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## Period pain presenteeism: investigating associations of working while experiencing dysmenorrhea

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### ABSTRACT

Although menstrual pain (dysmenorrhea) is common and can have detrimental effects on work and social functioning, little is known about how people manage it in their professional life. Existing evidence indicates that people with dysmenorrhea often engage in presenteeism, meaning they work despite experiencing symptoms and report perceptions of social stigma around menstruation. In this study, we investigated individual health-related factors, psychosocial factors, and work factors associated with period pain presenteeism in a cross-sectional survey study including  $N = 668$  employed people with experiences of dysmenorrhea. Our results show that symptom severity, disclosure of menstrual pain to the leader, and remote work are directly associated with period pain presenteeism. We further found that the presence of medical diagnosis moderates the association between symptom severity and presenteeism. Disclosure to the leader was associated with leader gender, leader-member exchange (LMX), and the absence of a medical diagnosis, indicating a potential mediating effect. We did not, however, find the perceptions of public beliefs regarding the concealment of menstruation to be related to presenteeism or disclosure. Our findings have important implications for research on menstrual health and occupational health management practice.

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### Period pain presenteeism: investigating correlates of working while experiencing dysmenorrhea


In 2022, Spanish lawmakers discussed a bill to provide additional medical leave days per month specifically for people experiencing menstrual pain, thus aiming to treat menstrual pain as a “proper health issue” [1], (para. 2). Although the public discourse about menstruation may be perceived as developing toward more openness, menstruation is still seen as a “taboo” and “private” matter, particularly in the context of work and performance [2].

Period pain (dysmenorrhea) is characterized by a painful, cramping sensation in the lower abdomen. It is very common, with prevalence studies indicating that up to 91% of menstruating people experience pain, and up to 29% report severe pain [3]. Dysmenorrhea strongly affects the quality of life and may cause work absence and productivity loss [4,5]. However, there are few scientific insights into how people with period pain manage their symptoms at

work and little evidence on how organizations and managers can improve the work life and self-management of people with dysmenorrhea.

Most of the discourse on menstruation, period pain, and work occurs outside academic research. In a representative German survey [6], half of the participants stated feeling uncomfortable about calling in sick due to their menstruation, reporting fear of negative comments and not being taken seriously. Around 28% of male participants stated that they perceive canceling a work activity due to period pain as “exaggerating”. Menstruation is still perceived as a stigma. Accompanying the stigma are beliefs about menstruation and how people should behave during menstruation [7], which may provide barriers for absence from work when experiencing pain, e.g. to avoid disclosing the exact absence reason [8]. These processes may explain why presenteeism contributes more greatly to productivity losses due to menstruation symptoms than absenteeism [5].

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Understanding menstruation-related presenteeism as a highly prevalent issue in the workforce [5] is essential to address the issue and provide adequate support appropriately. As organizations and leaders play an essential role in developing employee presenteeism [9], we aim to answer calls for more insights into the psychosocial correlates of period pain presenteeism and increased attention to the experiences of people with menstrual pain and their choices regarding work [10].

This study primarily aims at investigating the associations between period pain and health-related and work-related factors, with the latter focusing on the role of supervisor or manager and remote work. As secondary aims, we investigate the role of societal beliefs regarding the concealment of menstruation on period-related workplace attendance as well as the role of gender and gender distributions in the industry. Taking into account issues of gender, health status, public beliefs, leadership, and working conditions, our study aims at providing detailed insights into the experience of employees with period pain, thus contributing to research and practice regarding gender diversity and occupational health at work, as well as the development of absence and health education policies on the societal level.

### **Period pain – characteristics, impact on work and presenteeism**

The main symptom of dysmenorrhea is pain, or “cramps” in the lower abdomen which can be accompanied by bloating, headaches, nausea, fatigue, dizziness, mood changes [11], and gastrointestinal symptoms such as diarrhea [4]. Pain may also occur in the lower back, breasts, thighs, vaginal and pelvic region [11,12]. Dysmenorrhea can severely affect people’s work life and activities, with employees reporting that they sometimes must call in sick for entire workdays. In cases where they go to work, they report problems with concentration, sitting for long periods, and carrying out their work activities [11]. Primary dysmenorrhea, i.e. dysmenorrhea that is not caused by an underlying medical condition, is associated with lower quality of life, higher absenteeism, sleeping problems, and less participation in social activities [13]. Secondary dysmenorrhea, which is period pain related to an underlying medical condition such as endometriosis, has a similar negative impact on work productivity and quality of life [14].

Menstruation symptoms can lead to productivity loss: In a large cohort study including 32,748 women

aged 15–45 [5], menstruation symptoms and particularly abdominal pain were significantly associated with productivity loss due to absence from work and productivity loss despite being present at work (presenteeism). However, productivity loss despite presence seems to be the more significant problem: Whereas the mean absenteeism accounted for 1.3 d of productivity loss a year, presenteeism accounted for 8.9 d of productivity loss. 80.7% of participants reported engaging in presenteeism because of menstruation-related symptoms [5].

