CATÓLICA LISBON
BUSINESS & ECONOMICS

What Women Want: An Introductory Exploration into Choice of Female Healthcare Services

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Dissertation written under the supervision of Professor Sofia Jacinto

Dissertation submitted in partial fulfilment of requirements for the MSc in Business, at the Universidade Católica Portuguesa, 31/12/2022.

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Abstract

There has been a recent increase in female healthcare applications, but limited research on factors governing their use and comparative studies with physical clinics. This study aims to analyse the effect of psychological distance and social identity on attitudes to female healthcare services. We compare in-person consultations (offline service) with menstrual-tracking apps (online service). In Study A we distinguish between health service delivery modalities[1] as online or offline. We compare the effect of psychological distance from the health service on social proximity, perceived likelihood of fitting the described scenario and construal level. In Study B we manipulate the health service and social identity of the doctors to measure how these impact help-seeking, goal setting and social distance in black women. Study A results suggest that higher distance from the health service leads to decreased social proximity and perceived likelihood of the situation, but no change in construal level. In Study B we found that shared social identity and face-to-face health service increases help-seeking behaviour and decreases social distance but has no effect on the abstraction of goals. We suggest that there is a need for higher availability of face-to-face health services and for mechanisms to increase help-seeking through mobile apps in female healthcare.

Tem havido um aumento recente nas aplicações dos cuidados de saúde femininos, mas uma investigação limitada sobre os fatores que regem a sua utilização e pouca comparação entre os estudos e o realizado nas clínicas físicas. Este estudo visa analisar o efeito da psicologia à distância e da identidade social nas atitudes em relação aos serviços de saúde femininos. Comparamos consultas presenciais (serviço offline) com aplicações de rastreio menstrual (serviço online). No Estudo A, distinguimos entre modalidades de prestação de serviços de saúde online e offline. Comparamos o efeito do serviço de saúde prestado pela psicologia à distância com a proximidade social, a percepção da probabilidade de adaptação ao cenário descrito e o nível interpretativo. No Estudo B, manipulamos o serviço de saúde e a identidade social dos médicos para medir o modo como estes têm impacto na procura de ajuda, estabelecimento de objectivos e distância social nas mulheres negras. Os resultados do Estudo A sugerem que uma maior distância do serviço de saúde leva à diminuição da proximidade social e da percepção da situação provável, mas nenhuma mudança no nível interpretativo. No Estudo B descobrimos que a identidade social partilhada e o serviço de saúde presencial aumentam o comportamento de procura de ajuda e diminui a distância social, mas não tem qualquer efeito nos objetivos abstratos. Entendemos que há uma maior necessidade de disponibilidade de serviços de saúde presenciais e de mecanismos para aumentar a procura de ajuda através de aplicações móveis nos cuidados de saúde femininos.

[1] This is referred to throughout the study simply as "health service"

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Introduction

A need for a specific focus on women in healthcare which looks at health and disease from a gender-disaggregated perspective has been mounting over the past decade (Peters et al., 2016). While focus on the field of women's health has historically focused on sexual and reproductive health, research has found clear evidence that the differences between men and women can be observed right down to the cellular level, underlining the importance of furthering our understanding and research in women's health (Migliore et al., 2021). Furthermore, we are also witnessing a growing need and demand for an intersectional[2] approach to women's health (Hankivsky et al., 2010). Failure to distinguish between different groups, be it women of ethnic minority, non-able-bodied women, LGBTQIA+ women or any other group, leads to the mistaken assumption that all women experience the same circumstances and require the same care regardless of circumstances. Failure to address specific groups increases the likelihood that policies and developments in women's health will continue to exclude a large portion of the population that has a wholly different experience than those in higher power, more privileged positions.

The use of menstrual-tracking mobile applications[3] (called "menstrual-tracking apps" hereafter) is becoming ever more prevalent worldwide, with an estimated one third of women in the US using such apps in 2019 (Smith, 2022). There has been a global shift in recent years of women wanting to reclaim control of their reproductive and menstrual-related health and work towards decreasing the stigma and increasing access to menstrual-related information (Levy & Romo-Avilés, 2019). The reasons for use of these apps range from simply tracking cycles and preparing for upcoming periods to understanding and verifying their menstrual experiences, managing contraception and planning for pregnancy (Levy & Romo-Avilés, 2019). However, while this is certainly a fast-growing field, there is still much to be done in the way of research and assessments of safety, effectiveness, bias, privacy (Zwingerman et al., 2020), particularly amidst the conversations arising

[2] Defined by the Oxford Dictionary as "the interconnected nature of social categorisations such as race, class and gender, regarded as creating overlapping and interdependent systems of discrimination or disadvantage"

[3] The term "mobile-tracking apps" is often used to refer to the general offering of female health apps that offer menstrual-tracking, but also provide an interface in which users can report symptoms of vaginal-related issues and receive diagnoses and advice on treatment, read general information on maintaining good vaginal health and receive things such as contraception and conception assistance.

in this post Roe v. Wade era[4]. Furthermore, specific research on the usability and design of the apps, focussing on things such as inclusion and features that enhance the user experience are still lacking (Levy & Romo-Avilés, 2019).

Issues with stereotyping within menstrual-tracking apps has been explored in the past. App designs that reinforce gender normative stereotypes assume the gender of users and may risk excluding those that do not identify with traditional gender motifs (Levy & Romo-Avilés, 2019). Many of these apps also portray women that represent society's strict and harmful beauty standards, with fit, thin, well dressed and maintained women representing what we should see as healthy (Doshi, 2018). Moreover, many existing menstrual-tracking apps simply fail to include transgender men (assigned female at birth) (Pichon et al., 2021). Lack of diversity and inclusivity can harm (particularly the younger) users of the app, but also act to neglect the large population of users that do not fit the often-unattainable normative beauty standards. In terms of race, women depicted in menstrual-tracking apps are often white (Doshi, 2018), again failing to represent the large body of BIPOC (Black, Indigenous and people of colour) users, who may eventually be discouraged by the feeling that they are not the target audience. This failure of inclusion extends even further when you start considering the algorithms working within, and the data behind, the apps, which, when not racially disaggregated, can indeed lead to ineffective or even harmful suggested interventions and diagnoses due to unaccounted bias (Figueroa et al., 2021).

When thinking about race in the realm of female healthcare services, it is important to note the experiences of prejudice and racial-ethnic discrimination faced by many women of colour. In the US, black women face a risk of mortality associated with pregnancy at a rate of more than three times that of white women (Mehra et al., 2020). The common stereotyping and racial microaggressions that many women of colour experience not only in healthcare (Doshi, 2018) but in life also compound the experience of discomfort and anxiety many of these women may feel when dealing with people of authority (Mehra et al., 2020). The psychological stressors triggered by these experiences (Clark et al., 1999), but also high exposure to risk factors and access to substandard services in many areas, lower engagement in healthy behaviours due to psychological

[4] Roe v. Wade was a court ruling in the USA, which was passed in 1973 and stated that all women have a constitutional right to an abortion. In June 2022, in the Supreme Court ruling on Dobbs v. Jackson Women's Health Organization, the decision on Roe v. Wade was overturned. As a result, constitutional law now states that women across all 50 states in America do not have the legal right to an abortion (*Roe V. Wade and Supreme Court Abortion Cases*, 2022).

distress and potential risk of violence may all also function as catalysts of negative health outcomes in women of colour (Paradies et al., 2015). Thus, this study focuses on black women, to understand whether we may identify ways that negative associations with female healthcare services may be reduced.

This research argues that trust in and willingness to use in-person gynaecological services or menstrual-tracking apps may be influenced by being a victim of negative stereotypes, as previously shown in the literature (Agu et al., 2016). In this study, we aim to identify the role of the health service delivery modality[5] by comparing the effects of an online service of a menstrual-tracking app with the traditional offline scenario of visiting a gynaecologist in person on help-seeking behaviour[6], social distance and goal setting in women using these services. This is explored through the lens of Construal Level Theory, which affects the way individuals construe objects and events at differing levels of psychological distance (Trope et. al, 2007). In addition to the effect of the health service on these factors, we also consider the effect of Social Identity, as well as interactions between social identity and the health service (Klik et al., 2019; Reed, 2002). In doing so, we aim to establish whether there is a significant improvement in participants' perception of the services when they are faced with a doctor who belongs to their own ethnic group and whether this changes when moving from the offline to online space.

