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Keep Period Pain a Secret? Expanding the Theory of Planned Behavior With Endometriosis Knowledge and Menstrual Stigma to Explain Women's Intentions to Talk About Menstrual Discomfort

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Objective: Endometriosis is a chronic gynecological condition often characterized by severe menstrual pain. It takes 7 years on average to diagnose endometriosis, with menstrual stigma being an estimated factor for this delay. ***Method:*** In this preregistered study, both the Theory of Planned Behavior and Stigma Theory are included in an online survey to understand conversation intentions about menstrual symptoms and the impact of menstrual stigma in daily life. With a partial least squares structural equation model including 776 participants, the research investigates the facilitators and barriers influencing participants' intentions to seek advice for severe menstrual discomfort across different social contexts, including conversations with friends, medical experts, and coworkers. ***Results:*** The results highlight that the perceived public stigma surrounding menstruation is associated with higher self-stigmatization, decreased attitudes, and decreased perceived behavioral control, which in turn significantly decreases conversation intentions. ***Conclusions:*** The study's results inform targeted interventions to promote open dialogue about menstrual health and reduce stigma.

Public Significance Statement
This study sheds light on how menstrual stigma influences individuals' intentions to seek conversations about severe menstrual discomfort with medical experts, friends, or colleagues at the workplace. By identifying key barriers like public and self-stigma, the research provides valuable insights for developing interventions to encourage open conversations about menstrual health, fostering better support and understanding in various social contexts.

Keywords: stigma, endometriosis, Theory of Planned Behavior, women's health

Supplemental materials: https://doi.org/10.1037/hea0001502.supp

Endometriosis, a chronic gynecological disease affecting individuals with uteruses,[1] presents not only physical challenges but also significant social obstacles, including the often-overlooked prevalence of associated menstrual stigma (Hennegan et al., 2019). It takes on average 7 years from symptom onset to diagnosis (Nnoaham et al., 2011), even though the most prominent symptom is monthly reoccurring

[1] Notably, this article focuses on people who menstruate and identify as women, which is why we use the term "women" throughout the article. However, we are aware that the diagnosis might be even more difficult for nonwoman gender identities (e.g., trans men) due to transphobic norms in medicine (Krebs & Schoenbauer, 2020; Nadal et al., 2012), and we clearly acknowledge that not every menstruating person identifies as female.

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severe episodes of menstrual pain. While classified as benign, endometriosis can lead to complications such as inflammation, abscesses, anemia, and infertility. As of current understanding, there is no cure for endometriosis, but a diagnosis can initiate symptomatic treatment and help prevent severe complications (Horne & Missmer, 2022).

Participation in conversations about endometriosis symptoms such as menstrual pain is crucial for affected individuals to recognize the severity of their condition and seek appropriate medical care. However, societal stigma surrounding menstruation often leads to the concealment of menstrual pain and related symptoms (Olson et al., 2022), perpetuating the taboo against open discussions on the topic. This stigma, rooted in the perception of menstruation as shameful and repulsive (Zaman & Mohiuddin, 2023), influences what is deemed socially acceptable and contributes to low intentions among women to discuss menstrual issues, despite the prevalence of severe symptoms (Olson et al., 2022; Reinhardt & Eitze, 2023).

Withholding symptoms from peers complicate patients' ability to assess the severity of their experiences in comparison to those unaffected by endometriosis. Consequently, individuals are unable to effectively measure its intensity against the experiences of their healthy peers, which could potentially delay them seeking medical assistance. Second, concealing symptoms from medical professionals due to the perception that severe menstrual pain is something absolutely normal and natural (Krebs & Schoenbauer, 2020) delays diagnosis and treatment, heightening the risk of severe long-term consequences such as organ inflammation or infertility (As-Sanie et al., 2019). Third, within the workplace, concealing their condition can detrimentally impact workplace dynamics for affected women, potentially resulting in decreased well-being, heightened turnover rates, or the denial of promotions (Nnoaham et al., 2011). From an economic perspective, menstruation-related productivity loss costs $4,882 per woman annually (O'Shea et al., 2024), while chronic pelvic pain and conditions like endometriosis cost $16,970–$20,898 per woman annually (Armour, Lawson, et al., 2019; Rowlands et al., 2021). Earlier diagnosis and targeted pain management relate to a destigmatized working environment (Seear, 2009) and can help to decrease these losses (e.g., by stopping pain medication overdosing, Pergolizzi et al., 2016).

To address barriers of conversations, understanding the factors that facilitate or inhibit conversation intentions is crucial. This article aims to contribute to existing knowledge by empirically examining the influence of endometriosis knowledge, stigma (i.e., public and self-stigma), and behavioral determinants (i.e., attitudes, subjective norms, and perceived behavioral control [PBC]) on women's intentions to seek advice for severe menstrual discomfort. Drawing on the Theory of Planned Behavior (TPB; Ajzen, 2020) and Stigma Theory (Corrigan, 2004; Goffman, 1963), our study uniquely incorporates a comparative analysis across different conversational contexts (friends, medical experts, and coworkers), as it can be expected that the levers of behavior change differ between these spheres. Ultimately, our findings aspire to inform interventions aimed at destigmatizing conversations surrounding menstrual-related symptoms and bolstering support systems for affected individuals.

Determinants of Conversation Intentions About Menstrual Pain

The TPB (Ajzen, 2020) provides a structured approach to understanding health behaviors. At its core, TPB suggests that the immediate precursor to behavior is the individual's intention to engage in that behavior (Zandi et al., 2023). The intention is influenced by three main factors. First, attitudes toward the behavior are crucial, shaped by beliefs about its consequences. For instance, in discussing menstrual discomfort, one considers if it is helpful or unpleasant. Second, subjective norms, formed by injunctive and descriptive social norms, influence intention. Individuals consider if important people expect the behavior and if they engage in it. For example, a woman might assess whether her friends openly discuss menstrual pain or not. Finally, PBC includes factors like skills, resources, and environmental constraints affecting behavior. This involves evaluating one's ability to engage in the behavior under different circumstances, such as feeling confident discussing menstrual discomfort with coworkers.

