Intention to use a mental health app for the menopause: a Health Belief Model approach

Nayra A. Martin-Key, Erin L. Funnell, Jiri Benacek, Benedetta Spadaro, Sabine Bahn

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Nayra A. Martin-Key[1] PhD; Erin L. Funnell[1] BSc; Jiri Benacek[1] PgDip; Benedetta Spadaro[1] MPhil; Sabine Bahn[1] MD, PhD

[1]University of Cambridge Cambridge GB

Corresponding Author:
Sabine Bahn MD, PhD
University of Cambridge
Cambridge Centre for Neuropsychiatric Research, Department of Chemical Engineering and Biotechnology, University of Cambridge
Cambridge
GB

Abstract

Background: The menopause and menopause transition present a period of heightened vulnerability for mental health issues. Despite this, mental health screening is not consistently integrated into menopausal healthcare and access to psychological interventions is limited. Digital technologies, such as web and smartphone applications (apps) may offer a way to facilitate and improve mental healthcare provision throughout the menopause and menopause transition. However, little is known about potential users' intention to use such technologies during this critical phase of life.

Objective: To examine the factors that impact the intention of potential users to utilize a mental health app during the menopause and menopause transition. To accomplish this, we employed the Health Belief Model (HBM), a psychological framework widely used to understand and predict individuals' health-related behaviors.

Methods: An online survey was generated using Qualtrics XM® and participants were recruited via social media and organic posts on relevant forums. Structural equation modelling (SEM) was conducted to explore whether the factor structure of the HBM is a good fit for predicting the intention to use a mental health app for the menopause. Data from 826 participants were analyzed.

Results: 74.09% (n=612) of respondents sought online help for mental health symptoms related to menopause. The most common topics searched for were symptom characteristics (52.66%, n=435) and treatment or therapy options (25.42%, n=210). Psychoeducation (62.23%, n=514) was the most desired mental health app feature, followed by symptom tracking (60.41%, n=499) and self-help tips (56.78%, n=469). 63.80% (n=527) of respondents stated that they would not be willing to pay for a mental health app. In terms of intention to use the app, the Satorra Bentler-scaled fit statistics indicated a good fit for the model (?2(278)=790.44, p<0.001; CFI=0.933, RMSEA=0.047, SRMR=0.056), with cues to action emerging as the most significant predictor of intention (?=0.48, p<0.001). This was followed perceived barriers (?=-0.25, p<0.001), perceived susceptibility (?=0.15, p<0.001), and perceived benefits (?=0.13, p<0.001). Perceived severity (?=0.01, p=0.869) and self-efficacy (?=0.03, p=0.286) were not significantly associated with behavioral intention.

Conclusions: This study reveals important factors that influence women's intention to use a mental health app during menopause. It emphasizes the need to address barriers to app usage, while highlighting the impact of credible endorsements and psychoeducation. Furthermore, the study underscores the significance of improving accessibility for users with lower digital literacy or limited resources.

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Nayra A. Martin-Key[1], PhD; Erin L. Funnell[1], BSc.; Jiri Benacek[1], PgDip, Benedetta Spadaro[1], MPhil; & Sabine Bahn[1], MD, PhD

[1]Cambridge Centre for Neuropsychiatric Research, Department of Chemical Engineering and Biotechnology, University of Cambridge, Cambridge, United Kingdom

Corresponding author:
Professor Sabine Bahn
Department of Chemical Engineering and Biotechnology
University of Cambridge
Philippa Fawcett Drive
Cambridge CB3 0AS, UK
e-mail: sb209@cam.ac.uk

Keywords

App; health belief model; menopause; menopause transition; mental health; midlife; perimenopause; smartphone; structural equation modeling; women's health

Abstract

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Results: 74.09% (n=612) of respondents sought online help for mental health symptoms related to menopause. The most common topics searched for were symptom characteristics (52.66%, n=435) and treatment or therapy options (25.42%, n=210). Psychoeducation (62.23%, n=514) was the most desired mental health app feature, followed by symptom tracking (60.41%, n=499) and self-help tips (56.78%, n=469). 63.80% (n=527) of respondents stated that they would not be willing to pay for a mental health app. In terms of intention to use the app, the Satorra Bentler-scaled fit statistics indicated a good fit for the model ($\chi^2(278)=790.44$, $p<0.001$; CFI=0.933, RMSEA=0.047, SRMR=0.056), with cues to action emerging as the most significant predictor of intention (β=0.48, $p<0.001$). This was followed perceived barriers (β=-0.25, $p<0.001$), perceived susceptibility (β=0.15, $p<0.001$), and perceived benefits (β=0.13, $p<0.001$). Perceived severity (β=0.01, $p=0.869$) and self-efficacy (β=0.03, $p=0.286$) were not significantly associated with behavioral intention.

Conclusions: This study reveals important factors that influence women's intention to use a mental health app during menopause. It emphasizes the need to address barriers to app usage, while highlighting the impact of credible endorsements and psychoeducation. Furthermore, the study underscores the significance of improving accessibility for users with lower digital literacy or limited resources.

Introduction

The menopause represents a significant milestone in a woman's[1] life. It tends to occur naturally between the ages of 44 and 55 [1], marking the cessation of menstruation due to the decline of

[1] Throughout the current study, we refer to a woman as anyone assigned female at birth.

ovarian follicular function [2]. The perimenopause, also known as the menopause transition, refers to the phase leading up to menopause and is characterised by a gradual decrease in ovarian function, resulting in less frequent menstrual cycles. This transitional period is estimated to last a median of four years [3], signifying an important and transformative stage in a woman's reproductive journey.