Theoretical Background

Construal Level Theory and Psychological Distance

Construal level theory is the assumption that the way in which people construe objects and events is related to their perceived psychological distance. Psychological distance encompasses the four aspects of spatial distance (physical proximity or distance to an object), temporal distance (proximity or distance in time - past or future), personal distance (social proximity or distance to another person) and relative distance (how likely or unlikely an event is to occur) (Trope et al., 2007). These four aspects are often viewed as a unitary measure of psychological distance which

[5] Hereafter referred to as "health service"

[6] The online service of using a menstrual-tracking app is considered to have high psychological distance, while the offline service of an in-person doctors visit is considered to have low psychological distance.

can impact construal level individually and show only positive compounding effects when combined. Importantly, no negative compounding effects have been observed when looking at the individual distance aspects together (Fiedler et al., 2011). Through a manipulation of psychological distance on any or all of the distance aspects, construal level can be manipulated, and its effects explored (Liberman & Trope, 2008).

Under construal level theory, it is assumed that individuals perceive things that are more distant at a higher construal level (Trope et al., 2007). In the higher-level construal mind-set, objects and events are perceived more abstractly, resulting in broader and more inclusive categorization. Conversely, at the lower-level construal, objects and events are perceived more concretely, with a focus on details and more discriminatory categorization (McCrea et. al, 2011). The level at which individuals construe objects and events affects their behaviour and judgement, so this theory is often used in consumer behaviour studies to understand the basis for consumer decisions (Liberman et al., 2007). Changes in abstraction, however, do not occur in the form of a simple switch from concrete to abstract, but rather move along a hierarchical scale, becoming more abstract through the inclusion of more encompassing categorization. Equally, psychological distance can gradually increase, and it is assumed that construal level should match this with a gradual shift to higher levels of abstraction (Trope et. al, 2007).

Especially relevant to the online health service is the physical distance. Physical distance has a particularly strong effect on the overall perceived psychological distance and resulting construal level. Henderson showed through an empirical study, that even when social distance is held constant, changes in physical distance still had a significant effect on construal level as well as the types of goals that were set by individuals in social settings (2009). Fujita et al. conducted an experiment on the link between physical distance and construal level, in which participants were asked to imagine an event in which they were helping a friend move into an apartment in a spatially near or spatially distant location (2006). Using an adapted version of the Behavioural Identification Form (BIF) they tested the construal level of the two groups and showed that increasing spatial distance leads to higher construal level. Thus, we expect the shift from the offline to the online context to significantly affect the construal level of participants and in turn, influence their judgements and behaviours towards the health service they are dealing with.

Social Identity Theory

Social Identity Theory discusses how individuals categorize other social targets. When considering a social target, representation changes between individualization of single targets and broad categorization of the individual as part of a larger group (Hogg, 2016). As categorization of social targets broadens, attributions become more stereotypical, and category based. Conversely, in the lower order categorization, attribution is focused on the behaviours and traits specific to the individual (McCrea et. al, 2011). The level at which individuals categorize themselves or others as part of a group ultimately impacts their perceptions of themselves and others, judgements, behaviour, and attitudes (Oakes et. al, 1991).

Social identity theory can also be understood in the context of abstraction, in that social categorization that occurs at lower order levels is more concrete, while that at higher order levels is more abstract. When judging social targets and the self from a more abstract perspective, individuals tend to disassociate themselves from their individual characteristics and begin to identify and resonate more with the group characteristics (Brewer & Gardner, 1996). This is also known as the cognitive component of social identity theory (Liu and Chan, 2010). The level of inclusion in social categorization increases with increasing similarities between an individual and the target salient group (McCrea et. al, 2011).

It is believed that the activation of social categorization depends on the accessibility of identifiable similarities in the social target, which can be influenced by an individual's values and beliefs but also the level of interaction with the social target and the expectations of the individual when entering the situation (Oakes et al., 1991). Categorization of the self within a group can occur both through interpersonal relationship and through impersonal categorization. In social identity theory the focus is placed on the collective self which uses categorization based on impersonal collective identities and shared membership of a categorical social group (Brewer & Gardner, 1996).

At the social attraction level, Brewer and Gardner (1996) consider whether discrimination against "out-group" members and preference for "in-group" members results from lack of shared salient similarities. Thus, we might expect this to influence discrimination towards the "other" group within this experiment, which could influence the resulting help-seeking behaviour. This is particularly important when thinking about the emotional component of social identity and the resulting behaviours of in-group categorization. Cameron (2004) discusses this as one aspect of his

three-part model on social identity, namely the Ingroup Affect, which brings together research on the focus of positive identity involved in collective categorization.

Interaction of Psychological Distance and Social Identity Theories

In this study we aim to assess the combined effects of Construal Level Theory and Social Identity Theory on help-seeking behaviour, goal setting and perceived social distance to health services. Social distance is an important distance aspect in this study and relating to social identity (Trope et al., 2007). The more socially distant a person is to another, the less alike they are to that person. Conversely, social distance decreases with increased similarities to a target other (Trope et al., 2007). Furthermore, the increase in social attraction because of group similarities (Hogg & Hardie, 1992) also leads to feelings of social proximity which reduces overall psychological distance and should reduce construal level.

Therefore, as similarity decreases social distance, we expect the effects of social identity to be higher when psychological distance to the health service[7] is lower. As a result, we expect help-seeking behaviour to be higher, perceived social distance to be lower and goals to be more subordinate when shared social identity increases and distance decreases. It is also important to note that broader categorization of social targets can also lead to increased stereotyping and discriminatory behaviour towards out-group members (McCrea et al., 2011). Therefore, we may observe the negative response to the doctor in the "other" social group being stronger when the distance to the health service is higher than when it is lower.

Goal setting Theory

Underlying the seeking help behaviors is the need to recover what is considered the normal health condition and to take action to achieve this. Goal setting specifically is the action of "defining clear objectives or aims of action" (Locke & Latham, 2002). The types of goals set by a person will be influenced by the importance of the goal and how attainable that goal is for the individual (Latham

[7] Hereafter referred to simply as "distance to the health service"

& Locke, 2007). The specificity of goals may vary, but, in contrast to visions, the minimum specificity of a goal must be such that the goal can still be attained (Berson et al., 2015).

Construal level affects the types of goals that are set. At a high construal level, goals are more abstract, superordinate and focused on the "why" of doing something. At a low construal level, goals are more concrete, subordinate and focused on "how" to do something (Ulkümen and Cheema, 2011). This is underscored by the effect of psychological distance. When thinking about an action that should be undertaken in the distant future, for example, it is likely that more abstract goals will be set than for an event in the near future (Berson et al., 2015). Furthermore, construal level affects not only the detail at which goals are set, but also the relative attainability of a goal. When there is a mismatch between the psychological distance to a behaviour and the goal set to achieve or exert that behaviour, then the goal becomes less attainable (Berson et al., 2015). For example, a student setting the goal of "finishing their degree" may not be as compelled to study for their finance exam than a student who sets the goal of "completing 20 practice exam questions". We therefore expect participants in the online condition to set more superordinate goals overall than those in the offline condition.

Thinking again about psychological distance, when considering the effect of social identity on goal setting theory, it is important again to consider the effect of similarity between oneself and a social target. When an individual does not see any similarities between oneself and the social target, social distance is increased and as a result, the types of goals one identifies with become more abstract (Berson et al., 2015). Thus, we expect both in the online condition and in the offline condition for the goals set by participants to be more superordinate when the doctor belongs to the "other" social group than when the doctor belongs to the "same" social group.

Help-seeking behaviour

Trust

Trust can be defined as the existence of a belief in the integrity and reliability of an exchange partner and confidence in resulting positive outcomes of their actions. Trust also involves a level of vulnerability, as the assumption is that the trusting individual will be subject to the negative outcome, they hope to avoid should a trusted partner break one's trust (Morgan & Hunt, 1994). As

a result, trust is important in understanding consumers' desire to seek help and use certain services, as well as commitment to those services. Specifically, in the context of digitalized healthcare services, trust plays a significant role in desire to seek out health information online (Mou et al., 2016).

Trust is especially important in the doctor-patient relationship, as it is essential for the promotion of communication between the two which influences the quality of care that can be provided. Furthermore, higher trust can lead to better patient outcomes due to acceptance of and adherence to medication, engagement in follow-up treatment and overall patient satisfaction (Chandra et al., 2018). Trust in the healthcare sector occurs at the interpersonal and institutional level. Interpersonal trust is created through the relationship between patient and doctor. Institutional trust focusses on the confidence a patient has in the healthcare system overall (Chandra et al., 2018). Subjects that may have experienced prejudice within the healthcare system may be mistrusting of the system overall, however a level of interpersonal trust can be achieved between patient and doctor. In this study, we focus on the interpersonal trust between the participants and the individual doctor they are presented with.

Morgan & Hunt showed with their model on the antecedents of trust that a belief in shared values has a significant positive impact on trust (1994). As shared values are a trigger of increased collective identification in social identity theory (Oakes et. al, 1991), we posit that when the patient and doctor belong to the same social group, trust will increase compared with trust in a doctor belonging to a different social group. Furthermore, empirical studies show that individuals associate more positive beliefs including trustworthiness towards in-group members than out-group members (Brewer and Brown, 1998), further supporting our hypothesis.