In this study, we aim to use the TPB framework to gain a better understanding of women's intentions to talk about severe menstrual symptoms. However, while the TPB offers valuable insights into the factors influencing this behavior, it ignores two other crucial determinants: public stigma and self-stigma.

Menstrual Stigma and the TPB

Stigma Theory (Goffman, 1963) provides a comprehensive framework for understanding the various dimensions of stigma in the context of disease and health (e.g., human immunodeficiency virus: Logie & Gadalla, 2009; mental health: Bates & Stickley, 2013; endometriosis: Reinhardt & Eitze, 2023; Sims et al., 2021). Public stigma refers to the actual discrimination and rejection that individuals face from society due to their health-related condition (Karşidağ et al., 2019). Translated to menstrual health, a recent study demonstrated that public stigma encompasses perceptions that menstruation is a taboo topic associated with disgust, best kept private and away from men. Moreover, the findings of this study underscore that menstrual symptoms tend to be trivialized and not taken seriously (Reinhardt & Eitze, 2023). Conversely, self-stigma describes the process by which individuals internalize negative stereotypes and perceptions about themselves (Perugino et al., 2022; Rao et al., 2009), potentially hindering the intentions of affected people to seek help or open up about their condition (Fung et al., 2007).

Considering this literature, it becomes clear why conversation intentions in the context of menstrual pain cannot be solely explained by attitudes, subjective norms, and PBC but must be expanded to include public and self-stigma—two constructs strongly linked to menstruation itself. There are several recommendations from previous research on how to combine stigma with TPB constructs to explain health behavior and intentions (e.g., Li et al., 2017; Nichols & Newhill, 2023; Taylor & Kuo, 2020). In our study, we positioned self-stigma at the same level as attitude, subjective norm, and PBC, as research indicates that self-stigma follows public stigma (Vogel et al., 2013) and reflects a unique aspect of individuals' beliefs that is not fully captured by attitude alone (Lin et al., 2017).

In the field of health psychology research, one common strategy for changing behavior and underlying factors such as stigma (Kaur et al., 2021) is to increase knowledge through educational interventions. To explore the impact of endometriosis knowledge on the TPB constructs and menstrual stigma (Griffiths et al., 2004; Olson et al., 2022), and whether enhancing knowledge can lead to improvements

in conversation intentions regarding experienced menstrual pain, we suggest integrating endometriosis knowledge as a background factor within the model itself.

Research Model and Hypotheses

Drawing from the presented theoretical underpinnings, our model integrates constructs from the TPB, stigma theory, and knowledge transfer (see Figure 1). Specifically, our study aims to examine the relationships between endometriosis knowledge, public stigma, self-stigma, attitudes toward discussing menstrual discomfort, perceived subjective norms regarding menstrual discomfort conversations, and women's PBC over initiating such conversations on conversation intentions. Given that the social context can significantly influence conversation intentions due to menstrual stigma—for instance, it may be considered more socially acceptable to discuss menstruation with a doctor compared to a coworker—we explore these dynamics across three distinct conversational contexts. Preregistration of the hypotheses and research question can be found on the Open Science Framework (OSF) (https://osf.io/rd3xe).

Hypothesis 1 (H1): Endometriosis knowledge is a background factor of the proposed model, whereby higher knowledge leads to (a) weaker public stigma, (b) more positive attitudes, and (c) stronger PBC.

Hypothesis 2 (H2): The stronger the public stigma, the (a) more negative the attitude, (b) more negative the perceived subjective norm, (c) stronger the self-stigma, and (d) weaker the PBC.

Hypothesis 3 (H3): The more positive the attitude, the stronger the conversation intention.

Hypothesis 4 (H4): The more positive the perceived subjective norm, the stronger the conversation intention.

Hypothesis 5 (H5): The stronger the self-stigma, the weaker the conversation intention.

Hypothesis 6 (H6): The stronger the PBC, the stronger the conversation intention.

Method

Sampling Procedure

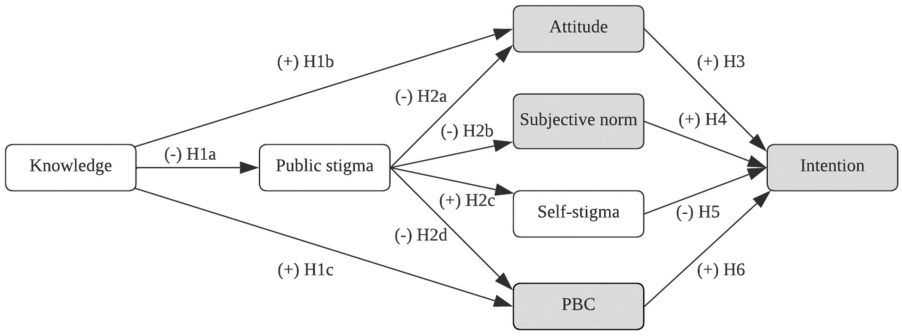
Before data collection, the study was preregistered (https://osf.io/rd3xe; Eitze & Reinhardt, 2025) and received approval from the Institutional Review Board of the University of Erfurt (ID 2023-28). Participants were recruited between September 26, 2023, and October 12, 2023, through the online panel provider Bilendi. Bilendi recruits its participants via social media, telephone surveys, and advertising. The German panel consists of around 300,000 registered participants who are checked for quality and attendance on a regular basis. From this online panel, participants were randomly selected and quota sampled for the highest educational graduation (with low education defined as anything below a university entrance diploma). The screening criteria included: (a) Participants had to report to be born as female. (b) Participants had to be between 16 and 40 years old, as endometriosis predominantly manifests in this age range. (c) Given the study's background (i.e., endometriosis), participants had to experience at least one symptom of menstruation or menstrual disorders occasionally or more. A self-test, comprising six questions (e.g., frequency of menstrual pain; see the Measures section), was used to identify eligible participants.