In this paper, we adopt the definition used by Hägerbäumer [15], which states that presenteeism is the behavior of continuing to engage in work activities despite the presence of symptoms and “the result of a complex decision-making process” (p. 92). Predictors of presenteeism can be grouped into two categories, namely work- or context-related antecedents (e.g. job demands, job security) and individual-related antecedents (gender, health, personality) [16]. Moreover, evidence indicates that the decision to be absent or present when experiencing symptoms is made within the social context at work [15], and qualitative research shows that the social context is an essential driver of the feeling to have to conceal menstruation [7]. Thus, the perception of social context and social relationships needs to be taken into account above and beyond individual-level factors and working conditions.

### **Investigating correlates of period pain presenteeism**

#### ***Symptom severity and causes of dysmenorrhea***

The occurrence of health events is what makes the difference between presenteeism and “normal” work [16]. Menstrual pain, particularly abdominal pain, is a crucial driver of presenteeism in terms of productivity loss [5]. There are great differences in how people experience dysmenorrhea and menstruation [4], so a differentiated view seems necessary. Period pain can be linked to underlying conditions such as endometriosis, PCOS, adenomyosis, or a combination of conditions (secondary dysmenorrhea). People with secondary dysmenorrhea experience more days of menstrual pain and more severe pain than primary dysmenorrhea [17]. The experienced interference with daily life, attention, sports, and paid work due to pain is also higher among secondary dysmenorrhea [18]. As secondary dysmenorrhea is linked to more severe symptoms and extended period pain, a medical diagnosis of an underlying medical condition such as

endometriosis may be associated with more presenteeism behavior.

However, there are also reasons to assume that medical diagnoses and presenteeism are negatively related. Endometriosis has a long diagnostic delay [19]. Thus, people categorized as having primary dysmenorrhea may have an underlying medical condition that is not yet diagnosed. Furthermore, people with primary dysmenorrhea may be reluctant to show absenteeism due to their menstrual problems as they do not perceive having a “legitimate health issue” [4], (p. 18). A medical diagnosis can significantly impact how people view and evaluate their symptoms: Qualitative evidence suggests that people diagnosed with endometriosis can view their diagnosis as a positive event stating that “a diagnosis brought relief through providing a language to talk about symptoms” [20], (p. 1299). Having no medical diagnosis can increase the perceived difficulty of explaining and justifying absence from work. Hence, a diagnosis may lead to the feeling that one’s symptoms are genuine and valid and that the absence is legitimized [20].

As the severity of period pain and the cause seem relevant for workplace attendance behaviors, we aim to investigate the relationship between period pain severity and the presence or absence of an underlying medical diagnosis (e.g. of endometriosis) on period pain presenteeism.

### **Societal factors**

There are many stereotypes, beliefs, and unwritten “behavior rules” regarding menstruation [2,7]. A highly relevant belief for presenteeism is that signs and symptoms of menstruation should be concealed as much as possible [7]. In qualitative interview studies amongst women, the participants reported an awareness of “menstrual etiquette” that they feel they must abide by, including the rule that menstruation must be kept private.

The stigma of menstruation can be seen in all facets of society, but it is especially stigmatized in the workplace. Qualitative evidence shows that, even when absence from work is necessary due to menstrual pain, people refrain from naming menstruation as the cause of the absence. Instead, they follow the perceived rules of menstrual etiquette by either stating symptoms that are not specific to menstruation (e.g. stomach cramps) or more general reasons, such as feeling unwell [7]. In addition, even people who have disclosed troubles with period pain or, in the

case of secondary dysmenorrhea, an underlying illness, may be reluctant to choose absenteeism over presenteeism when experiencing symptoms due to a fear of violating “the cultural mandate to keep menstruation concealed” [8], (p. 568). Thus the perceived public belief regarding the concealment of menstruation is likely to be positively associated with period pain presenteeism.

### **Leadership**

Supervisors play an essential role in employee presenteeism [9,15]. Illness disclosure to the supervisor seems to be an essential predictor of sickness absence in people with chronic conditions. Employees with chronic or recurring health problems that have disclosed the nature of their health issues to the supervisor may find it easier to call in sick [21]. In the decision between presenteeism and absenteeism when experiencing period pain, employees can potentially experience the necessity to state or explain the reason for their absence as an obstacle and therefore decide on attending work or carrying out work tasks instead [5]. Thus, presenteeism can seem like an option to avoid having to communicate about menstruation.

Information on the nature of a health condition or event can be disclosed to varying degrees [22]. In the case of secondary dysmenorrhea, this can mean that employees disclose, for example, the name of their diagnosis (e.g. endometriosis) but decide not to share details about the nature and severity of the symptoms. If employees have disclosed more information about their period pain toward their leader, they should be less likely to feel the necessity to engage in presenteeism to conceal their problem. We thus propose that disclosure toward the leader is likely to be an important factor related to period pain presenteeism in a way that disclosure and period pain presenteeism are negatively related.