Increased psychological distance has a negative effect on trust, due to the social and physical distance perceived between the consumer and the provider. Social proximity can, however, be fostered in the online space to decrease perceived psychological distance and increase trust (Cui et al., 2020). As an increase in similarity decreases the perceived social distance, we hypothesise that although trust may be decreased when moving from the offline scenario to the online scenario, this decrease in trust may not be as large when the doctor is perceived as belonging to the same social group.

Willingness to Use and Continued Need for Help

In considering “willingness to use" theoretically, we focus mainly on help-seeking behaviour. In this study we measure willingness to use as well as the continued need for help from the service to grasp the readiness of participants to use the service (gynaecologist or menstrual-tracking app) to deal with vaginal health issues. Thus, a desire to seek help through the service must be present if they are willing to use the service and so we can look at this theory to make predictions on this variable. Help-seeking behaviour has been studied for a long time by healthcare practitioners to understand the motivations for help-seeking by patients and, more critically, the reasons for delayed help-seeking that lead to negative health outcomes (Cornaly & McCarthy, 2011). The theoretical background behind help-seeking behaviour has received increased attention in recent years to increase our understanding of the complex psychological factors influencing this behaviour. To categorize as help-seeking behaviour, intentional action must be taken to seek out said help (Cornaly & McCarthy, 2011). Thus, help-seeking involves an interpersonal relationship in which the help seeker must actively seek out the person they wish to help them (Nir, 2009).

To seek help, one must disclose personal information relating to the issue they wish to seek help for, also known as “self-disclosure” (Hinson & Swanson, 1993): when individuals tend to construe themselves in a more interdependent manner, help-seeking behaviour is also likely to increase (Shea & Yeh, 2008). Shea and Yeh (2008) argue that individual relationships play a greater role than collective identities, but social identity and the feeling of similarity to a social target is likely to influence help-seeking behaviour. Liu and Chan (2011) showed that increased homogeneity in a group leading to in-group social categorization leads to higher participation in virtual healthcare communities. Furthermore, Haslam et al., (2004) showed that in-group categorization leads to higher perceived information reliability. Participants who believe in the information they are being provided are likely to be more willing to continue using the service in the future. Thus, we expect that willingness to use and the need for continued help from the service will be higher, both online and offline, when the doctor belongs to the “same” social category than when belonging to the “other” social category.

Research Model and Hypotheses

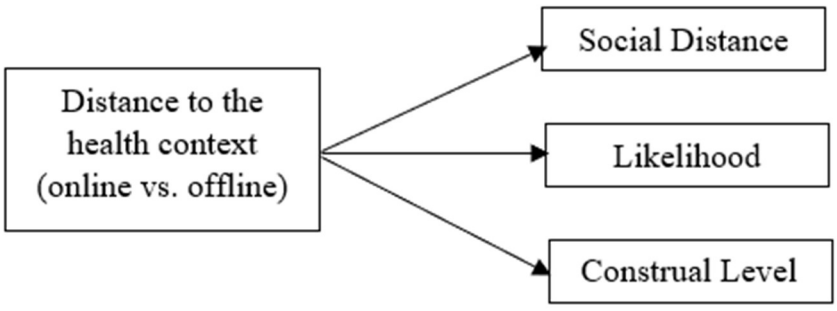
In this study, we will manipulate the health service and specifically distance to the health information provider by presenting participants with an offline (in-person visit) or online (menstrual-tracking app) scenario. The perceived physical distance to the doctor in question is a key factor in the increase in psychological distance when comparing the offline and online environments. Considering the previous theory on psychological distance and construal level (Trope et al., 2007) we expect that individuals that are dealing with the health service online will feel higher distance to the event and therefore construe it more abstractly than those in the offline condition. While it has been shown that the frequency of communication online can decrease feelings of psychological distance (Norman et. al, 2017), the analysis of this effect will not be considered in the present study.

Two studies were conducted to test the role of (1) the difference in construal level and psychological distance perceived when dealing with healthcare service in the offline vs. online context and (2) the effects of the health service and social identity on measures of help-seeking, social distance, and goal setting. Both studies were conducted in the form of surveys and are presented to two different subject pools. Experimental designs for the two studies are presented below in **Figure *1*** and **Figure *2***.

Study A

The dependent variables in this model are (1) social distance, (2) probability distance and (3) construal level. The independent variable is the context in which the health scenario is presented – either offline or online.

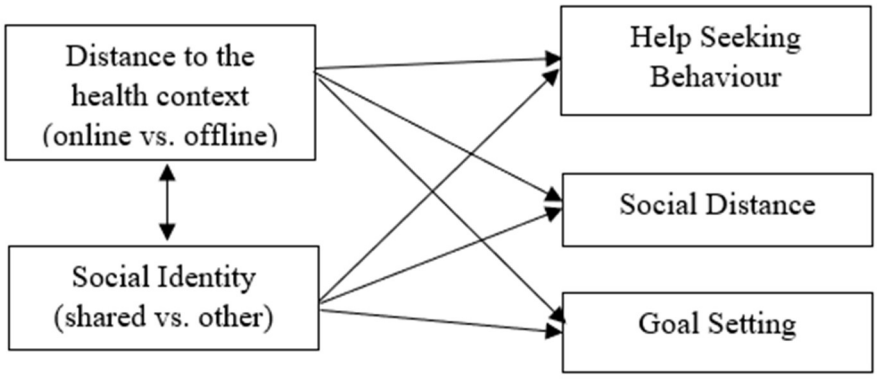
Figure 1 Research Model Study A



Study B

The dependent variables in this model are (1) trust in the health service (in-person gynaecologist or mobile app), (2) willingness to use the service, and (3) types of goals set in relation to seeking out female healthcare services. The independent variables are (1) construal level and (2) social identity. We will also assess the interaction between the distance to the health service and social identity

Figure 2 Research Model Study B



Based on the theoretical background, we formed the following hypotheses:

Study A

H1a: Higher distance to the health service leads to lower perceived social proximity

H1b: Higher distance to the health service leads to lower perceived likelihood of being in the described health scenario

H1c: Higher distance to the health service leads to higher construal level

Study B

Distance to the Health Service

H2a: Higher distance to the health service leads to decreased help-seeking behaviour

H2b: Higher distance to the health service leads to higher perceived social distance

H2c: Higher distance to the health service leads to more superordinate goals

Social Identity

H3a: Higher shared social identity leads to increased help-seeking behaviour

H3b: Higher shared social identity leads to decreased perceived social distance

H3c: Higher shared social identity leads to more subordinate goals

Interactions

H4a: Shared social identity leads to higher help-seeking behaviour and perceived social distance when distance to the health service is low than when it is high

Method

This research followed an experimental paradigm design to examine the effect of construal level and social identity on the levels of trust in, and willingness, to use different forms of female healthcare services.

Two separate studies were conducted in a survey format. Study A tested and compared the effects of using healthcare services in the online and offline environments on construal level and perceived psychological distance. Study B aimed to analyse the interaction effects between construal level and social identity on help-seeking behaviour, social distance, and goal setting.

Materials

Independent variables

Distance to the Health Service

To analyse changes in psychological distance and the resulting construal level, the health service was manipulated in both studies, to assess the effects of distance manipulation within the online and offline environments. Thus, participants were presented either with an online (higher distance) or offline (lower distance) condition. The online and offline scenarios were randomly and evenly distributed to participants taking the surveys. In both scenarios, participants were asked to

remember a time when they experienced vaginal discomfort and to remember the feelings and emotions they felt at the time. They were then asked to imagine a scenario in which their symptoms and discomfort got so bad that they felt the need to seek out medical help.

In the online condition, participants were asked to imagine the situation in which they do not have a trusted, local gynaecologist and do not feel comfortable discussing their symptoms in person. They were presented with a scenario in which hey have heard of menstrual-tracking apps and have decided to search for and download an app on their phone. After downloading the app and filling out their symptoms, as requested, they were given a diagnosis of vulvovaginitis by the app. The diagnosis was presented by a doctor, who, within the app, appears to be speaking to them "directly". A photo and the name of the doctor was also provided, such that participants felt some sort of familiarity with the doctor.

In the offline condition, participants were asked to imagine the situation in which they feel the need to discuss their symptoms in person, but, again, do not yet have a doctor that they know and trust (so that this position remains constant between the two conditions). After a Google search of (female) local gynaecologists, they chose a well-rated doctor online, booked an appointment and went to visit her immediately in person. Participants were then presented with pictures of the health centre and waiting room and told to imagine being in that environment. They were then told that once they see the doctor, she began with a physical examination following which she sat with the participant at her desk to discuss the symptoms. They were shown a picture of the doctor and were asked to imagine sitting with her in her office while she gives the same diagnosis of vulvovaginitis.

