



# Investigating how menopausal factors and self-compassion shape well-being: An exploratory path analysis



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## ABSTRACT

**Objectives:** A large body of work has investigated the relationship between menopausal factors and negative well-being (e.g. anxiety and depressive symptoms), but less is known about positive well-being and its correlates among midlife women. This study tests two models with both positive and negative well-being indices as outcomes: the first included menopausal factors as predictors; the second model expanded the first by adding self-compassion, a protective trait, as a predictor and moderator.

**Study design:** Cross-sectional study based on self-report questionnaires from 206 women aged 40–60, currently experiencing hot flushes.

**Main outcome measures:** Hot flush interference ratings, emotional balance, satisfaction with life, eudaimonic well-being and depressive symptoms.

**Results:** In model one, menopausal stage and hot flush frequency were independent of well-being outcomes. Beliefs about perceived control over menopause was the strongest predictor of well-being ( $\beta$  range: .22–.32), followed by hot flush interference ratings ( $\beta$  range: .15–.33). In model two, self-compassion was the strongest predictor of well-being indices ( $\beta$  range: .20–.39), followed by beliefs about control ( $\beta$  range: .16–.20) and interference ratings ( $\beta$  range: .17–.26).

**Conclusions:** Psychological aspects of the menopause appear more strongly linked to well-being than physiological aspects such as menopausal stage and hot flush frequency. Specifically, self-compassion, feeling in control of menopause and low interference ratings are three factors that are associated with well-being among midlife women. These aspects could be considered in tandem, as a means to support well-being in the context of menopause.

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## 1. Introduction

A large body of work has investigated how menopausal factors, including menopausal stage, symptoms and thoughts about the menopause influence psychological symptoms, such as depression and anxiety [1,2]. In contrast, surprisingly little is known about how the menopause influences positive mental well-being such as emotional happiness and a sense of purpose in life. The World Health Organisation defines health as a state of complete well-being and not merely the absence of symptoms [3], so addressing this issue

is paramount to gaining a more comprehensive understanding of how the menopause relates to mental health.

Mental well-being is a multifaceted construct that involves the absence of distressing psychological symptoms, together with feeling good and functioning optimally in the world [4]. Traditionally, these aspects have been considered in isolation. For example clinical psychology has typically emphasised symptom reduction as the cornerstone of well-being [5], a focus that is sometimes referred to as negative well-being [4]. Positive well-being can be differentiated into hedonic and eudaimonic aspects. Hedonic well-being involves feeling good through the predominance of positive emotions and thoughts of satisfaction with life [6]. Eudaimonic well-being relates to functioning optimally in the world, through leading a life of meaning and self-actualisation. There is now a growing move to consider negative, hedonic and eudaimonic well-being in tandem, given that they have distinct neural correlates and contribute unique information about health [4,7].

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The measurement of well-being provides useful information over and above quality of life (QoL), which is a related construct that has been widely researched in the menopause literature (for reviews see [8,9]). A number of menopause specific QoL measures have been developed (e.g. [10,11]), but these typically measure potential impairments in functioning associated with menopause, and thus fail to capture positive aspects of well-being, or else measure functioning in specific domains of life (such as career and sex life) that may vary in relevance between women. Mental well-being, in contrast, involves the subjective experience of happiness, fulfilment and freedom from distressing symptoms independent of life domains. Accordingly, there is a need to consider well-being in addition to QoL among midlife women.

Women's experience of the menopause is heterogeneous, influenced by hormonal changes, physical symptoms – the most common and bothersome of which are hot flushes and night sweats (HFNS) [12], and psychological factors including menopausal beliefs and the perceived degree to which symptoms interfere with daily life [13]. A large body of work has investigated the link between physiological aspects of menopause, namely menopausal stage and reported HFNS, and indices of negative well-being, especially depressive symptoms. Recent reviews demonstrate that while findings have been mixed, on average both the perimenopausal stage [14] and HFNS frequency [15] may be associated with elevated depressive symptoms. Conversely, though, our recent review found no evidence of a link between these factors and positive well-being [16].

