**PSYCHOLOGICAL PERSPECTIVES
ON HEALTH AND DISEASE**

**VOLUME 1
DETERMINANTS OF SOMATIC AND MENTAL HEALTH**

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Editor

UEHS Press

Warsaw
2019

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Psychological and physiological predictors of affect in premenopausal and perimenopausal women

Introduction

Menopause is the last natural menstruation, after which no bleeding occurs for 12 months. This period typically occurs in women aged between 44 and 55 (Utian, 1999; World Health Organization, 1996). Research shows that, on average, symptoms preceding the approaching menopause start at the age of 47 and last approximately 4 years. The mean age of onset of menopause in Poland is 51 (Kaczmarek, 2007; Skrzypulec et al., 2007).

The menopausal change occurs along with changes in hormonal secretion. The follicle-stimulating hormone (FSH) activates follicular growth and the production of oestrogens. The perimenopausal period is characterised by an elevated concentration of FSH in blood. It increases throughout premenopause (reaching levels exceeding 30 IU/l). The highest concentrations of FSH (10–20 times higher than normal) are found 1–3 years after menopause. The concentration of estradiol in perimenopausal women remains constant, but after menopause, it falls below 20 pg/ml.

Menopause is a normative physiological process, but in some women, hormonal changes are accompanied by somatic and psychological symptoms at levels exceeding ordinary adaptation capabilities (Pinkerton & Zion, 2006). The symptoms may cause, exacerbate, or overlap with other disorders (Sprawka et al., 2008). An accurate diagnosis followed by early administration of hormonal

therapy enables the prophylaxis of circulatory diseases, osteoporosis, urinary incontinence, as well as psychological disorders related to menopause.

Many studies indicate that women in the perimenopausal period are more depressed, anxious, and irritable. Approximately 90% of women experience at least one of these states. Studies demonstrate that 40% of women report mood problems of a depressive type related to menopause (Prairie et al., 2015), and 40% regard this time as emotionally difficult and potentially bringing about many somatic diseases (Vesco et al., 2007). Biochemical research indicates that a decreased concentration of oestrogens is directly related to biochemical processes in the brain which lead to depression. Mood disorders can be caused by a disturbed balance of neurotransmitters, which regulate and mediate the function of neurons (Schmidt et al., 2015). Other studies suggest that an elevated risk of depression is associated not so much with a lower level of oestrogens as with its sudden decline (Dennerstein, 1996). The menopause-related decrease in oestrogens is thought to be a factor responsible for vasomotor symptoms (e.g., hot flushes, night sweats) in the course of menopause (Pinkerton & Zion, 2006). Other reports indicate that the frequency of vasomotor and somatic symptoms increases along with depressed affect (Borkoles et al., 2015; Prairie et al., 2015), although some studies have failed to confirm a higher prevalence of depression during the perimenopausal period (Vesco et al., 2007). Undesirable symptoms of menopause also include those associated with psychological functioning, for example, confusion, worse memory, anxiety, and so forth. Lipińska-Szałek et al. (2003) point out a possible influence of oestrogen levels on cognitive function. However, researchers emphasize the ambiguity of this correlation, since some studies do confirm the influence of oestrogens on verbal memory but not on concentration. Other studies failed to establish a link between cognitive function and hormones (Henderson, 1999).

Hormonal changes associated with menopause can influence emotional states, but they are not the only predictors of a disturbed mood (Schmidt et al., 2015). During the perimenopausal period, women experience many conflicts between their actual capabilities and their personal and social expectations. Some aspects of their appearance deteriorate (e.g., teeth, voice, skin). Facial hair is likely to

appear, while hair on the head is shed or/and becomes grey, and body mass increases. Western culture promotes beauty, youthfulness, independence, and self-actualisation. However, this may be experienced as a source of anxiety and may influence women's affect in the perimenopausal period (Stotland, 2002).

