Understanding the Impact of Menstruation on Work Performance: The Role of Presenteeism and Job Demands

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Abstract

This study investigated the impact of menstruation on work performance, focusing on the potential mediating role of presenteeism. Additionally, it explored the moderating effects of workload and cognitive job demands on the relation between menstrual pain and presenteeism. Using a daily diary methodology over a ten-day period, the study captured behaviors, feelings, and attitudes, providing insights into the human behavior in the work context. Convenience sampling was employed to recruit 130 women who completed online questionnaires, and statistical analyses, including t-tests and mediation analysis, were conducted using SPSS 28 and the PROCESS plugin by Andrew F. Hayes. The findings revealed a significant positive relationship between menstruation and pain, indicating higher pain levels during menstruation compared to non-menstruation days, both during working and non-working days. However, no significant direct or mediated effects were observed for pain on performance or the moderating effects of workload and cognitive job demands on the relationship between pain and presenteeism. These results emphasize the importance of further research to explore additional mediators and moderators that may contribute to a comprehensive understanding of the intricate dynamics between menstrual pain, work-related outcomes, and contextual factors. By uncovering these underlying mechanisms, future studies can inform the development of targeted interventions and support systems to address the challenges faced by individuals experiencing menstrual pain in the workplace.

Keywords: menstruation, pain, performance, moderated mediation, diary study

Introduction

The participation of women in the workforce has been steadily increasing over the past few decades, and today they make up approximately half of the working population (World Bank Group, 2016). This demographic shift has brought about changes in the way we think about work and employment, as well as in the policies and practices that govern the workplace (Grandey et al., 2019). One issue that has received little by little increasing attention in recent years, is the impact of menstruation on the working lives of women. Menstruation affects the vast majority of women at some point in their lives, yet it is often shrouded in taboo and stigma (Johnston-Robledo & Chrisler, 2020). Although menstruation is a common experience, it is still not often discussed in the context of work, and policies to support women who menstruate are often lacking. This gap in workplace policies might affect women's health and well-being, as well as their ability to participate fully in the workplace (Grandey et al., 2019).

Very recently, the government of Spain recognized the importance of menstrual health and its impact on menstruating women's well-being and decided to come up with a new approach; they became the first country in Europe to introduce a menstrual leave law, which entitles people who suffer from painful periods to take up to three days of leave per month (Camut, 2023). Although this law is not introduced without debate, this decision highlights the need for greater awareness and support for menstrual-related issues in the workplace and raises important questions about if and how other countries might follow Spain's lead in this area. More considered decisions could be made when there is more knowledge available about the relation between menstruation and work performance. By examining the extent and the pathways via which menstruation affects work performance, this research can contribute to filling the knowledge gap and improving decision-making. This will be done by formulating an answer to the research question "*To what extent is menstruation related to daily work performance and how can this be explained?"*

The impact of menstruation on work performance remains a sparsely explored area in the literature. While some qualitative studies (Brantelid, Nilvér & Alehagen, 2014; Gamberale, 1985; Holst et al., 2022) have investigated the experiences of menstruation at work, a recent cross-sectional survey by Schoep et al., (2019) revealed that menstruation-related symptoms have a significant impact on productivity loss, primarily attributed to presenteeism rather than absenteeism. These findings underscore the need for further research on this topic, particularly through quantitative studies such as diary research, to deepen the

understanding of the effects of menstruation in the workplace. Therefore, this research will investigate the role of presenteeism on the relation between menstrual pain and performance.

Additionally, the role of workload and cognitive job demands will be included, since job demands are showed to be associated with physiological and psychological costs (Bakker & Demerouti, 2006), that could be related to the decision to engage in presenteeism.

In conclusion, this research aims to contribute to the literature on presenteeism by exploring the extent to which environmental characteristics (i.e., cognitive job demands and workload) affect the association between menstrual pain and presenteeism. By incorporating these contextual factors, we can gain a deeper understanding of how the work environment interacts with menstrual experiences and their relations with work attendance and performance.

Theoretical background

Menstruation and pain

In the early teenage years, most women start to menstruate with an average of 3 to 8 days of menstruation per month (Grandey et al., 2019). During these days, menstruating women can experience physical and emotional changes due to the fluctuation of hormones in their bodies (Isselée et al., 2002). These symptoms vary largely in intensity and duration between individuals. Examples of physical complaints are cramps, breast tenderness, and headaches (Grandey et al., 2019; Isselée et al., 2002), and examples of emotional changes are feeling restless, fearful, and irritable (Farage, Osborn & MacLean, 2008). The increased pain level during menstruation is caused by the decrease of estrogen in the body (Isselée et al., 2002). This is a hormone that plays a vital role in regulating the menstrual cycle. When estrogen levels drop, the body's pain threshold decreases, leading to among others heightened pain sensitivity, discomfort in joints and bones, and facial pain (Isselée et al., 2002). Therefore, menstruating women may experience more significant discomfort during their menstruating days than on their non-menstruating days, especially during their first few menstruating days, when estrogen levels are at their lowest (Owen, 1975). This leads to the following hypothesis:

Hypothesis 1: Menstruation is positively associated with pain.

Pain, presenteeism, and performance

The previously mentioned physical and emotional changes experienced by menstruating women during their menstrual cycle can have a significant impact on various aspects of their lives, including their working life (Al-harbi, 2022). Research suggests that heightened pain sensitivity and physical discomfort can lead to decreased performance levels (Cochrane et al., 2018). The pain and discomfort, such as cramps, breast tenderness, and headaches, may not only be distracting but also limit one's ability to focus and concentrate on the tasks at hand (Cochrane et al., 2018). Therefore, it is essential to recognize and test the potential negative relation between menstrual pain and women's performance in the workplace.

Moreover, an important factor to consider in understanding the relation between pain and performance is the concept of presenteeism. The definition and way of measuring presenteeism is subject to substantial scholarly discourse and disagreement. The review of Lohaus & Habermann (2019) distinguishes two lines of understanding: The American lines of research that focus on how health conditions can impact productivity, and the European lines of research that mainly focus on why employees show up for work, when their health condition gives them a reason to stay home. This research uses the American way of seeing presenteeism and defines presenteeism as ‘the behaviour of working in a state of ill-health’ (Aronsson et al., 2002). The reasons for presenteeism can differ, but menstruating women in our society often feel compelled to continue working despite experiencing pain, as they face pressures to maintain their level of performance (Bergström, 2009). This pressure can stem from various work-related factors, such as low replaceability and high attendance requirements. Attendance requirements describe the negative consequences of being absent for the individual (Johansson & Lundberg, 2004), such as catching up on missed work, stress, and job insecurity. Additionally, personal factors like financial difficulties and a tendency to overcommit to work can further contribute to this phenomenon (Bergström, 2009). These findings lead to the expectation that pain is positively related with presenteeism. This expected relation can be explained by the Conservation of Resources (COR) theory by Hobfoll (1989), which states that human decisions are being made based on the motivation to protect from resource loss, recover from resource loss, and gain resources. Hobfoll states that losing resources has a bigger influence on people than gaining resources. So, when loss occurs (i.e., pain), people apply conservation resources strategies to adapt successfully by investing in resources that are still available, to avoid further loss (i.e., engaging in presenteeism to avoid negative consequences like catching up on missed work, stress, and

financial difficulties). Therefore, it can be expected that while menstruating, women experience pain, but they will still go to work to avoid struggles regarding high attendance requirements.

Previous research has pointed out that presenteeism can reduce work engagement, productivity, and task performance (Miraglia & Johns, 2015; Rivkin et al., 2002; Schultz et al., 2009; Schoep et al., 2019). Therefore, presenteeism is expected to be negatively related to performance. This leads to the following hypotheses:

Hypothesis 2: There is a negative relation between pain and performance.
Hypothesis 3: There is a positive relation between pain and presenteeism.
Hypothesis 4: There is a negative relation between presenteeism and performance.
Hypothesis 5: The negative relation between pain and performance is mediated by presenteeism.

