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The role of the self-concept in the relationship of menstrual symptom attitudes and negative mood

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ABSTRACT

Background: A relationship between symptom attitudes and negative affect has consistently been found in a range of different symptom domains. Little is known, however, about the role of different aspects of the self-concept in this relationship. We explored the mediating role of interferences of symptoms with the self-concept in the association of menstrual symptom report and depressive mood. Methods: Eighty-one women completed an online survey on menstrual symptoms, perceived interferences of symptoms with various self-aspects and negative mood states. We tested our hypothesis in a mediation analysis. Results: We found a complete mediation of the relationship of symptom attitudes and depressive mood by interferences of symptoms with self-aspects. However, interferences with self-aspects did not play a role in the association of anxious mood and symptom report. Conclusion: The self-concept should receive greater attention in research on symptom attitudes and psychological well-being. This would be particularly important in research on medically unexplained symptoms.

Keywords: Self-Concept; Health; Symptom Perception; Symptom and Illness Attitude Model; Menstruation

1. INTRODUCTION

Concerns about menstrual symptoms are a common reason for primary care visits in women and associated with substantial healthcare costs [1,2]. However, it has been argued that self-reported menstrual symptoms are often treated by extensive medical and surgical means such as hysterectomies despite lack of pathology [3]. Lilford [4] reports that "perceived abnormal bleeding accounts for 70% of hysterectomies in pre-menopausal British women, and in most cases of "menorrhagia," menstrual blood loss is within the "normal" range.

Public campaigns altering the perception of menstruation via messages in the mass media were successful to reduce rates of hysterectomies by 25.8% - 33.2% [5]. These numbers suggest that psychological factors play a major role in the perception of menstruation and menstrual symptoms.

The impact of psychological factors such as mood states, expectations, and personality traits on the perception of bodily sensations and symptoms in general (not only with regard to menstruation) has been demonstrated in a still growing body of research [6-8]. However, in this research on symptom perception, personal psychological variables such as negative affect have been in the focus of attention, while little is known on social psychological variables. However, social groups in which we are members such as communities, families, neighbourhoods, work teams, and networks of friends are not mere external factors. Membership in formal and informal social groups and our roles in these groups are integral part of our self-concept. We internalise these social aspects and we derive a sense of meaning, purpose, and belonging from these groups which has impact on self-perception and emotional well-being [9].

The evaluation of a bodily experience is based on physiological norms (which are debated regarding menstrual loss [10,11]) and personal norms of experience. However, another important factor in the perception of symptoms can be the perception of interferences of symptoms with the self-concept [12]. Changes in psychological and physiological well-being which women attribute to menstruation might be perceived to be inconsistent with a favourable self-concept, in particular, to interfere with social functioning, and to violate social norms. Symptoms interfering with self-aspects can be perceived as a burden regardless of their clinically relevance. In other words, the consequences of symptoms for the self-concept might be as important for symptom

report and help seeking behaviour as sensory experience and physiological consequences.

Qualitative studies have shown that menstruation in its non-clinical, 'normal' form can be perceived to be highly invasive and to affect a broad range of social and personal self-aspects such as professional life, family life, and intimate relationships [13]. There is growing evidence that identity-continuity, i.e. the perception of continuity and consistency of the self-concept, is an important factor in psychological well-being and health-management [14]. Interferences of menstruation with self-aspects might be perceived as threat for perceived consistency of the self. The impact of menstrual symptoms on a variety of aspects of social life are one major argument of supporters for extending menstrual cycles by continuous use of oral contraceptives [15], although this continuous suppression can have side effects such as nausea and breakthrough bleeding, and long-term adverse effects have not been explored yet [16]. However, studies are missing that explore perceived interferences of symptoms with the social self-concept.

The importance of the self-concept in symptom perception has been outlined recently in the Symptom and Illness Attitude Model (SIAM [12]). The SIAM predicts that mental representations of bodily processes such as menstruation are influenced by salient aspects of the self. Furthermore, it predicts that mental representations of bodily sensations and illness in interaction with the meaning of these representations for salient self-aspects will influence mood and behaviour. Following this model, perceived interferences of symptoms with some self-aspects might be one of the underlying processes increasing the strength of the relationship of depressive and anxious mood and self-report of somatic symptoms [17]. Personal characteristics such as locus of control were found to moderate the relationship of symptom report and depressive and anxious mood in women with non-clinical menstruation [18]. However, we are not aware of a study testing whether interferences with the self-concept might be another underlying process in the relationship between symptom attitudes and negative mood. Identifying processes that produces relationships between variables is essential, because it is a precondition for designing efficient interventions [19]. We believe it is essential to include not only personal traits as moderators and mediators in this research, but also variables linked to the social and personal self- concept.