Affect is the totality of experienced feelings and emotions (Hogg et al., 2010). It is the individual's emotional disposition, or a tendency to have particular feelings/emotions in particular circumstances. Historically, emotions were described using a set of basic labels, such as sadness, joy, happiness, and unhappiness, arranged in two opposing dimensions. An increasing level of positive emotions was tantamount with a decrease of negative emotions. Watson and Tellegen (1985) proposed an alternative approach, suggesting that individual emotions can be grouped in two uncorrelated dimensions: positive and negative affect (Tellegen et al., 1999; Watson & Tellegen, 1985). Positive affect is associated with various states of pleasant mood (e.g., joy or enthusiasm), while negative affect is manifested in states of unpleasant mood (e.g., sadness, guilt). Their bipolar relation remains in place only for intense emotional experiences (Fajkowska & Marszał-Wiśniewska, 2009; Watson, 2000; Watson & Clark, 1992, 1994; Watson & Tellegen, 1985). The independence of valence of positive and negative affect can be seen when mood is appraised as an affective trait characterized by relative stability in various circumstances. The stable nature of affect derives from personality or temperamental factors such as neuroticism or extraversion (Clark et al., 1994; Watson, 2000). Watson (2000) claims that all people have a predominant affective state and a prevalent mood, in other words, a relatively constant emotional tendency. Negative affect is a general dimension of subjective distress and dissatisfaction that involves a wide range of negative moods, including sadness, fear, anger, or guilt. Its presence in structural analyses reflects the fact that these various negative emotions co-occur both within and among various individuals. Similarly, the general positive affect dimension reflects important co-occurrences among various positive mood states. For example, someone who is happy will also report feeling energetic, confident, and alert (Watson et al., 2008). Positive affect is associated with good health and a good psychological state (Watson et al., 2008; Watson et al., 2011). Positive and negative emotional responses have

been linked to different personality dimensions and to different kinds of behavioural activation. Extreme levels of both positive and negative affect that are permanently present become maladaptive and indicate psychopathology (mania, depression, psychosis). Affects of low motivational intensity broaden the cognitive scope whereas affects of high motivational intensity narrow down the cognitive scope regardless of their valence. A negative emotional tendency has a bearing on attention, information processing, thinking, and decision-making. A prolonged negative emotional state has a role in the emergence of mood disorders (Kaczmarek, 2007). The higher order positive affect factor has stronger (negative) associations with depression than with anxiety (Watson et al., 2011). Negative affect represents a specific dimension that is common to depression and anxiety, whereas low positive affect is a specific factor that is (negatively) related primarily to depression (Watson et al., 2011), though sadness and guilt are more strongly correlated with depressive (major depression) than with anxiety disorders.

Women in the perimenopausal period are particularly exposed to fluctuations in their emotional state and are subject to a higher risk of developing psychopathological symptoms. Therefore, the aim of the current study was to find predictors of positive and negative affect in women before menopause and in women in the perimenopausal period.

Participants and Methods

Participants. The study involved 113 women, aged from 25 to 65, divided into two subgroups: 58 premenopausal women aged 25–40 and 55 perimenopausal women aged 45–60. The inclusion criteria for the perimenopausal group were: age and typical perimenopausal symptoms which are identified during a medical physical examination and an interview (dryness of the mucous membrane, irregular menstruation, and changed intensity of menstrual bleeding). For diagnostic purposes, concentrations of FSH and estradiol hormones were assessed. The thyroid-stimulating hormone (TSH) in the blood serum was analysed in order to distinguish menopausal symptoms from those caused by dysfunctions of the thyroid gland. As a result, the individuals whose TSH level was too low or too high were excluded.

Methods.

1. Assessment of hormone levels in the blood serum, carried out as part of a routine diagnostic-therapeutic procedure.

2. Menopause Symptoms Scale by Kraczkowski and Szymona-Pałkowska (see Rykowska-Górnik 2016)—features a list of 67 symptoms divided into 9 categories. The respondent assesses the severity of a given symptom on a scale ranging from 0 to 10. The symptom categories are: Sexual symptoms, mass and body shape, vasomotor symptoms, skin/hair/voice, sleep and fatigue, affective symptoms (depression-anxiety), pain symptoms, cognitive symptoms, and urinary incontinence. The method has good psychometric properties. Cronbach's α coefficients range from .716 for the skin/hair/voice scale to .957 for the affective symptoms scale (Rykowska-Górnik, 2016).