Workload and cognitive demands

In work environments with high attendance requirements, menstruating women may face pressure to attend work even when experiencing pain. The fear of falling behind, missing out on opportunities, or facing potential negative consequences can drive them to prioritize attendance over their well-being. This pressure of high attendance requirements, and thus the relation between pain and presenteeism, is expected to be strengthened by high levels of job demands (i.e., workload and cognitive demands). Bakker and Demerouti (2006) define job demands as “the physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and/or psychological costs.” (p. 312). Examples of job demands are workload and cognitive job demands. Those demands will be included in this research.

The role of high workload and cognitive job demands within the relation between pain and presenteeism can be explained by the person-environment interaction theory (Simpson & Winterheld, 2012), which can provide insights into the behaviour of menstruating women in the workplace. According to this theory, human behaviour is not solely determined by a single factor but rather is the result of the interplay of forces between the individual and the environment. These so-called forces can be internal (such as motivation, beliefs, or values) or external (such as social norms and environmental factors), and their strength can also vary depending on the individual’s context, such as their specific job demands and personal resources, such as social support or self-efficacy.

Applying the person-environment interaction theory to the context of menstruating women, we can expect that the work environment, particularly the demands placed on them, can influence their behavior and the relation between pain and presenteeism. Pain affects an individual's behavior, limiting their ability to fully engage in work tasks. However, the decision to engage in presenteeism is influenced by both supporting factors, such as social norms, financial motives, and the fear of job loss, and hindering factors, such as pain and discomfort.

Low levels of workload or cognitive demands may make it easier for an individual to prioritize their health and take time off work, but when the levels of workload or cognitive demands are high, the individual is more likely to engage in presenteeism. In this scenario, the influence of the work environment, including job demands, becomes crucial; workload and cognitive demands act as additional factors in the environment that can influence the balance between supporting and hindering factors for presenteeism. Therefore, the following hypotheses are formulated:

> *Hypothesis 6: The relation between pain and presenteeism is stronger among employees who experience high levels of workload as compared to employees who experience low levels of workload.*
> *Hypothesis 7: The relation between pain and presenteeism is stronger among employees who experience high levels of cognitive job demands as compared to employees who experience low levels of cognitive job demands.*

The present study

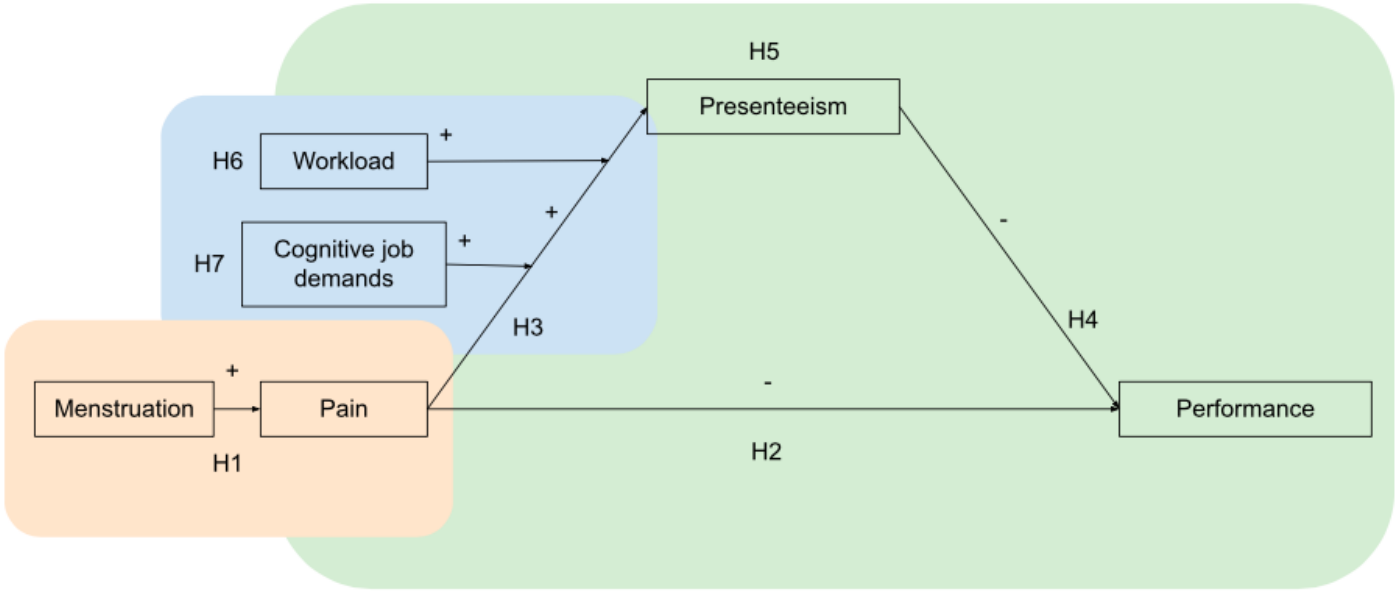
To answer the research question "*To what extent is menstruation related to daily work performance and how can this be explained?"*, the relation between pain due to menstruation and performance will be tested in different steps. This is visualized in Figure 1. The first step is the orange part of the model. This step tests if people who menstruate experience more pain during their menstruation. The second step is shown in the green part of the model, where the mediating role of presenteeism on the relation between pain and performance is being tested. In the last step, workload and cognitive job demands are tested as moderators of the relations between pain and presenteeism. This is indicated in the blue part of the model.

Control variables were age, given birth, having a menstrual disorder, the use of hormonal contraceptives, and using painkillers. Age was used as a control variable because the pain caused by menstruation can vary across different age groups (Pitangui et al., 2013).

Additionally, Schoep et al. (2019) concluded that younger employees who menstruate engage more in presenteeism than older employees who menstruate, so age can affect the relation between menstruation and presenteeism. Given birth and the use of hormonal contraceptives were used as a control variable because this can both influence the menstrual cycle (Mohammed, 2017; Barrett et al., 2014). Menstrual disorders could cause higher pain levels during menstruation (O'Sullivan et al., 2010), therefore it is used as a control variable. Additionally, it is crucial to control for the use of pain medication, since this can reduce the perceived levels of pain. By controlling for these variables, we can account for any potential influence it may have on the relations being studied.

Figure 1

The hypothesized model



Method

Design

To test the proposed hypotheses, we designed a daily diary study focusing on capturing behaviors, feelings, and attitudes. This is a study of ten consecutive days, with one brief measurement per day and a general baseline questionnaire. This approach allowed us to gain insights into participants' experiences over the course of the study period. The ten-days observation period allows us to get a more comprehensive and nuanced understanding of the

individuals' experiences compared to a single-day measurement (Ohly et al., 2010). The advantages of diary studies are being cost-effective – since there are no material costs and a wide participant reach - and reducing the retrospective bias compared to survey studies (Ohly et al., 2010).

The daily questionnaire was distributed to the participant an estimated two or three days before the commencement of their next cycle. Therefore, the starting date of distribution of questionnaires is unique to each participant. The general questionnaire at the beginning of the ten days included questions about stable factors of the individual and some demographics.

Procedure

Convenience sampling was used to recruit participants for this study. This is a non-random method that is widely used by researchers in the field of psychology (Sedgwick, 2013). The benefits of using convenience sampling include low cost and time, allowing us to gather data in an accessible, quick and efficient way (Sedgwick, 2013). Demerouti and Rispens (2014) argued that student-recruited samples may increase external validity and generalization because of its heterogeneity. Participants were recruited by the online social and professional network of the researchers, a group of six Master students. These platforms included WhatsApp, Instagram, LinkedIn, Facebook. In addition to this, the snowball method was used: participants were asked whether they know someone who could also participate in this study (Stratton, 2021).

An information letter (see Appendix A) was sent to inform participants about the purpose of this study. Before starting the study, the participants had to sign an informed consent (see Appendix B). After agreeing with the informed consent, the respondents could participate in the study.