Beyond disclosure as a possible major factor, it is also relevant to consider the quality of the dyadic relationship between leader and employee, which is captured by the concept of Leader-Member Exchange (LMX, [23]). High LMX within is characterized by high trust, friendliness, and respect [24] and is negatively associated with presenteeism [25]. When the leader-member relationship quality is low, employees fear their supervisor might distrust them or not believe them when they call in sick due to a health problem. Furthermore, they can perceive higher levels of coworker competitiveness [26], which may make

absenteeism feel riskier. Hence, in cases where period pain has not been disclosed to the leader, employees perceiving high LMX may still experience more safety and fewer negative consequences in case their supervisor can assume the cause of their absence. We, therefore, propose that the negative associations found between LMX and presenteeism in previous work should also be visible regarding period pain presenteeism.

### Remote work

In the context of the recent Covid-19 pandemic and the increased prevalence of remote work, we deemed it crucial to consider remote work as a factor, particularly because evidence indicates that employees experiencing menstrual problems prefer to work from home [5].

On the one hand, working from home may allow for better self-management of symptoms. More than half of the people affected by dysmenorrhea report taking over-the-counter medication to manage the symptoms [11]. An increase in flexibility due to remote work could improve access to pain medication, for example, due to the availability of the medication in one's medicine cabinet or the possibility of purchasing the medication at a pharmacy without the necessity of having to explain the absence at the workplace to colleagues or supervisors. Working from home would also lower potential social stress to conceal one's menstruation and menstrual symptoms and facilitate other self-management strategies, such as relaxation techniques, heat, and specific types of exercise [13], thus potentially leading to reduced or alleviated symptoms and, thus, lower presenteeism (due to the absence of symptoms).

On the other hand, remote work could be an essential factor in the decision to work or call in sick. Reflecting on remote work and presenteeism during the Covid-19 pandemic [27], argue that, with more remote work, "being sick will no longer be a sufficient "excuse" not to complete tasks according to some companies and supervisors" (p. 8). People experiencing period pain may perceive that, with no need for physical presence, their symptoms do not legitimize absenteeism. Compared to people working in jobs requiring physical presence and possibly even physically more strenuous activities, employees working remotely may be more likely to decide to work at home instead of choosing sickness absence. Thus, we aim to investigate the association between remote work and period pain presenteeism.

## Methods

### Study design and procedure

We conducted a cross-sectional online survey study in the spring of 2022. The study documents were approved by the Ethics Review Board of (masked for anonymity). Participants were recruited to social media, topical discussion boards, and groups on platforms such as Facebook and Reddit. In the data collection period, we received support from German and Dutch associations focusing on endometriosis that posted the call on their social media pages. Participants had to be at least 18 years old, have experienced period pain in the past six months, be employed for a minimum of 20 h/week, not on long-term sick leave or maternity leave, and have a direct supervisor. After reading the study information and giving informed consent, participants needed to confirm that they fulfilled the inclusion criteria to proceed with the study (Appendix A). All questions were available in English, Dutch, and German<sup>1</sup>.

### Materials

We used an abridged version of the presenteeism scale by Hägerbäumer [15] to assess *period pain presenteeism*. We asked the participants to answer questions regarding their behavior in the past six months when experiencing menstrual pain. As the scale was developed to assess presenteeism due to more acute temporary illnesses, we omitted one item assessing whether the participants worked despite doctors telling them not to. The scale consists of five items with a 5-point Likert-type scale from 1 = never when experiencing symptoms/pain to 5 = very often when experiencing symptoms/pain. An example item is "I worked even though I experienced severe symptoms or pain". The scale's reliability was good, with  $\alpha = 0.83$  and  $\omega = 0.87$ .

We assessed *perceived pain severity* using an item from the pain scale of the SF-36 health survey [28], asking, "How much menstrual pain have you had during the past six months". The item was answered on a five-point Likert-type scale from 1 = not at all to 5 very severe.

We asked participants to state whether they have a *medical diagnosis of an underlying health condition* and, if yes, which diagnosis. If participants selected the option "I have menstrual cramps and menstrual symptoms, but I do not have a medically diagnosed underlying disease," we coded the response as 1 to signify the absence of an underlying diagnosis. If

participants selected at least one of the other options (diagnosed endometriosis, polycystic ovary syndrome, pelvic inflammatory disease, uterine myoma) or stated a different relevant condition, we coded the response with 0.

We used seven items from the *secrecy* subscale of the Beliefs about and Attitudes Toward Menstruation Scale (BATM, [29]) to assess *perceived public beliefs around the concealment of menstruation*, rephrasing the items so that the statements assessed perceived attitudes instead of the participants' attitudes. An example is, "People generally think that women should hide anything that shows that they are having their periods". The items were answered using a five-point Likert-type scale from 1 = strongly disagree to 5 = strongly agree. The scale's reliability was good, with  $\alpha = 0.86$  and  $\omega = 0.88$ .