Every woman's journey through the menopause is unique, but the associated symptoms and the transitional phase can be incredibly challenging. Indeed, the menopause and perimenopause phases are typically associated with physical symptoms (eg, hot flushes, bone and joint pain, loss of libido) that can have a significant impact on an individual's quality of life [4]. In addition, the menopause, and particularly the menopause transition, can increase vulnerability to mental health issues [5], particularly depression and anxiety [6-8], as well as suicidal ideation [9]. Critically, despite several professional bodies recommending psychological interventions as a primary treatment option for menopause-related mental health concerns [10-12], access to these treatments is often limited [13], even in high-income countries like the UK. There is also evidence to suggest that mental health screening is not consistently integrated into menopausal healthcare in the UK [14], indicating a missed opportunity to identify and address potential mental health concerns that may arise during this challenging phase of life.

In this regard, digital technologies, such as web and smartphone applications (apps) may offer a cost-effective and highly scalable way to facilitate and improve mental healthcare provision in the UK throughout the menopause and menopause transition. There is evidence to suggest that digital platforms have the potential to enhance the reach, quality, and effectiveness of mental healthcare services [15], with the use of digital applications for screening and monitoring of mental health symptoms showing promising results across various mental health conditions [16]. Additionally, evidence suggests that individuals are more inclined to disclose severe symptoms on technology platforms than to a healthcare professional (HCP) [17], and patients appear to value the autonomy and empowerment gained through the utilization of digital platforms [18]. Recent evidence also suggests that virtual interventions have the potential to improve both physical and psychosocial outcomes of menopausal women [19] but little is known about UK-based perimenopausal and menopausal women's *intention* to use digital technologies for mental health concerns that may arise during this critical phase of life.

To this end, we set out to explore (i) experiences with and preferences towards mental health apps for mental health concerns related to the menopause in the UK, as well as (ii) factors which may influence potential users' intention to use a mental health app throughout the menopause and menopause transition. To achieve the latter, we used the Health Belief Model (HBM; [20]), a psychological framework that seeks to explain and predict individuals' health-related behaviors, in this case, the intention to use a mental health app throughout the menopause and menopause transition. The HBM consists of several key components, namely perceived susceptibility (an individual's perception of their vulnerability or likelihood of experiencing a particular health condition), perceived severity (an individuals' belief about the seriousness and potential consequences of a health condition), perceived benefits (an individuals' beliefs in the effectiveness and positive outcomes of adopting a health-related behavior), perceived barriers (an individual's assessment of obstacles, costs, or negative aspects associated with adoptive a health-related behavior), cues to action (triggers that prompt an individual to take action towards a particular health-related behavior), and self-efficacy (an individual's belief in their ability to successfully perform a specific health-related behavior).

The HBM has been widely used to understand and promote health behaviors in various contexts, including disease prevention [21], health promotion [22], adherence to medical treatments [23], and health behaviours in the menopause [24, 25]. The key objective of this study was to understand the health belief constructs that may influence UK women's intention to use a mental health app throughout the menopause and menopause transition. The secondary objective of this study was to explore online help-seeking behaviors and preferences in app features in women with experience of

menopause-related mental health concerns in the UK. The findings from this study have important implications for the development of effective ways to provide digital mental healthcare solutions throughout this complex time.

Methods

Overview

The current study used data from a UK-wide anonymous online survey study conducted by the Cambridge Centre for Neuropsychiatric Research between January and March 2023 [14]. The key objectives of the study were to (1) understand the current state of care provision offered via healthcare services in the UK throughout the menopause and menopause transition and (2) explore the use of and interest in digital technologies for mental health throughout the menopause and menopause transition. To this end, an anonymous online survey was created using Qualtrics XM®. The survey could be completed in 15-20 minutes and comprised five sections: (1) socio-demographic information, (2) healthcare provision throughout the menopause, (3) mental health symptoms and care provision throughout the menopause, (4) menopause-specific quality of life symptoms, and (5) experiences and interest in using a web or smartphone app for mental health symptoms related to the menopause.

The latter section also included 26 items pertaining to the HBM constructs (see Table 4 for a description of the constructs and list of items in the current study). Items were developed based on previous research [26, 27] and in consultation with a practicing psychiatrist (SB) and a patient and public involvement (PPI) panel of members with lived experience of mental health concerns. Items were rated on a six-point Likert-scale, from 1 (strongly disagree) to 6 (strongly agree). For the purpose of the current study, only data from sections 1 and 5 were included. The survey was adaptive in nature, meaning that only relevant questions were asked based on responses to previous questions.

Table 4. HBM constructs, their descriptions, and respective items

HBM construct	Description	Items
Perceived benefits	The perceived benefits associated with using a mental health app for mental health symptoms related to the menopause	A better understanding of my mental health symptoms would prevent problems with friends and family
		A burden would be lifted off me if I better understood my mental health symptoms
		A better understanding of my mental health symptoms would encourage me to seek professional help
Perceived severity	The perceived severity of mental health symptoms related to the menopause	My mental health symptoms are serious
		My mental health symptoms have