In this study we explored symptoms report as well as symptom *attitudes*. From a methodological perspective, to measure symptom attitudes, two aspects need to be taken into account: 1) beliefs about the symptom, and 2) the affective evaluation of these beliefs [20]. This conceptualization of mental representations of bodily sensations as associations of believes about a sensation with an affective evaluation has also been outlined in the SIAM [12]. According to this model, we measured the mental representation of menstruation assessing the belief strength that a symptom was perceived to be linked to menstruation (symptom self-report) and the affective evaluation of this belief.

As already pointed out by Wood and Badley [21], a medical intervention alone might not be efficient if patients perceive the most urgent problems on social levels and would not seek help for symptoms alone if they would not perceive them as interfering with the social self. This might be especially true for menstruation, since menstruation is subjected to a number of implicit social norms and taboos [13,22]. Social interferences might be the key to understand help seeking for subclinical menstrual symptoms and solving social interferences might be an important step to support medical interventions in women with clinically relevant symptoms. We believe that social interferences of symptoms and their relationship with depressive or anxious mood are not restricted to menstruation, but can be extended to other disease domains as well.

We hypothesize that symptom report is related to negative mood as it has been shown on a number of studies exploring the interaction of negative affect and health self-report [6-8]. Furthermore, following the SIAM, we expected that the association of menstrual symptom report and attitudes with negative mood is mediated by perceived interference of menstrual symptoms with the social self-concept. Because of the lack of research on menstrual symptom attitudes and the social self-concept, we tested our hypotheses on a sample of women with mainly non-clinical menstrual symptoms in a cross-sectional design.

2. METHODS

2.1. Participants

Eighty-one women completed an online survey. They were recruited at the university and via links at online forums for sport and lifestyle. Participants were informed about the purpose of the study at the beginning of the survey and participation was completely anonymous. The local ethics committee approved the study.

2.2. Online Research

We took great care to follow recommendations given in the field of online research [23]. The survey was server-side programmed (EFS Survey, Unipark). To participate, no special browser requirements were necessary. Furthermore, we assigned each participant a session ID

("cookie") to keep the users from participating in the survey more than once. At the beginning of the study, participants were informed about the purpose of the study and gave consent by clicking on a check box. At the end of the questionnaire people were asked again whether they would allow us to analyse their data for scientific purposes in anonymous form. Individuals indicating that they would prefer to be deleted from the data pool were excluded.

2.3. Instruments

We presented a list of 12 symptoms [24] stereotypically associated with menstruation including back pain, abdominal pain, cramps, pain in the breast, headache, nausea, irritability, fatigue, decreases in physical resilience, decrease in alcohol tolerance, concentration deficits, or mood changes. Participants were asked whether or not they would typically experience these symptoms during menstruation (*yes* = 1/*no* = 0). Subsequently, participants rated on a five-point scale to which extent they would evaluate these symptom to be a normal aspect of menstruation and not worrying, or to be rather unusual and worrying (1 = *normal and not worrying*/5 = *unusual and very worrying*). To control for the influence of variation in knowledge about the reproductive cycle on symptom attitudes, we asked participants to answer 15 knowledge questions about the menstrual cycle and menstrual symptoms.

Furthermore, participants rated how strongly menstrual symptoms would interfere with ten social self-aspects such as professional life or being a family member (1 = *no interference at all*/5 = *extreme interference*) (**Table 1**). All items consisted of the phrase "*My menstruation interferes with …"* followed by the respective self-aspect (for example "*My menstruation interferes with my professional life."*). Furthermore, women were asked how important these social self-aspects were to them (1 = *not important at all*/5 = *very important*). If a self-aspect did not apply to them, they were asked to indicate this by clicking on a response button labelled "not applicable".

Additionally, participants completed the Hospital Anxiety and Depression Scale (HADS [25], a self-report measure of negative mood states that avoids reference to physical symptoms that are often included in assessment instruments of anxious and depressive mood. Participants were instructed to rate their mood regarding the last four weeks in general and not specifically regarding their last menstruation. For the two HADS-subscales, anxious mood (HADS-A) and depressive mood (HADS-D), a score of 0 - 7 is considered normal, 8 - 10 indicates borderline clinically relevant, and 11 or more indicates clinically relevant anxious or depressive mood. A meta-analysis has demonstrated high reliability and validity of the HADS [26]. Participants completed questions on demographical, health-related, and cycle-related variables such as age, body weight and height, typical length of cycle, regularity of the cycle (1 = *irregular*/ 5 = *very regular*), presence or absence of menstruation at the time of completing the survey, and day of the last onset of menstruation.