We used a four-item scale by Munir et al. [30] to assess the degree of *disclosure of dysmenorrhea to the supervisor*. The items ask to which extent the participant shared the information about having menstrual problems, the symptoms, their management, and their effect on work. The items were answered on a five-point Likert-type scale from 1 = "not at all" to 5 = "to full extent". The scale's reliability was good, with  $\alpha = 0.87$  and  $\omega = 0.90$ .

To measure *Leader-Member Exchange (LMX)*, we used the scale of Graen and Uhl-Bien [23]. It comprised seven items that were answered on a five-point Likert scale from 1 = none to 5 = very high. An example question is: "Regardless of how much formal authority he/she has built into his/her position, what are the chances that your leader would use his/her power to help you solve problems in your work?" The scale's reliability was very good, with  $\alpha = 0.89$  and  $\omega = 0.92$ .

Remote work was assessed with one item: "On average, how many days per week have you been working remotely in the past six months?"

We controlled for participant age, gender identity, weekly work hours, leader gender, and gender distribution in the industry. *Age* is negatively related to dysmenorrhea [3]. Younger people can also be in a less stable phase of their career, have shorter tenures, and have different attitudes regarding menstruation, with evidence indicating that younger people treat the topic of menstruation with less secrecy [31]. We controlled for *gender* to account for the fact that menstruating people can have different gender identities. For the analyses, we transformed gender into a dichotomous variable with 1 = identifying as female and 0 = not identifying as female. *Working hours per week* were assessed to control for the overall time commitment

and to control for an alternative explanation of less presenteeism due to less work time.

Participants were asked to state *the gender of their direct supervisor* at work. We coded having a male leader = 1, whereas having a non-male leader (including female, non-binary, and "other option") was coded with 0. Participants' perceptions regarding the *gender distribution in the industry* they work in were assessed using a scale going from 0 = completely male-dominated to 100 = completely female-dominated. The mid-point (50) was labeled as "balanced".

## Sample

We recruited  $N = 668$  participants. Most participants were born female ( $N = 666$ ), one participant stated being born intersex, and one participant did not respond to the individual item. Regarding gender, most participants identified as female ( $N = 659$ ), seven participants identified as non-binary (1.04%), one person as male, and one person checked the "no answer" option<sup>2</sup>. The mean age of participants was 29.89 years ( $SD = 6.04$ ), ranging from 18 to 53. Most participants,  $N = 471$  (70.51%), lived in Germany. In contrast,  $N = 118$  (17.66%) were living in the Netherlands,  $N = 19$  (2.84%) in the United States,  $N = 13$  (1.94%) in Austria,  $N = 11$  (1.65%) in Switzerland, and  $N = 8$  (1.20%) in the United Kingdom. The other 28 participants ( $N = 4.19%$ ) in the sample were living in Belgium, Canada, Australia, France, Ireland, Armenia, Bahamas, India, Italy, Luxembourg, New Zealand, Romania, Slovenia, South Africa, Sweden, and the United Republic of Tanzania. Thus, the sample primarily consisted of people living in the European Union.

$N = 236$  (35.33%) participants had no underlying diagnosis (primary dysmenorrhea),  $N = 383$  stated having a medical diagnosis of endometriosis,  $N = 43$  had polycystic ovary syndrome (PCOS),  $N = 48$  adenomyosis,  $N = 29$  = uterine myoma,  $N = 2$  pelvic inflammatory disease, and  $N = 17$  stated having a different underlying medical diagnosis.

The largest group of the participants,  $N = 230$  (34.43%), had an undergraduate degree, and about two-thirds stated having a permanent contract (75.55%). Participants worked in various industries, with the largest group working in health care ( $N = 154$ , 23.05%).

## Results

Table 1 shows the study variables' bivariate correlations. Older participants were more likely to have a

**Table 1.** Descriptives and bivariate correlations of the study variables.

	<i>M(SD)</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Gender (female)												
2. Age	29.89(6.04)	0.05										
3. Hours/week	35.56(6.46)	0.09*	-0.02									
4. Leader gender male		0.00	0.04	0.09								
5. Gender distribution industry	55.85(26.06)	-0.01	-0.01	-0.15**	-0.37**							
6. Symptom severity	4.07(0.80)	0.01	-0.04	0.00	0.06	0.06						
7. Medical diagnosis (present)		0.09*	0.15**	0.02	-0.07	0.04	0.30**					
8. Public attitude concealment	3.68(0.75)	-0.01	-0.01	0.06	0.03	-0.11**	0.05	0.03				
9. LMX	3.40(0.81)	0.07	0.00	0.07	-0.09*	0.03	-0.10*	-0.05	0.00			
10. Disclosure to leader	2.24(1.11)	-0.05	0.07	0.00	-0.11**	0.11*	0.31**	0.32**	0.00	0.17**		
11. Days/week remote work	1.90(2.00)	0.08*	0.14**	0.12**	0.05	-0.28**	-0.04	0.04	0.02	0.21**	-0.04	
12. Presenteeism	4.22(0.78)	-0.06	-0.04	0.09*	0.00	0.03	0.23**	0.09*	0.07	-0.09*	-0.08*	-0.11*

*N* = 668, Gender (female) coded: 1 = identifying as female, 0 = not identifying as female; Medical diagnosis coded: 1 = medical diagnosis present, 0 = no medical diagnosis; Leader gender male coded: 1 = male, 0 = not male; Gender distribution in the industry assessed: 0 = completely male-dominated, 100 = completely female-dominated.