There were two stages of data collection. First, participants had to complete a one-time questionnaire addressing demographic variables and some other more or less stable factors such as perceived organizational support. Additionally, participants were asked about their estimated start date of menstruation, which allowed for the scheduling of the first daily questionnaire to be sent two or three days before their anticipated start date. The participants were instructed to fill in these questionnaires every day between 16.00 and 20.00 for ten consecutive days. Within the daily questionnaires, the participants were asked how many hours they worked that day. If they did not work that day, due to pain or because it was a free day, they got a shortened version of the questionnaire without the questions about work.

Both questionnaires were programmed with the online application ‘Qualtrics’. First, the respondents who agreed to participate received a link to the one-time questionnaire. In this questionnaire, the email addresses of the respondents were asked, and a personalized link to the daily questionnaire was made and sent for ten consecutive days. Since the data collection was done together with six master students, the both the general questionnaire and the daily questionnaires contained more variables than were used for the present study.

This study is approved by the Faculty Ethical Review Committee (FERC) of the Faculty of Social Sciences at Utrecht University and complies with ethical guidelines.

Participants

Participants had to meet three inclusion criteria – they had to be 18 years or older, they had to menstruate, and had to work at least 24 hours - to ensure relevant data about work outcomes, while maintaining a low minimum requirement. The researcher ensured that all participants voluntarily took part in the study.

The exclusion criteria for this research were being a freelancer (as social and organizational support was being measured in the questionnaire), being pregnant or in a menopausal state, or currently breastfeeding. The reason for these exclusions is that they can affect the production of estrogen. This can cause problems and irregularities within a woman’s cycle, making it hard to keep track of when the period will start (Fleischman, Navarrete, & Fessler, 2010; Halbreich et al., 2003).

In total, 130 women showed interest in the study and completed the general questionnaire. 101 of them filled in the daily questionnaires, resulting in a 77,7% daily response rate. For the mediation and moderation analyses, respondents had to work and menstruate at the same time. This led to 10 more respondents that could not be included in the analyses. At the end, 91 respondents were used for the mediation and moderation analyses. Of the respondents, 94% worked 24-40 hours per week, while 4% worked more than 40 hours per week (M = 33.03, SD = .71). The sample included a wide variety of employment sectors, such as social work, administrative work, airline industry, and recruiting. 77% respondents were between the ages of 18 and 25, 20% of the respondents were between the ages of 26 and 35, and 3% of the respondents were 36 and older (M = 24.38, SD = .38). 71,5% of the participants lived in the Netherlands at the moment of conducting this study, and 52% had a Dutch nationality. The other half is widely distributed ranging from countries such as China and Brazil to Canada and Syria. Furthermore, 62,3% of the respondents had a bachelor’s or master’s degree at university level.

Measures

All variables of the research model (Figure 1) were measured in the daily questionnaires (Appendix C).

Daily questionnaire

Menstruation was measured using a single question, asking if the person is menstruating (yes or no), based on Motro et al. (2019).

Pain was measured by asking if the menstruating person experiences physical pain (0 = not at all, 5 = excruciating) based on Christian, Eisenkraft & Kapadia (2015).

Presenteeism was assessed by asking one question: 'How much did you work today, even though you did not feel well enough?', with answering possibilities from 1 = I worked the whole day without pain, until 5 = I worked the whole day with pain due to my menstruation. The scale is based on Rivkin et al. (2022) and the answering scales have been slightly adapted by the researchers, to create a better fit with the present study.

Cognitive job demands and workload were measured by using two three-item scales from Breevaart & Bakker (2018). An example is: 'Today, my work required a high level of concentration' (i.e., cognitive demands) and 'Today, I had to work very hard' (i.e., workload). Both scales could be answered on a seven-point Likert scale (1= completely disagree, 7 = completely agree). The workload scale has a Cronbach's Alpha of .83, and the cognitive job demands scale has a Cronbach's Alpha of .84.

Performance was assessed by using the task-performance subscale from Koopmans et al. (2014) which consists of 3 items. This scale is adjusted to the day level, resulting in statements like 'Today, I was able to perform my work well with minimal time and effort'. Participants rated each item on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The original scale by Koopmans consists of 5 items, but the items about planning were deleted because they were considered less relevant for this study. The reliability analysis of this scale resulted in a Cronbach's Alpha of .69.

General questionnaire

The general questionnaire was sent to the participants prior to the daily questionnaire. This questionnaire included questions about the demographic factors such as age, field of work and nationality. Additionally, the general questionnaire included questions about stable factors of the individual, including the control variables. The control variables were age, menstrual disorders, given birth, the use of pain medication (1 = yes and 2 = no), and the use

of hormonal contraceptives (1 = yes and 2 = no). Given birth was recoded (from 3 = yes and 4 = no to 1 = yes and 2 = no) and menstrual disorders was manually changed into a numeric scale (1 = no menstrual disorder and 2 = a menstrual disorder).

Strategy of analysis

The statistical analyses were done using the Statistical Package for Social Sciences (SPSS) 28. To simplify the analyses for the purpose of this study, the data of this research was aggregated to obtain one line of data per person, which allowed us to work with the average scores on the study variables during menstruation days (both at work and not at work), and non-menstruation days (both at work and not at work). Those average scores are used for the first part of the research model, where the relation between menstruation and pain is being tested, both on working and non-working days. For the second and third parts of the research model, only the data of the menstruation days on working days was used. Prior to the multiple regression analyses, reliability analyses and factor analyses were conducted to assess measurement consistency and identify underlying factors or dimensions within the data.

As outlined before, the model of this research consists of three parts. The first part consists of the relation between menstruation and pain (hypothesis 1). This was tested by using a Wilcoxon test, measuring if people experience more pain during days on which they menstruate than on days on which they do not menstruate.

The second part is a mediation analysis conducted using the PROCESS plugin by Andrew F. Hayes model 4 (hypotheses 2, 3, 4, and 5). The assumptions of normally distributed residuals, linearity, multicollinearity, outliers, and homoscedasticity were tested for all variables.

The third part of the research model is a moderated mediation analysis in which the PROCESS plugin by Andrew F. Hayes model 9 is used. The assumptions were checked in the previous part. For both the mediation and the moderation parts, bootstrapping (5000 samples) was used.

Results

Descriptive statistics

The means, standard deviations and Pearson correlations are reported in Table 1. Results from the correlation analysis showed that all correlations were in the expected direction, with the highest significant correlation of .84 between pain and presenteeism. It is

noticeable that the mean score on cognitive job demands is very high. The mean score on pain and presenteeism are relatively low.

Table 1

Mean, standard deviation and Pearson Correlations between the study variables

Variable	*Mean*	*SD*	1	2	3	4	5	6	7	8	9
1. Pain	2.21	.85	-								
2. Performance	3.49	.64	-.41**	-							
3. Presenteeism	2.10	.94	.84**	-.40**	-						
4. Workload	4.54	1.16	.08	-.17	.03	-					
5. Cognitive job demands	5.26	.98	.05	-.28**	.05	.56**	-				
6. Menstrual disorder	1.07	.26	.21*	-.01	.24*	-.21*	-.05	-			
7. Given birth	1.02	.14	.162	-.01	.23*	-.02	-.03	-.04	-		
8. Pain medication	1.20	.27	.43**	-.08	.48*	.03	-.08	.26**	.53	-	
9. Hormonal contraception	1.25	.50	-.00	-.05	.01	-.23*	-.11	-.08	-.02	.17	-
10. Age	24.38	3.70	.023	-.09	.08	-.13	.01	.18	.28**	.10	.15

Note: N = 91

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Hypothesis testing

According to *hypothesis 1,* there is a positive relation between menstruation and pain. This was supposed to be tested by using a paired sample t-test, but before conducting the t-test, the assumptions of normally distributed were tested and violated. The variables pain on non-menstruating days were not normally distributed, both on working days (Skewness = 2.35, Kurtosis = 6.42) and non-working days (Skewness = 2.62, Kurtosis = 7.21). To control for this issue, the Wilcoxon signed-rank test was conducted to compare the score on pain during menstruation days and non-menstruation days (both on working and non-working days). During the working days, there was a significant difference ($p < .001$) in the scores for pain on menstruating days (M = 2,21, SD = .85) and non-menstruating days (M = 1.32, SD = .57). During the non-working days, the difference between the pain level on menstruating days (M = 2.08, SD = .95) and non-menstruating days (M = 1.26, SD = .59) is tested to be significant as well ($p < .001$). This means that hypothesis 1 is supported; the scores on pain are higher when respondents were menstruating, both on working and non-working days.