Sample

An a priori power analysis guided our aim for a sample size of $N = 800$ participants (Soper, 2020; power = 0.95, $\alpha = .05$, medium effect size). Ultimately, we reached a total of $N = 865$ individuals who met the eligibility criteria based on our screening process. Because we did not include attention checks, participants who spent less than 3 min completing the questionnaire were excluded to ensure the validity of responses ($n = 89$). Also, participants from the "coworkers" condition were excluded if they stated they were still in school or unemployed. This led to a final sample size of $N = 768$. Supplement 1 in the online supplemental materials illustrates drop-out, screen-out, and the composition of the final sample in a flowchart.

The average age of participants was 30.73 years ($SD = 7.21$, range = 16–40), with 49.3% ($n = 379$) having a higher level of education. The majority of participants were familiar with the term

Figure 1
Research Model



Note. Constructs in the shaded shapes were measured for the respective reference group (friends, physicians, and coworkers), whereas knowledge, public stigma, and self-stigma were measured as global constructs. H = hypothesis; PBC = perceived behavioral control.

endometriosis ($n = 616$, 80.2%). Only 42 women (5.4%) had an official endometriosis diagnosis. However, 37.0% ($n = 284$) personally knew someone diagnosed with endometriosis. Regarding their own symptoms, 93.4% ($n = 717$) reported experiencing menstrual pain at least occasionally. Additionally, 65.8% ($n = 505$) at least occasionally use painkillers to manage their pain, and 47.9% ($n = 368$) still experience severe pain in most of the cases despite taking painkillers. Distributions for all self-test items can be seen in Supplement 2 in the online supplemental materials. For an overview of sample characteristics, see Table 1.

Design and Procedure

An online survey was employed to address the hypotheses and research question. Upon providing informed consent, participants first responded to screen-out questions, including age, gender, and educational level. Subsequently, participants engaged in the self-test on endometriosis and provided information about their awareness and personal diagnosis of the condition. Following this, we evaluated endometriosis knowledge, public stigma, and self-stigma for all eligible participants.

Given our interest in exploring predictors of conversation intentions across three social contexts, participants were randomly assigned to one of the three groups: Group 1 answered the TPB items for the reference group friends, Group 2 for physicians, and Group 3 for coworkers. Within these groups, the sequences were consistent: PBC was queried first, followed by subjective norm, attitude toward discussing menstrual pain, and intention to discuss menstrual pain with the respective group.

Toward the end of the questionnaire, participants provided additional sociodemographic information. On the closing page, correct answers for the endometriosis knowledge questions were provided. It was emphasized that the initial self-test was not intended for medical diagnosis. However, if participants marked "often" or "always" for more than two questions, consulting with a gynecologist about their symptoms was recommended.

Measures

A comprehensive list of the questionnaire can be found on the OSF as part of the additional online materials (https://osf.io/snpek/).

Sociodemographic Variables

Age, gender, and education were assessed on the first page for screen-out. At the end of the questionnaire, we additionally included questions to cover job status and knowing someone with endometriosis.

Symptom Self-Test

A self-test regarding endometriosis symptoms was adapted from an educational leaflet for adolescents (Mechsner, 2021) and included the most common symptoms of endometriosis. On a scale from 1 (*never*) to 5 (*always*), participants should indicate their pelvic pain during menstruation, their use of painkiller medication, and their pelvic pain instead of pain medication intake. Further questions included diarrhea/pain during defecation, pain during sex, and pelvic pain several days a month, independent of menstruation. Supplement 2 in the online supplemental materials shows the analysis for the items and the mean score.

Table 1
Sample Characteristics

			Conversational context					
	Overall		Friends		Physicians		Coworkers	
Sociodemographic variables	*n*	%	*n*	%	*n*	%	*n*	%
Education								
Low	389	50.7	135	51.5	141	52.6	113	47.5
High	379	49.3	127	48.5	127	47.4	125	52.5
Status								
School	19	2.5	8	3.1	11	4.1	[a]	[a]
University student	66	8.6	24	9.2	21	7.8	21	8.8
Employed	636	82.8	207	79.0	212	79.1	217	91.2
Unemployed	47	6.1	23	8.8	24	9.0	[a]	[a]
Job in health care								
Yes	160	20.8	55	21.0	49	18.3	56	23.5
No	608	79.2	207	79.0	219	81.7	182	76.5
Personal endo diagnosis								
Yes	42	5.5	12	4.6	18	6.7	12	5.0
No	726	94.5	250	95.4	250	93.3	226	95.0
Endo diagnosis of others								
Yes	284	37.0	96	36.6	96	35.8	92	38.7
No	484	63.0	166	63.4	172	64.0	146	61.3

Note. $N_{overall} = 768$, $N_{friends} = 262$, $N_{physicians} = 268$, $N_{coworkers} = 238$. Low education = any category below a university entrance diploma; conversational context: social setting of TPB constructs (either referring to conversations about menstrual symptoms with friends, doctors, or coworkers). Endo = endometriosis; TPB = Theory of Planned Behavior.
[a] Participants were removed due to data cleansing strategy in the coworker condition.

Endometriosis Knowledge

Participant knowledge was assessed through 10 questions covering disease definition, incidence, symptoms, and treatment options (Reinhardt & Eitze, 2023). Each question had one correct answer and three distractors. Correct responses were summed up to create a knowledge score (0 = *no correct answers*, 10 = *all answers correct*, $M = 6.30$, $SD = 2.20$).

Menstrual Stigma

We adapted the Infertility Stigma Scale (Fu et al., 2015) to measure menstrual stigma. Using a 7-point Likert scale, we assessed the subdimensions of public stigma (eight items; e.g., "It happens again and again that women are discriminated against due to their menstruation," Cronbach's $\alpha = .90$, $M = 3.09$, $SD = 1.38$) and self-stigma (eight items; e.g., "Because of my period and the discomfort associated with it, I feel like a burden on my family," Cronbach's $\alpha = .91$, $M = 2.68$, $SD = 1.43$).