This finding indicates that there may be a dissociation, in which physiological aspects of menopause directly affect negative but not positive well-being. A possibility that has not been thoroughly explored, however, is that HFNS symptoms might indirectly relate to positive well-being, through HFNS interference ratings. There is a large amount of individual differences in the strength of relationship between the frequency and the degree to which symptoms are perceived to interfere with daily activities [17]. This means that some women find a given frequency of HFNS to be far more interfering in daily life activities like sleep, work and mood than others.

It is therefore plausible that it is only when HFNS interfere with daily life that symptoms potentially undermine positive well-being. For example, if HFNS interfere substantially with sleep, work, family and sex life, then a woman may experience depressed mood [17,18] and also less pleasure (hedonic well-being) and less fulfilment (eudaimonic well-being) in her life because her functioning is impaired. Supporting this hypothesis, Dennerstein and colleagues [19] found evidence of an indirect (but not direct) effect of HFNS on emotional well-being, mediated through sleep problems and self-rated health. To date, however, indirect effects of HFNS on life satisfaction and eudaimonia have not been considered.

In addition to HFNS frequency, beliefs about the menopause play a key role in explaining how problematic symptoms are likely to be. For example, Hunter and Chilcot demonstrated that beliefs were more than three times stronger a predictor of HFNS problem ratings than perceived hot flush frequency [20]. Beliefs might influence interference ratings because they involve the appraisal of symptoms. For example, a woman who views menopause as benign may find symptoms to be less troublesome relative to a woman who believes that HFNS have serious life consequences, will last for a very long time and are uncontrollable. Based on Levanthal's model of illness, The Menopause Representation Questionnaire (MRQ) measures menopause beliefs on four dimensions: beliefs about timeline, consequences, perceived symptoms and control [21]. Menopause related beliefs have been found to predict problem ratings [22,23], which we hypothesise will subsequently predict positive and negative well-being. Additionally, Hunter and O'Dea found that specifically control beliefs linked to depressive

symptoms [21], and we hypothesised that feeling in control of menopause may directly link to positive well-being as well, given that control implies a sense of self-efficacy, which is known to predict positive functioning [24].

Modelling how menopausal factors predict well-being serves to advance an understanding of what aspects of menopause are most relevant to positive and negative well-being. A consensus in the literature, however, is that it is also useful to consider the psychosocial context of a woman's life [25]. A wide range of psychosocial factors have been found to explain more variance in well-being indices than menopause alone [25], so broader models of well-being that acknowledge some of these factors help place menopause in perspective of the life context. Psychosocial factors may also serve to explain why some women are more prone to suffer from menopausal symptoms than others. For example, in an earlier study we found that self-compassion, defined as a healthy way of relating towards the self when facing hardship [26], was a direct negative predictor of HFNS interference and depressive symptoms, and it also weakened the association between HFNS frequency and HFNS interference ratings [18]. Here, we extend this finding, through considering menopausal factors and self-compassion as a predictor of HFNS interference, and also a range of positive and negative well-being outcomes. In this study, we test two hypothesised models of well-being of midlife women. The first considers how menopausal factors contribute to indices of positive and negative well-being, after controlling for demographics including age, employment, relationship status and body mass index. The second is a broader model that includes self-compassion, which we expect will explain additional variance in well-being, above and beyond the menopause. The hypothesised models are illustrated in Fig. 1.