		negative consequences on my life
		My mental health symptoms cause difficulties for those who are close to me
Perceived susceptibility	The perceived likelihood or vulnerability of experiencing mental health symptoms related to the menopause (eg, low mood)	My family history puts me at risk for mental health disorders
		My lifestyle puts me at risk for mental health disorders
		The amount of stress in my life puts me at risk for mental health disorders
		The menopause puts me at risk for mental health disorders
Perceived barriers	The perceived obstacles associated with using a mental health app for mental health symptoms related to the menopause	I am not comfortable getting my symptoms assessed by a mental health app
		I think knowing the results of my mental health assessment would be too distressing
		I think that a mental health app would not be able to understand my symptoms
		I worry about the mental health app keeping my data confidential
		I worry about the potential costs related to the app and seeking mental health support
Cues to action	A prompt which would encourage use of a mental health app for mental health symptoms related to the menopause	I would use the mental health app if it were developed and validated by psychiatrists
		I would use the mental health app if it were developed by a reputable university
		I would use the mental health app if a healthcare professional (eg,

		my GP) or the NHS recommended it
		I would use the mental health app if a friend or family member recommended it
		I would use the mental health app if it were advertised on social media (Facebook, Instagram, Twitter, YouTube, etc)
Self-efficacy	Belief in possessing the necessary resources and skills to use a mental health app for mental health symptoms related to the menopause	I know how to download an app or access a website online
		I have the necessary resources to use a mental health website or app (eg, computer, smartphone, internet connection)
		I can get help from others (eg, family, or others) if I am having difficulties using an app or website
Behavioural intention	Intention to use a mental health app for mental health symptoms related to the menopause	I would be willing to try the mental health app
		I plan to try the mental health app once it becomes available
		I want to use the mental health app in the future

Participants

Participants were recruited between January 2023 and March 2023 via email, paid Facebook and Instagram advertisements, organic posts on the Cambridge Centre for Neuropsychiatric Research Facebook and Twitter pages, and Reddit. Recruitment messages were also disseminated by word-of-mouth and through relevant foundations and support groups. Inclusion criteria for the study were: (1) ≥18 years, (2) UK residence, (3) must be currently experiencing symptoms of the menopause or menopause transition (eg, hot flushes, mood changes, night sweats, irregular/absent periods, decreased sex drive). Participants were also required to *not* be currently pregnant or breastfeeding and did *not* have to have been diagnosed with a mental health condition to take part in the study. Participants were invited to enter their email for the chance to win one of three £50 Highstreet vouchers. Participants were able to withdraw from the study at any point.

Data analytic strategy

Descriptive statistics were conducted in SPSS version 28.0.1.1. Figures were created using Excel version 2206 and PowerPoint version 2206 (Microsoft Office 365). HBM data were analysed in Stata

version 17.0 [28]. Mean scores per HMB construct were obtained by summing the corresponding HBM items and dividing by the number of items. Structural equation modelling (SEM) was conducted to explore whether the factor structure of the HBM is a good fit for predicting the intention to use a digital mental health app for mental health-related symptoms that can arise as a result of the menopause or menopause transition. All exogenous latent variables were assumed to be correlated. The Satorra-Bentler scaled χ^2 test for model goodness-of-fit evaluation was reported as data were non-normally distributed (assessed using the Doornik-Hansen test). While χ^2 is commonly reported to evaluate fit, and a good model should present with a p-value above the 0.05 threshold [29], it is very sensitive to sample size. As such, it is not necessarily a reliable basis for the acceptance or rejection of a model [30-32]. For this reason, we also evaluated the model fit using the comparative fit index (CFI), root mean square error of approximation (RMSEA), and the standardised root mean square residual (SRMR), as is the recommendation [33]. A good model fit for the purposes of the current study satisfied the CFI value of 0.90, RMSEA below 0.60, and SRMS of less than 0.08 [34].

Ethical approval and informed consent

The study was approved by the University of Cambridge Human Biology Research Ethics Committee (approval number PRE.2022.110). All participants provided informed consent electronically to participate in the study.

Results

Sociodemographic characteristics

Participants' sociodemographic information across the entire sample can be found in Table 1. A total of 1154 participants commenced the survey, of which 82.50% (n=952) completed at least 97% of the survey (this completion rate ensured no missing data for the analyzes of interest). Of these, 86.76% (n=826) expressed that their menopausal symptoms had negatively affected their mental health and went on to answer questions in section 5 (ie, experiences and interest in using a web or smartphone app for mental health symptoms related to the menopause). Data from this subgroup (N=826) were analyzed.

The average age was 50.01 (SD 5.27), with the majority of respondents self-identifying as female (98.00%, n=933), being white (97.27%, n=933), having at least an undergraduate degree (59.98%, n=571), and being married or in a civil partnership (61.97%, n=590). Regarding accommodation characteristics, living with a partner and children (44.96%, n=428) or living with a partner (33.82%, n=322) were the most common arrangements. 85.19% (n=811) were employed and 61.76% (n=588) had a household income of at least £35,001 (US $43,646.77) before tax.

Table 1. Socio-demographic characteristics (N=826)

		***M* (SD)**
Age		50.28 (5.08)
		***n* (%)**
Gender identity	Female	811 (98.18)
	Male	1 (0.12)
	Non-binary	5 (0.61)
	Other	7 (0.85)
	Prefer not to answer	2 (0.24)
Ethnicity	White	803 (97.22)
	Asian/Asian British	4 (0.48)
	Black/African/Caribbean/Black British	1 (0.12)
	Mixed/Multiple ethnic groups	16 (1.94)
	Arab	2 (0.24)
Education	Below GCSE/equivalent	17 (2.06)
	GCSE/equivalent	122 (14.77)
	A Level/IB/Advanced higher	169 (20.46)
	Undergraduate degree	244 (29.54)
	Postgraduate degree	257 (31.11)
	Other	14 (1.69)
	Prefer not to answer	3 (0.36)
Relationship status	Single	88 (10.65)
	Married/Civil partnership	518 (62.71)
	Cohabiting	134 (16.22)