Social identification

To study the effects of social identity on the dependent variables in Study B, participants were presented in both the offline and online scenarios with one black, female doctor and one white, female doctor. As the participants were a homogeneous group of black females, the doctors therefore represented "shared" or "different" social identity. Participants saw pictures of the doctors either within the app or in the doctor's office. All doctors were female and middle aged, such that age and gender do not affect participants' judgement. Similarly, all pictures presented smiling doctors, dressed similarly and in almost identical scenarios, to ensure no other factors influenced results.

The information presented in each condition was identical in terms of the diagnosis and the situation that participants were asked to imagine themselves in. The differences between each phase were 1) the name and image of the doctor presented; 2) the photographs of the health centre (in the offline survey) or the name and logo of the mobile application (in the online survey) and 3) the specific text that was written (to help participants to believe that they were facing a different situation).

Study A

Dependent Measures

Participants were asked three questions aimed at assessing their overall psychological distance and ease of mentally simulating the presented scenario.

Social Proximity

- How close do you feel to the doctor presented to you in this scenario?

  Rated on a 7-point scale from 1 = Not close at all to 7 = Extremely close

  NB: A low response on the social proximity scale corresponds to increased perceived social distance.

Likelihood

- How likely do you imagine yourself to be in the described situation and seeking help in this manner?

  Rated on a 7-point scale from 1 = Not at all likely to 7 = Extremely likely

  NB: A low response on the likelihood scale corresponds to higher perceived probability distance.

Ease of Imagination

- How easy was it to picture yourself in the described scenario?

  Rated on a 7-point scale from 1 = Not easy at all, to 7 = Extremely easy

NB: This question was aimed at assessing whether there was a significant difference in the ease of imagination of the scenario between the two groups. Should there be a statistically significant difference in this variable, this could bring into question the applicability of further responses in analysis.

To assess the level of abstraction, participants were then given a shortened version of the Behavioural Identification Form (Vallacher et al., 1989), including eight of the original behaviour pairs and three sets of individually created goal-related behaviours (see

Table 1).

Manipulation Check

To control for the extent to which participants actively and attentively took part in the study, participants were asked about the scenario they just saw:

- In the described scenario you were asked to imagine that you looked for help in which context?
    - Gynaecologist at the local health centre
    - Emergencies at the hospital
    - Menstrual health app for your phone
    - Zoom consultation with a gynaecologist

Demographics

- Age
- Nationality
- Ethnicity (Black, Hispanic, Asian, Indigenous, White, Other (with text entry box))
- Level of identification with the social group rated on a 7-point scale from 1 = Don't identify at all to 7 = Extremely identify
- Gender

Participants

Eighty participants completed Study A. In this survey, the participants were an ethnically heterogeneous group of women of different ages. The participants were randomly assigned a survey in which they were discussing vaginal discomfort with a doctor either in person or through a menstrual-tracking app. The survey was evenly distributed between participants.

Procedure

The first survey aimed to assess the effect of the health service manipulation on changing construal level. Social identity of the doctor remained constant in this study, therefore, participants in both surveys saw only a black, female doctor. In both conditions, participants were presented with the previously described questions relating to their perceived psychological distance and ease of imagining the situation to confirm if the desired level of psychological distance has been achieved.

Participants then filled out a modified BIF. The BIF was developed as a measure of construal level (Vallacher et al., 1989). The original BIF contains 25 behaviours each with a set of two behaviour identifications, one representing an abstract and one a concrete description of the behaviour. There is no official shortened version of the BIF or consensus on the minimum number of behaviours to include in a BIF, however studies have been conducted with just eight behaviours (Lee et al., 2014). Therefore, we included eight of the original BIF behaviours in our adapted BIF. Additionally, the six goals that were used in Study B (see **Table 2** of the Appendix) were paired to make a set of three further behaviour identifications and we formed corresponding behaviours to mimic the style of the original BIF. These goals were included to test the consistency of construal level of these goals in relation to the other behaviour identifications. Overall, our modified BIF had a total of 11 behaviours, each with a pair of behaviour identifications, eight of which were from the original BIF and three of which correspond to the health goals used in Study B (see **Table 1**).

Table 1 Adapted Behavioural Identification Form

Behaviour	Behaviour Identifications
Picking an apple	**Getting something to eat** *vs* Pulling an apple off a branch
Eating	**Getting nutrition** *vs* Chewing and swallowing
Toothbrushing	**Preventing tooth decay** *vs* Moving a brush around in one's mouth
Painting a room	**Making the room look fresh** *vs* Applying brush strokes
Resisting temptation	**Showing moral courage** *vs* Saying "no"
Filling out a personality test	**Showing what you are like** *vs* Answering questions
Climbing a tree	**Getting a good view** *vs* Holding onto branches
Making a list	**Getting organized** *vs* Writing things down
	Individualised goal-related behaviours
Studying female health	**Improving my holistic wellbeing** *vs* Reading about vulvovaginitis
Looking at information on vaginal issues	**Maintaining my vaginal health status** *vs* Reading information about how to treat vaginal swelling
Looking for treatments for vaginal issues	**Improving my vaginal health understanding** *vs* Going to a health website and finding the name of an ointment

NB: Behaviour identifications in bold type correspond to the higher-level identification.

Participants were asked to answer a simple manipulation check question relating the scenario they just encountered. Survey responses with incorrect answers were not included in the analysis.

Study B

Dependent measures

The following questions relating to the dependent variables help-seeking (measured through trust, willingness to use and need for continued help), social distance, and goal setting were asked with corresponding rating scales.

Trust

- Please rate the extent to which you trust the information provided by the doctor at the clinic/in the app.

  Rated on a 7-point scale from 1 = No trust at all to 7 = Extremely trust

Willingness to use

- How willing are you to visit this doctor/use this app to deal with your vaginal discomfort?

  Rated on a 7-point scale from 1 = Not willing at all to 7 = Extremely willing

Continued need for help

- To which extent do you feel the need to continue getting help from this service

  Rated on a 7-point scale from 1 = No need at all to 7 = Extremely need

Recommendation to a friend

- To which extent would you recommend this app to a friend?
  Rated on a 7-point scale from 1 = Would not recommend at all, to 7 = Extremely recommend

Social distance

- How socially distant do you feel to the doctor providing you with this information?

  Rated on a 7-point scale from 1 = Not distant at all to 7 = Extremely distant

Goal setting

- Please rank the following goals in terms of how much you identify with each goal while seeking out this health information with 1 being the goal you most identify with and 6 being the goal you least identify with
    - To improve my holistic wellbeing (6)
    - To maintain my menstrual- and vaginal-related health status (5)
    - To improve my menstrual- and vaginal-related health understanding (4)
    - To read about vulvovaginitis (3)
    - To read information about how to treat vaginal swelling (2)
    - To go to a health website and find the name of an ointment (1)

  The numbers next to each goal correspond to the order of goals from 1 – most concrete, to 6 – most abstract. The order of goals in the list was randomized to avoid bias.

- To which extent do you feel the need to achieve these goals?
    - To go to a health website and find the name of an ointment (most concrete)
    - Improve my holistic wellbeing (most abstract)

  Each of the goals was rated on a 7-point scale from 1 = Don't feel the need at all to 7 = Extremely feel the need

Control variables

All participants were asked a set of control questions relating to their previous use of and experience with gynaecologists and menstrual tracking apps.

1. Do you have a gynaecologist that you know and trust?
2. How often do you visit the gynaecologist?
3. Have you ever had a negative experience with a gynaecologist?
4. Have you ever used a menstrual tracking app?
5. What are your reasons for using a menstrual tracking app? This was a multiple-choice question with the following possible responses:
    - Menstruation tracking
    - Gaining menstrual-related health information

- Contraception
- Ovulation tracking
- Understanding my overall health better

6. If you used a menstrual-tracking app, how often do you visit your gynaecologist?
    - Never visit a gynaecologist
    - Only for acute issues
    - Visit once a year
    - 2-3 times a year
    - More than three times a year
7. Have you ever had a negative experience with a menstrual-tracking app?