## 2. Materials and methods

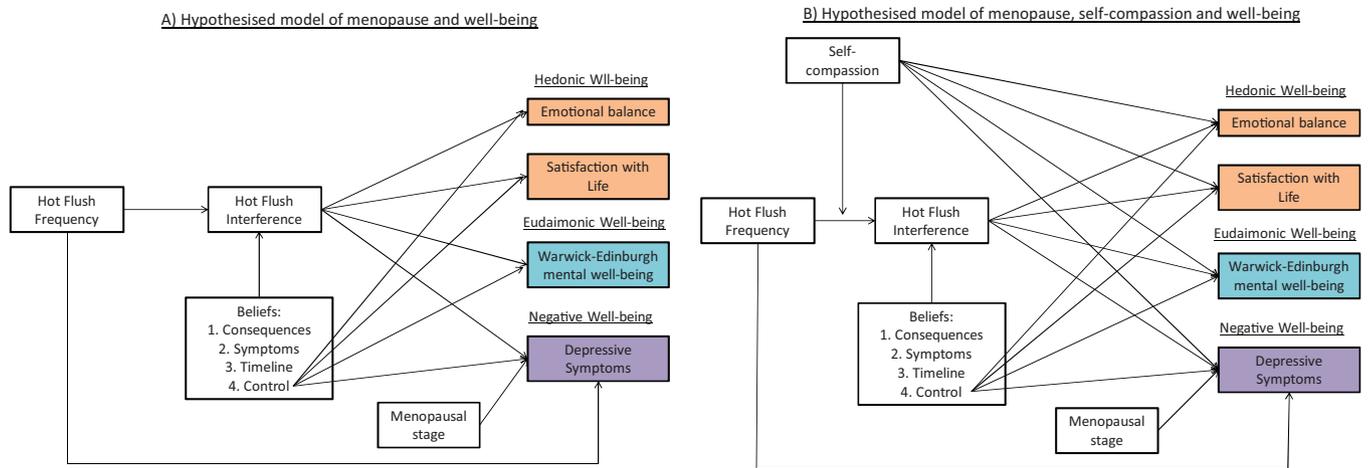
### 2.1. Participants

Participants included a subset of a larger community sample of men and women aged between 18 and 101 ( $N=7615$ ) who were randomly recruited from the electoral roll [27]. Women aged between 40 and 60 at the time of data collection, and who expressed willingness to be involved in future research ( $n=1450$ ) were invited to participate. Valid consent and questionnaire responses were received from 517 participants, resulting in a response rate of 35.7%. Responders were more likely to be married at baseline (odds ratio 95% CI: 1.13–2.02) and were on average 1.40 years older than non-responders,  $t(1634)=4.47, p<0.001$ . Responders also reported significantly higher satisfaction with life,  $t(1573)=3.03, p=0.003$ , at baseline relative to non-responders. Given that the current model includes HFNS frequency and interference ratings as independent variables, only women currently experiencing HFNS ( $n=206$ ) were included in analysis.

### 2.2. Measures

#### 2.2.1. Menopausal factors

**2.2.1.1. Menopausal status.** Menopausal status was assessed using the Stages of Reproductive Ageing Workshop +10 criteria [28]. Women were classified into four reproductive stages based on the regularity of their menses: premenopausal (regular cycles or subtle changes in length/flow), early perimenopausal (persistent change  $\geq 7$  days in consecutive cycles), late perimenopausal (interval of amenorrhoea of at least 60 days) or postmenopausal (at least 12 months of amenorrhoea). Women taking hormone contraceptives or hormone replacement therapy (HRT) were unable to be classified by stage, and were classified as hormone users.



**Fig. 1.** Hypothesised models of well-being among women currently experiencing hot flashes and night sweats. Model (A) considers the influence of menopausal factors on well-being. Model (B) involves the addition of self-compassion as a predictor in the model.

**2.2.1.2. Frequency of hot flashes and night sweats.** Participants were asked to rate on average how many hot flashes and night sweats they currently experienced. They were given the option of reporting a daily, weekly or monthly frequency, with scores converted into an average daily frequency for comparison.

**2.2.1.3. Hot flush interference ratings.** The HFI is a 10-item scale measuring the degree to which hot flashes interfere with daily activities including work, socialising, leisure, sleep, mood, concentration, relaxation, sex, enjoyment, and quality of life [17]. Subjects rate the degree of interference on a scale ranging from 0 (do not interfere) to 10 (completely interfere). A total score is computed by summing items, with a higher score indicating a greater impact of hot flashes. The HFI has good published reliability and validity [17] and Cronbach's  $\alpha$  was 0.95 in this study.