2.4. Data Analysis

We computed a symptom attitude score along the attitude measurement model of Fishbein & Ajzen [20] and the SIAM [12] in creating a sum score of reported symptom weighted by reported distress related to symptoms. We used an SPSS Mediation Macro commonly used in social sciences for mediation analysis [27] to test our hypothesis of a mediation of the relationship of menstrual attitudes and the depressive mood score by perceived social interferences, including estimation of the indirect effect with a bootstrap approach (**Figure 1**). According to Baron and Kenny [28] a variable is a significant mediator if the paths (c) and (a) as displayed in **Figure 1** are $\neq 0$ and the mediator significantly predicts the dependent variable controlling for the independent variable (*i.e.*, $b \neq 0$ in **Figure 1**). If the relationship between independent and dependent variable (c') is no longer significant after including the mediator within the model the mediation is called complete mediation. In this case, the mediator accounts for the major part of variance in the relationship of the two other variables.

3. RESULTS

3.1. Participants' Characteristics

Mean age (± standard deviation) of the eighty-one participants was 25.7 ± 5.4. Participants reported on average 5.11 ± 2.96 symptoms in the menstrual phase.

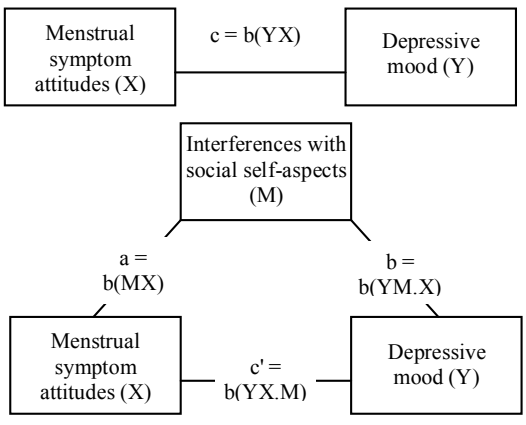

Figure 1.

Most common symptoms were mood changes (67.5%), heightened irritability (66.3%), cramps and abdominal pain (56.6%), pain in the breast (44.6%), and back pain (20.5%). 28% of the participants had at least one time in their life consulted a general practitioner because of menstrual symptoms. Women evaluated their symptoms on average to be not worrying (2.35 ± 0.55). However, they reported that their menstruation would partly interfere with their social life (**Table 1**). All social-self aspects were on average evaluated to be important. Mean depressive mood scores (HADS-D) were 2.68 ± 2.42 and mean anxious mood scores (HADS-A) were 5.93 ± 3.28. Borderline to clinically relevant scores in the HADS subscales (above eight points) were found for six women regarding the HADS-D subscale and for seventeen women regarding the HADS-A subscale.

The majority of women (58%) reported a regular or very regular cycle. Only 3.7% reported an irregular cycle. Sixteen women reported menstrual symptoms to be present at the time they completed the survey and 44.2% were within the first half of their cycle. Mean reported cycle length was 27.3 days ± 3.7. Women had on average 10.7 points of 15 possible points in the questions on menstrual cycle. Regarding level of education, 78.3% had achieved or were pursuing a university degree.

3.2. Associations between Variables Included within the Mediation Mod

Symptom attitudes were significantly associated with HADS-D scores, $r(81) = 0.25$, $p = 0.03$ (symptom report not weighted by affective evaluation $r(81) = 0.23$, $p = 0.04$, all reported correlations Pearson, two tailed).

Table 1. Mean importance of social self-aspects and mean interference of menstruation, standard deviation in parentheses.