	Separated	15 (1.82)
	Divorced	51 (6.17)
	Other	19 (2.30)
	Prefer not to answer	1 (0.12)
Living arrangement	Living alone	87 (10.53)
	Living in shared accommodation with previously unknown individual(s)	1 (0.12)
	Living with relative(s), including single parent	82 (9.93)
	Living with a partner	281 (34.02)
	Living with a partner and children	375 (45.40)
Employment[a]	Full-time employment	394 (47.70)
	Part-time employment	220 (26.63)
	Self-employment	92 (11.14)
	Parental leave/care for a family member	30 (3.63)
	Student	15 (1.82)
	Voluntary work	15 (1.82)
	Retired	35 (4.24)
	Unemployed	57 (6.90)
	Prefer not to answer	13 (1.57)
Household income	Less than £15,000	61 (7.38)
	£15,001 - £ 25,000	60 (7.26)
	£25,001 - £35,000	100 (12.11)
	£35,001 - £45,000	85 (10.29)
	£45,001 - £55,000	94 (11.38)

£55,001 - £65,000	75 (9.08)
£65,001 - £75,000	79 (9.56)
£75,001 - £85,000	54 (6.54)
More than £85,001	118 (14.29)
Prefer not to answer	100 (12.11)

Note. A level, Advanced level qualification; GCSE, General Certificate of Secondary Education; IB, International Baccalaureate; MH, mental health.
Key. [a] Percentages add to more than 100% as participants could select multiple options.

Experiences and interest in using digital technology for mental health symptoms related to the menopause

A summary of respondents' experiences and interest in using digital technology for mental health symptoms related to the menopause can be found in Figure 1.
74.09% (n=612) of respondents had sought help online regarding mental health symptoms related to the menopause (Figure 1A), with the most commonly searched-for help including looking for information on symptom characteristics (52.66%, n=435) and treatment or therapy options (25.42%, n=210) (Figure 1B). When respondents were asked to select features for their ideal mental health app, the most sought for feature was psychoeducation (ie, gaining a better understanding of one's mental health state) (62.23%, n=514) (Figure 4C). This was closely followed by the capability to track symptoms over time (60.41%, n=499) and self-help tips (56.78%, n=469) (Figure 4C). When asked about willingness to pay for a mental health assessment app, 63.80% (n=527) of respondents said they would *not* be willing to pay, while 21.19% (n=175) said they would pay as a one-off service and 15.01% (n=124) as a subscription-based service (Figure 4D).

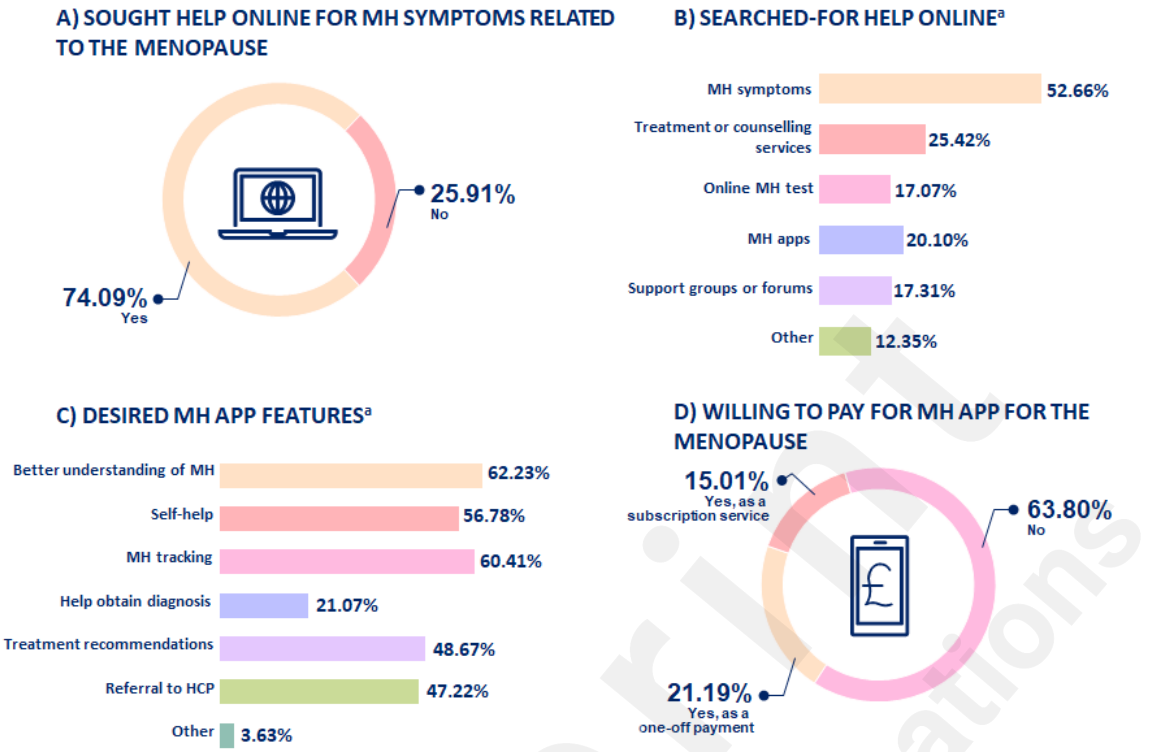

Figure 1. Experiences and interest in using digital technology for mental health symptoms related to the menopause, including (A) Sought help online for MH symptoms related to the menopause, (B) Searched-for help online, (C) Desired MH app features, and (D) Willing to pay for MH app for the menopause. ***Key.*** [a]Percentages add up to more than 100% as respondents could select multiple options

Structural equation modelling

Descriptive statistics for the HBM constructs, including internal consistency scores (overall α=0.74) can be found in Table 2, with a correlation matrix of the constructs presented in Table 3. The mean behavioural intention score was 4.51 (*SD*=1.14) indicating an interest in using an app for mental health symptoms related to the menopause, and behavioural intention was seen to be significantly correlated to all HBM constructs (*rs*=0.20-0.66, *ps*<0.01). Perceived barriers was negatively correlated with behavioural intention (*r*=-0.40, *p*<0.01).