**2.2.1.4. Menopausal beliefs.** The Menopause Representation Questionnaire (MRQ) is a 37-item measure of cognitions about menopause [21]. Based on Leventhal's self-regulation model of illness, the MRQ has four subscales covering identity, consequences, time frame and perceptions of control/cure. For the identity subscale, women rated which of 20 symptoms they believed were part of their menopause by checking 'yes', 'no', or 'uncertain.' The frequency of the 'yes' response was summed to generate the subscale score. Other subscales were scored on a 5-point scale from strongly agree [5] to strongly disagree [1], some items were reverse scored such that higher scores on consequences indicated more negative beliefs about the menopause, and higher scores on control/cure indicated more positive beliefs.

## 2.2.2. Self-compassion

**2.2.2.1. Self-compassion scale (SCS).** The SCS is a 26-item scale measuring six facets of self-compassion: self-kindness, self-judgement, common humanity, isolation, mindfulness and over-identification [26]. Participants indicated agreement to statements describing responses to challenging experiences (for example "when I see aspects of my personality that I don't like, I get down on myself") on a 5-point Likert scale ranging from 1 "Almost never" to 5 "Almost always." A total score was generated through obtaining a grand mean, after reverse-scoring Self-Judgement, Isolation and Over-identification items. In this study Cronbach's  $\alpha$  for the full scale was 0.94.

## 2.2.3. Hedonic well-being

**2.2.3.1. Positive and negative affect schedule (PANAS).** The PANAS consists of two 10-item subscales measuring positive and negative affect [29]. Participants rate the degree to which they experienced positive emotions (such as 'interested' and 'enthusiastic') and negative emotions (such as 'distressed' and 'upset') during the past week. Items are rated on a 5-point Likert scale ranging from 1 ('slightly or not at all') to 5 ('extremely'). Emotional balance was calculated through subtracting the sum of negative emotions from the sum of positive emotions. Cronbach's  $\alpha$  for emotional balance was 0.92.

**2.2.3.2. Satisfaction with life scale (SWLS).** Diener's 5-item SWLS is a one-dimensional scale that measures an individual's global judgement of life satisfaction [30]. All items are positively worded (for example "the conditions of my life are excellent"), and are rated on a 7-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree". The SWLS demonstrated good internal consistency in this study ( $\alpha = 0.90$ ).

## 2.2.4. Eudaimonic well-being

**2.2.4.1. Warwick-Edinburgh mental well-being scale (WEMWBS).** The WEMWBS consists of 14 positively worded items that measure mental well-being [31]. It is unique in that it captures hedonic (e.g. "I've been feeling cheerful") and eudaimonic (e.g. "I've been feeling useful") aspects of well-being in a single scale. It demonstrates good concurrent and convergent validity [31]. Cronbach's  $\alpha$  in this study was 0.95.

## 2.2.5. Negative well-being

**2.2.5.1. Centre for epidemiological studies depression scale (CES-D).** The CES-D is a widely used measure of depressive symptoms where participants rate symptom experience during the past week on a 4-point scale ranging from 0 ('rarely') to 3 ('most or all of the time'). In this study, Cronbach's  $\alpha$  was 0.94.

## 2.3. Procedure

Participants ( $n = 1450$ ) were mailed a questionnaire booklet, a plain language statement, a consent form and a prepaid envelope. To enhance response rate, a second copy of the questionnaire and consent form was sent to participants who did not respond within two months. This was an anonymous survey, and so unidentified questionnaire booklets and consent forms containing contact

information were separated once they were returned. Ethics approval for the study was sought and obtained from the University of Melbourne's Human Ethics Committee (HREC#1136819.1).

2.4. Data analysis

First, bivariate associations between well-being outcomes and the independent variables were tested using Pearson's *r* correlation and one-way analysis of variance (ANOVA) to assess the feasibility of the hypothesised models.

The models were then tested using path analysis with Mplus version 6.0. Missing data were handled using full information maximum likelihood. Four demographic variables (age, education, relationship status, employment status) were included as control variables in both models, in order to ensure that observed results were not epiphenomenal of these factors.