\**p* < .05.

\*\**p* < .01.

medical diagnosis,  $r = 0.08$ ,  $p = .02$ . The age of the participants was negatively correlated with the days working remotely, indicating that younger participants working more remotely,  $r = .14$ ,  $p < .01$ . Working hours per week correlated positively with having a male leader,  $r = 0.09$ ,  $p = .03$ , and negatively with working in a more female-dominated industry,  $r = -0.15$ ,  $p < .01$ . Disclosure to the leader was significantly correlated with symptom severity,  $r = 0.31$ ,  $p < .01$ , and the presence of a medical diagnosis,  $r = 0.32$ ,  $p < .01$ , LMX,  $r = .17$ ,  $p < .01$ , having a male leader,  $r = -0.09$ ,  $p < .01$ , and days per week working remotely,  $r = 0.21$ ,  $p < .01$ . LMX was negatively and significantly correlated with having a male leader,  $r = -0.09$ ,  $p = .02$ .

Period pain presenteeism was positively correlated with period pain symptom severity,  $r = .23$ ,  $p < .01$ , and positively correlated with the presence of a medical diagnosis, LMX, disclosure of period pain problems toward the leader, and days spent working remotely. Presenteeism was not significantly correlated with the perception of a public attitude toward the concealment of menstruation,  $r = -0.07$ ,  $p = .08$ , or having a male leader,  $r < 0.01$ ,  $p = .42$ .

We conducted two-step multiple linear regression analyses using the package *psych* for the R environment [32,33]. In the first step (Model 1), we regressed standardized period pain presenteeism on the standardized covariates. In the second step (Model 2), we added the standardized predictors to the model. The results of the regression analyses are stated in Table 2.

The period pain severity was significantly and positively associated with presenteeism,  $\beta = 0.27$ ,  $p < .01$ . The presence of a medical diagnosis underlying the menstrual problems was positively, but not significantly associated with presenteeism,  $\beta = -0.15$ ,  $p = .08$ . The perceived public attitudes regarding the necessity to

conceal menstruation were not significantly associated with presenteeism,  $\beta = 0.05$ ,  $p = .16$ . Whereas the degree of disclosure toward the leader was negatively and significantly associated with presenteeism,  $\beta = 0.20$ ,  $p < .01$ , LMX was not,  $\beta = 0.01$ ,  $p = .80$ .

More days of remote work per week were negatively and significantly associated with period pain presenteeism,  $\beta = -0.10$ ,  $p = .01$ , indicating that remote work seems to be indeed related to presenteeism. Participants working more days per week remotely and not at the office reported engaging in less period pain presenteeism. Adding the predictors to the model resulted in an explanation of 9% of the variance in period pain presenteeism.

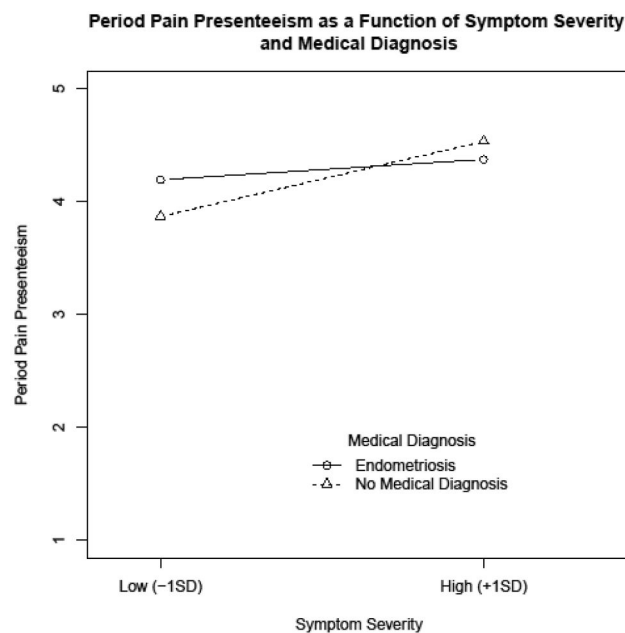
To gain more insights into differences between people with primary and secondary dysmenorrhea, we carried out separate regression analyses for participants with endometriosis, as this was the largest group with a particular diagnosis and participants with no medical diagnosis (Table 2). Due to the differences in the coefficients between groups regarding symptom severity and disclosure, we carried out a moderation analysis using a dataset consisting of only participants with endometriosis and participants with no medical diagnosis. The medical diagnosis moderated the effect of symptom severity,  $\beta = -0.31$ ,  $p < .01$ , but not the effect of disclosure on presenteeism (Model 4, Table 2). The plot of the simple slopes (Figure 1) illustrated the direction of the interaction, as the association between symptom severity and period pain presenteeism is stronger among participants with no medical diagnosis and weaker amongst participants with endometriosis.

