has been demonstrated to have high reliability (test retest reliability, $r=0.71$) and good predictive accuracy when compared to the full 20 item CESD [27]. Scores range from 0 to 30. The cut off range of <10 is used to categorise normal versus mild to moderate symptoms [13,28].

2.2.3. Independent variables

A number of biological, lifestyle and health factors were assessed at each time point. A full overview of the independent variables used in the Women's Healthy Ageing project is provided elsewhere [21]. The independent variables considered in this analysis included age, body mass index (BMI), severity of 'hassles' as derived from a shortened version of the Hassles scale [26], number of bothersome physical symptoms, employment status, education status, use of alcohol, menopausal status (as defined by STRAW + 10 criteria [29])

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