TPB Constructs

All TPB constructs adhered to Ajzen's recommendations (2020). Items were tailored to the respective social context (friends, physicians, or coworkers). Attitude toward menstrual disclosure was evaluated with six items on a 5-point semantic differential (e.g., "Talking to [reference group] about menstrual discomfort is pleasant/unpleasant," Cronbach's $\alpha = .89$, $M = 3.67$, $SD = 0.96$). PBC and subjective norm, each measured with two items on a 7-point Likert scale, utilized a single-item solution due to reliability concerns (see the Model Assessment section). PBC was displayed in the item "If I want, I can easily talk to [reference group] about menstrual complaints" ($M = 5.29$, $SD = 1.85$). Subjective norm featured the item "Most people whose opinion is important to me think it's OK if I talk to [reference group] about menstrual complaints" ($M = 5.66$, $SD = 1.57$). Finally, the intention to discuss menstrual discomfort was assessed using two items on a 7-point Likert scale (e.g., "How likely do you think it is that you would talk to [reference group] if you had severe menstrual discomfort?" Cronbach's $\alpha = .91$, $M = 4.35$, $SD = 1.90$).

Statistical Approach

In the first step, we conducted a Kruskal–Wallis H test with Wilcoxon post hoc tests, using the conversational context as the independent variable and the TPB constructs (attitude, subjective norm, PBC, and intention) as the dependent variables. Although this analysis was not specified in the preregistration, we deemed it necessary to understand how the TPB constructs differ between the three observed social contexts. Notably, we opted for a nonparametric test due to the violation of analysis of variance assumptions.

Second, as preregistered, we employed partial least squares structural equation modeling with multigroup analysis (MGA) to examine our model (10,000 bootstrap samples, SEMinR package, Version 2.3.0, Ray et al., 2021). Initially, path coefficients were computed for each model independently. Subsequently, MGAs were performed using the complete data set with the reference group as the grouping variable. It is important to note that the SEMinR package only accommodates dummy-coded grouping variables; hence, we contrast one conversation setting against both others.

Results

Descriptive Analysis of TPB Constructs

The mean differences between the TPB constructs per conversational context are presented in Figure 2. Regarding attitude, a Kruskal–Wallis H test showed that there was a statistically significant difference between all manipulated conversational contexts, $\chi^2(2) = 101.34$, $p < .001$, with participants exhibiting the most favorable attitude toward discussing menstrual discomfort with their physicians ($M = 4.02$, $SD = 0.75$, $Mdn = 4.17$), followed by conversations with friends ($M = 3.79$, $SD = 0.91$, $Mdn = 3.83$) and finally coworkers ($M = 3.14$, $SD = 1.01$, $Mdn = 3.17$).

A similar trend was observed for the perceived subjective norm, $\chi^2(2) = 86.49$, $p < .001$. Post hoc analysis again revealed significant differences between all comparisons, showing that participants perceived it as most socially acceptable to discuss menstrual symptoms with physicians ($M = 6.18$, $SD = 1.30$, $Mdn = 7.00$), followed by friends ($M = 5.78$, $SD = 1.37$, $Mdn = 6.00$) and coworkers ($M = 4.93$, $SD = 1.74$, $Mdn = 5.00$).

For PBC, the Kruskal–Wallis test reached significance, $\chi^2(2) = 57.54$, $p < .001$. Post hoc comparisons indicated that participants felt significantly less empowered to discuss the topic with coworkers ($M = 4.49$, $SD = 2.06$, $Mdn = 5.00$) compared to friends ($M = 5.58$, $SD = 1.60$, $Mdn = 6.00$) or doctors ($M = 5.72$, $SD = 1.64$, $Mdn = 6.00$). However, the difference in PBC between conversations with friends and physicians was not significant.

Finally, for intention, the Kruskal–Wallis H test showed that there was a statistically significant difference between all tested conversational contexts, $\chi^2(2) = 76.57$, $p < .001$, with a mean rank intention score of 4.88 ($SD = 1.87$, $Mdn = 5.00$) for physicians, 4.60 ($SD = 1.75$, $Mdn = 5.00$) for friends, and 3.48 ($SD = 1.78$, $Mdn = 3.50$) for coworkers.

Model Assessment

Before model evaluation, the reliability and validity of reflective constructs were scrutinized following the guidelines of Hair et al. (2021). The results can be found in Supplements 3 and 4 in the online supplemental materials. For a comprehensive overview of model assessment (for both the complete model and each conversational context), please refer to the open analysis R scripts in the OSF folder, which is found in the additional online materials (https://osf.io/snpek/).

Model Test (H1–H6)