For the mediation and moderated mediation, the variables age, given birth, having a menstrual disorder, the use of hormonal contraceptives, and using painkillers were used as control variables and the assumptions for a multiple regression analysis were checked. No violations were detected, and centered variables were used to avoid multicollinearity issues. To test the direct effects (hypotheses 2, 3, 4) and the mediation effect (hypothesis 5), Hayes' (2017) model 4 was run. A summary of the path coefficients and the indirect effect can be found in Figure 2.

Hypothesis 2 predicted a negative relation between pain and performance. The total effect (c) was significant (b = -.37, t(84), p < .001), which means that this hypothesis is supported.

Hypothesis 3 predicted a positive relation between pain and presenteeism. This hypothesis is supported (t(84), p = <.001) with a large effect size (b =.83).

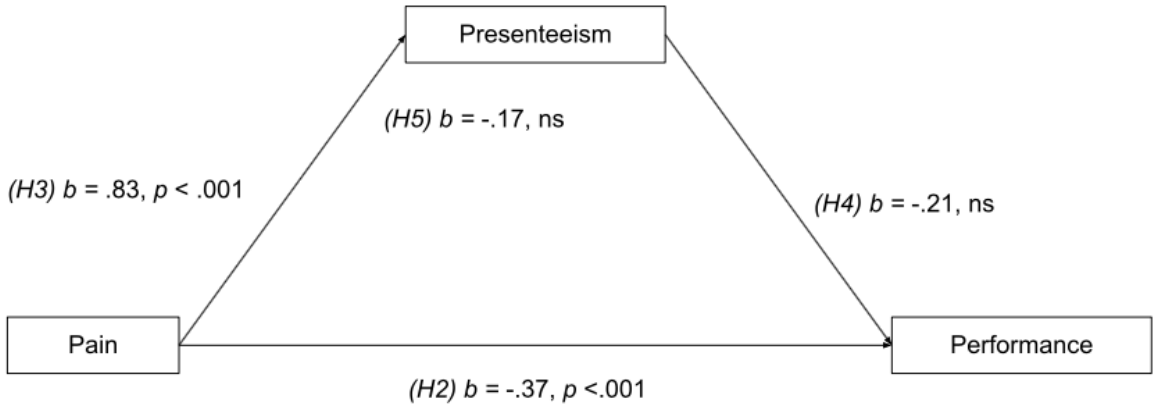
Hypothesis 4 suggests a negative relation between presenteeism and performance. This effect (b = -.21) was not significant (t(83), ns). This means hypothesis 4 is not supported.

Hypothesis 5 tests if presenteeism mediates the relation between pain and performance. The analysis does not show a significant mediation. The direct effect (*c'*) was not significant (b = -.20, t(84), ns), and neither was the indirect effect with a 95% CI [-.40, .17] and a small effect size of -.17. Hypothesis 5 is not supported.

The results of this mediation analysis are visualized in Figure 2.

Figure 2

Research model including the results of analyses 2, 3, 4, and 5

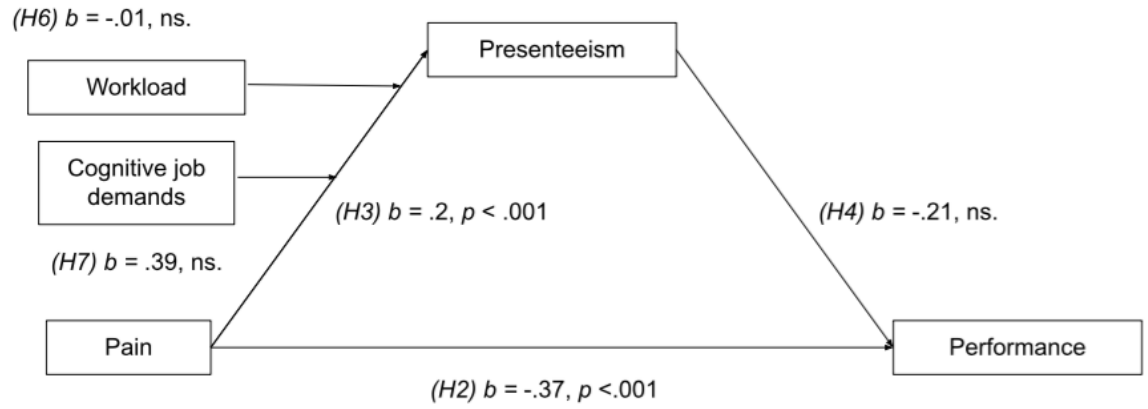


Next, the moderating effects of workload and cognitive job demands (hypotheses 6 and 7) were tested by running Hayes' (2017) PROCESS model 9. Hypotheses 6 and 7 test if

the relation between pain and presenteeism is moderated (strengthened) by workload (H6) and cognitive demands (H7). The results showed that workload was not a significant moderator: (*t*(80), ns) with a very small negative effect size (*b* = -.01). This finding suggests that higher levels of workload do not strengthen the relation between pain and presenteeism, and hypothesis 6 is not supported. The moderator cognitive job demands was also not tested to be significant: *b* = .07, *t*(80), ns. This means that cognitive demands do not moderate the relation between pain and presenteeism, and hypothesis 7 is rejected. The indices of the moderated mediation showed a 95% CI of [-.02, .06] and [-.12, .02]. This means that there is no moderated mediation. The results of the moderated mediation analysis are visualized in Figure 3.

Figure 3

Research model including the results of hypothesis 6 and



Discussion

As menstruation is a regular occurrence for a significant portion of the workforce, there is a growing need to investigate its effects. The purpose of this study was to shed light on the relation between menstruation and work performance, particularly focusing on the potential role of presenteeism, and to explore the contribution of workload and cognitive job demands on the relation between menstrual pain and presenteeism. This research reveals that individuals experience higher levels of pain during menstruating and that these higher levels of pain are negatively associated with performance. By delving into these dynamics, the study aimed to contribute to a deeper understanding of the intricate interplay between menstrual pain, work-related outcomes, and contextual factors, as well as to break the taboo.

Theoretical implications

The first part of this research showed that while menstruating, people experience more pain than when they are not menstruating. This aligns with previous research highlighting the physiological changes and discomfort experienced by individuals during their menstrual cycle (Grandey et al., 2019; Isselée et al., 2002).

The second phase of this research investigates the relation between pain during menstruation and work performance and the mediating role of presenteeism. The negative relation between pain and performance has been found in this study. This means that according to this research, individuals who experience higher pain levels during their menstruation, perform worse at work. This aligns with the literature about decreased performance levels during physical comfort (Cochrane et al., 2018).

Additionally, the expected relation between pain and presenteeism that was explained by the Conservation of Resources Theory (Hobfoll, 1989), was confirmed in this research. This points out that individuals experiencing higher levels of pain are more likely to exhibit increased presenteeism. So, when resource loss occurs and people experience pain, they engage in presenteeism to avoid further loss like catching up on missed work, stress, and financial difficulties. This is in line with the findings of Cochrane et al. (2018), who stated that pain and discomfort could be distracting and limit one's ability to focus and concentrate. This highlights the impact of pain on employees' ability to fully engage in their work, even when physically present.