Manipulation checks

To check the efficacy of the manipulation and the extent to which participants attentively took part in the survey, the following two questions were asked:

1. To which ethnic group would you attribute the doctors that gave you advice?
    - Both black women
    - One black woman and one white woman
    - Both white women
    - I don't remember
2. In the described scenario you were asked to imagine that you looked for help in which context?
    - With a local gynaecologist
    - Emergencies at the hospital
    - Menstrual health app for your phone
    - Zoom consultation with the gynaecologist

Demographics

- Age
- Nationality
- Ethnicity (Black, Hispanic, Asian, Indigenous, White, Other (with text entry box))
- Level of identification with the social group rated on a 7-point scale from 1 = Don't identify at all to 7 = Extremely identify
- Gender

Participants

Forty-two participants completed the Study B surveys, with an even distribution between the two surveys. Participants were an ethnically homogeneous group of black women of different ages. Participants were randomly assigned a survey in which they were discussing vaginal discomfort with a doctor in person or through a menstrual tracking app. This phase of the study also involved a within subject design, measuring the role of social identity. In each survey participants were randomly presented with either a white doctor first (different social identity) and then a black doctor (same social identity) or vice versa and were asked the same set of questions relating to the dependent variables.

Procedure

In Study B, participants were randomly assigned to either the offline or online group. The survey began with a question to ensure the person answering the survey has a vulva as the survey and its contents are only relevant to people with a vulva who will be affected by related health issues. They then saw the previously described scenario of feeling vaginal discomfort and the need to seek health. In the offline condition, they were told that following a search online, they booked an appointment and went to visit a gynaecologist at the local health centre, where they underwent a physical check-up and discussed their symptoms and diagnosis with the doctor in person. In the online condition they were told that they searched for and downloaded a menstrual-tracking app in which they recorded their symptoms and got a diagnosis through the app. In each health service,

offline and online, participants were asked to reply to the two conditions of social identification, a black doctor, and a white doctor, shown in a randomized order to avoid bias.

In each condition, after the health scenario is presented and the diagnosis has been made by the doctor, participants were asked to answer the dependent variables: help-seeking behaviours, social distance, and goal setting. Subsequently, participants were asked a set of control questions to understand the presence of pre-existing attitudes towards the healthcare services being presented. Finally, manipulation checks were answered to ensure that responses being analysed were given by participants who were fully engaged in the study. Before concluding the study, participants provided their demographic data (age, gender, nationality, and ethnicity). In the end, participants were asked to leave comments if they felt the need to share their thoughts or had any questions.

Results

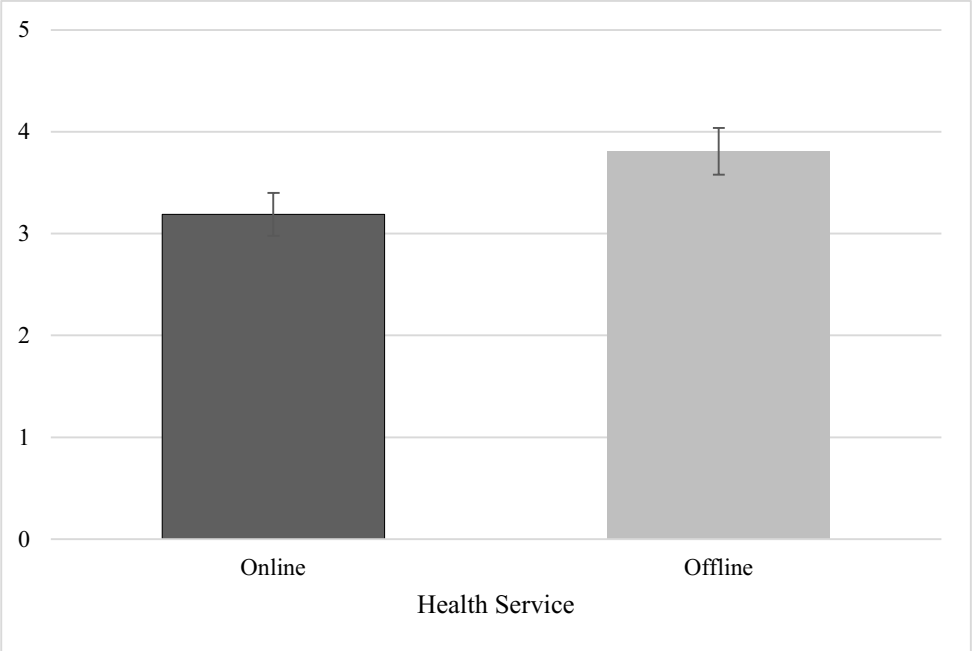
Study A

Social Proximity

To test the hypothesis that the online condition leads to lower perceived social proximity than the offline condition, an independent *t*-test was performed[8]. There is a main effect of health service on social proximity, $t(78) = -2.00$, $p = .03$, $d = 1.40$ in which the online context ($M = 3.19$, $SD = 1.29$) led to higher social proximity than the offline context ($M = 3.81$, $SD = 1.48$) (see **Figure *3***)

This is in line with our hypothesis that the online context leads to lower social proximity than the offline context. There is a statistically significant reduction in perceived social proximity in the online condition, in comparison with the offline condition.

Figure 3 Social Proximity

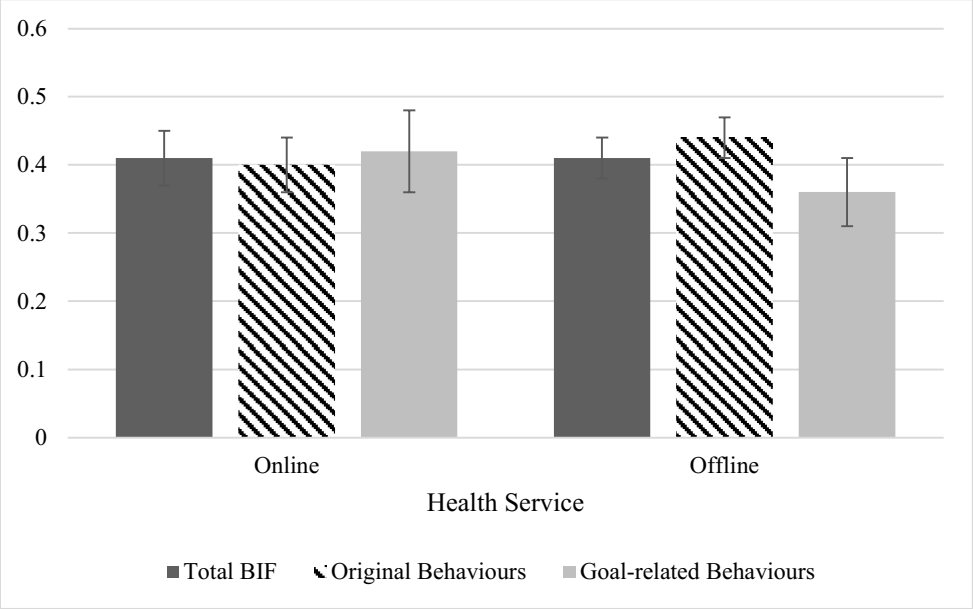


[8] The equality of variances assumption was satisfied, with a Levene's F test of $F(78) = 1.12$, $p = .29$.

Behavioural Identification Form

An independent samples *t*-test was performed, to test the hypothesis that participants seeking healthcare advice in the online format would have a statistically significantly lower BIF than the participants seeking healthcare advice in the offline format[9]. The independent samples *t*-test for the total BIF score was not associated with a statistically significant effect, $t(78) = -.20$, $p = .42$, $d = .20$. Participants in the online condition *(n* = 37*)* showed a total BIF score of $M = .41$ ($SD = .22$), while in the offline condition the score was $M = .41$ ($SD = .03$). Despite there being almost no difference in the BIF scores, $t(78) = -.77$, $p = .22$, the original behaviours showed a tendency for higher abstraction in the offline condition ($M = .42$, $SD = .32$) than in the online condition ($M = .40$, $SD = .23$). The health related behaviours also showed no significant difference, $t(78) = .86$, $p = .20$, however the tendency was reversed here, such that the offline condition led to lower abstraction ($M = .36$, $SD = .32$) than the online condition ($M = .42$, $SD = .37$). Thus, the hypothesis that the BIF score in the online condition is statistically significantly lower than the BIF score in the offline condition is rejected (see **Figure *4***)

Figure 4 Mean BIF Scores

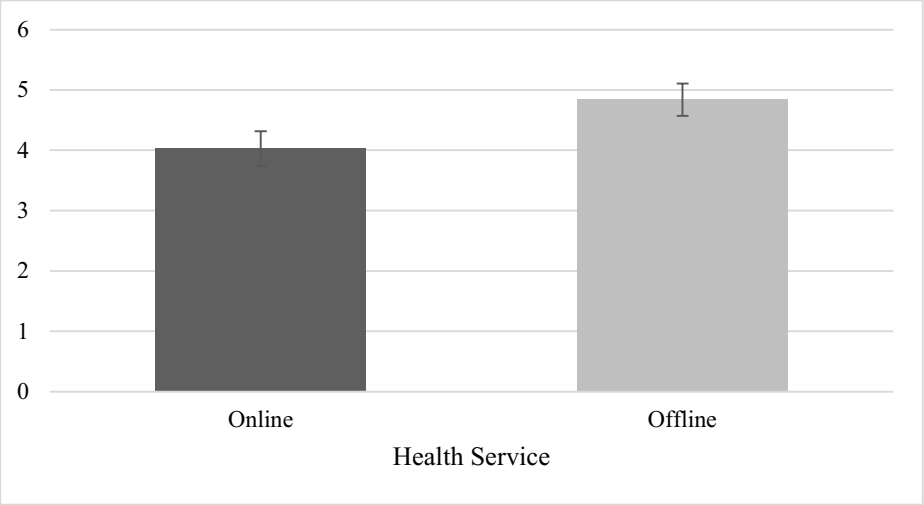


[9] The Levene's test for Equality of Variances for the total, original behaviour and individual behaviour BIF scores were $F(78) = .46$, $p = .50$, $F(78) = .11$, $p = .74$, and $F(78) = 1.75$, $p = .21$, respectively. Thus, the assumption of equality of variances was satisfied for all three dependent variable measures.