Because testing relationships between menopausal factors and well-being is a relatively underdeveloped area of research [16], following recent protocol [32] we considered theoretically justified post hoc modifications to the model in order to include relevant relationships that have not been considered to date.

Overall model fit was assessed through multiple fit statistics, with  $p > .05$  for likelihood-ratio  $\chi^2$ , Comparative Fit Index (CFI)  $\geq .95$ , Tucker Lewis Index (TLI)  $\geq .95$ , the Root Means Square Error of Approximation (RMSEA)  $\leq .06$ , and the Standardised Root Mean Square Residual (SRMR)  $\leq .08$ , indicating good fit [33,34]. Further, we considered the *R*-square of outcome variables, which represents the proportion of variance explained by predictors.

3. Results

3.1. Preliminary analyses

Descriptive characteristics of this subsample ( $n = 206$ ) are presented in Table 1.

A series of one-way ANOVAs revealed that menopausal stage was independent of all outcomes, as was beliefs about the timeline of menopause, and so these variables were not included in the multivariate model. Bivariate relationships among all study variables are presented in Table 2.

3.2. Model 1: menopausal factors and well-being

Hypothesised Model 1 demonstrated adequate fit in terms of CFI and SRMR (.97 and .041 respectively), but there was a highly significant  $\chi^2$  ( $p < .001$ ) and substandard fit according to TLI (.90) and RMSEA (.081). Inspection of modification indices recommended the

**Table 1**  
Demographic characteristics of the sample.

Variable	Description
Age	$M = 53.64$ ; $SD = 3.99$
Menopause status	
Premenopausal	30 (14.6%)
Perimenopausal	26 (12.6%)
Postmenopausal (total)	148 (71.8%)
Natural menopause	124 (60.2%)
Surgical menopause	23 (11.2%)
Employment status	
Disability/sickness benefit	10 (4.9%)
Unemployed	5 (2.4%)
Full time house duties	16 (7.8%)
Retired	10 (4.9%)
Working part-time	91 (44.2%)
Working full-time	74 (35.9%)
Missing	0
Relationship status	
Single	42 (20.4%)
In a relationship	160 (77.7%)
Missing	4 (1.9%)
BMI	$M = 28.47$ , $SD = 6.49$

Note: BMI = body mass index.

inclusion of a direct path from beliefs about perceived symptoms to both eudaimonic well-being and symptoms of depression. This final model resulted in good fit to the data,  $\chi^2(20) = 45.38$ ,  $p = 0.03$ , CFI = .98, TLI = .95, RMSEA = 0.058, SRMR = 0.038.

In the final model, HFNS interference ratings significantly predicted all well-being outcomes ( $\beta$  ranging between  $-.15$  and  $.33$ ), as did beliefs about control/cure ( $\beta$  ranging between  $-.22$  and  $.32$ ). Beliefs about perceived symptoms weakly predicted depressive symptoms ( $\beta = .13$ ,  $p = .004$ ) and eudaimonic well-being ( $\beta = -.11$ ,  $p = .024$ ).

While HFNS frequency did not directly predict well-being outcomes, there were small indirect effects through HFNS interference ratings for depressive symptoms ( $\beta = .05$ ,  $p = .026$ ) and emotional balance ( $\beta = -.04$ ,  $p = .036$ ). There were also significant, small indirect effects of control, consequences and perceived symptom beliefs onto emotional balance, eudaimonic well-being and depressive symptoms, through interference ratings (absolute  $\beta$  ranging between  $.047$  and  $.099$ ). Model 1 is illustrated in Fig. 2. For parsimony, significant relationships between demographics and outcomes are not shown in the diagram, but are reported in Table 3.