In contrast, presenteeism does not seem to have a direct relation with performance, and neither does it explain the relation between pain and performance. There was a significant negative total effect from pain to performance, but once presenteeism was added as a mediator to the model, the direct effect disappeared. Usually, this means that there is a mediation effect (the indirect effect) that explains the relation. But in this study, presenteeism does not seem to mediate the negative relation between pain and performance. This is not in line with the consulted literature that showed that presenteeism reduces work engagement, productivity and task performance (Miraglia & Johns, 2015; Rivkin et al., 2002; Schultz et al., 2009; Schoep et al., 2019). The lack of significance could be attributed to social expectations around menstruation. Menstruation remains a taboo and individuals may choose not to disclose how it impacts their professional and personal lives (Schoep et al., 2019). The social pressure to conceal menstruation (O'Flynn, 2006) could have compelled the participants to hide any impact it may have had on their work performance.

The third part of this study showed that the relation between pain and presenteeism remains the same, regardless of the levels of workload or cognitive demands. This is in contrast with the previous expectations based on the person-environment interaction theory (Simpson & Winterheld, 2012), which suggested that the relation between pain and presenteeism is stronger among individuals who report higher levels of workload or cognitive job demands. These results emphasize the importance of considering the multifaceted nature of the relation between pain and presenteeism and suggest the need for further investigation into the underlying mechanisms involved. It might be the case that menstruating women have developed coping strategies and adaptive behaviors to control their pain and its consequences (Haythornthwaite et al., 1998). This could result in maintaining performance levels, regardless of workload or cognitive demands.

The lack of statistical significance in the second and third part of this study could also be explained by the sample size. The sample size of 91 participants could have been too small and may have limited the statistical power of the study (Bullen, 2022). With a larger sample, it is possible that more robust findings could have been found. Additionally, the variation in menstrual experiences should be taken into account. As menstruation differs from month to month, testing only one month may not capture the full range of potential relations between pain, presenteeism, performance, and the contextual factors.

In summary, during their menstruation, women experience higher pain levels than when they are not menstruating. It was also found that women who experience greater pain tend to engage in presenteeism. Additionally, there is a negative relation between pain and presenteeism, but this is not mediated by presenteeism. In this study, presenteeism does not seem to be related with lower levels of performance. In other words, while menstruating women who experience higher levels of pain during menstruation are more likely to engage in presenteeism, there is no evidence to suggest that presenteeism leads to lower levels of performance. This relation stays the same, regardless of the level of workload or cognitive demands experienced.

Limitations and strenghts

The present study provides valuable insights into the relation between menstruation, pain, performance and presenteeism. However, it is important to acknowledge the strengths and limitations of the study to interpret the findings appropriately.

One strength of this study is the use of a daily dairy study over a period of ten days. This allows to examine patterns and trends, which provides a better understanding of

individual's experiences. However, for the purpose of this thesis, we worked with aggregated data to simplify the analyses. The use of aggregated data, which involved averaging scores across the 10-day period, still offers a more nuanced perspective compared to a one-time survey because by averaging scores across multiple days, we minimize the impact of daily fluctuations and capture the general information of individual experiences. On top of that, the choice for a daily dairy study helped to minimize the risk of retrospective bias (Ohly et al., 2010).

Additionally, according to Demerouti and Rispens (2014), student-recruited samples can increase the generalizability of the findings because of its heterogeneity. However, the choice for convenience sampling allowed for the recruitment of participants to go through our network and referrals. This may have led to the inclusion of participants who share similar characteristics or backgrounds. This self-consistency in the sample may limit the generalizability of the findings to a broader population (Baxter, Courage, & Caine, 2015).

Moreover, the internal consistency of the performance scale was compromised during the development of the scale for this particular study: two items were removed, and the questions were adjusted to the day-level, resulted in a lower Cronbach's Alpha (.69). The original scale is tested to be reliable with a Cronbach's Alpha of .79 (Koopmans et al., 2014).

Furthermore, all variables were measured using online self-report questionnaires, which may introduce self-report bias (Donaldson & Grant-Vallone, 2002), social desirability bias (Demetriou, Ozer, & Essau, 2015), and common-method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The independent and dependent variables were measured within the same survey and participants may have responded in a socially desirable manner or provided inaccurate responses, especially when sensitive questions were involved.

Future research

Future research in this area should consider several key recommendations to enhance our understanding of the relationship between pain and work outcomes. Firstly, exploring additional variables that may influence these relations would provide valuable insights into the complex interplay between pain and various work-related factors. Research points out that job satisfaction is positively related to presenteeism (Rodrígues-Cifuentes et al., 2020) and strain is negative related to performance (Van dyne et al., 2002). Examining these variables could uncover nuanced connections and identify potential moderators and mediators that shape the pain-performance relationship. This, in turn, can contribute to the existing literature on menstruation and work outcomes.

Furthermore, to improve the reliability of findings, future studies should consider using a more robust performance measure. This would help ensure the accuracy and validity of the results, thereby strengthening the scientific rigor of the research.

In addition, enhancing the external validity of the findings is crucial. To achieve this, researchers should adopt a more diverse and representative sampling strategy. By including participants from different education levels and ages, researchers can capture a broader range of experiences and perspectives, thus increasing the generalizability of the findings.

Practical implications

The findings of this study emphasize a few practical implications. First of all, recognizing that individuals experience increased pain levels during their menstruation, organizations should consider implementing supportive measures to accommodate the needs of the menstruating women. This could involve providing flexible work arrangements, allowing breaks for pain management, or providing access to resources such as pain-relieving activities. Secondly, the tendency for menstruating women to engage in presenteeism suggests a need for interventions to promote employee well-being and productivity. Employers should focus on creating a work environment that fosters open communication, encourages self-care, and provides resources for managing pain and discomfort. By considering these practical implications, organizations can better understand and address the impact of menstrual pain on employee well-being, presenteeism, and overall performance.

Conclusion

In conclusion, this research provides insights into the relation between physical complaints due to menstruation and work performance. The findings indicate that individuals experience increased pain during menstruation, highlighting the physiological changes and discomfort associated with the menstrual cycle. Moreover, the study reveals that higher levels of pain are positively associated with increased presenteeism, emphasizing the negative relation between pain and employees' ability to fully engage in their work. However, the direct relation between pain and performance was not supported. Additionally, the study found no significant moderation effects of workload or cognitive job demands on the relation between pain and presenteeism, indicating that these contextual factors do not affect the relation. Despite the strengths of the research, such as the use of a daily diary study of 10 days, limitations related to measurement reliability, sampling method, and potential biases in self-report questionnaires should be acknowledged. Addressing these limitations in future

research will contribute to a more comprehensive understanding of the dynamics between pain, presenteeism, and work-related factors, enabling the development of targeted interventions and support systems for employees experiencing menstrual pain in the workplace, as well as breaking the taboo.

References

Al-harbi, S. S. (2022). The Impact of Menstrual Periods on Performance of Female Workers. Women's Health Medicine, *16*(1).

Aronsson, G., Gustafsson, K., & Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. Journal of Epidemiology and Community Health, *54*(7), 502–509. https://doi.org/10.1136/jech.54 .7.502

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: state of the art. Journal of Managerial Psychology, *22*(3), 309-328. https://doi.org/10.1108/02683940710733115

Barrett, E. S., Parlett, L. E., Windham, G. C., & Swan, S. H. (2014). Differences in ovarian hormones in relation to parity and time since last birth. *Fertility and sterility*, *101*(6), 1773-1780.

Baxter, K., Courage, C., Caine, K. (2015). Choosing a user experience research activity. *In Understanding your Users* (pp. 96-112). Morgan Kaufmann.

Bergström, G., Bodin, L., Hagberg, J., Aronsson, G., & Josephson, M. (2009). Sickness Presenteeism Today, Sickness Absenteeism Tomorrow? A Prospective Study on Sickness Presenteeism and Future Sickness Absenteeism. *Journal of Occupational and Environmental Medicine*, *51*(6), 629–638. http://www.jstor.org/stable/45009514

Brantelid, I. E., Nilvér, H., & Alehagen, S. (2014). Menstruation during a lifespan: a qualitative study of women's experiences. *Health care for women international*, *35*(6), 600-616.