Self-aspects *My menstruation interferes with…*	Mean importance	Mean Perceived interference	Not applicable
being a family member.	3.52 (1.28)	1.59 (0.96)	9
being a student.	3.39 (1.10)	2.51 (1.16)	7
my professional life.	4.09 (0.97)	2.72 (1.17)	16
important appointments.	4.20 (0.99)	2.83 (1.26)	1
doing sport.	3.58 (0.97)	2.69 (1.17)	9
being a friend.	3.90 (1.20)	1.55 (0.94)	1
participating in social events.	3.69 (1.14)	2.78 (1.16)	1
being with friends.	3.90 (1.11)	2.05 (1.05)	1
going out.	3.46 (1.13)	2.71 (1.21)	1
in general when being in public.	3.43 (1.19)	1.84 (0.93)	0

Furthermore, symptom attitudes were associated with social interferences $r(81) = 0.44$, $p < 0.01$; (symptom score not weighted $r(81) = 0.51$, $p < 0.01$). The association between social interferences and HADS- D scores was also significant, $r(81) = 0.38$, $p < 0.01$. The HADS-A score was only significantly associated with symptom attitudes, $r(81) = 0.22$, $p = 0.05$ (symptom score not weighted $r(81) = 0.20$, $p = 0.07$), but not with social interferences, $r(81) = 0.10$, $p = 0.40$. Because of this lack of significant association of HADS-A scores with the mediator, we tested the mediation model for depressive mood only. The number of correct answers to questions about the menstrual cycle was not associated with any of the measures, suggesting that self-report was not substantially biased by a lack of knowledge about menstruation. No differences in any of the variables included within our model were found between women reporting to menstruate at the time they completed the survey ($n = 16$) and women reporting menstrual symptoms retrospectively ($n = 63$) (all $ts \leq 1.20$, all $ps \geq 0.24$).

3.3. Mediation Analyses

We found a complete mediation of the relationship of symptom attitudes and depressive mood by perceived interferences of symptoms with social self-aspects (**Tables 2-4**, values for symptom scores not weighted by affective evaluation in parentheses). The effect of menstrual symptom attitudes on depressive mood decreased by a nontrivial amount and was no longer significant with inclusion of the mediator. Additionally, **Table 3** shows the results of the test of the indirect effect with the Sobel test by comparing the strength of the indirect effect to the null hypothesis that the indirect effect equals zero. We found the same result with bootstrapping, a procedure which is not based on the assumption of normality (**Table 4**).

Table 2. Indirect effect of menstrual symptom attitudes (X) on depressive mood (Y) through inferences with social self-aspects (M).

	Direct and total effects				
	B	*SE b*	*T*	*p*	criteria
b (YX)	0.22 (0.20)	0.10 (0.09)	2.28 (2.12)	0.03 (0.04)	c
b (MX)	0.47 (0.50)	0.10 (0.10)	4.44 (5.17)	< 0.001 (< 0.01)	a
b (YM.X)	0.28 (0.29)	0.10 (0.10)	2.28 (2.83)	< 0.03 (< 0.01)	b
b (YX.M)	0.09 (0.04)	0.10 (0.10)	0.87 (0.47)	0.38 (0.63)	c'

Table 3. Estimation of the indirect effect a/b with a normal theory approach.

	ab	*SE ab*	95% CI-l	95% CI-u	*z*	*p*
Sobel	0.13 (0.13)	0.06 (0.06)	0.02 (0.02)	0.24 (0.25)	2.34 (2.21)	0.02 (0.03)

Note: Criteria for mediation: see **Figure 1**.

Table 4. Bootstrap results for indirect effect.

	M	*SE*	95% CI-l	95% CI-u
Effect	0.13 (0.13)	0.06 (0.06)	0.06 (0.06)	0.29 (0.29)

Note: Number of bootstrap resamples = 5000. Estimation of the indirect effect with a bootstrap approach advocated by Preacher and Hayes (2004). 95% CI-l/95% CI-u = lower/upper bounds of a 95% confidence interval for the bootstrap estimates of *ab*.

4. DISCUSSION

Although menstrual symptoms were on average not perceived to be particularly unusual or alarming in our sample of women with mainly non-clinical menstruation, women reported that symptoms would partly interfere with social self-aspects. We found symptom attitudes to be related to both, social interferences and depressive mood. Furthermore, our results support the hypothesis that the social self-concept mediates the association of symptom report and depressive mood as predicted in models such as the SIAM [12]. We found no association of social interferences with anxious mood. In the light of the complete mediation of the relationship between symptom attitudes and depressive mood by perceived social interferences, these interferences can be regarded as important targets for interventions to reduce negative impact of symptom perception on psychological well-being. Social stereotypes related to symptoms and the perception of an interference of symptoms with social life should be taken into account when exploring symptom self-report in research and clinical practice.