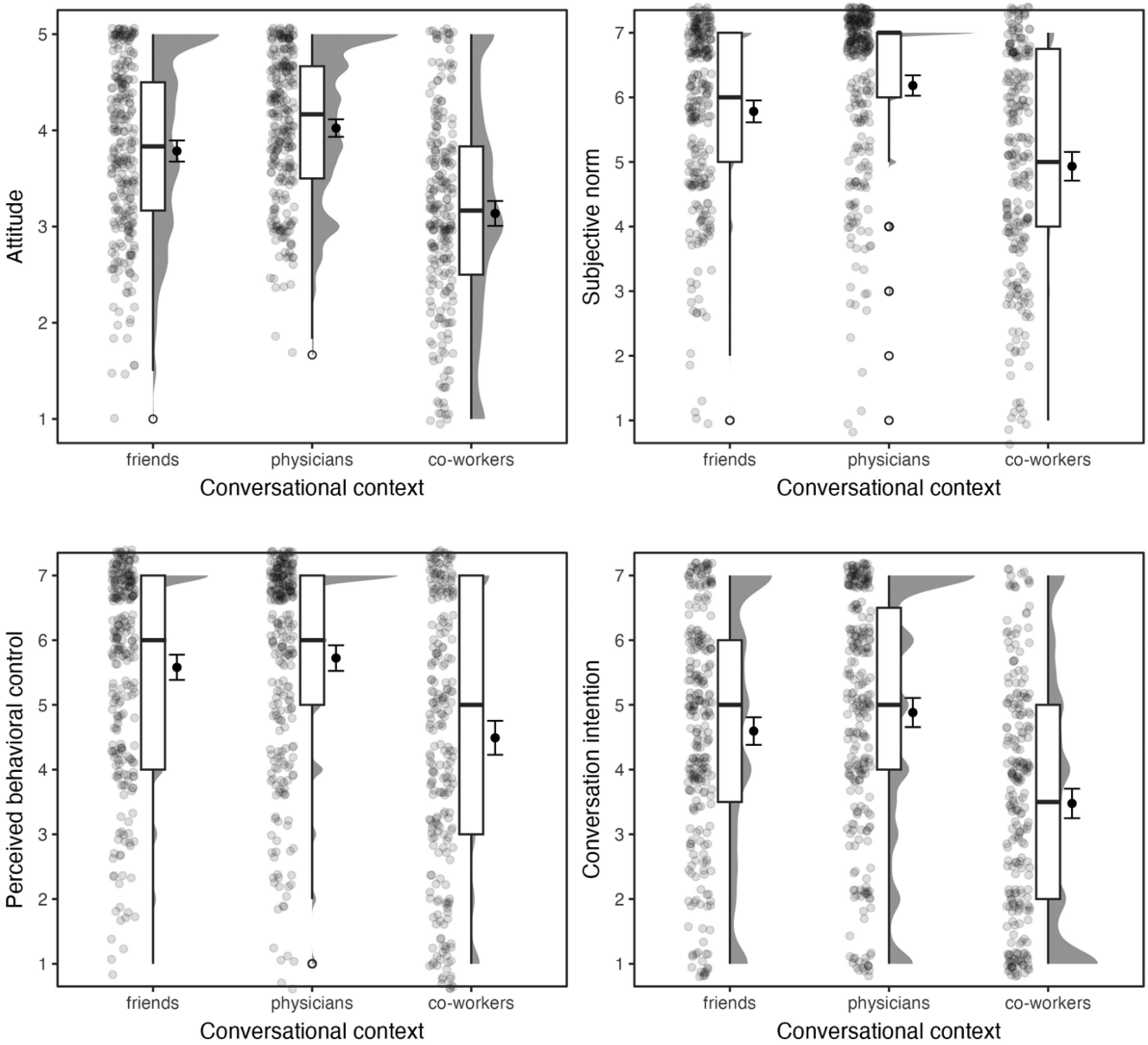
Standardized estimates for all paths are presented in Table 2. For greater clarity, Figure 3 shows all significant relationships in the tested models.

Knowledge Hypothesis (H1)

Concerning endometriosis knowledge, we hypothesized direct effects on public stigma, attitude, and PBC (H1a–c). Notably, regarding attitude, the path did not reach significance in any tested model. Hence, H1b must be rejected. However, in the coworker condition, higher endometriosis knowledge decreased participants' public stigma ($b = -0.14$, 95% confidence interval [CI] = [0.27, 0.00], $p < .05$). Moreover, higher endometriosis knowledge positively influenced

Figure 2

ANOVA Results for Differences in Attitude, Subjective Norm, PBC, and Conversation Intentions Between the Conversational Contexts (Raincloud Plot, Boxplots With 95% CI)



Note. Significant differences between all groups for attitude, norm, and intention; for PBC, there was no significant difference between friends and doctors but for all other group comparisons. Participants rated conversations with coworkers significantly less regarding their attitudes, perceived subjective norms, behavioral control, and their conversation intentions. Error bars represent 95% CI. ANOVA = analysis of variance; PBC = perceived behavioral control; CI = confidence interval.

participants' PBC to discuss the topic with their friends ($b = 0.14$, 95% CI = [0.03, 0.25], $p < .05$). Thus, H1a and H1c were partly supported.

Public Stigma Hypotheses (H2)

We found full support for our public stigma hypothesis (H2a–d), demonstrating that higher perceived public stigma negatively influenced attitudes toward conversation about menstrual discomfort (friends: $b = -0.46$, 95% CI = [−0.57, −0.36], $p < .001$; physicians: $b = -0.33$, 95% CI = [−0.46, −0.19], $p < .001$; coworkers: $b = -0.32$, 95% CI = [−0.456, −0.185], $p < .001$), the perceived subjective norm (friends: $b = -0.42$, 95% CI = [−0.54, −0.29], $p < .001$; physicians: $b = -0.17$, 95% CI = [−0.30, −0.05], $p < .01$; coworkers: $b = -0.42$, 95% CI = [−0.53, −0.30], $p < .001$), self-stigma (friends: $b = 0.66$, 95% CI = [0.57, 0.74], $p < .001$; physicians: $b = 0.60$, 95% CI = [0.52, 0.68], $p < .001$; coworkers: $b = 0.59$, 95% CI = [0.50, 0.69], $p < .001$), and PBC (friends: $b = -0.41$, 95% CI = [−0.54, −0.28],

Table 2
Model Estimates (PLS-SEM, 10,000 Bootstrap Samples)

	Conversational context								
	Friends			Physicians			Coworkers		
Path	*b*	*SD*	95% CI	*b*	*SD*	95% CI	*b*	*SD*	95% CI
Knowledge → pub stigma	−0.014	0.072	[−0.16, 0.13]	0.047	0.069	[−0.09, 0.18]	−0.139*	0.069	[−0.27, −0.00]
Knowledge → attitude	0.097	0.059	[−0.02, 0.21]	0.074	0.064	[−0.05. 0.20]	−0.138	0.071	[−0.28, 0.00]
Knowledge → PBC	0.141*	0.058	[0.03, 0.25]	0.032	0.061	[−0.09, 0.15]	−0.075	0.067	[−0.20, 0.06]
Pub stigma →attitude	−0.468***	0.054	[−0.57, −0.36]	−0.352***	0.061	[−0.47, −0.23]	−0.329***	0.067	[−0.46, −0.19]
Pub stigma →norm	−0.418***	0.063	[−0.54, −0.29]	−0.176**	0.067	[−0.30. −0.05]	−0.420***	0.060	[−0.53, −0.30]
Pub stigma →PBC	−0.414***	0.064	[−0.54, −0.28]	−0.176**	0.057	[−0.29, −0.06]	−0.403***	0.060	[−0.52, −0.28]
Pub stigma →self-stigma	0.659***	0.042	[0.57, 0.74]	0.606***	0.041	[0.52, 0.68]	0.600***	0.048	[0.50, 0.69]
Att → Int	0.493***	0.072	[0.35, 0.63]	0.387***	0.068	[0.25, 0.52]	0.451***	0.066	[0.32, 0.58]
Norm → Int	0.014	0.084	[−0.15, 0.18]	0.075	0.069	[−0.06, 0.21]	0.134**	0.058	[0.02, 0.25]
PBC → Int	0.009	0.087	[−0.16, 0.18	0.068	0.071	[−0.07, 0.21]	0.222***	0.068	[0.09, 0.36]
Self-stigma → Int	0.006	0.068	[−0.13, 0.14]	0.124*	0.056	[0.01, 0.23]	0.111*	0.054	[0.01, 0.22]