Based on the bivariate correlations of several study variables with period pain disclosure, we conducted exploratory analyses to investigate the possibility of disclosure being a mediator. We first carried out two-step multiple regression analyses using the degree of

**Table 2.** Results of models regressing standardized period pain presenteeism on the standardized covariates and predictors.

	Full dataset (N = 668)		Endometriosis (N = 383)		No medical diagnosis (N = 236)		Endometriosis and no diagnosis (N = 619)
	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b	Model 4
Intercept	0.53	0.74*	0.03	0.10	0.57	0.71	0.64*
Gender (female)	-0.55	-0.66*	-0.02	-0.04	-0.67	-0.80*	-0.65
Age	-0.03	<0.01	-0.07	-0.02	-0.03	0.02	-0.01
Hours/week	0.10**	0.11**	0.13*	0.14**	0.04	0.08	0.12**
Leader gender (male)	0.02	-0.07	-0.01	-0.13	0.16	0.13	-0.02
Industry gender distribution	0.05	0.02	0.05	0.03	0.08	0.05	0.04
Symptom severity		0.27**		0.12*		0.43**	0.43**
Medical diagnosis (present)		0.15					0.10
Public attitude concealment		0.05		0.02		0.03	0.03
LMX		-0.01		-0.01		0.01	< -0.01
Disclosure to leader		-0.20**		-0.23**		-0.11	-0.13
Days/week remote work		-0.10*		-0.09		-0.06	-0.08
Symptom severity × medical diagnosis							-0.31**
Disclosure to leader × medical diagnosis							-0.09
R <sup>2</sup>	0.01	0.10	0.01	0.06	0.003	0.16	0.12

Gender female: 1 = identifying as female, 0 = not identifying as female, Medical diagnosis: 1 = present, 0 = absent, Leader gender male: 1 = male, 0 = not male, industry gender distribution: 0 = completely male-dominated, 100 = completely female-dominated \*  $p < .05$  \*\*  $p < .01$ .



**Figure 1.** Plot of the association between degree of disclosure to the supervisor and period pain presenteeism moderated by the presence or absence of a medical diagnosis.  $N = 619$ , Figure based on unstandardized coefficients

the disclosure as an outcome (Table 3). Symptom severity,  $\beta = 0.27$ ,  $p < .01$ , and LMX,  $\beta = -0.22$ ,  $p < .01$ , were positively and significantly associated with the degree of disclosure. The presence of a medical diagnosis,  $\beta = 0.51$ ,  $p = .01$ , and the male gender of the leader,  $\beta = -0.16$ ,  $p = .03$ , were significantly and negatively related to disclosure.

We then explored a possible mediating role of the degree of disclosure on the relationship between symptom severity, the presence or absence of a medical diagnosis, leader gender, and the relationship quality with the leader (LMX) on period pain

**Table 3.** Results of models regressing standardized disclosure to leader on the standardized covariates and predictors.

	Model 5a	Model 5b
Intercept	0.57	1.00
Gender (female)	-0.49	-0.76**
Age	0.08*	0.06
Hours/week	0.02	<0.01
Leader gender (male)	-0.18*	-0.16*
Industry gender distribution industry	0.08	0.03
Symptom severity		0.27**
Medical diagnosis (present)		0.51**
Public attitude concealment		-0.01
LMX		0.22**
Days/week remote work		-0.05
R <sup>2</sup>	0.02	0.21

$N = 668$ , Gender female: 1 = identifying as female, 0 = not identifying as female, Medical diagnosis: 1 = present, 0 = absent, Leader gender male: 1 = male, 0 = not male, industry gender distribution: 0 = completely male-dominated, 100 = completely female-dominated \*  $p < .05$  \*\*  $p < .01$ .