Table 2. Mean and internal consistency scores of the HBM constructs (N=826).

	***M* (SD)**	**Cronbach's alpha**
Perceived benefits	4.12 (1.13)	0.80
Perceived severity	3.90 (1.30)	0.81
Perceived susceptibility	3.48 (1.08)	0.63
Perceived barriers	2.83 (1.00)	0.66

Cues to action	4.08 (0.86)	0.75
Self-efficacy	5.53 (0.63)	0.66
Behavioural intention	4.51 (1.14)	0.94

Table 3. Correlation matrix of the HBM constructs (N=826).

	Perceived benefits	Perceived severity	Perceived susceptibility	Perceived barriers	Cues to action	Self-efficacy	Behavioral intention
Perceived benefits	-	0.20**	0.11**	-0.11**	0.35**	0.05	0.38**
Perceived severity	-	-	0.45**	-0.00	0.16**	0.01	0.23**
Perceived susceptibility	-	-	-	0.04	0.17**	0.00	0.20**
Perceived barriers	-	-	-	-	-0.36**	-0.18**	-0.40**
Cues to action	-	-	-	-	-	-0.23**	0.66**
Self-efficacy	-	-	-	-	-	-	0.23**

Key. ***$p<0.01$.

The results of the Satorra Bentler-scaled fit statistics indicate a good model fit ($\chi^2(278)=790.44$, $p<0.001$; CFI=0.933, RMSEA=0.047, SRMR=0.056). The model schema and results are presented in Figure 2 (covariates have been removed for readability purposes, see Figure 1 in the Supplementary Materials for the model schema including covariates). All factor loadings between our observed and latent variables were significant and ≥0.36.

Our analyses revealed that the constructs of perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cues to action, and self-efficacy explained 58.59% of the variance in behavioral intention. The most important predictor of intention was cues to action (β=0.48, $p<0.001$; eg, the app being developed by psychiatrists or a reputable academic institution, the app being recommended by a HCP or the NHS). This was followed by perceived barriers (β=-0.25, $p<0.001$; eg, not feeling comfortable having symptoms assessed by a mental health app, the app not being able to understand mental health symptoms related to

the menopause), which was negatively associated with behavioural intention. Perceived susceptibility (β=.15, p<0.001; eg, lifestyle factors and life stressors increasing one's vulnerability to mental health symptoms related to the menopause) and perceived benefits (β=0.13, p<0.001; eg, an improved understanding of menopause-related mental health symptoms having the potential to alleviate the burden of mental health symptoms and encourage formal help seeking behaviour) were also significant predictors of behavioural intention. On the other hand, perceived severity (β=0.01, p=0.869; eg, mental health symptoms related to the menopause having negative consequences of one's life) and self-efficacy (β=0.03, p=0.286; eg, having the necessary resources to use a mental health app) were not significantly associated with behavioural intention.

Figure 2. Model schema of HBM constructs predicting intention to use an app for mental health symptoms related to the menopause. ***Key.*** ***$p<0.001$

Discussion

Principal findings

The key objective of the current study was to explore women's intention to use a mental health app throughout the menopause and menopause transition. The secondary objective of this study was to explore previous online help-seeking behaviors and preferences in features for apps designed for women with experience of menopause-related mental health concerns. Overall, the vast majority of women had turned to online resources for assistance with mental health concerns associated with the menopause. The most frequently searched for help online included gaining information on symptom characteristics and exploring treatment or therapy options. When asked about their preferred features in a mental health app, psychoeducation, which involves gaining a better understanding of one's mental health condition, was the most frequently selected feature. This was closely followed by the ability to track symptoms over time and access self-help tips. In regard to intention to use the app based on the HBM, we found that cues to action was the strongest predictor of women's intention to adopt the app. This was followed by perceived barriers, perceived susceptibility, and perceived benefits. On the other hand, perceived severity and self-efficacy were not significantly associated with intention to use the app.

Regarding cues to action, the importance of the app being developed by psychiatrists, or a reputable academic institution were recognized as key factors driving cues to action, and in turn, intention to use the app, supporting previous research [35]. Additionally, receiving active recommendations for the app from HCPs was identified as an excellent strategy to encourage adoption, aligning with previous studies [36]. These findings emphasize the significance of establishing strong collaborations between app developers, reputable organizations, such as the NHS and academic institutions, as well as HCPs. Actively involving these partners in the development, promotion, and endorsement of the app is likely to significantly enhance positive attitudes and intentions towards its adoption. Moreover, leveraging the authority and influence of HCPs and healthcare systems can help address concerns or skepticism regarding the app's effectiveness, reliability, and suitability for managing mental health symptoms related to menopause.