Note. $N_{overall} = 768$, $N_{friends} = 262$, $N_{physicians} = 268$, $N_{coworkers} = 238$. Displayed are the bootstrapped estimates, standard deviations, and 95% CIs for each model relationship; conversational context: social setting of TPB constructs (either referring to conversations about menstrual symptoms with friends, doctors, or coworkers). PLS-SEM = partial least squares structural equation modeling; CI = confidence interval; Pub = public; PBC = perceived behavioral control; Att = attitude; Int = intention; TPB = Theory of Planned Behavior.
* $p < 05$. ** $p < .01$. *** $p < .001$.

$p < .001$; physicians: $b = -0.17$, 95% CI = [−0.29, −0.06], $p < .01$; coworkers: $b = -0.40$, 95% CI = [−0.52, −0.28], $p < .001$).

Conversation Intention Hypotheses (H3–H6)

In all models, the effect of attitude on the intention to discuss severe menstrual discomfort became significant (friends: $b = 0.49$, 95% CI = [0.341, 0.633], $p < .001$; physicians: $b = 0.38$, 95% CI = [0.244, 0.510], $p < .001$; coworkers: $b = 0.46$, 95% CI = [0.324, 0.592], $p < .001$), supporting H4.

The expected effect of subjective norm on intention (H5) only reached the significance threshold in the model referring to coworkers ($b = 0.14$, 95% CI = [0.02, 0.25], $p < .01$). Participants who felt that important others find it okay if they would speak to their coworkers about severe period complaints showed a stronger intention to do so. Hence, H5 was partly supported.

Self-stigma was a significant predictor of participants' intentions to speak to physicians ($b = 0.12$, 95% CI = [0.01, 0.23], $p < .05$) and coworkers ($b = 0.11$, 95% CI = [0.06, 0.22], $p < .05$) but not when it comes to talking with their friends. Contrary to our hypothesis, the effect was not negative but positive: higher self-stigma even increased their conversation intentions. With this, H5 has to be rejected.

Finally, we hypothesized a positive effect of PBC on the intention (H6). While this hypothesis was supported for talking to coworkers ($b = 0.22$, 95% CI = [0.09, 0.36], $p < .001$), the path did not become significant referring to friends and physicians. Thus, H6 was only partly supported.

To investigate whether the observed path coefficients significantly depend on the conversational setting, we conducted an explorative MGA. Complete results can be seen in Supplement 4 in the online supplemental materials. The analysis revealed the highest explained variance in the conversation intention in the model referring to coworkers ($R^2_{adj} = .42$), followed by friends ($R^2_{adj} = .24$) and physicians ($R^2_{adj} = .17$).

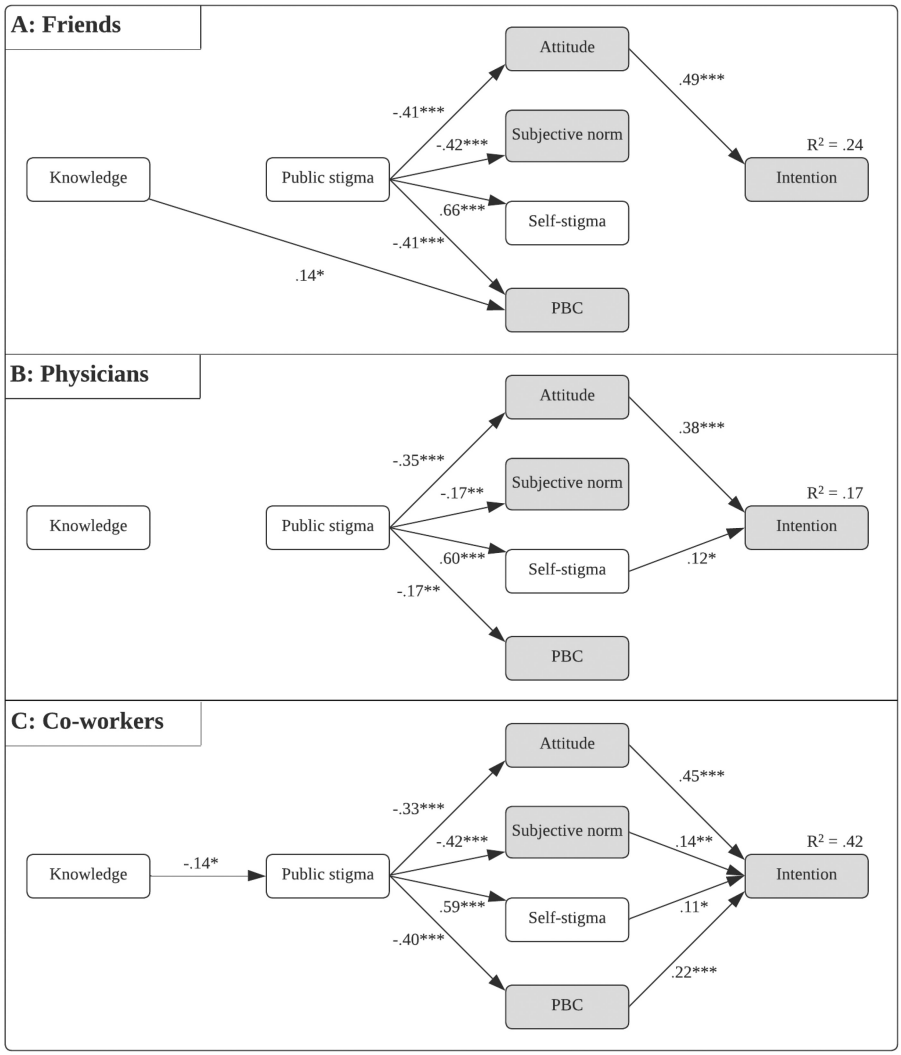
As part of the review process, we conducted a sensitivity analysis by rerunning the partial least squares structural equation modeling analysis on a subsample of women who reported to use painkillers at least occasionally to manage their pain ($N = 368$). This analysis aimed to assess the generalizability of our findings and explore whether the mechanisms of influence differed between women with frequent severe menstrual pain and those with milder symptoms. Notably, the results remained consistent across all social contexts, with the same significant relationships observed in both models. Effect sizes were also highly comparable, with the only notable difference being a slightly stronger influence of self-stigma on intentions in the subsample with more frequent severe pain experiences. Given the alignment of these findings with the main analysis, detailed results are provided in Supplements 5 and 6 in the online supplemental materials.