Breevaart, K., & Bakker, A. B. (2018). Daily job demands and employee work engagement: The role of daily transformational leadership behavior. *Journal of Occupational Health Psychology, 23*(3), 338–349. https://doi.org/10.1037/ocp0000082

Bullen, P. B. (2022, September 28). *How to choose a sample size (for the statistically challenged)*. tools4dev. https://tools4dev.org/resources/how-to-choose-a-sample-size/#:~:text=The%20minimum%20sample%20size%20is,to%20survey%20all%20of%20them.

Camut, N. (2023, February 16). *Spain approves paid menstrual leave, first country in Europe to do so*. POLITICO. Retrieved February 17, 2023, from https://www.politico.eu/article/bill-europe-spain-parliament-creates-first-menstrual-leave-in-europe/.

Christian, M. S., Eisenkraft, N., & Kapadia, C. (2015). Dynamic associations among somatic

complaints, human energy, and discretionary behaviors: Experiences with pain fluctuations at work. Administrative Science Quarterly, 60, 66–102. https://doi.org/10.1177/0001839214553655

Cochrane, A., Higgins, N. M., Rothwell, C., Richardson, J., & Sandler, C. X. (2018). Work outcomes in patients who stay at work despite musculoskeletal pain. Journal of Occupational Rehabilitation, 28(3), 559-567. https://doi.org/10.1007/s10926-017-9748-4

Demerouti, E., & Rispens, S. (2014). Improving the image of student-recruited samples: A commentary. *Journal of Occupational and Organizational Psychology*, *87*(1), 34-41.

Demetriou, C., Ozer, B. U., & Essau, C. (2015). Self-reported Questionnaires. In R. L. Cautin & S. O. Lilienfeld (Ed.), *The encyclopedia of clinical psychology* (pp. 1-6). John Wiley & Sons.

Donaldson, S. I., & Grant-Vallone, E. J. (2002). Understanding self-report bias in organizational behavior research. *Journal of business and Psychology*, *17*, 245-260.

Farage, M. A., Osborn, T. W., & MacLean, A. B. (2008). Cognitive, sensory, and emotional changes associated with the menstrual cycle: A review. Archives of Gynecology and Obstetrics, 278, 299-307. https://doi.org/10.1007/s00404-008-0708-2

Fleischman, D. S., Navarrete, C. D., & Fessler, D. M. (2010). Oral contraceptives suppress ovarian hormone production. Psychological Science, 21(5), 750–752. https://doi.org/10.1177/ 0956797610368062

Gamberale, F. (1985). Effects of menstruation on work performance. *Ergonomics*, *28*(1), 119-123. https://doi.org/10.1080/00140138508963121

Grandey, A. A., Gabriel, A. S., & King, E. B. (2020). Tackling taboo topics: A review of the three M s in working women's lives. *Journal of Management*, *46*(1), 7-35.

Halbreich, U., Kinon, B. J., Gilmore, J. A., & Kahn, L. S. (2003). Elevated prolactin levels in patients with schizophrenia: Mechanisms and related adverse effects. Psychoneuroendocrinology, 28, 53–67. https://doi.org/10.1016/S0306-4530(02)00112-9

Haythornthwaite, J. A., Menefee, L. A., Heinberg, L. J., & Clark, M. R. (1998). Pain coping strategies predict perceived control over pain. *Pain*, *77*(1), 33–39. https://doi.org/10.1016/s0304-3959(98)00078-5

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist, 44*(3), 513–524. https://doi.org/10.1037/0003-066X.44.3.513

Holst, A. S., Jacques-Aviñó, C., Berenguera, A., Vargas, M., Perdiguero, E., Vela, M., Otero Garcia, L., García-Sanjuán, S., Zabaleta-del-Olmo, E., & Bosch-Farré, C. (2022). Experiences of menstrual inequity and menstrual health among women and people who menstruate in the Barcelona area (Spain): A qualitative study. Reproductive Health, 19(1), 45. https://doi.org/10.1186/s12978-022-01470-2 https://doi.org/10.1186/s12978-022-01354-5

Isselée, H., De Laat, A., De Mot, B., & Lysens, R. (2002). Pressure-pain threshold variation in temporomandibular disorder myalgia over the course of the menstrual cycle. Journal of Orofacial Pain, 16, 105–117.

Johansson, G., & Lundberg, I. (2004). Adjustment latitude and attendance requirements as determinants of sickness absence or attendance. empirical tests of the illness flexibility model. *Social Science & Medicine*, *58*(10), 1857–1868. https://doi.org/10.1016/s0277-9536(03)00407-6

Johnston-Robledo, I., & Chrisler, J. C. (2020). The menstrual mark: Menstruation as social stigma. *The Palgrave handbook of critical menstruation studies*, 181-199.

Koopmans, L., Bernaards, C. M., Hildebrandt, V. H., de Vet, H. C. W., van der Beek, A. J. (2014). Construct Validity of the Individual Work Performance Questionnaire. *Journal of Occupational and Environmental Medicine*, *56*(3). DOI 10.1097/JOM.0000000000000113

Lohaus, D., & Habermann, W. (2019). Presenteeism: A review and Research Directions. *Human Resource Management Review*, *29*(1), 43–58. https://doi.org/10.1016/j.hrmr.2018.02.010

Miraglia, M., & Johns, G. (2015, November 9). Going to Work Ill: A Meta-analysis of the Correlates of Presenteeism and a Dual-path Model. Journal of Occupational Health Psychology. Advance online publication. http://dx.doi.org/10.1037/ocp0000015

Mohammed, N. (2017). Effect of Contraceptive use on Menstrual Cycle Pattern among clients attending Family Planning Clinics at Assiut City. https://doi.org/10.21608/asnj.2017.58461.

Morling, B., Carr, D., Heger Boyle, E., Cornwell, B., Correll, S., Crosnoe, R., Freese, J. & Waters, M.C. (2018). Research methods. Custom edition voor Universiteit Utrecht. Norton. ISBN 9780393691894

Motro, D., Gabriel, A. S., & Ellis, A. P. (2019). Examining the effects of menstruation on women's helping behaviour in the workplace. *Journal of Occupational and Organizational Psychology*, *92*(3), 695–706. https://doi.org/10.1111/joop.12258

O'Flynn, N. (2006). Menstrual symptoms: the importance of social factors in women's experiences. PubMed, 56(533), 950–957. https://pubmed.ncbi.nlm.nih.gov/17132384

Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organizational research. *Journal of Personnel Psychology*.

O'Sullivan, M., Sneddon, A., & Arbon, P. (2010). The menstrual disorder of teenagers (MDOT) study: determining typical menstrual patterns and menstrual disturbance in a large population-based study of Australian teenagers. Bjog: An International Journal Of Obstetrics And Gynaecology, 117(2), 185–192. https://doi.org/10.1111/j.1471-0528.2009.02407.x

Owen Jr, J. A. (1975). Physiology of the menstrual cycle. *The American journal of clinical nutrition*, *28*(4), 333-338.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879-903.

Pitangui, A. C. R., Gomes, M. R. D. A., Lima, A. S., Schwingel, P. A., Albuquerque, A. P. D. S., & de Araújo, R. C. (2013). Menstruation Disturbances: Prevalence, Characteristics, and Effects on the Activities of Daily Living among Adolescent Girls from Brazil. Journal of Pediatric and Adolescent Gynecology, 26(3), 148–152. https://doi.org/10.1016/j.jpag.2012.12.001

Rodríguez-Cifuentes, F., Fernández-Salinero, S., Moriano, J. A., & Topa, G. (2020). Presenteeism, overcommitment, workplace bullying, and job satisfaction: A moderated mediation relationship. *International Journal of Environmental Research and Public Health*, *17*(22), 8616. https://doi.org/10.3390/ijerph17228616

Sedgwick, P. (2013). Convenience sampling. *Bmj*, *347*.

Stratton, S. J. (2021). Population research: convenience sampling strategies. *Prehospital and disaster Medicine*, *36*(4), 373-374.