Perceived Likelihood

An independent samples *t*-test was also performed to test the hypothesis that the perceived likelihood of being in the described scenario decreases in the online condition (correlating to higher probability distance) compared with the offline condition. There was a significant effect of health service on perceived likelihood of the situation, $t(78) = -2.03$, $p = .02$, $d = 1.78$. The online group ($n = 37$) was associated with a lower likelihood ($M = 4.03$, $SD = .29$) than the offline group ($n = 43$, $M = 4.84$, $SD = .27$)[10]. Thus, we do not reject the hypothesis that there is a statistically significant reduction of perceived likelihood (corresponding to increased probability distance) in the online condition, when compared with the offline condition (see **Figure *5***).

Figure 5 Mean Perceived Likelihood



Ease of Imagination

Ease of imagination of the scenario was measured, to ensure that the results were not affected by a statistically significant difference in the ease of imagining each scenario. An independent samples t-test showed that there is no difference ($t(78) = -1.29$, $p = .10$, $d = 1.48$) between the ease of imagining the situation in the online group compared with the offline group. As such, we cannot attribute any of our results to the ease at which participants imagined themselves being in the described scenario. For the means see **Table *3*** in the Appendix.

[10] The equality of variance assumption for this dependent variable was satisfied, as proven by the Levene's F test, $F(78) = .01$, $p = .93$.

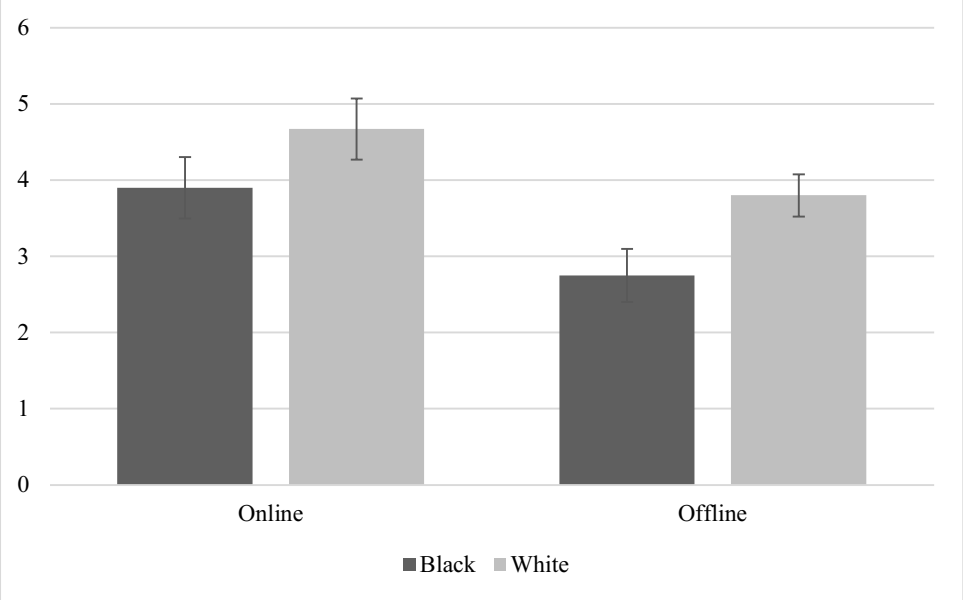
Study B

Social Distance

The total social distance was lower from the black doctor (M = 3.34, SD = 1.78) than from the white doctor (M = 4.24, SD = 1.61). In the online condition, social distance from the black doctor was higher (n = 21, M = 3.90, SD = 1.84) than in the offline condition (n = 20, M = 2.75, SD = 1.55). Similarly, social distance from the white doctor was higher in the online condition (n = 21, M = 4.67, SD = 1.83) than in the offline condition (n = 20, M = 3.80, SD = 1.24). The difference between social distance in the online and offline condition was numerically larger for the services with the black doctor than for those with the white doctor (see **Figure *6***). A two-way repeated measures ANOVA was used to test for the significance of these differences.

A statistically significant effect of social group on social distance was observed in the within-subjects test, $F(1, 39) = 9.45$, $p = .004$, $\eta^2 = .20$, irrespective of the health service. In the between-subjects test, the health service was observed to have a statistically significant effect on social distance, $F(1, 39) = 5.83$, $p = .02$, $\eta^2 = .13$, with a higher social distance in the online condition, not considering the social group. The interaction between the health service and social identity on social distance showed no statistically significant effect, $F(1, 39) = .24$, $p = .63$, $\eta^2 = .01$. Thus, we conclude that there is no statistically significant interaction between social identity and the health service on perceived social distance towards the doctor.

Figure 6 Mean Social Distance



Social Identity

To understand the effect of distance to the health service on the salience of the social identity, participants were asked to state their ethnicity and then rate the extent to which they identified with their ethnic group. A t-test comparing online-offline showed no significant effect of distance on social identity, $t(35) = 1.26$, $p = 0.11$. Therefore, we do not reject the null hypothesis that there is no effect of distance on the salience of social identity. Despite the lack of difference, social identity was higher in the online condition (analysing all participants regardless of social group of the doctor), $n = 18$, $M = 6.67$, $SD = 1.03$, compared with the offline condition, $n = 19$, $M = 6.11$, $SD = 1.60$[11].

Trust

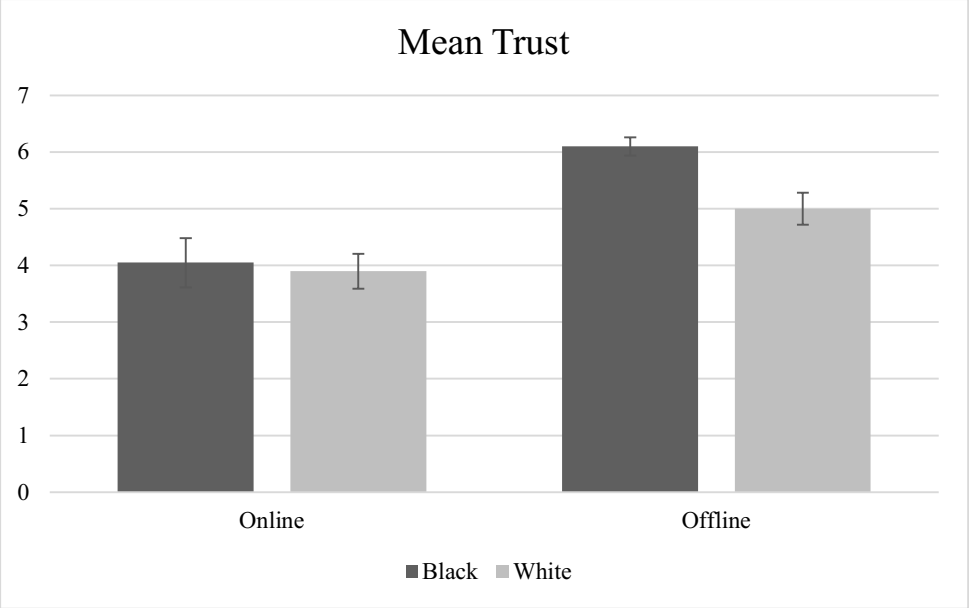
To test our hypotheses of the effect of social identity and distance on trust, a two-way repeated measures ANOVA was performed, with health service as a between-subject factor and social identity as a within-subject factor. Results show a main effect of health service $F(1, 39) = 16.86$, $p < .001$, $\eta^2 = .30$, with higher levels of trust in the offline condition ($n = 20$, $M = 5.55$) than in the online condition ($n = 21$, $M = 3.98$), regardless of the social group of the doctor (see **Figure 7**). Therefore, we reject the null hypothesis that there was no reduction in trust in the online context compared with the offline context.