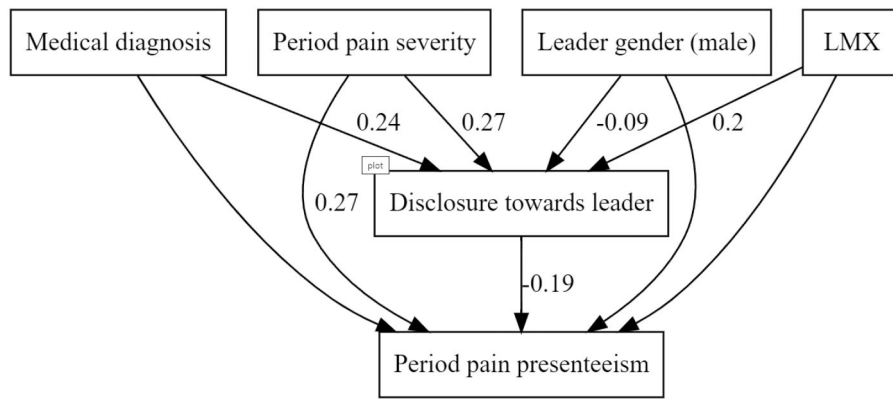
presenteeism. We fitted a mediation path model using the lavaan package [34] for R. The path model's direct association between period pain severity and presenteeism remained significant (Figure 2). When accounting for the possible mediation of disclosure toward the leader, the direct relations between period pain presenteeism and absence of a diagnosis,  $\beta = -0.11$ ,  $p = .10$ , having a male leader,  $\beta = -0.06$ ,  $p = .34$ , and LMX,  $\beta = -0.03$ ,  $p = .44$ , were not significant.

All four indirect paths were significant (Table 4), indicating a possible mediator role of disclosure to the leader. As the analysis was carried out with cross-sectional data, the results must be interpreted cautiously and only be used as explorative indications of possible mediations.

### Discussion

This study investigated the correlates of period pain presenteeism amongst employees experiencing





**Figure 2.** Path analysis Model of associations between the standardized predictors, disclosure to the leader, and period pain presenteeism.  $N = 668$ , only significant estimates ( $p < .05$ ) stated.

**Table 4.** Results of the analysis of the indirect associations between the standardized predictors and period pain presenteeism *via* disclosure to the leader.

	Estimate	SE	95%CI
Severity → Disclosure → Presenteeism	-0.05	0.01	[-0.073; -0.023]
Medical diagnosis → Disclosure → Presenteeism	-0.07	0.02	[-0.112; -0.035]
Leader gender male → Disclosure → Presenteeism	-0.04	0.01	[-0.055; -0.016]
LMX → Disclosure → Presenteeism	0.03	0.01	[0.004; 0.050]

$N = 668$ , Medical diagnosis: 1 = present, 0 = absent, Leader gender male: 1 = male, 0 = not male.

dysmenorrhea to identify possible causes and risk factors for people to work despite experiencing severe menstrual symptoms. We found a positive association between the perceived severity of the period pain and presenteeism and a negative association between the level of disclosure toward the leader and period pain presenteeism. Additionally, we found that the relation between period pain presenteeism and remote work was negative. Additional analyses provided implications for a moderating effect of a medical diagnosis (endometriosis) on the association between symptom severity and presenteeism, indicating that symptom severity is more strongly related to presenteeism amongst people without a medical diagnosis (i.e. primary dysmenorrhea). We further found that medical diagnosis, symptom severity, leader gender, and LMX are significantly associated with disclosing dysmenorrhea to the leader, indicating a possible mediation effect of disclosure.

### Implications for theory and research

An essential finding of our research was the relevance of disclosing menstrual problems to the leader. The more information about the health condition was disclosed to their manager, the less likely participants were to engage in period pain presenteeism. Theoretical approaches toward the disclosure of stigmatized identities emphasize that the interpersonal context and relationship, more specifically the

relational quality with the “target” of the disclosure, are relevant [35]. Feelings of closeness and trust play an important role when choosing with whom to talk about personal health problems, as people anticipate a more positive response if there is a good relationship with the target [36]. Our research supports this assumption as employees disclosed more if they had a good relationship with their leader and when their leader was not male. Thus, although we did not see a direct relation between leader gender and LMX on period pain presenteeism, the explorative findings indicate that disclosure could be the process through which these aspects come into effect. The results mirror evidence on LMX and presenteeism climate [26] and perceived problems of discussing menstrual problems with men in work settings [37].

Moreover, we found an association between pain severity and disclosure of dysmenorrhea to the leader in the explorative analyses. This finding is in line with findings among employees with chronic illnesses that show that the personal experience of an illness is a predictor of disclosure: If a health problem is more severe, people are more likely to disclose information [38], for example, because they feel the manager “needs-to-know” or because symptoms cannot be masked or hidden.

We found the degree of disclosure to be positively correlated with more female-dominated industries. Although leaders as the disclosure targets are essential, future research should look at other disclosure

targets, such as coworkers, as consideration toward one's colleagues can be a reason to work despite symptoms [15]. Employees may fear that menstruation-related work absence could confirm existing stereotypes of women [2] and may anticipate more positive consequences of disclosure if they believe they are working with similar others [39].

We found several indications that a medical diagnosis, such as endometriosis, may be relevant to period pain presenteeism. Participants with endometriosis showed different associations compared to participants with no medical diagnosis. More particularly, for people with no diagnosis (i.e. primary dysmenorrhea), symptom severity was significantly stronger related to period pain presenteeism than it was among people with endometriosis. This finding indicates that presenteeism may be motivated and caused by different factors depending on the type of dysmenorrhea and that future research should differentiate between primary and secondary dysmenorrhea or specific underlying diagnosis when researching period pain and workplace behavior. Moreover, we found that a medical diagnosis was related to more disclosure to the manager. A diagnosis may give the employee a higher sense of illness legitimacy and is in line with previous research indicating that a diagnosis can help communicate one's menstrual problems [20].