Rivkin, W., Diestel, S., Gerpott, F. H., & Unger, D. (2022). Should I stay or should I go? The role of daily presenteeism as an adaptive response to perform at work despite somatic complaints for employee effectiveness. *Journal of Occupational Health Psychology*, *27*(4), 411–425. https://doi.org/10.1037/ocp0000322

Ruhle, S. A., Breitsohl, H., Aboagye, E., Baba, V., Biron, C., Correia Leal, C., Dietz, C., Ferreira, A. I., Gerich, J., Johns, G., Karanika-Murray, M., Lohaus, D., Løkke, A., Lopes, S. L., Martinez, L. F., Miraglia, M., Muschalla, B., Poethke, U., Sarwat, N., Schade, H., Steidelmüller, C., Vinberg, S., Whysall, Z., & Yang, T. (2020). "To work,

or not to work, that is the question" – Recent trends and avenues for research on presenteeism. European Journal of Work and Organizational Psychology, 29(3), 344-363. DOI: 10.1080/1359432X.2019.1704734

Schoep, M. E., Adang, E. M. M., Maas, J. W. M., De Bie, B., Aarts, J. W. M., & Nieboer, T. E. (2019). Productivity loss due to menstruation-related symptoms: a nationwide cross-sectional survey among 32 748 women. *BMJ Open*, *9*(6), e026186. Https://doi.org/10.1136/bmjopen-2018-026186

Schoep, M. E., Nieboer, T. E., van der Zanden, M., Braat, D. D., & Nap, A. W. (2019). The impact of menstrual symptoms on everyday life: a survey among 42,879 women. American Journal of Obstetrics and Gynecology, 220(6), 569.e1-569.e7. https://doi.org/10.1016/j.ajog.2019.02.048

Schultz, A. B., Chen, C., & Edington, D. W. (2009). The Cost and Impact of Health Conditions on Presenteeism to Employers. *PharmacoEconomics*, *27*(5), 365–378. https://doi.org/10.2165/00019053-200927050-00002

Simpson, J. A., & Winterheld, H. A. (2012). Person-by-situation perspectives on close relationships. In K. Deaux & M. Snyder (Eds.), Oxford handbook of personality and social psychology (pp. 493–516). New York: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190224837.013.21

Van Dyne, L., Jehn, K. A., & Cummings, A. L. (2002). Differential effects of strain on two forms of work performance: individual employee sales and creativity. Journal of Organizational Behavior, 23(1), 57–74. https://doi.org/10.1002/job.127

World Bank Group. (2016). Labor force, female. Retrieved on January 1, 2018, from https://da ta.worldbank.org/indicator/SL.TLF.TOTL.FE.ZS

Appendix

Appendix A

Information letter

Dear participant,

Thank you for agreeing to participate in this study. This research concerns the relationship between menstruation and work-related outcomes. To help you make an informed decision about your participation, this letter will explain what the study entails, the potential risks and benefits of this research, and your rights as a research participant. If you have any questions or concerns, please do not hesitate to contact us.

1. What is the aim of the study?

The aim of this study is to investigate the impact of menstruation on work performance and well-being at work. According to previous research menstruation is still stigmatised in the workplace, which can have a significant negative impact on one's feelings and behaviour in the workplace. With this study, we seek to gain more insight into the effects of menstruation on employee's well-being and performance. In doing so, we hope to fill in the knowledge gap on menstruation and its potential effects on work outcomes. We invite you to join us in this effort by participating in our study.

2. How will the study be conducted?

The design of this study is a daily diary study. Participation entails filling out one brief questionnaire per day for a period of 10 days. Day 1 of participation will occur approximately two or three days before the expected start of your next menstrual cycle.

On Day 1, you will first receive a general questionnaire to assess some personal characteristics such as your age, nationality, educational level, and some questions about your work. On days 1-10, we ask you to fill out one short questionnaire each day. This questionnaire will assess factors which may fluctuate daily, such as exhaustion, work engagement, and pain levels.

We invite you to complete the questionnaires once a day, between 16:00 and 20:00, after your day at work is complete.

3. What are the advantages and disadvantages of participating in this research?

There are neither immediate benefits nor drawbacks to participating in this study. One potential disadvantage is that it takes time to complete the daily questionnaires. Potential advantages of participating in this study are that it might provide you with insight into your own menstrual cycle and how it affects your work life. Secondly, participation will contribute to a better understanding of workplace experiences of people who menstruate. This can help workplace supervisors and Human Resource consultants gain more knowledge and awareness about the specific needs of the employee throughout their menstrual cycle that might help them perform and feel well at work.

4. What are risks and side effects?

The study is approved by the Ethical Review Board of the faculty of Social Sciences of Utrecht University. This ensures that taking part in this research does not involve any risks or side effects for the participant.

5. Is the participation in the diary study voluntary?

Participation in this study is entirely voluntary. You may withdraw from the study at any time, without any explanation and with no negative consequences. If you end your participation, we will use the data collected up to that point, unless you explicitly inform us otherwise.

To participate in this study, you must provide your consent at the beginning of the questionnaire under the heading ‘consent form’. After giving consent, you may start with the questionnaire. If you do not give consent, you will automatically be forwarded to the end of the questionnaire and thanked for your time.

6. Will you be informed of the study results?

On the consent form you can indicate whether you would like to be kept informed about the progress of the study and the publication of the results.

Individual results are not available because participation is anonymous and cannot be traced back to you as an individual.

7. How will your data be processed?

The only information we collect that can be traced back to you as a person is your email address. This email address is used to send you a link to both the initial general questionnaire and each daily questionnaire. At the end of the investigation, the file with e-mail addresses will be destroyed and will not be stored together with the rest of the data. We will not be examining individual patterns of data and will only be analysing data from a group perspective.

The server on which data is stored is secured to the highest standards at Utrecht University, and only researchers involved in this project will have access to this data. The data itself will also be protected by a security code. Your data will be stored for a maximum of 10 years. This is in accordance with the guidelines provided by the VSNU Association of Universities in the Netherlands. Please refer to the website of the Authority for Personal Data. https://autoriteitpersoonsgegevens.nl/nl/onderwerpen/avg-europese-privacywetgeving, for more information about privacy.

8. Complaint procedure

If you have any questions or comments about the study, please contact the master coordinator, Dr Veerle Brenninkmeijer at v.brenninkmeijer@uu.nl.

If you have an official complaint about the study, you can send an email to the complaints officer at klachtenfunctionaris-fetcsocwet@uu.nl.

9. Further information

If you have any questions about this study, please email a member of the research team. You can contact our team representative through the following means:

Rafael van de Hoef: r.j.vandehoef@students.uu.nl

Supervised by:

Prof. Dr Maria Peeters: m.peeters@uu.nl

Dr. Gonneke Ton, MSc: g.m.ton@uu.nl

Appendix B

Informed Consent

Consent statement:

By clicking agree, I hereby declare that

- I have read and understood the information letter dated … on the study …….

- I am well informed about the purpose and procedure of the study and I participate in this study on a voluntary basis.

- I know that I can stop the research at any time, without having to give a reason.

o Yes (1)

o No (2)

Appendix C

Questionnaires

Person-level

First informed consent (with information letter)

Then mention the structure of the questionnaires

Inclusion questions

What is your age?

Open question

Do you have a paid job within an organisation or work with colleagues? (Unpaid) internships are included.

1= Yes

2= No

How many hours per week do you work according to your contract?

Open question

Do you expect to menstruate within four weeks?

1= Yes

2= No

3= I do not know precisely

When do you expect to menstruate? If you know, please indicate the day and the month. If you do not know precisely, please indicate it the best you can. If your menstruation is very irregular, please indicate that below and send us an email when your menstruation starts, we will send you the daily questionnaire at that moment.

Open question

Demographics

For the distribution of the daily questionnaire, we need to ask your email address. With your email address, we can send you a personal link every day starting two or three days before you are expected to menstruate.

What is your email address?

Open question

The subject of this study is the relation between menstruation and work outcomes. Therefore, we want some background information that might influence this relation. Therefore, please answer the following questions:

Have you previously given birth?