A main effect of social identity on trust was found, $F(1, 39) = 7.49$, $p = .01$, $\eta^2 = .16$. Specifically, trust was lower in the white doctor ($M = 4.44$, $SD = 1.43$) than in the black doctor ($M = 5.05$, $SD = 1.82$), regardless of the health service. In the conditions with the black doctor, there was a tendency for higher trust in the offline condition ($n = 20$, $M = 6.10$, $SD = .72$) than in the online condition ($n = 21$, $M = 4.05$, $SD = 1.99$). Similarly, in the conditions with the white doctor, trust was higher in the offline condition ($n = 20$, $M = 5.00$, $SD = 1.26$) than in the online condition ($n = 21$, $M = 3.90$, $SD = 1.41$). We therefore also reject the null hypothesis that there was reduction in trust in the white doctor, compared with the black doctor.

[11] The Levene's Test showed no statistical significance, $F(35) = 1.72$, $p = .20$, thus we can assume equality of variance for this sample.

An interaction effect was found ($F(1, 39) = 4.44$, $p = .42$, $\eta^2 = .10$). Pairwise comparisons showed, for the offline context, the black doctor condition leads to higher social proximity than the white doctor condition ($p = .002$). However, for the online context, there is no difference between the black and white doctor conditions ($p = 0.66$) (see **Table *4*** of Appendix for means). Thus, we reject the interaction hypothesis that the effect of social identity remains the same in the offline and online conditions.

Figure 7 Mean Level of Trust



Willingness to Use

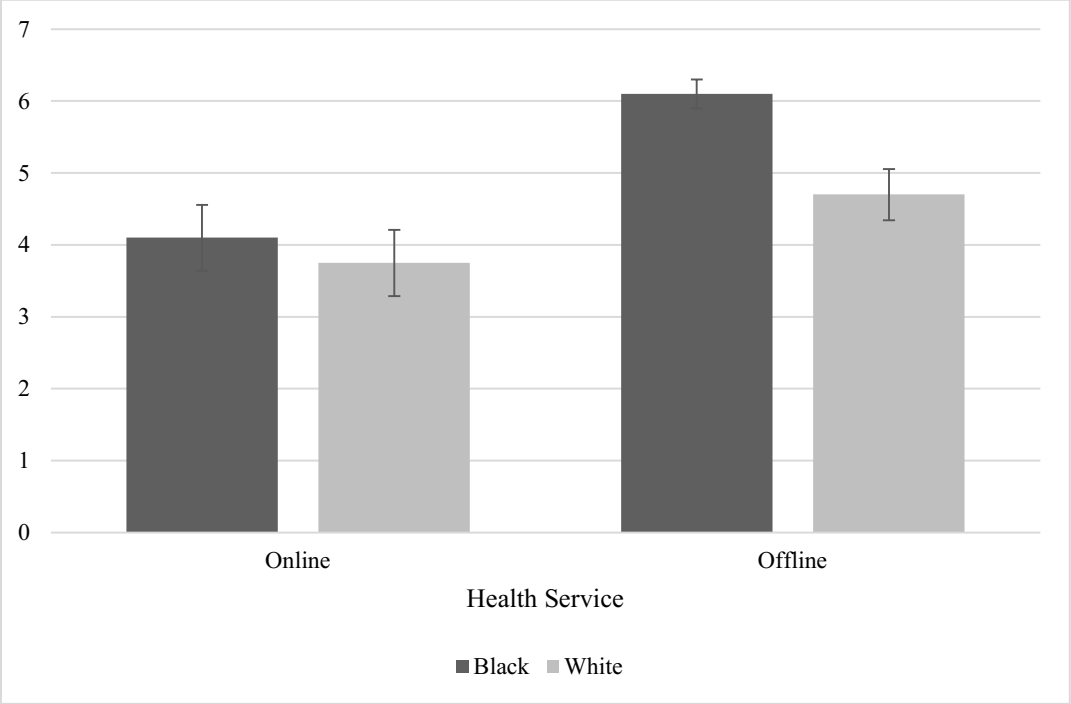
To test our hypotheses of the effect of social identity and distance on willingness to use, we performed a two-way repeated measures ANOVA, analysing the effect of the health service between subjects and social identity within subjects. Results show a main effect of health service $F(1, 38) = 8.44$, $p = .01$, $\eta^2 = .18$, such that willingness to use was higher in the offline condition ($n = 20$, $M = 5.40$) than in the online condition ($n = 20$, $M = 3.93$), irrespective of the social group of the doctor (see **Figure *8***). Therefore, we do not reject the hypothesis that willingness to use is not lower in the online context than in the offline context.

We also found a main effect of social identity on willingness to use, $F(1, 38) = 16.31$, $p < .001$, $\eta^2 = .30$, irrespective of the health service. Willingness to use was higher overall for the service with

the black doctor (M = 5.10, SD = 1.92) than with the white doctor (M = 4.22, SD = 1.87). Willingness to use for service with the black doctor was higher in the offline condition (n = 20, M = 6.10, SD = .91) than in the online condition (n = 20, M = 4.10, SD = 2.15). Similarly, willingness to use the service with the white doctor was also higher in the offline condition (n = 20, M = 4.70, SD = 1.59) than in the online condition (n = 20, M = 3.75, SD = 2.05). Again, we do not reject the null hypothesis that there is not lower willingness to use for the service with the black doctor than with the white doctor.

A significant interaction between the health service and social identity was found, $F(1, 38) = 5.87$, $p = .02$, $\eta^2 = .13$. Pairwise comparisons showed that willingness to use was higher significantly higher with the black doctor than the white doctor in the offline condition ($p < .001$) but not in the online condition ($p = .26$) (See **Table *5*** of the Appendix for means). Thus, we do not reject the hypothesis that the effect of social identity on willingness to use remains the same in the offline and online contexts.

Figure 8 Willingness to Use



Continued Need to get Help

To test the hypotheses of the effects of social identity and health service on the need to continue getting help from the health service, a two-way repeated measures ANOVA was performed. In the between subjects test of the health service, no significant effect was found, $F(1, 36) = 2.53$, $p = .12$, $\eta^2 = .06$, despite a tendency for slightly higher need in the offline context ($n = 20$, $M = 5.63$) than the online context ($n = 18$, $M = 4.78$). Therefore, we do not reject the hypothesis that there is no effect of the health service on the continued need for help.

In the within subjects test of social identity, no significant effect was found, $F(1, 36) = .69$, $p = .41$, $\eta^2 = .02$. Looking at the means however, there was a tendency for higher need for continued help for the black doctor ($M = 5.34$, $SD = 1.73$) than for the white doctor ($M = 5.11$, $SD = 2.02$), regardless of the health service. We do not reject the null hypothesis that there is no effect of social identity on the need to continue getting help from the health service.

Finally, a cross-over interaction was not determined in the test for the interaction of the independent variables, $F(1, 36) = .002$, $p = .96$, $\eta^2 = .000$. Therefore, we do not reject the hypothesis that the effect of social identity on the need for continued help remains the same in the offline and online contexts.

Goals

To analyse the hypotheses of effects of the health service and social identity on the types of goals set in each condition, several different variables were analysed using two-way repeated measures ANOVAs.

<u>First Place Goal</u>

To start, the goal that was ranked in the first position and thus correlating to the goal that participants most identified with was analysed. The goals were coded from 1-6 with one being the most concrete goal and six being the most abstract goal (see **Table *2*** of the appendix). We found no main effect of the health service on the abstraction of goals set, $F(1, 37) = .01$, $p = .93$, $\eta^2 = .000$. Participants chose a first-place goal that was slightly more abstract in the offline condition ($n = 18$, $M = 3.64$) than in the online condition ($n = 21$, $M = 3.56$). Therefore, we do not reject the null

hypothesis that goals do not become more abstract in the online condition than in the offline condition.

We also found no main effect of social identity on the goal chosen in the first place ($F(1, 37) = .85$, $p = .36$, $\eta^2 = .02$). Overall, the goal score in the condition with the black doctor was slightly more concrete ($M = 3.51$, $SD = 1.99$) than the goal score in the conditions with the white doctor ($M = 5.11$, $SD = 2.02$). This result means we cannot reject the hypothesis that goals become more abstract when the social identity is the same than when it is other.

Finally, a cross-over effect was ruled out by an statistically insignificant effect of the interaction, $F(1, 37) = 2.20$, $p = .15$, $\eta^2 = .06$. Therefore, we do not reject the null hypotheses that there is no interaction effect of social identity and the health service on the types of goals set.

Abstract Goal

Subjects were asked to rate the extent to which they identify with a very abstract, health-related goal. Here too, we found no main effect of health service on the extent to which subjects identify with an abstract goal, $F(1, 35) = 3.82$, $p = .06$, $\eta^2 = .10$. There was, however, a slight tendency for those in the offline condition to identify more with the abstract goal ($n = 18$, $M = 5.39$) than those in the online condition ($n = 19$, $M = 4.18$).

