

The Impact of Menstrual and Mental Health on Patients' Interactions with a Healthcare Chatbot

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Background: Menstrual health has historically been neglected in research despite evidence suggesting its significant impact on physical and psychological well-being. This neglect extends to the provision of personalized digital healthcare technologies (DHTs), such as healthcare chatbots, for menstruating individuals. To the best of our knowledge, no study has specifically explored how the menstrual cycle affects patient-chatbot engagement within healthcare settings.

Objective: This work explores how the menstrual cycle influences patients' engagement with empathic chatbots. We specifically evaluate the impact of empathic self-awareness (ESA) and empathic active listening (EAL) cues in text- and rule-based healthcare chatbots and how these cues affect perceptions of empathy, user engagement, and the patient-chatbot relationship in healthcare contexts.

Methods: We developed four functional but fictitious healthcare chatbot prototypes engaging patients in a realistic anamnesis dialogue incorporating EAL and ESA cues. These cues were manipulated following a 2 x 2 full-factorial between-groups design (1: no empathic cues, 2: ESA only, 3: EAL only, 4: EAL+ESA). We aimed to recruit 1'000 participants with chronic conditions from the UK. Thus, participants were invited via Prolific and randomly assigned to interact with one of these prototypes; 921 provided complete data (female: 50.27%; mean age = 42.4 years, SD = 14.1). Menstruating individuals were also asked for menstrual health and cycle-related questionnaires to examine the influence of characteristics such as menstrual cycle phase or menstrual health disorders on the patient-chatbot engagement. To assess the effects of empathic cues on users' perceptions of empathy, engagement, and the patient-chatbot relationship, we will apply conventional statistical methods and (e.g., MANOVAs) and machine learning approaches (e.g., for sentiment analysis).

Preliminary Results: Early findings suggest that chatbots incorporating only EAL cues enhance users' perceptions of empathy, engagement, and the user-chatbot relationship. However, combining both ESA and EAL cues yields conflicting results.

Further Expected Outcomes: Ongoing analysis will investigate how individual experiences and (menstrual and mental) health conditions may highlight the need for personalized empathic responses to enhance user experience and satisfaction. We expect that engagement metrics and perceptions of empathy will vary with menstrual and mental health disorders, presenting a contrast to the experiences of non-menstruating individuals. These contrasts will further inform the development of chatbot communication strategies, ensuring they are inclusive and sensitive to the changing needs of patients for personalized DHTs.

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1 Problem

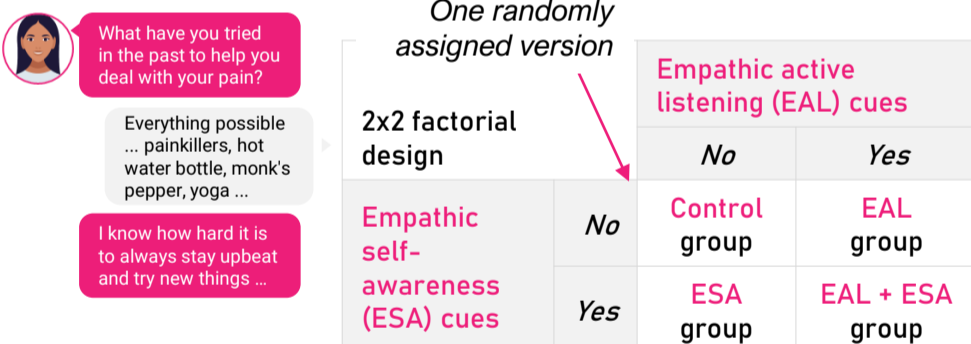
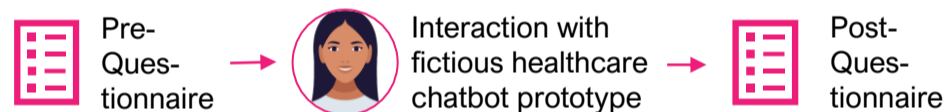
The menstrual cycle (MC) impacts well-being but is often overlooked in digital healthcare technologies (DHTs).^{1,2,3} This study explores how the menstrual cycle affects engagement with healthcare chatbots employing different types of empathic cues.⁴

2 Research Questions

1. How does user's **menstrual and mental health** affect their **perceptions and engagement** with a healthcare chatbot?
2. How do distinct **empathic cues** affect users' **self-disclosure**?

3 Method

- Online experiment with a fictitious anamnesis chatbot
- Participants recruited via Prolific

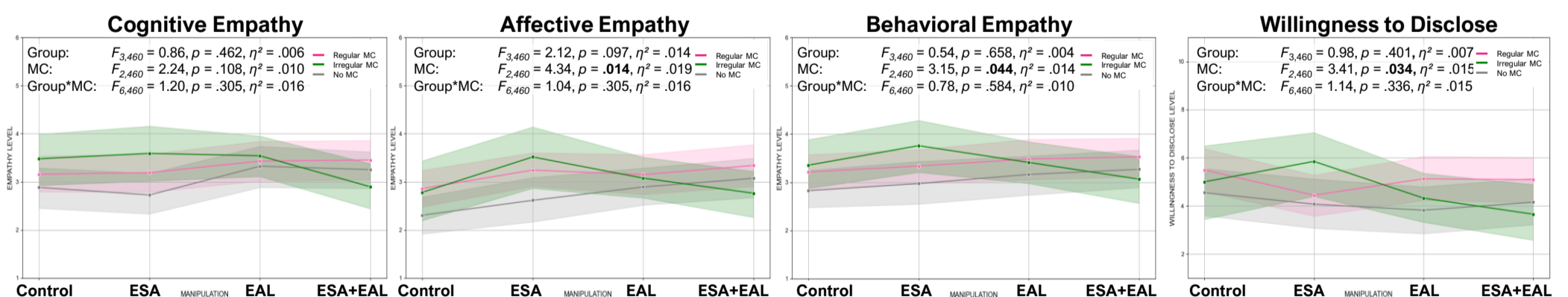


4 Sample Characteristics

- 18+ years
- UK
- English-speaking
- "personal relevance" (chronically-ill)
- 1'000 recruited
- 921 completes
- 460 born female

		Empathy manipulation				Total
		Control	ESA	EAL	ESA+EAL	
Menstrual cycle type	Regular	55	54	48	44	201
	Irregular	16	20	28	26	90
	None	42	42	39	46	169
	Total	113	116	115	116	460

5 Preliminary Results: Effects of Empathy Group & Menstrual Cycle Type



Participants with irregular menstrual cycles perceive affective and behavioral empathy more strongly and are more willing to disclose information than participants with no/regular MC.

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