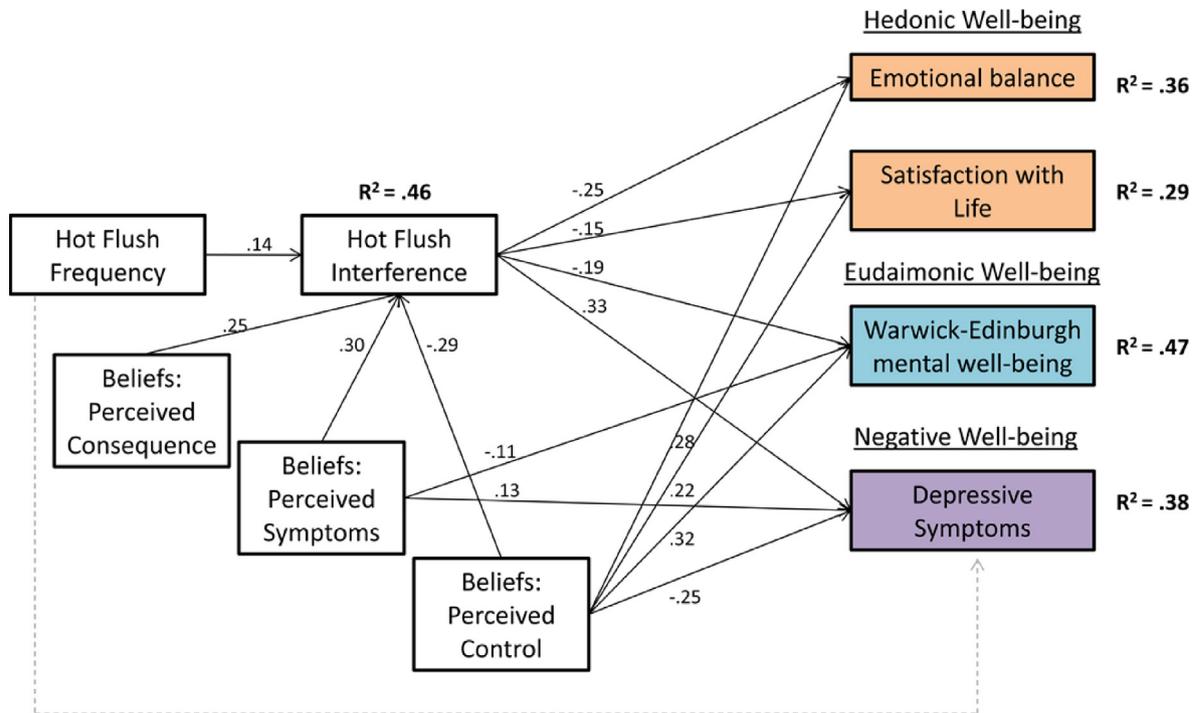
3.3. Model 2: menopausal factors, self-compassion and well-being

When including self-compassion to the final model above, Model 2 demonstrated good fit to the data,  $\chi^2(23) = 26.42$ ,  $p = 0.28$ ,

**Table 2**  
Pearson correlations among study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Affect	1															
2. SWL		1														
3. WEMWBS			1													
4. CES-D				1												
5. Age					1											
6. BMI						1										
7. Employment							1									
8. Relationship								1								
9. Education									1							
10. HFNS Fq										1						
11. HFI											1					
12. Identity												1				
13. Consequence													1			
14. Timeline														1		
15. Control/cure															1	
16. Self-compassion																1

Note: SWL = satisfaction with life; WEMWBS = Warwick-Edinburgh mental well-being scale; CES-D = Centre for Epidemiologic Studies Depression Scale; BMI = body mass index; HFNS = hot flushes and night sweats; HFI = hot flush interference.



**Fig. 2.** Structural equation model of how menopausal factors influence a range of well-being outcomes. Path coefficients are standardised. Significant paths are signified by dark lines, together with their corresponding beta coefficients. Paths that were tested, but that were not significant ( $p > .05$ ) are included as light dashed grey lines .

CFI = .99, TLI = .99, RMSEA = 0.028, SRMR = 0.028. Self-compassion explained significant variance in all outcomes. The change in R-square for well-being outcomes between Model 1 and Model 2 ranged from .02 to .10, demonstrating that self-compassion explained between 2% and 10% of unique variance above menopausal factors and demographics.