Discussion

This study aimed to investigate the primary facilitators and barriers influencing women's intentions to seek advice when experiencing severe menstrual discomfort such as pain—a symptom that may indicate endometriosis. Based on exploratory descriptive analysis, significant variations were observed in attitudes, norms, PBC, and conversation intentions across the investigated social contexts. Notably, all TPB constructs were significantly more negative when pertaining to conversations with coworkers compared to the groups of peers or medical experts. This finding is particularly concerning from an equity perspective (Soliman et al., 2017). Symptoms and pain from menstruation and menstrual disorders significantly impact work and have economic consequences (Armour, Lawson, et al., 2019; Armour, Parry, et al., 2019). Nevertheless, many women experiencing dysmenorrhea (pelvic pain during menstruation) feel unable to broach the topic in the workplace, potentially compromising their productivity and well-being (Gilmour et al., 2008; Krsmanovic & Dean, 2022). Notably, these first results do not further differentiate between organizational cultures or working climates (Schneider et al., 2013) neither does it distinguish between project leaders or colleagues. It is a crucial next step for further research to identify organizational structures that encourage a destigmatized approach to the topic of severe menstrual symptoms. Career counseling with informed professionals for endometriosis patients

Figure 3

Significant Path Relationships in all Assessed Conversational Contexts



Note. (A) Friends, (B) physicians, and (C) coworkers. Constructs in the shaded shapes were measured for the respective conversational context (friends, physicians, and coworkers), whereas knowledge, public stigma, and self-stigma were measured as global constructs. PBC = perceived behavioral control.
* $p < .05$. ** $p < .01$. *** $p < .001$.

could also increase patients' communication skills about their complaints so that they are enabled to maintain their employment and career options (Gilmour et al., 2008).

Upon examining the other observed societal spheres, attitudes, norms, PBC, and intentions were most positively pronounced regarding conversations with medical experts, closely followed by discussions with friends. While the barrier appears somewhat lower in these contexts compared to the workspace, it is noteworthy that intention levels remain improvable. This raises the question: how can we encourage women to seek advice when experiencing severe menstrual discomfort?

Contrary to our expectations, increasing knowledge about endometriosis did not seem to be an overall effective solution. Only in one submodel, higher knowledge was associated with lower public stigma; however, this effect did not hold true in the overall model. This finding contradicts previous studies indicating a reduction in menstrual stigma and an increase in the acceptance of menstrual leave policies with greater knowledge about endometriosis (Reinhardt & Eitze, 2023). However, we want to note one main difference from our previous research on this topic: In the 2023 study, we used a gender-mixed sample, with men showing significantly lower knowledge (and therefore more space for improvement) compared to women. In contrast, this recent study focused solely on women experiencing menstrual discomfort—notably, despite showing variability in their knowledge, their overall knowledge was rather high. Thus, it might be that endometriosis knowledge may be an effective lever to decrease stigma among men; however, among affected women, the stigma surrounding menstruation might be so deeply ingrained in their perceptions that despite knowing about potential underlying conditions, knowledge alone is not sufficient to overcome these deeply rooted biases.

Nevertheless, we want to highlight that endometriosis knowledge can positively impact women's perceived ability to manage conversations about their menstrual health, even if it does not directly reduce stigma in the broader sense. In detail, higher knowledge indeed increased women's PBC when it comes to conversations with friends about addressing the topic of menstrual-related problems. This suggests that while knowledge about endometriosis may not significantly reduce public stigma or shift deeply entrenched attitudes among affected women, it does empower them to feel more confident and capable of discussing their menstrual issues. This finding indicates that increased knowledge can enhance women's sense of agency and control, potentially leading to more open and supportive discussions within their social circles.

In addition, our findings highlight the meaningfulness of expanding the TPB with stigma dimensions in the context of the promotion of menstrual health. Public stigma emerged as a potent background factor, significantly deterring women from discussing menstrual discomfort even if it would be severe. This public stigma not only heightens self-stigma, leading affected individuals to internalize negative stereotypes and perceptions about themselves, but also contributes to a poorer attitude toward discussing menstrual discomfort, a diminished perception of subjective norms, and lower PBC. However, there were notable differences observed across conversational contexts in the degree of influence exerted by public stigma, with discussions with medical experts demonstrating a comparatively lower impact on PBC and subjective norms compared to conversations with friends and coworkers, indicating that some social spheres are more affected by public stigma than others. The pronounced effect of public stigma in the workplace context is perhaps unsurprising, as it represents the most public and least protected social environment among those examined in this study. However, the prominence of public stigma in the peer context is particularly noteworthy. If women feel hesitant to discuss menstrual discomfort even with their friends, this represents not only a massive psychological burden for affected women (in terms of emotional support) but also hinders women from accurately classifying the severity of their symptoms. By addressing public stigma and fostering supportive social environments, interventions can facilitate open and informed discussions about menstrual health, ultimately improving outcomes for women affected by endometriosis.