3. Appearance Self-Rating Sheet (ASRS, Janowski et al., 2011)—features a schematic diagram of the human body (woman/man, depending on the gender of the respondent) with numbers 1–25 labeling specific body areas. The respondent is requested to assess how satisfied they are with the appearance of these body areas and how important the appearance of these body areas is to them. Each body area is assessed on a scale ranging from 0 (*entirely unsatisfied/unimportant*) to 10 (*totally satisfied/ important*). Then, a mean satisfaction index of appearance satisfaction (ASRS-Satisfaction) is calculated, as well as a mean index of appearance importance (ASRS-Importance).

4. Body Dysmorphic Symptoms Questionnaire (BDSQ, Awruk et al., 2011)—measures the severity of symptoms of body dysmorphic disorder. The items were formulated on the basis of diagnostic criteria for body dysmorphic disorder in the DSM-IV. The questionnaire consists of 33 statements concerning thoughts, activities, and fears associated with defects in bodily appearance. Answers are given using a five-point scale of *always*, *often*, *sometimes*, *rarely*, and *never*. The questionnaire consists of four subscales measuring: (a) the sense of a defect in one's appearance, (b) efforts to mask defects, (c) obsessive preoccupation with defects, and (d) checking up/controlling defects. The total score is also calculated, which is the overall measure of body dysmorphic concerns. The BDSQ has a satisfying Cronbach's α : .98

for the total score, and .97, .86, .77, and .81 for the respective subscales.

5. Positive and Negative Affect Schedule (PANAS-X, Watson et al., 1988; Polish version by Fajkowska & Marszał-Wiśniewska, 2009)—features 60 adjectives describing various affective states (positive and negative). It is used to calculate the general positive affect (PA) and general negative affect (NA). Eleven additional subscales are distinguished, which make up three general categories. The general negative affect subscale consists of four dimensions: fear, sadness, guilt, and hostility. The general positive affect subscale is composed of three dimensions: joviality, self-assurance, and attentiveness. The other affective states subscale comprises four dimensions: shyness, fatigue, serenity, and surprise. Reliability of the scales (based on the coefficient of internal consistency) ranges from 0.83 to 0.90 for PA and NA, and equals 0.85 for the other affective states subscale.

6. Generalized Self-Efficacy Scale (GSES)—draws on concepts of expectations and perceived self-efficacy developed by Bandura (1977, 1997). The Polish version of the scale was developed by Schwarzer, Jerusalem, and Juczyński (see Juczyński 2012). The scale consists of 10 statements. It measures the respondent's beliefs about their efficacy in dealing with difficult situations and obstacles. The Polish version of the scale has good psychometric properties, with Cronbach's α of .85 (Juczyński, 2000).

Statistical Analyses

In order to extract statistically significant predictors of positive and negative affect, a series of stepwise regression analyses was conducted. Each analysis was carried out separately for the subgroup of premenopausal women (aged < 45 years) and perimenopausal women (aged $\geq$ 45 years). Two global indices of affect were introduced as dependent variables: positive and negative affect. The following independent variables were introduced: (a) variables associated with the body mass index (BMI) and (b) variables pertaining to body image: mean ASRS-Satisfaction, mean ASRS-Importance, and total BDSQ score, (c) variables reflecting the severity of the nine groups of perimenopausal symptoms, (d) total GSES score, and (e) hormone (FSH and estradiol) levels.

Results

Negative and Positive Affect in Both Subgroups. The mean levels of negative affect were 2.43 ($SD = 0.61$) in the premenopausal women and 2.33 ($SD = 0.54$) in the perimenopausal women. The mean levels of positive affect were 3.11 ($SD = 0.61$) in the premenopausal women and 2.92 ($SD = 0.57$) in the perimenopausal women.

