Maturitas 108 (2018) 13–17

Contents lists available at ScienceDirect

Maturitas

journal homepage: www.elsevier.com/locate/maturitas

Self-compassion, physical fitness and climacteric symptoms in oophorectomized *BRCA1/2* mutation carriers

Marieke Arts-de Jong[a,*], Liselore L. van Westerop[a], Nicoline Hoogerbrugge[b], Leon F. Massuger[a], Angela H. Maas[c], Maria H. van Beek[d], Joanne A. de Hullu[a]

[a] Department of Obstetrics and Gynaecology, Radboud University Medical Center, Nijmegen, The Netherlands
[b] Department of Human Genetics, Radboud University Medical Center, Nijmegen, The Netherlands
[c] Department of Cardiology, Radboud University Medical Center, Nijmegen, The Netherlands
[d] Department of Psychiatry, Radboud University Medical Center, Nijmegen, The Netherlands

ARTICLE INFO

Keywords:
BRCA mutation
Self-compassion
Climacteric symptoms
Risk-reducing salpingo-oophorectomy
Physical fitness

ABSTRACT

Objectives: To reduce the risk of ovarian cancer, *BRCA1/2* mutation carriers are advised to undergo salpingo-oophorectomy (RRSO) around the age of 40 years. This may induce severe climacteric symptoms, potentially lowering their quality of life. Personal positive resources such as physical fitness and self-compassion may help women to deal with these symptoms. We investigated the association of climacteric symptoms with self-compassion and physical fitness in oophorectomized *BRCA1/2* mutation carriers.

Study design: A cross-sectional study was conducted in 165 *BRCA1/2* mutation carriers, aged 40–63 years, who underwent an RRSO at age 45 years or younger and at least 5 years previously.

Main outcome measures: Climacteric symptoms were measured by the Greene Climacteric Scale. Self-compassion was rated using the Self-Compassion Scale–Short Form, and physical fitness using the Duke Activity Status Index.

Results: *BRCA1/2* mutation carriers reported low levels of climacteric symptoms (mean 10.28 [SD 6.45], and being highly self-compassionate and physically fit. After adjustment for possible covariates, higher self-compassion (β = −1.65, 95% CI −2.46, −0.84) and physical fitness (β = −0.25, 95% CI −0.34, −0.16) were associated with fewer climacteric symptoms. Current smoking was independently associated with more climacteric symptoms (β = 2.66, 95% CI 0.26, 5.07).

Conclusions: Being self-compassionate and physically fit were associated with fewer climacteric symptoms. Future research is needed to investigate the effect of training in self-compassion and physical fitness on climacteric symptoms in *BRCA1/2* mutation carriers.

1. Introduction

Women with germline *BRCA1/2* mutations have a high risk of developing breast and ovarian cancer. The lifetime risk for ovarian cancer in *BRCA1* mutation carriers is 39% (95% confidence interval [CI] 34, 44) and for *BRCA2* mutation carriers 16% (95% CI 12, 20) [1]. Therefore, a risk-reducing salpingo-oophorectomy (RRSO) is recommended to all *BRCA1/2* mutation carriers around the age of 40 years, reducing the ovarian cancer risk by more than 80% [2].

RRSO in pre-menopausal women immediately induces menopause, which, to a different extent, may lead to vasomotor symptoms (VMS) (hot flushes and nights sweats), sexual dysfunction and other physical and psychological complaints [3–5]. Hormone replacement therapy (HRT) has a positive effect on surgically induced VMS, but may not fully alleviate all symptoms, especially not sexual dysfunction [3]. Furthermore, HRT is contraindicated in *BRCA1/2* mutation carriers with prior breast cancer [6].

Hence, *BRCA1/2* mutation carriers could benefit from other interventions with potential for reducing climacteric symptoms. Earlier research on the impact of VMS on daily life functioning showed a possible positive effect of self-compassion [7]. Self-compassion, as described by Neff [8,9], involves being open to and moved by one's own suffering, and being kind to oneself when dealing with difficult experiences. Self-compassion entails 3 basic components: self-kindness, common humanity, and mindfulness. Self-kindness is defined as being kind and understanding, rather than judgemental or critical toward the self. The sense of common humanity involves recognizing that all people make mistakes and are challenged with serious life stressors, which leads to

* Corresponding author at: Department of Obstetrics and Gynaecology, Radboud University Medical Center, Geert Grooteplein Zuid 10, 6525 GA Nijmegen, The Netherlands.
E-mail address: Marieke.Arts-deJong@radboudumc.nl (M. Arts-de Jong).

https://doi.org/10.1016/j.maturitas.2017.11.002
Received 30 June 2017; Received in revised form 21 September 2017; Accepted 1 November 2017

seeing one's experiences as part of the greater human experience, rather than as separating and isolated. Mindfulness in the context of self-compassion entails being aware of one's painful thoughts and feelings in balanced awareness, rather than over-identifying with them [8]. Being self-compassionate yields benefit for individuals' well-being and is viewed as a protective factor for psychopathology, in particular anxiety and depression [10,11] One of the promising interventions is a Mindful Self-Compassion (MSC) programme, an 8-week training programme designed to cultivate self-compassion; this appeared to be effective at enhancing self-compassion and well-being [12].

Another way to diminish the burden of climacteric symptoms may be enhancing physical fitness. Physical (or cardio-respiratory) fitness can be modified by physical activity, and it is generally associated with better health outcomes [13]. The effect of physical activity on climacteric symptoms is studied extensively with predominately positive effects on psychological and somatic symptoms, and inconsistent results on VMS and sexual symptoms [14]. There have been fewer studies relating to physical fitness and climacteric symptoms; however, increasing fitness appears to decrease climacteric symptoms, and it is associated with better quality of life in early postmenopausal women [15,16].