With the inclusion of self-compassion, HFNS interference ratings no longer significantly predicted satisfaction with life or eudaimonic well-being. Thoughts about control/cure remained significant predictors of well-being outcomes other than depressive symptoms, although the strength of the relationships was attenuated. With inclusion of self-compassion, the mean reduction in  $\beta$  coefficients from control beliefs to well-being outcomes was 0.09. Model 2 is illustrated in Fig. 3.

**4. Discussion**

This study aimed to investigate how menopausal status, HFNS frequency and interference ratings, beliefs about the menopause and self-compassion influence a range of well-being outcomes.

**Table 3**  
Standardised parameter estimates (p value) of demographics significantly predicting HFI and well-being outcomes.

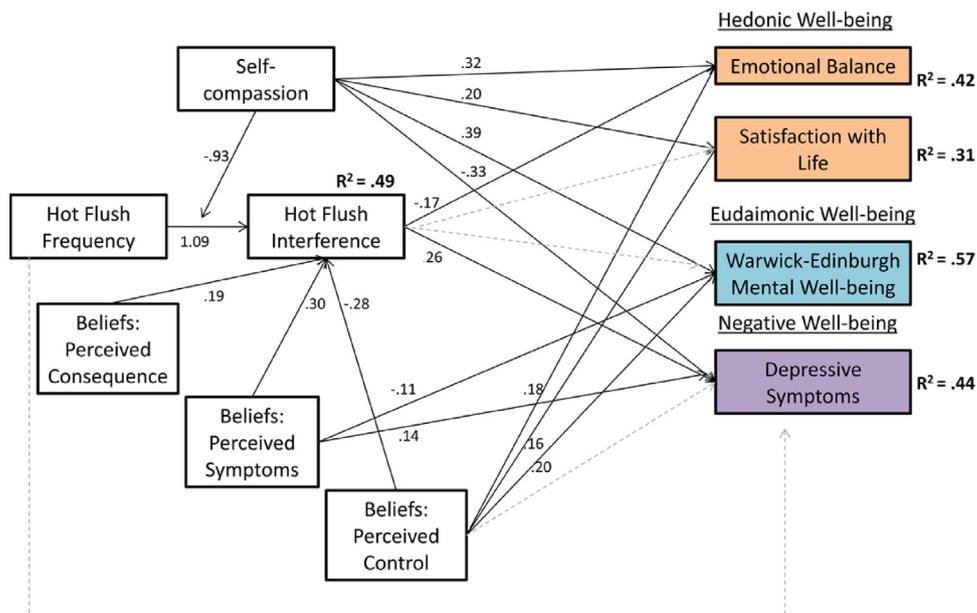
Outcome variable	Model 1	Model 2 (with self-compassion)
HFI	Age .19 (.002)	Age .17 (.008)
Affective balance	Employment .25 (<.001)	Employment .20 (<.001)
Satisfaction with life	Age.15 (.021) Employment .16 (.011)	Employment .13 (.036) Relationship .22 (<.001)
Eudaimonic well-being	Age.25 (<.001)	Age.23 (<.001)
Depressive symptoms	None	None

Note: HFI = hot flush interference.

No prior studies have examined how menopausal factors link to a wide range well-being outcomes [16], and so this work adds valuable information in modelling how menopause, together with self-compassion, may associate with reports of happiness, satisfaction, purpose in life and symptoms of depression among midlife women. Our results partially supported our hypothesised models, and indicated that self-compassion and beliefs about control of menopause are associated with well-being, after controlling for demographics.