Perceived barriers, such as discomfort with an app assessing one's mental health symptoms and doubts about the app's ability to understand the complexity of mental health issues, were identified as significant barriers for app usage. Interestingly, evidence indicates that individuals tend to feel more at ease disclosing sensitive health information digitally than to a HCP [37]. However, app developers must be mindful of fostering trust by providing clear and transparent app descriptions and privacy policies to users [38, 39], as not doing so can inadvertently create a sense of mistrust. Research also suggests that users feel more comfortable with certain app features, such as appointment reminders, compared to passive data tracking features like GPS and call/text log monitoring [40]. Therefore, app developers need to investigate perceptions of trust of specific app features in their population of interest. Regarding concerns about the app's ability to understand mental health symptoms, developers should thoroughly assess its effectiveness and feasibility in the intended population [41]. This approach ensures the creation of a high-quality evidence-based assessment and fosters trust among users. Consequently, HCPs can rely on this evidence to confidently suggest or refer to clinically safe and effective technologies.

Regarding perceived susceptibility, women who believed they were more susceptible to mental health symptoms were more likely to express an intention to use the app. In particular, women who viewed their lifestyle and life stressors as key drivers of poor mental health were more likely to state an interest in using the app. Indeed, there is a well-established correlation

between modifiable lifestyle factors and poor mental health during the menopause. For instance, having a high body mass index (BMI) and leading a sedentary lifestyle are both linked to increased odds of experiencing mental health issues [42, 43]. Additionally, a recent systematic review revealed that stressful life events occurring during the menopause, including illness, marital discord, and situations where children leave home, face difficulties in pursuing higher education or finding employment, were found to be linked with increased rates of depression and anxiety during this transitional phase [44]. Considering these findings, app developers may find it beneficial to adopt a holistic approach to mental healthcare by providing women with tips on maintaining a healthy lifestyle and reducing stress during this challenging phase of life, as the inclusion of such features are likely to be attractive to those most willing to use a mental health app.

When considering the perceived benefits of using a mental health app, an improved understanding of menopause-related mental health symptoms was found to have the potential to alleviate the burden of mental health symptoms as well as encourage formal help seeking behavior. In this regard, increased awareness and discussions about the menopause and its associated mental health implications in healthcare campaigns and the media can facilitate women's understanding of their vulnerability to these symptoms, and, in turn, motivate them to adopt the app as a proactive measure for self-care and mental health symptom management. Notably, research has highlighted that a better understanding and awareness of the menopause and its transition allow women to feel more empowered to make better healthcare decisions during this phase of life [45]. Similarly, providing individuals with information about mental health symptoms and conditions via the means of psychoeducation, for instance, can increase symptom knowledge and has been demonstrated to boost intention to seek help, as well as improve patient engagement and adherence to HCPs' recommendations [39, 46, 47]. It is crucial, therefore, for app developers to explore potential collaborations with public health bodies or media who are delivering menopause education, as well as identify any opportunities to empower individuals with high-quality evidence-based psychoeducation resources that support women's mental health during the menopause and menopause transition through increased knowledge and signposting to services.

In the current study, both perceived severity and self-efficacy were *not* significant drivers of app usage. Regarding the former, it is often assumed that individuals who perceive their symptoms as more severe would be more motivated to use a mental health app as a means of managing and addressing their symptoms. However, contrary to this expectation, the study findings did not support a significant relationship between perceived severity and intention to use the app. Notably, previous studies have reported similar findings, indicating that perceived severity does not significantly predict health-related behaviours in various contexts. For instance, research has shown that perceived severity is not a significant factor in determining behaviours such as facemask use [48], vaccine uptake [49], and adoption of contact tracing apps [26]. In addition, a qualitative study investigating methods of optimizing smartphone apps for cardiovascular disease did not find perceived severity to be a key driver of app-usage [50].

In terms of self-efficacy, the majority of women in the current study expressed confidence in their ability to utilize a mental health app and had the necessary resources for its use. This confidence can be attributed to the widespread prevalence of smartphones in the UK, and it is likely that the study sample consisted of individuals with a high level of digital literacy. While perceived self-efficacy had no influence on intention to use the app, app developers should focus on strategies that promote sustained app engagement. Improving ease of use and providing in-app guidance have proven effective in increasing app utilization [51]. Furthermore, to ensure inclusivity and reach individuals who may benefit from the app but lack the necessary resources, developers should consider incorporating features such as

offline functionality or the option to complete a mental health assessment via text messaging. These measures have the potential to enhance accessibility, particularly for hard-to-reach women.

Limitations

The participants in this study exhibited characteristics that differed from the general UK population in several ways. They had higher levels of education, a higher household income, and a higher proportion of white individuals. As a result, it is important to acknowledge that the views expressed in this study may not provide a comprehensive representation of the broader UK population. Specifically, the perspectives of ethnic minorities and disadvantaged populations in the UK, who may face additional barriers or have different attitudes towards using digital solutions for menopause-related concerns, may be underrepresented. Furthermore, it is worth noting that the primary method of participant recruitment for this study was through social media channels. This means that the respondents in this study are more likely to possess high levels of digital literacy skills and may have a greater inclination to utilize digital tools for healthcare purposes. Considering these factors is crucial when interpreting the findings of this study and extending them to the wider UK population.

Conclusions

The current study sheds light on behavioral drivers influencing women's intention to use a mental health app during the menopause and menopause transition. Notably, credible endorsements from reputable sources, addressing perceived barriers, such as concerns about the efficacy of the app, and enhancing mental health literacy through psychoeducation, emerged as significant factors in encouraging app usage. App developers should take these insights into account during development and promotion to create apps that can positively impact women's mental health during this challenging life phase. Additionally, considering features that enhance accessibility for users with lower digital literacy or limited resources will ensure inclusivity and reach a broader audience. By integrating these strategies, app developers can offer valuable support and care to women facing mental health challenges during menopause and contribute to their overall wellbeing.