Finally, significant differences were observed in the direct effects of the determinants on women's conversation intentions across the three social spheres, highlighting the importance of context-specific considerations in understanding and addressing conversation intentions. (a) For discussions with friends, attitudes emerged as the sole decisive factor, suggesting that women may already view discussing menstrual discomfort with friends as socially acceptable (subjective norm) and practicable (PBC). However, if women perceive such conversations as uncomfortable or unhelpful (attitude), their intention to engage in them significantly diminishes. This underscores the need to foster positive attitudes and destigmatize menstrual discussions within peer groups, creating a supportive environment where women feel empowered to seek advice and support when needed. (b) Conversely, discussions with medical experts or coworkers involve factors beyond attitudes, with self-stigma also playing a significant role. Surprisingly, a positive effect of self-stigma was observed, indicating that women with higher levels of self-stigma were more inclined to seek medical help or disclose their symptoms in the workplace if they would experience severe menstrual discomfort in the future. This unexpected finding may be attributed to the heightened sense of urgency and distress experienced by affected women, prompting them to overcome internal barriers and seek assistance. However, the underlying mechanisms driving this positive effect of self-stigma warrant further investigation in future studies. (c) The greatest explained variance in intention was observed in the model relating to the workplace context. Here, alongside attitudes and self-stigma, norms and PBC also had a significant effect in the expected direction. The result highlights the necessity to correct norms regarding menstrual concealment in the workplace and implement measures to bolster women's self-efficacy, such as providing easy access to help through policy initiatives (e.g., remote work possibilities).

Importantly, the sensitivity analysis conducted as part of this study provides further insights into the robustness of our findings. By focusing on women who reported frequent menstrual pain that requires pain medication, we found that the key determinants influencing conversation intentions remained consistent across social contexts. This reinforces the broader applicability of our results, highlighting that the barriers to discussing severe menstrual symptoms are largely universal and persist regardless of the frequency with which women experience such symptoms. These findings emphasize the need to address stigma and foster supportive environments across all societal spheres to enable open and informed discussions about menstrual health.

While our study contributes valuable insights into the determinants of women's conversation intentions regarding menstrual discomfort, several limitations should be acknowledged. First, it is important to recognize that menstrual stigma is heavily influenced by cultural norms and beliefs (Kaur et al., 2021; Shin et al., 2013; Yamashiro & Matsuoka, 1997), and our study is limited to the German-speaking context and does not further classify participants with different norms and beliefs. Replicating the study in other cultural contexts and measuring their impact on participants could provide valuable insights into the generalizability of our findings and the cultural specificity of menstrual stigma (for instance, literature suggests that stigma may be especially relevant and important in Asian populations because of their traditional values of family honor, and in most East Asian countries, the concept of stigma is closely linked to the concept of dishonor; e.g., in Japan; Shin et al., 2013, Yamashiro & Matsuoka, 1997).

Furthermore, a methodological limitation of our study is the necessity of using single-item measures for PBC and subjective norms in the model due to reliability violations rather than the planned two-item solution. Notably, we utilized the well-tested TPB measurement (see Rozenkowska, 2023 for a review of consumer behavior studies and Alhamad & Donyai, 2021 for a review of medication reuse studies); however, the employed measurement of PBC and subjective norms may not fully capture the complexity of these constructs in the context of menstrual health discussions. Future studies should consider employing more comprehensive scales to assess PBC and subjective norms related to menstruation, allowing for a more nuanced understanding of their influence on conversation intentions.

At last, our sample consists of women who are affected by regular symptomatic restrictions during their menstruation. We can assume from the self-test that there is an experience of being restricted by menstruation in various areas of life. Future studies nevertheless need to generate a deeper understanding of which symptoms are particularly relevant to restriction and whether any of the symptoms are particularly associated with stigma and disclosure.

Conclusion

This study investigated the determinants of women's intentions to seek advice when experiencing severe menstrual discomfort such as pain, with a focus on the roles of endometriosis knowledge, menstrual stigma, and conversational context. Contrary to expectations, knowledge was not a significant background factor of the proposed model, highlighting that individuals who are more knowledgeable about endometriosis do not necessarily exhibit more positive attitudes or experience less public stigma. Moreover, the findings underscore the importance of considering context-specific factors in understanding conversation intentions among women experiencing severe menstrual discomfort, indicating that facilitators and barriers of conversation intentions strongly depend on the communication partner. Particularly in the workplace, there is significant room for improvement. In comparison, in more protected spaces, such as conversations with peers or physicians, norms or PBC do not play a significant role. From a health psychology perspective, our results emphasize the need for tailored interventions to address menstrual stigma and promote open conversations about menstrual health, particularly in the workplace. However, as our findings regarding the role of knowledge demonstrate, addressing these barriers requires more than just educational interventions. Further research and action are needed to identify and implement effective strategies that go beyond education to foster supportive environments and empower women to seek advice and support for menstrual health concerns.

Resumen

Objetivo: La endometriosis es una afección ginecológica crónica que a menudo se caracteriza por dolor menstrual intenso. El diagnóstico de la endometriosis demora un promedio de 7 años, y se estima que el estigma menstrual es un factor de este retraso. ***Método:*** En este estudio preinscrito, se incluyen tanto la Teoría del Comportamiento Planificado como la Teoría del Estigma en una encuesta en línea para comprender las intenciones de conversación sobre los síntomas menstruales y el impacto del estigma menstrual en la vida diaria. Mediante un modelo de ecuaciones estructurales (PLS-SEM) con 776 participantes, la investigación indaga en los factores facilitadores y las barreras que influyen en la intención de las participantes de buscar consejo para molestias menstruales severas en diferentes contextos sociales, incluyendo conversaciones con amigas, médicos expertos y compañeros de trabajo. ***Resultados:*** Los resultados destacan que el estigma público percibido en torno a la menstruación se asocia con una mayor auto estigmatización, disminución de actitudes y un menor control conductual percibido, lo que a su vez reduce significativamente las intenciones de conversación. ***Conclusiones:*** Los resultados del estudio informan intervenciones específicas para promover un diálogo abierto sobre la salud menstrual y reducir el estigma.

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