In agreement with prior work, psychological aspects of menopause including control beliefs and HFNS interference ratings were more strongly related to well-being than physiological aspects such as menopausal stage and HFNS frequency. Indeed, it is when symptoms interfere with daily life that women commonly seek treatment for HFNS, so the link between interference and well-being is not surprising. However, the strong link between control beliefs and well-being is worthy of attention. During focus groups used to develop the menopause representation questionnaire, Hunter and O’Dea found that midlife women did not commonly raise control beliefs in open discussion, and instead spoke more about perceived consequences and symptoms of menopause [21]. So while women may not always raise control as an issue, our data demonstrate that it is directly relevant to well-being. Strategies to bolster perceived control such as education programmes, access to cooling facilities in the workplace, and appropriate diagnosis and treatment of symptoms may thus be helpful to promote the well-being of midlife women.

We found no evidence of a link between menopausal stage and depressive symptoms either in our full sample (n = 517) or in the subset of women currently experiencing HFNS (n = 206). One possibility is that our cross-sectional study design, which cannot control for individual differences, lacks the power to detect the link that has been observed in longitudinal studies [35]. Nonetheless, other large studies have also failed to find a link between stage and depressive symptoms [36]. Therefore, if a true effect does exist at the population level, it is sufficiently small so as to be hard to detect and therefore menopausal stage is not a central



**Fig. 3.** Structural equation model of how menopausal factors and self-compassion influence a range of well-being outcomes. Path coefficients are standardised. Significant paths are signified by dark lines, together with their corresponding beta coefficients. Paths that were tested, but that were not significant ( $p > .05$ ) are included as light dashed grey lines.

contributor to depression [14]. While HFNS was weakly associated with depressive symptoms in bivariate analyses ( $r = .19$ ), the relationship was no longer significant once more psychological aspects of menopause (interference ratings and beliefs) were taken into account. This result further advances the argument that well-being during the menopause transition hinges more on psychosocial than physiological factors [13].

Consistent with studies of younger and older adults, in Model 2 self-compassion was a powerful predictor of all mental well-being outcomes, explaining between 1% and 10% of unique variance over and above menopausal factors. Further, self-compassion fully accounted for the relationships between HFNS daily interference ratings and satisfaction with life and eudemonia. This does not mean that the degree to which symptoms interfere with daily life is unimportant; but rather that self-compassion might help account for the relationship between interference and some well-being outcomes. Building on our prior work [18], this data strengthens the hypothesis that self-compassion may be a helpful modifiable factor that is associated with well-being during the menopause transition.

Limitations of this study include the exploratory nature of our model and the cross-sectional study design. There is limited research on links between menopausal factors and well-being, and so while our hypotheses were theoretically justified, we allowed for post hoc modifications that modelled new relationships between variables previously unexplored. As is the case with all new findings, therefore, our results may be sample specific and, therefore, replication in independent samples is warranted. Further, given the cross-sectional study design, directions of causality cannot be confirmed. Indeed, it is likely high baseline well-being might contribute to positive beliefs about menopause, thus fuelling a positive cycle that reinforces good outcomes across time. Longitudinal work is needed to build on our preliminary findings to advance knowledge of well-being during the menopause transition.

Despite these limitations, this is the first study to report a comprehensive picture of how menopausal factors and self-compassion together contribute to well-being among midlife women. Consistent with prior work [13], our findings demonstrate that psychological aspects of menopause are more closely associated with well-being than physiological aspects including HFNS

frequency and menopausal stage. Moreover, in the final model we found that self-compassion and control beliefs were the most important contributors to well-being. Therefore, treatment strategies that simultaneously bolster self-compassion and a woman's sense of control over the menopause may be helpful to protect well-being at midlife.

### Contributors

Ms L. Brown, Ms V. Brown, Dr Bryant and Professor Judd formulated the research question and designed the study. Ms L. Brown, Ms V. Brown and Dr Bryant carried out data collection. Ms L. Brown and Dr Bei were responsible for carrying out the statistical analysis. Ms. Brown wrote the paper, and all authors contributed to its revision.

### Competing interest

None.

### Funding

The cost of printing and mailing the questionnaire where all study data was obtained was covered by a small grant available to PhD students in the School of Psychological Sciences, University of Melbourne.

### Ethics

Ethics approval for the study was sought and obtained from the University of Melbourne's Human Ethics Committee (HERC#1136819.1). Written, informed consent was obtained from all participants.

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