Although societal beliefs regarding concealment were not associated with period pain presenteeism, we found a significant negative correlation between the perceived public beliefs and industry gender distribution, signifying that participants working in more male-dominated industries perceive a more vigorous public opinion toward concealment of menstruation. As people spend a large amount of their daily time at work and many social interactions take place in the work context, experiences at work likely impact the perception of public beliefs. Future research should investigate the perceived stigma/beliefs among the people at work and their connection to the perceived consequences of the decision to be present or absent.

Finally, days spent working from home were negatively related to period pain presenteeism. We argued that lower presenteeism in people working more from home could be connected to increased flexibility at home, facilitating symptom management and leading to a perceived alleviation of symptoms. More flexibility could allow employees to organize their working hours differently, avoiding work during phases of more severe pain. Research should explore how employees with dysmenorrhea manage their

symptoms in the workplace and during remote work to identify differences.

## Limitations

To our knowledge, our study is one of the first to investigate presenteeism caused by dysmenorrhea in terms of workplace attendance behavior and consider health- as well as work and organization-related correlates. However, our study has several limitations. Firstly, our analysis is based on cross-sectional self-report data, which does not allow for the analysis of causal relationships and insights into the temporal dynamics. There is a need for longitudinal research, e.g. using monthly assessments and experimental studies can help understand the processes that lead to disclosure events, as this variable is not likely to change continuously.

Second, our sample is primarily made up of people from Western Europe, which limits the generalizability of the findings. There are cultural differences in attitudes toward menstruation [40] and differences in the perceived legitimacy of absenteeism from work [41]. Also, countries can differ in sick leave policies, emphasizing the need for international studies.

Third, our study mainly focused on dysmenorrhea in the form of experienced pain. Menstruation symptoms are very diverse, and the brief assessment of pain that we used cannot capture the complexity of symptoms that can occur [17]. Moreover, we only assessed for symptoms during menstruation, which does not allow us to investigate the potential impact of experiencing symptoms at other points in the cycle [42]. Thus, future research endeavors should account for the diversity of symptoms, duration, and occurrence during the menstrual cycle.

## Practical contributions

Our findings indicate that flexibility in where employees work may enable them to deal with menstrual pain in a way that makes them perceive it as presenteeism to a lesser degree. Thus, work adjustments such as flexibility regarding remote work could be appropriate to counteract period pain presenteeism. Moreover, to prove adequate work adjustments, organizations must try to overcome disclosure barriers [38]. Thus, organizations need to take both occupational health considerations and gender diversity into account and invest in interventions to improve illness disclosure that is perceived as safe by the employees. Organizations should also develop means to aid self-management of symptoms at work without the

necessity to disclose, e.g. “quiet rooms” for all employees that guarantee privacy or the introduction of more flexibility regarding remote work or customizing work schedules [8].

The finding that people with a diagnosed condition are more likely to have disclosed their condition has implications beyond the work context. Although approximately one-third of participants did not have a diagnosis, there may be an underlying cause for their problems. Medical practitioners do not always take menstrual pain seriously and often “normalize” severe dysmenorrhea [19,43]. This normalization may also contribute to the low rates of people with dysmenorrhea that seek physician contact [44]. Increased efforts in physician education and increased public awareness could facilitate receiving a diagnosis, which may affect the disclosure and presenteeism of people with severe dysmenorrhea. Increased education and information about dysmenorrhea as a legitimate health problem may also help people to seek medical help and take medical sick leave.

Our findings also have implications for menstrual leave policies [8], as employees affected by dysmenorrhea need to feel able, safe, and willing to use them. As psychosocial work conditions can impact period-pain-related absenteeism, policy efforts should take those into account.

## Notes

1. Questionnaires for which there were no published or author-provided translations were translated by native speakers using a two-step procedure including translation, back-translation, and comparison.
2. One participant using the in the “other” category and answering “woman and queer” was categorized as female in the further analyses.

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## Ethical approval

The study documents and design were reviewed and approved by the Ethics Review Board of the Faculty of Social and Behavioral Sciences at the University of Amsterdam (Project Nr. 2022-WOP-14738). The study conforms to the standards of the Declaration of Helsinki.

## Consent form

Informed consent was obtained from all participants prior to their participation.

## Disclosure statement

The authors report that there are no competing interests to declare.

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## Data availability statement

The data that support the findings of this study are openly available in the Open Science Framework at [https://osf.io/5j6h8/?view\\_only=034fda59add448278154dd14eeb106ac](https://osf.io/5j6h8/?view_only=034fda59add448278154dd14eeb106ac) (anonymous view-only link for peer-review – will be made publicly accessible after publication).

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