Interestingly, the mediating role of social interferences was not found for the relationship of symptom report and anxious mood. These findings are in line with research showing that social psychological evaluative processes are more closely related to depressive mood than to anxious mood. Unfavourable comparison to an upward social standard has been shown to be linked to depressive mood, low-self-esteem and uncertainty [29]. Furthermore, it has been found that depressed individuals tend to interpret social information more negatively than non-depressed individuals and to engage in unfavourable social comparison more often and react more negatively than non-depressed individuals [30]. Furthermore, recent research shows that hiding physical symptoms (or other aspects of the self-concept) in the work place is related to depressive mood [31]. Our results encourage research on potential distinct relationships between perceived social consequences of symptoms and anxious and depressive mood.

Sociological studies have shown that women working in positions that are supervised by others and do not allow a flexible reorganisation of work load perceive more problems with managing symptoms [13]. In turn, these women might perceive more interference of symptoms with social life compared to women working in positions which allow more flexibility. Working on attitudes towards menstrual symptoms to improve psychological well-being might not be sufficient, as long as the social setting is characterized by social norms that are very likely to lead to interferences between the social self and any kind of clinical or non-clinical menstrual symptoms. Interventions aiming at improving psychological well-being should include cognitive intervention targeting the perception of social interferences of symptom as well as social psychological interventions, targeting socially shared stereotypes and misconceptions about menstruation, coping strategies such as seeking social support and a re-evaluation of implicit social norms.

The perception of social interferences with non-clinical symptoms might be especially likely in the domain of menstrual symptoms compared to other symptom domains. Qualitative studies show that hiding any signs of menstruation is a strong implicit social norm in our society [13,24]. The perception of interferences of menstruation with the social self might be due to attempts to comply with such implicit rules. However, although implicit social norms might be especially strong in the case of menstruation, it can be assumed that interferences of symptoms with the self-concept are not limited to menstrual problems. The results presented here in a non-pathological domain can be assumed to be relevant for a broader range of symptoms. Most chronic diseases have their own social stereotypes [32] and strong informal norms exist on hiding symptoms as well as medication intake [33]. Thus, we hypothesize to find a similar mediating role of social interferences in other symptom domains.

Exploring the role of the self-concept might be especially promising in the domain of medically unexplained symptoms (MUS [34]), *i.e.* symptoms for which no physiological cause can be detected. MUS has been found to be associated with negative affect. One potential underlying mechanism in MUS might be the perceived or feared interferences between ambiguous, but not pathological bodily sensations and aspects of the self-concept.

Furthermore, this research on social interferences could also help to gain a better understanding of delay in

help seeking. A lack of perceived social interferences could reduce help seeking behaviour despite the perception of symptoms.

We analysed cross-sectional data. Our findings highlight a social process behind the relationship of depressive mood and symptom report which has received little attention so far. However, we cannot draw conclusions about causal relationships between variables. Negative affect has been identified as possible sources of bias, increasing the report of bodily sensations and other variables [6-8]. Women with clinical relevant depression might interpret symptoms more negatively and perceive more social interferences. However, because of the subclinical levels of depressive mood in our sample, we cannot assume that perception of social interferences of symptoms above the midpoint of the scale found is this sample was due to depression. However, whether the nature of the relationship found here is causal or mutually aggravating, still needs to be clarified empirically.

As a further limitation, we analysed self-report of symptom, but had no information on the objective severity and clinical relevance of symptoms themselves. However, menstrual symptoms are usually not measured in general practice with means other than self-report, because of the difficulty of this assessment and dispute about normative values for clinical relevant menstrual loss [10,11]. We analysed mainly retrospective report. However, comparing report of women with menstrual symptoms present and women with menstrual symptoms not present at the time they completed the survey, we did not find any differences in the variables included within our analyses, indicating that retrospective self-report bias played only a minor role in this research on menstrual symptom attitudes.

4.1. Limitations

Although we analysed self-report of women with menstrual symptoms on a mainly subclinical level, women did report relevant interferences of menstruation with aspects of their self-concept. However, future research has to explore whether results can be generalised to clinical samples. Furthermore, we analysed data from a homogeneous sample of young women, mainly with academic background. We cannot generalize our results to groups with another socioeconomic or cultural background. As outlined above, women with a higher socio economic status often have more flexibility to reorganize work load if they perceive an interference of menstruation with, for example, work. Interferences of menstruation with the social self in women with lower socio economic status can be expected to be even stronger than in our sample of young woman with a university degree or pursuing a university degree.

4.2. Conclusions

Consequences of symptoms for the social self-concept should receive greater attention in research on symptom attitudes and psychological well-being. If patients perceive the most urgent problems on a social level and would not seek help for symptoms if they would not interfere with social life, intervention to improve well-being and symptom report need to target personal, social psychological, and social factors.

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