Predictors of Negative Affect. In the premenopausal subgroup, self-efficacy, as measured by the GSES, proved to be a statistically significant predictor of negative affect. The resultant model was statistically significant, $p = .025$, and it explained about 10% of variance in negative affect. The β coefficient was negative, -0.32 , which means that higher self-efficacy was a predictor for lower negative affect (see Table 1).

Table 1

The Regression Model of Negative Affect in Premenopausal Women

Independent variables	R	R^2	adjusted R^2	R^2 change	F change	p
Self-efficacy	0.32	0.10	0.08	0.10	5.33	.025

In contrast, in the perimenopausal subgroup, the total BDSQ score was revealed to be a statistically significant predictor of negative affect. The resultant model was of high statistical significance, $p = .002$, and it explained about 19% of variance in negative affect. The β value was positive, 0.44 , which means that higher dysmorphic symptoms were a significant predictor for higher negative affect (see Table 2).

Table 2

The Regression Model of Negative Affect in Perimenopausal Women

Independent variables	R	R^2	adjusted R^2	R^2 change	F change	p
Total BDSQ score	0.44	0.19	0.17	0.19	10.40	.002

Note. BDSQ = Body Dysmorphic Symptoms Questionnaire.

Predictors of Positive Affect. In the premenopausal group, the regression model yielded three variables which turned out to be statistically significant predictors of variance in positive affect. These variables were: ASRS-Satisfaction, self-efficacy, and cognitive symptoms measured by the Menopause Symptoms Scale. The model encompassing these three predictors was statistically significant, $p = .046$, and it explained about 54% of variance in positive affect.

Table 3

The Regression Model of Positive Affect in Premenopausal Women						
Independent variables	<i>R</i>	<i>R</i> ²	adjusted <i>R</i> ²	<i>R</i> ² change	<i>F</i> change	<i>p</i>
ASRS-Satisfaction	0.61	0.37	0.35	0.37	27.86	.000
Self-efficacy	0.70	0.49	0.47	0.13	11.65	.001
Cognitive symptoms	0.73	0.54	0.51	0.04	4.21	.046

ASRS-Satisfaction and self-efficacy turned out to be positive predictors of positive affect, which means that a higher level of these variables predicts a higher level of positive affect. Cognitive symptoms were a negative predictor (see Tables 3 and 4).

Table 4

Significant Predictors of Positive Affect in the Premenopausal Group			
Predictors which were statistically significant in the model	β	<i>t</i>	<i>p</i>
ASRS-Satisfaction	0.44	4.09	.000
Self-efficacy	0.36	3.36	.002
Cognitive symptoms	−0.21	−2.05	.046

In the perimenopausal group, the resultant regression model revealed self-efficacy as one statistically significant predictor of positive affect. This model was highly statistically significant, $p = .006$, and accounted for about 16% of variance in positive affect.

Table 5

The Regression Model of Positive Affect in Perimenopausal Women

Independent variables	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>R</i> ² change	<i>F</i> changes	<i>p</i>
Self-efficacy	0.40	0.16	0.14	0.16	8.52	.006

Table 6

Significant Predictors of Positive Affect in the Perimenopausal Group

Predictors which were statistically significant in the model	β	<i>t</i>	<i>p</i>
GSES	0.40	2.92	.006

Self-efficacy was a positive predictor of positive affect ($\beta = 0.40$), implying that a higher level of the former makes it possible to predict higher positive affect in this group of women (Tables 5 and 6).