In particular, *BRCA1/2* mutation carriers with prior breast cancer or being reluctant to use HRT can profit from non-hormonal treatment, such as self-compassion training or enhancing physical fitness. The aim of this study is to investigate our hypothesis that higher self-compassion and physical fitness are associated with fewer climacteric symptoms in oophorectomized *BRCA1/2* mutation carriers, and to explore which domains of climacteric symptoms are associated with self-compassion and physical fitness.

2. Methods

2.1. Participants and procedure

A cross-sectional study using self-report questionnaires was performed at the Radboud university medical center (Radboudumc), Nijmegen, the Netherlands between June and November 2015, as being part of a study on cardiovascular risk assessment in *BRCA1/2* mutation carriers (not published yet). All *BRCA1/2* mutation carriers known by the Department of Human Genetics and/or the Department of Obstetrics and Gynaecology were eligible to participate if an RRSO was performed at age 45 years or younger and at least 5 years ago. In total, 268 *BRCA1/2* mutation carriers were invited by letter supplemented with detailed information about the study and informed consent forms. After receiving written informed consent, a personal link to a digital questionnaire was sent by email. Previous ovarian cancer or current treatment for metastatic breast cancer were exclusion criteria. The study was approved by the Medical Ethics Committee of the Radboudumc (CMO: 2014-1430).

2.2. Measures

2.2.1. Demographic and clinical information

Demographic information included age, parity, marital stage and the highest level of education. Clinical information contained type of *BRCA* mutation, age at RRSO, time since RRSO, current use of HRT, body mass index (BMI), current smoking status, prior breast cancer, and use of antidepressant.

2.2.2. Climacteric symptoms

The Greene Climacteric Scale (GCS) [17,18] is a self-report measure for climacteric symptoms containing 21 items divided into 4 subscales. The subscales are psychological symptoms, subdivided into anxiety (6 items) and depression (5 items), somatic symptoms (7 items), VMS (2 items) and sexual interest (1 item). Each symptom is rated on a 4-point Likert scale between 0 (not at all) and 3 (extremely). The total score is the sum of all 21 scores ranging from 0 to 63. A higher score corresponds with more burden of climacteric symptoms. Internal consistency of the scale was evidenced in a Cronbach's α of 0.85, and showed good construct validity [17]. In the present study, the Cronbach's α was also 0.85.

2.2.3. Self-compassion

Self-compassion was determined with the Dutch version of Self-Compassion Scale–Short Form (SCS-SF) [9,19]. It is a self-reported 12-item scale measuring 6facets of self-compassion: self-kindness versus self-judgement, common humanity versus isolation, and mindfulness versus over-identification. Participants indicated agreement to statements on a 7-point Likert sale ranging from 1 (almost never) to 7 (almost always). Note that the Dutch version of the SCS-SF differs from the English version, which uses a 5-point Likert scale. After reverse-scoring items on self-judgement, isolation, and over-identification, a mean total self-compassion score was computed, where higher scores indicate more self-compassion (range 1–7). No validated cut-offs are available yet; however, Neff suggested on her website (http://self-compassion.org) the following interpretation of the total score based on a 5-point Likert scale: low (< 2.5), moderate (2.5–3.5), and high (> 3.5) self-compassion. To convert this interpretation to our Dutch validated 7-point Likert scale, we used the formula $y = (1.5^*x) - 0.5$; a score of < 3.25 indicates low self-compassion, 3.25–4.75 indicates moderate self-compassion and > 4.75 indicates high self-compassion. The SCS-SF demonstrated adequate internal consistency (Cronbach's $\alpha \geq 0.86$) and a near-perfect correlation with the 26-item long-form SCS ($r \geq 0.97$) [19]. In this study, the Cronbach's α was 0.88.

2.2.4. Physical fitness

The Duke Activity Status Index (DASI) [20] is a self-assessment tool to examine physical fitness, which includes 12 activities representative of major aspects of physical function (personal care, ambulation, household tasks, sexual function and recreational activities). It was developed to predict an individual's maximal exercise capacity. A score is calculated based on weighted answers from 12 questions related to daily activities of living, for which each item is weighted by its known metabolic cost, and weights of positive terms are summed to form the individual patient DASI score. The possible scores range from 0 (worst) to 58.2 (best). DASI scores correlate well with peak oxygen uptake [20].

2.3. Data analysis

Questionnaires were scored using the above-mentioned standard scoring methods. Categorical data were presented as frequencies (percentages), and continuous variables as mean (standard deviation [SD]) or median (first quartile [Q_1]–third quartile [Q_3]). A linear regression analysis was performed to assess the association of climacteric symptoms with self-compassion and physical fitness. Potential covariates were tested in univariate analysis, including socio-demographics (age, marital status, education level, having children), *BRCA*-related variables (sort of *BRCA* mutation, age at RRSO, time since RRSO, prior breast cancer), and physical and psychological variables (current HRT use, use of antidepressant, BMI, current smoking status). The variables found to be significant with p-value < 0.1 in the univariate analysis were included in a multivariable linear regression model. To explore the correlations of the GCS subscales with self-compassion and physical fitness, Spearman correlations were used. All data were analyzed using the Statistical Package for the Social Sciences software version 22.0 (SPSS Inc., Chicago, IL, USA). A p-value < 0.05 was considered statistically significant.

3. Results

A total of 165 *BRCA1/2* mutation carriers (response rate of 62%), aged 40–63 years, agreed to participate and gave informed consent.