Data Availability

The datasets used and analyzed during the current study are available from the corresponding author (SB) on reasonable request.

Authors Contributions

NAM-K, ELF, BS, and SB conceived the study focus and materials. EF coordinated and conducted participant recruitment. Data analysis was performed by NAM-K and JB. NAM-K and ELF prepared the manuscript with revisions from JB, BS, and SB. All authors contributed to the article and approved the submitted version.

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Conflicts of Interest

Author SB is a director and holds shares in Psyomics Ltd and Psynova Neurotech Ltd but declares no non-financial competing interests. Author ELF is a paid consultant for Psyomics Ltd but declares no non-financial competing interests. Authors NAM-K, JB, and BS declare no financial or non-financial competing interests.

Multimedia Appendix

Supplementary Materials. Figure 1. Model schema of HBM constructs predicting intention to use an app for mental health (including all covariates)

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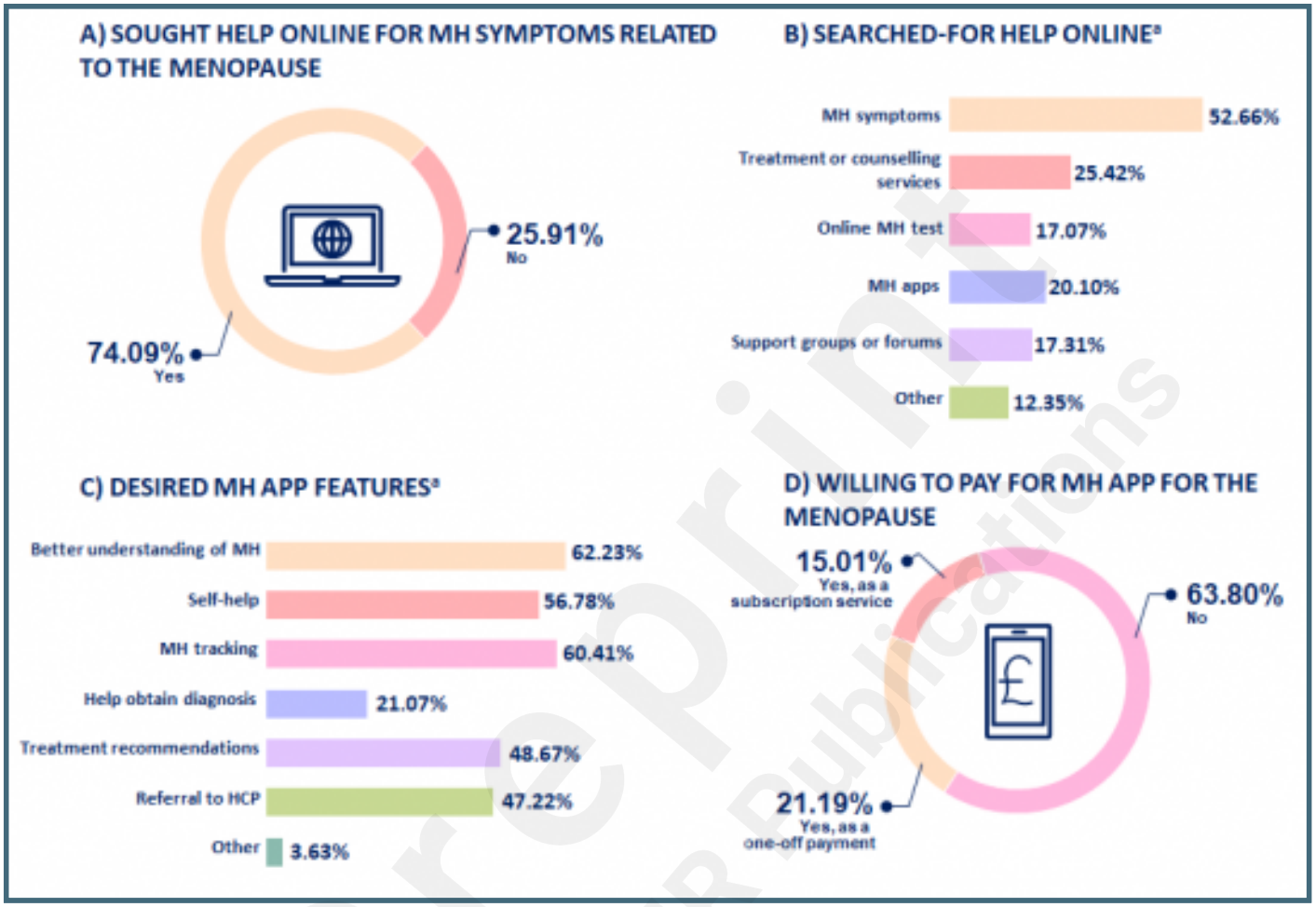
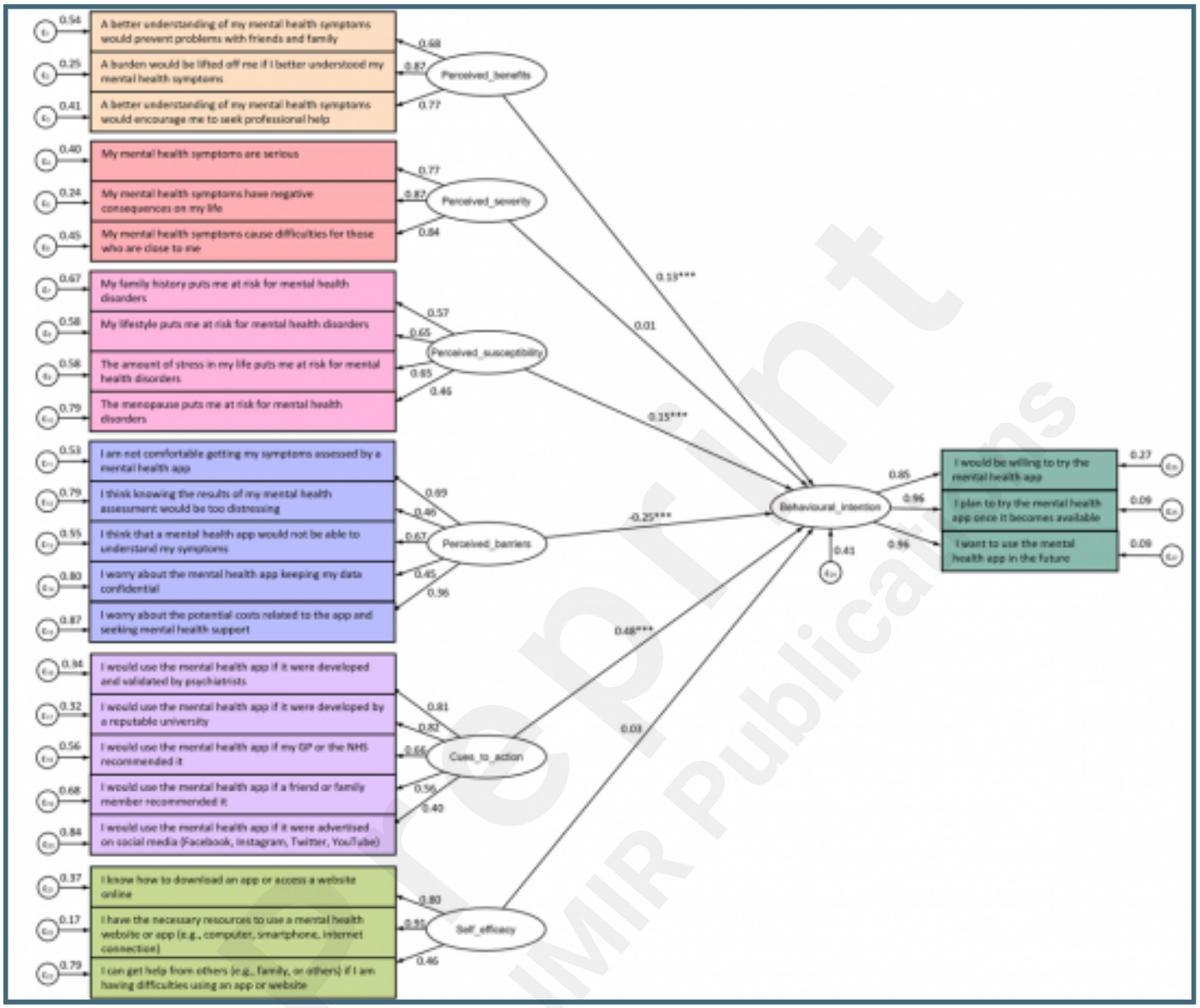
Supplementary Files