Discussion

In order to identify predictors of positive and negative affect in the premenopausal and perimenopausal women, a stepwise regression analysis was carried out. The premenopausal period is relatively stable in terms of hormonal activity, therefore, variability in affect is determined chiefly by personality and temperamental factors, as well as life experiences (Dennerstein, 1996). Our findings show that general negative affect in the group of premenopausal women is best explained only by self-efficacy (as measured by the GSES). Self-efficacy is a measure of ego-strength, and people who score highly on this trait tend to feel an internal drive pushing them to achieve their goals despite various adversities (Fajkowska & Marszał-Wiśniewska, 2009). The level of self-efficacy also affects coping strategies and effective problem solving. People with low self-efficacy tend to give up active coping more easily (Watson, 2005). Our results indicate that, among the included factors, low self-efficacy best explains variance in negative feelings and the general tendency for negative affect in the premenopausal women. No variable related to body image was found to be a significant predictor of negative affect in this subgroup.

Our results show that in the premenopausal period, body image and concerns about flaws in one's appearance do not contribute to negative affect. However, positive body image accounts for positive feelings. Our analyses demonstrated that general positive affect is explained by appearance satisfaction (ASRS-Satisfaction), self-efficacy (GSES), and a lack of cognitive symptoms associated with menopause (negative relationship). This suggests that stronger cognitive symptoms of menopause are linked with lower positive affect. It seems that the constellation of these predictors—positive body image, efficient cognitive processes, and beliefs about one's coping competences—imply a higher frequency of positive experiences, that is, joy and pleasure.

It was pertinent to verify whether changes in appearance, hormonal fluctuations, as well as physiological and psychological changes occurring during the perimenopausal period are predictors of affect during this time. Apparently, menopausal symptoms and concentrations of sex hormones did not prove to be significant predictors of general positive or negative affect.

Negative affect in perimenopausal women was best accounted for by the global index of dysmorphic symptoms (BDSQ). Preoccupation with physical appearance defects seems to constitute a predictor of negative emotions. Positive affect in the group of premenopausal women was best explained by self-efficacy (GSES), which means that positive feelings experienced in this period correlate with a sense of empowerment.

Self-efficacy was the strongest predictor of positive affect regardless of the period in the women's lives. A positive body image contributes to satisfaction, especially in younger women, but in some perimenopausal women, changes in their appearance bring about dysmorphic oversensitivity. This is a predictor of negative affect, causing fear, sadness, and dissatisfaction.

Conclusions

In the current study, the sense of self-efficacy was the strongest predictor that explained both positive and negative affect, and this was especially true of perimenopausal women.

Women's psychological well-being was also affected by their perception of their body. In younger women, however, satisfaction with their body was a predictor of positive affect whereas in older women, that is, those in the perimenopausal period, dysmorphic symptoms (BDSQ) were predictors of negative affect.

These results indicate that good emotional state of premenopausal women is not determined by hormonal changes. The intensity of positive affect, which is a risk factor in depressive disorders (Watson, 2005; Watson et al., 2011; Watson et al., 2008), is explained by the concept of self-efficacy beliefs. The sense of competence and efficacy generates activation and motivation, bringing internal peace. Prevention of mental health disturbances in women in the perimenopausal period should aim at enhancing their sense of self-efficacy.

Summary

During menopause, undesirable vasomotor, somatic, and psychological symptoms can occur, which may be accompanied by increased negative affectivity. The current study aimed to identify psychological and physiological factors related to affect in premenopausal and perimenopausal women. One-hundred thirteen women took part in the study, including 55 women aged 45 to 60 (the perimenopausal group) and 58 women aged 25 to 40 (the control group). Blood serum hormone levels were assessed and questionnaires measuring body image, self-efficacy, menopausal symptoms, and affect were used.

In the premenopausal group, self-efficacy was found to be a statistically significant predictor of negative affect. In the perimenopausal group, the global index of dysmorphic symptoms was a statistically significant predictor of negative affect. In the premenopausal group, three were statistically significant predictors of positive affect: satisfaction with one's own appearance, self-efficacy, and severity of cognitive symptoms of menopause (negative predictor). In the perimenopausal group, positive affect was predicted by self-efficacy.

Factors which have an impact on positive affect and negative affect are different before and during the menopause period.

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