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Decreasing menopausal symptoms in women undertaking a web-based multi-modal lifestyle intervention: The Women's Wellness Program

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ABSTRACT

Menopausal transition can be challenging for many women. This study tested the effectiveness of an intervention delivered in different modes in decreasing menopausal symptoms in midlife women.

The Women's Wellness Program (WWP) intervention was delivered to 225 Australian women aged between 40 and 65 years through three modes (i.e., on-line independent, face-to-face with nurse consultations, and on-line with virtual nurse consultations). All women in the study were provided with a 12-week Program Book outlining healthy lifestyle behaviors while women in the consultation groups were supported by a registered nurse who provide tailored health education and assisted with individual goal setting for exercise, healthy eating, smoking and alcohol consumption. Pre- and post-intervention data were collected on menopausal symptoms (Greene Climacteric Scale), health related quality of life (SF12), and modifiable lifestyle factors.

Linear mixed-effect models showed an average 0.87 and 1.23 point reduction in anxiety ($p < 0.01$) and depression scores ($p < 0.01$) over time in all groups. Results also demonstrated reduced vasomotor symptoms ($\beta = -0.19$, SE = 0.10, $p = 0.04$) and sexual dysfunction ($\beta = -0.17$, SE = 0.06, $p < 0.01$) in all participants though women in the face-to-face group generally reported greater reductions than women in the other groups.

This lifestyle intervention embedded within a wellness framework has the potential to reduce menopausal symptoms and improve quality of life in midlife women thus potentially enhancing health and well-being in women as they age. Of course, study replication is needed to confirm the intervention effects.

1. Introduction

Midlife is a challenging time for many women. It often marks the end of reproductive life and the onset of menopause with associated psycho-social and physical symptoms [1]. It is also a time of life when the accumulated effects of unhealthy lifestyle behaviors and aging become apparent with health problems arising [2,3].

Among peri-menopausal women who are overweight or obese [4–10], who smoke cigarettes [7,11,12], who consume high levels of alcohol [12,13], and who have a sedentary lifestyle [4,10,11,14–17], they also report increased risk of menopausal symptoms like hot flushes, night sweats, sleep disturbance and changes in libido [18], independent of confounding variables. During this time, women can also face a variety of pressures from work [19], and family life [20], and changes in health and physical functioning [21]. From this perspective, adopting and maintaining healthy lifestyle behaviors can be at odds with existing life commitments particularly among low-income midlife women [22] or among those who view lifestyle changes as temporary to attain shorter-term goals [19].

Research suggests that post-menopause, women who consume a diet consistent with "quality diet" indices [23,24], who maintain healthy weight [25], and who report higher midlife physical activity [26], also have a lower risk of death from chronic disease [23] and better general health and well-being as they age [24]. One strategy for sustained lifestyle change is to promote lifestyle modifications within a structured wellness framework. Indeed, Segar et al. [19] revealed that women who approached lifestyle modifications from a "sense of well-being and stress reduction" showed greater commitment to ongoing participation in physical activity goals.

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The *Women's Wellness Program* (*WWP*) is an evidence-based, structured 12-week health promotion program designed to be easily integrated into midlife women's lives [27–36]. The primary aim of the program is to create sustained positive health behaviors including increased exercise and physical activity, healthy eating, better sleep and stress management.

This study, evaluated the effectiveness of the WWP intervention delivered in different in modes (i.e., on-line independent, face-to-face with nurse consultations, and on-line with virtual nurse consultations) in decreasing menopausal symptoms including anxiety, depression, vasomotor and somatic symptoms, and sexual dysfunction in midlife women.

2. Methods

2.1. Participants and procedure

Australian women aged between 40 and 65 years were recruited from across metropolitan, regional and rural areas of Australia following media publicity about the study. The inclusion criteria for the study were: (1) able to speak, read and understand English; (2) had basic computer literacy; and, (3) access to a personal computer or tablet device. Women were excluded from the study if they reported physical or mental illness or injury that would prevent a participant committing to a 12-week lifestyle program or participating in vigorous exercise.

Of 250 participants who initially consented, 225 completed the first questionnaire and commenced the 12-week program. Of those 225 participants who completed the baseline survey, 157 completed the program and the final questionnaire at the end of the program. This represented a 30% attrition rate from the total sample, with the rate of attrition being highest for the online group that completed the program independently (35.5%) and lowest among the face-to-face group (9.7%).