Figures

Experiences and interest in using digital technology for mental health symptoms related to the menopause, including (A) Sought help online for MH symptoms related to the menopause, (B) Searched-for help online, (C) Desired MH app features, and (D) Willing to pay for MH app for the menopause. Key. aPercentages add up to more than 100% as respondents could select multiple options.




A better understanding of my mental health symptoms would prevent problems with friends and family
A burden would be lifted off me if I better understood my mental health symptoms
A better understanding of my mental health symptoms would encourage me to seek professional help
Perceived_benefits
My mental health symptoms are serious
My mental health symptoms have negative consequences on my life
My mental health symptoms cause difficulties for those who are close to me
Perceived_severity
My family history puts me at risk for mental health disorders
My lifestyle puts me at risk for mental health disorders
The amount of stress in my life puts me at risk for mental health disorders
The menopause puts me at risk for mental health disorders
Perceived_susceptibility
I am not comfortable getting my symptoms assessed by a mental health app
I think knowing the results of my mental health assessment would be too distressing
I think that a mental health app would not be able to understand my symptoms
I worry about the mental health app keeping my data confidential
I worry about the potential costs related to the app and seeking mental health support
Perceived_barriers
I would use the mental health app if it were developed and validated by psychiatrists
I would use the mental health app if it were developed by a reputable university
I would use the mental health app if my GP or the NHS recommended it
I would use the mental health app if a friend or family member recommended it
I would use the mental health app if it were advertised on social media (Facebook, Instagram, Twitter, YouTube)
Cues_to_action
I know how to download an app or access a website online
I have the necessary resources to use a mental health website or app (e.g., computer, smartphone, internet connection)
I can get help from others (e.g., family, or others) if I am having difficulties using an app or website
Self_efficacy
Behavioural_intention
I would be willing to try the mental health app
I plan to try the mental health app once it becomes available
I want to use the mental health app in the future
0.19***
0.01
0.15***
-0.25***
0.48***
0.03

Multimedia Appendixes

Model schema of HBM constructs predicting intention to use an app for mental health (including all covariates).

URL: http://asset.jmir.pub/assets/56aaed55971056985ce600a20249de53.docx