1= Yes

2= No

3= I prefer not to say

Do you have a menstruation-related disorder? If yes, which one do you have?

If you feel uncomfortable sharing this information feel free to skip this question.

Open question

In the next set of questions you will be asked about your demographic background. If there is a question you would rather not answer feel free to skip it.

What is your field of work?

1= Industry/manufacturing

2= Construction

3= Trade

4= Hospitality

5= Transportation

6= Finance

7= Communication

8= Governance

9= Education

10= Health care

11= Culture and leisure

12= Agriculture

13= Other, namely …

What is the highest level of education you have achieved?

1= High school

2= MBO (Netherlands only)

3= HBO (Netherlands only)

4= Bachelor (university level)

5= Master

6= Other

What is your nationality?

Open question

Which country are you currently living in?

Open question

Which gender do you identify with?

1=Female

2=Male

3=Non-binary

4=Other

5= I prefer not to say

Person level questions

The following statements relate to your view of the organisation you currently work for. Please, indicate how much you agree with each statement using a 7-point scale from strongly disagree to strongly agree. After each statement, select a number on the adjacent scale.

There are no right or wrong answers. For each statement, select the answer that best fits you.

The organisation values my contribution to its well-being

The organisation strongly considers my goals and values

The organisation really cares about my well-being

1 = Strongly disagree

2 = Disagree

3 = Somewhat disagree

4 = Neither agree or disagree

5 = Somewhat agree

6 = Agree

7 = Strongly agree

Respond to the following statements. If you are not familiar with the situations mentioned, try to imagine how you would experience that situation.

Menstrual blood is more unpleasant than other bodily fluids (e.g., breast milk or saliva)
I feel comfortable when buying tampons and pads
I find menstrual blood dirty
I believe others see menstruation as dirty
I would feel embarrassed when I leak menstrual blood in my pants
I think others would feel embarrassed when they leak menstrual blood in their pants
I would sit next to a woman on the bus if I knew she was menstruating
I think others would sit next to a woman on the bus if they knew she was menstruating
At their first menstruation, girls have become a woman
When girls start menstruating they should start acting like women
Women are easily irritated when they are menstruating
I think others see menstruating women as easily irritated

Answered with slider option in Qualtrics: 0= Completely disagree; 10= Completely agree.

End statement

This is the end of this survey. Thank you for your time.

We will send you an e-mail for the next questionnaire. This questionnaire will assess factors that fluctuate daily, such as exhaustion, work engagement, and strain. We ask you to complete the questionnaires once a day, after work, preferably between 16:00 and 20:00.
This will allow you to answer questions about your day retrospectively.

End statement when not included

When people did not fit the inclusion criteria, they received the following message:
Thank you for your time. Unfortunately, you do not meet the inclusion criteria for this research. Therefore, we lead you to the end of this survey.

If you miss clicked and you are meeting our inclusion criteria (being older than 18 years, working in an organisation or with colleagues for at least 24 hours, and expect to menstruate within roughly four weeks), please fill in the questionnaire again or contact us at r.j.vandehoef@students.uu.nl

Day-level

[indicate that it should be answered between 16:00 and 20:00, but not restricting]

Hello, it's nice to see you again! Let's start with the first question:

What is your email address?

Open question

For what day are you filling out the questionnaire?

1=Monday

2= Tuesday

3=Wednesday

4=Thursday

5=Friday

6=Saturday

7=Sunday

Are you menstruating today?

1=No

2=Yes

How much pain were you in during the day?

1= no pain

2 = mild pain

3 = moderate pain

4 = severe pain

5= very severe pain

6 = excruciating / worst possible pain

Did you take pain medication today?

1 = No

2 = yes

Did you work today?

1= No

2= Yes

To what extent did you feel shame today?

1= Not at all

2= Mild shame

3= Moderate shame

4= Severe shame

5= Very severe shame

6= Worst possible shame

How many hours did you work today?

Open question

How many hours did you work from home today?

Open question

Were you supposed to work today?

1=Yes, but I called in sick

2=No, it's a holiday/day off for me

Workdays

The following items refer to Presenteeism. This is when an employee is present at work despite being unwell.

How much did you work today, even though you did not feel well?

1 = I worked the whole day without pain

2 = I worked a small part of the day with pain; the rest of the day I felt quite well

3 = I worked half of the day with pain; the other half I was feeling quite well

4= I worked a large part of the day with pain

5= I worked the whole day with pain.

The following items refer to Cognitive Job Demands. These are the cognitive requirements (memory, attention, concentration, etc.) of the duties of your job.

Today...

My work required a high level of concentration.

My work required me to constantly pay attention.

My work required great diligence.

1=Completely disagree

2=Disagree

3=Somewhat disagree

4=Either agree or disagree

5= Somewhat agree

6= Agree

7= Completely agree

The following items refer to Self-regulation. This is your ability to understand and manage your behaviour, reactions to feelings and things happening around you while you are at work.

Today…

I was able to concentrate on one activity for a long time, if necessary.

If I was distracted from an activity, I did not have any problem coming back to the topic quickly.

I was able to control my thoughts from distracting me from the task at hand.

I did not have any problem resuming my concentrated style of working after an interruption.

I stayed focused on my goal and did not allow anything to distract me from my plan of action.

1 =Not at all true

2= Barely true,

3= Moderately true

4= Completely/exactly true

The following items refer to Workload. This is the amount of work you had to do today while in the workplace.

Today...

I had to work really fast

I had a lot of work to do

I had to work very hard to finish something

1=Completely disagree

2=Disagree

3=Somewhat disagree

4=Either agree or disagree

5= Somewhat agree

6= Agree

7= Completely agree

The following items refer to Job Strain. This is a form of stress that occurs in the workplace.

Today...

Today, I felt

I felt fulfilled

I felt tense

I felt depressed

1=Never

2=Seldom

3=Occasionally

4=Regularly

5=Often

The following items refer to Exhaustion. This is a feeling of weariness, tiredness, or a general lack of energy while you were at work.

Today …

I feel mentally exhausted

I want to be active at work, but somehow I am unable to manage

1= Never

2= Sometimes

3= Regular

4= Often

5= Always

The following items refer to Social Support. This is the degree to which you perceive that your well-being is valued by colleagues, supervisors and the broader organization in which you are an employee.

Today...
Today …
My colleagues paid attention to my feelings and problems.
My colleagues showed that he/she appreciated the way I do my work.
My colleagues showed that he/she liked me.
My colleagues spoke highly about the way I accomplish my tasks.

1= Never
2= Sometimes
3= Regular
4= Often
5= Always

The following items refer to Work Engagement. This is positive behaviour or a positive state of mind at work that leads to positive work-related outcomes.
Today...
I felt bursting with energy
I felt enthusiastic about my job
I felt immersed in my work

1= Fully Agree
2= Agree
3=Somewhat Agree
4= Neither Agree nor Disagree
5= Somewhat Disagree
6= Disagree
7= Fully Disagree

The following items refer to Work Performance. This is the process of carrying out an action, task, or function.
Today...

I was able to perform my work well with minimal time and effort.
I kept in mind the results that I had to achieve in my work.
I was able to separate main issues from side issues at work.

1= Fully Agree
2= Agree
3=Somewhat Agree
4= Neither Agree nor Disagree
5= Somewhat Disagree
6= Disagree
7= Fully Disagree

The following items refer to Counterproductive Work Behaviours. These are voluntary behaviors of an employee that potentially harm the organisation.

Today...
I complained about unimportant matters at work.
I made problems greater than they were at work.
I focused on the negative aspects of a work situation, instead of on the positive aspects.
I spoke with colleagues about the negative aspects of my work.
I spoke with people from outside the organisation about the negative aspects of my work.

1= Never
2= Sometimes
3= Regular
4= Often
5= Always

End statement

This is the end of this survey. Thank you for your time today. Tomorrow, you will receive an e-mail for the next daily questionnaire. We ask you to complete the questionnaire after work, preferably between 16:00 and 20:00. This will allow you to answer questions about your day retrospectively.

Please click the arrow below to submit your data.