Potential participants registered interest to participate in the study through a secure study website and were then emailed a Participant Information and Consent Form and Eligibility Checklist. If participants decided to join the study they completed the forms and returned them, either by scanning and emailing back or by mailing through Australia Post. All participants completed the baseline electronic questionnaire before being allocated in blocks of 50 to one of three intervention groups: online independent (Group A); face to face with health professional support (Group B) and, online with health professional support (Group C).

2.2. Measures

An online questionnaire was used to collect information from participant's at baseline (T1) and post-intervention (T2) on a range of health and lifestyle factors including: (1) socio-demographic characteristics (T1 only); (2) health-related quality of life (MOS SF-12®) [37], modifiable lifestyle factors [33,34,38–42], and; (3) menopausal symptoms [43].

This paper presents pre- and post-intervention menopausal symptoms measured by the Greene Climacteric Scale (GCS©). The GCS is used extensively in population-based and clinical samples [43,44] to assess menopausal transition [43]. The 21-item instrument is summed into four subscales (vasomotor symptoms, somatic symptoms, psychological symptoms (anxiety and depression), and sexual function) and one overall GCS summary scale with higher scores representing more menopausal symptoms [43].

2.3. Program

The 12-week program incorporates strategies from social cognitive theory and provides participants with a step by step guide to promote healthy lifestyle behaviors with an emphasis on regular exercise and healthy eating. On every day of the first 3 weeks, new information and activities are given to provide the structure and detailed foundational information that is built upon during the remainder of the program. In the following 9 weeks, weekly information is provided about a range of health topics including: menopause; pelvic floor exercises; stress management; sleep; healthy weight; chronic disease prevention; and health screening behaviors. There are several components to the program including the Program Book, the Program Website and health consultations provided by advanced practice registered nurses. These are designed to complement one another, and are available in a variety of e-health delivered or face-to-face formats. This study aimed to investigate the efficacy of the three different administration modes. All participants are encouraged to undertake realistic goal setting and weekly exercise planning and review. In groups received health consultations this process is facilitated by registered nurses.

The online independent group (*Group A*) was provided with access to the WWP website which contains all of the information provided in the book, but also contains additional elements such as: a diary, visual prompts, tips, alerts, recipes, podcast information, news items, a discussion board, and frequently asked questions. Participants in this group were also able to download an electronic copy of the Program Book.

The face-to-face supported group (*Group B*) received a hard copy of the Program Book as well as four 30–60 min face-to-face group consultations provided by a registered nurse at 0 weeks, 4 weeks, 8 weeks and 12 weeks. The consultations included reinforcement of health education and information provided about topics on different stages of the program, and supporting participants to set realistic and achievable goals for behavior change.

The online supported group (*Group C*) were able to access the WWP website and to download an electronic copy of the Program Book. Group C were also provided with four virtual consultations though a portal built in to the website at 0 weeks, 4 weeks, 8 weeks and 12 weeks. While there was consistency in information provided and structure for the consultations, the information was also tailored for the individual needs of participants depending on the goals they identified or topics that arose in the conversation.

2.4. Statistical analysis

Analyses were performed using SPSS (Statistical Package for the Social Sciences) version 22 [45]. Descriptive data are expressed as counts and percentages, and mean (SD), and inferential statistics were performed using χ^2 tests, *t*-tests, analysis of covariance (ANCOVA), linear mixed-effect modeling, with statistical significance was set at $\alpha = .05$.

Additional analysis of effect size was performed using Cohen's *d* [46,47] to examine the magnitude of change in the three groups over the study period. Effect size was calculated using a standard formula, i.e., subtracting the mean value at time 1 from the mean of the group at time 2 and then dividing the result by the standard deviation of the pooled sample at time 1 [46,47]. Using Cohen's guidelines [46,47] an effect size of 0.20 as small, an effect size of 0.50 was moderate, and an effect size of 0.80 or more was considered to be a large.

Preliminary inferential statistics used ANCOVA, however, as several interactions were noted between the groups over time, linear mixed models were used to predict decrements in GCS scores in the three groups over time. This analysis enabled individual- and group-level effect estimations over time [48]. To examine model fit two criteria were used: (1) a likelihood ratio chi-square test (LR test) was performed to estimate best fit of the models (see Eq. (1)). The LR test statistic was calculated where ll(m1) represents the log-likelihood for the more restrictive model (random