Looking specifically at identification with the abstract goal, we again found no main effect of social identity on identification with an abstract goal, $F(1, 35) = .07$, $p = .79$, $\eta^2 = .002$. On average, subjects who were presented with a black doctor in the offline and online conditions identified with the abstract goal marginally more ($M = 4.81$, $SD = 1.20$) than participants who were presented with a white ($M = 4.73$, $SD = 2.21$). A cross-over effect of the interaction was not found, $F(1, 35) = 4.08$, $p = .051$, $\eta^2 = .002$.

Concrete Goal

Subjects were also asked to rate the extent to which they identify with a very concrete health-related goal. Reinforcing previous results, we found no main effect of health service on the identification with a concrete goal, $F(1, 37) = .22$, $p = .64$, $\eta^2 = .01$. Interestingly, participants in

the offline condition also identified more with the concrete goal (n = 20, M = 4.15) than those in the online condition (n = 19, M = 3.87).

We also found no main effect of social identity on identification with a concrete goal, $F(1, 37) = 2.49$, $p = .12$, $\eta^2 = .06$. Overall, participants presented with a black doctor identified less with the concrete goal (M = 3.82, SD = 2.05) than those presented with a white doctor (M = 4.21, SD = 1.94). A cross-over interaction was disregarded, due to the statistically insignificant effect of the interaction, $F(1, 37) = .59$, $p = .45$, $\eta^2 = .02$.

Discussion

Two studies were conducted to assess the effect of distance in the health service and social identity on factors relating to help-seeking, construal level and psychological distance. Study A involved a manipulation of the health service, in which participants were presented with a health condition in the online or offline setting. This study aimed to analyse the effect that this distance had on (1) social proximity, (2) likelihood of being in the described scenario and (3) construal level (measured through the BIF). Individual t-tests measured the effects on these dependent variables.

Health service showed a main effect on social proximity, with social proximity being higher in the offline context than in the online context. There was also a main effect on likelihood, with likelihood being lower in the online condition than in the offline condition. Thus, we confirmed our hypotheses that a higher distance to the health service reduced social proximity and reduced perceived likelihood of being in the described health condition. There was no effect of health service on construal level.

Having found a significant effect of the health service on psychological distance, and specifically social distance, in the first study, a second study was conducted in which the effects of both distance and social identity were examined. In this study, we measured the effect of the independent variables on help-seeking behaviour (measured through trust, willingness to use and need for continued help), social distance and goal setting behaviour. To understand the extent to which participants identified with the social (ethnic) group of the doctor, a control measure on the extent to which they identify with their ethnic group (black) was analysed. No significant difference

between the online and offline conditions was found on the level of social identification; and overall social identification was found to be very high, with an average of above six out of seven in both conditions (seven being "extremely identify"). Thus, we can assume the sense of belonging to a social group to be high for all participants and that the differences observed between experimental conditions are not explained by the level of social identification.

In Study B we analysed trust, willingness to use and need for continued help from the service to understand the effect of the conditions on help-seeking behaviour and judgements. Both the health service and social identity had significant effects on trust, with trust being higher in the offline condition compared to the online condition and higher in the black doctor compared to the white doctor. Thus, we confirm both hypotheses that (1) lower distance to the health service leads to increased trust and (2) shared social identity leads to higher trust. Furthermore, a statistically significant interaction effect between health service and social identity was found, such that shared social identity leads to higher trust in the face-to-face health service but has no effect on trust when dealing with app-based healthcare services.

Health service and social identity each had a main effect on willingness to use, with willingness to use being higher for the health services with the black doctor than with the white doctor, and higher in the offline condition than in the online condition. As for "trust", there was an interaction effect between health service and social identity on willingness to use, with social identity showing a stronger effect in the offline condition than in the online condition. Therefore, we confirm our hypotheses that (1) lower distance to the health service led to higher willingness to use, (2) shared social identity leads to higher willingness to use.

Regarding the continued need for getting help from the service, no effect was found either through the health service, or the social identity, and no interaction was observed. Therefore, we rejected our hypotheses on the continued use of the service. Despite this and looking at the other three variables, we determine that both the health service and social identity individually have a major impact on help-seeking behaviours. Furthermore, we determine that there is a strong interaction between these two factors, with social identity affecting help-seeking behaviour in the face-to-face context, but not in the online context.

Having found a significant main effect of distance to the health service on perceived social proximity in Study A, we tried to replicate this result in Study B. Participants were asked about

the distance, as opposed to closeness, they felt to the doctor, to see whether this affected results. As in Study A, we found a significant effect of the health service on perceived social distance, with social distance being higher in the online condition than in the offline condition. Social identity also had an effect, with distance being lower from the black doctor than the white doctor. We found a significant interaction effect between the health service and social identity on perceived social distance, such that social identity influences social distance when distance to the health service is low but not when it is high.

In Study A we found no effect of the health service on construal level, as shown by the insignificant effect of the health conditions on the BIF scores. In Study B, we analysed construal level from a goal theory perspective, looking at whether the abstraction of health goals is affected by distance and social identity. We found no significant effect of either the health service, or social identity on abstraction. This result reinforced our findings that construal level and abstraction are not affected by the health service, as shown in Study A. We also reject our hypothesis that shared social identity increases abstraction.

Theoretical implications

Abstraction

Much of the research on distance and its effects on behaviour and judgement is done through the lens of construal level theory (Trope et al., 2007, Liberman & Trope, 2008, Norman et al., 2016). We expected the increase in distance to the health service to lead to higher construal level and abstraction. Our studies showed no effect of or link between increased distance and abstraction, neither through in the BIF nor in the types of goals set. This may pose a challenge to the existing literature and to the ways in which we study construal level.

We expected construal level to increase in the online environment, due to the higher distance from the doctor providing the health information. As the world becomes increasingly digitalized, it is likely that the classic theories relating to distance and construal level may no longer apply. Norman et al. (2016) commented on how frequent communication online and the removal of interpersonal barriers that may normally be present in power-imbalanced relationships reduce overall psychological distance. Gaining further understanding of the effect of the online environment on

abstraction in a time when people are spending such a large part of their lives online would be beneficial to the literature.

Social Distance

While construal level showed no significant difference between the online and offline services, results in both studies are in line with literature with regards to distance. Trope and Liberman (2010) explained the interactive relationship of the different distance aspects (spatial, temporal, social and probability). When distance increases in one aspect, such as physical distance to the health service, we expect other aspects of perceived distance to increase. Macrae et al. (1994) showed that participants who were seated farther away from a social target felt higher social distance to that target and displayed increased stereotype rebound as a result. In line with Suzuki's findings (1998) on social distance and social identity, we found in both studies that when individuals identify a social target as an in-group member, social distance decreases and they feel closer to that individual.

Interestingly, the effect of social identity on perceived social distance was significantly higher in the offline than in the online environment, suggesting that the salience of the social target may not be as strong in the online environment. Existing literature on distance and group judgements mainly focusses on construal level, that as distance increases and construal level increases, social categorization and grouping increases (Henderson, 2009). However, our results suggest that the feeling of similarity towards a social target significantly reduces perceived social distance to the doctor when physical distance is low, but not when it is high. Thus, it is necessary to broaden the literature focusing specifically on the aspect of perceived social distance, regardless of construal level, to the resulting social identity.

Help-seeking

Help-seeking was analysed in this study through the variables "trust", "willingness to use", and "need for continued help". All these factors apart from the need to continue getting help from the service were found to be significantly affected by the health service and social identity separately, but also by an interaction between the two. The lack of effect on the need to continue getting help

may be in part due to the formulation of the question which focused on the services as opposed to the doctor. Furthermore, it is possible that psychological distance acts as a "barrier to entry" to getting help from the service. Once this initial level of psychological distance has been overcome and the individual has already received help from the service, it is possible that the differences in psychological distance through shared social identity and the modality of health service delivery no longer affect continued use.

Future research that focusses more on the social factor might produce different results. Aside from this, help-seeking behaviour was higher in the offline context and with the black doctor, but the effect of social identity was far stronger in the offline context. These results are in line with previous research which suggests that factors such as trust and a desire to seek help are higher when social distance is lower (Cui et al., 2020) and towards in-group members (Brewer and Brown, 1998). From a theoretical perspective, our research supports the current literature on the factors affecting help-seeking behaviour and reinforces that this is relevant for female healthcare services.

Goal setting

The effects of the health service on goal setting were previously mentioned with regards to construal level. There was no main effect of health service or social identity on goal setting. This supports the findings of Study A that the online condition has no impact on abstraction. Again, this contradicts the literature that would suggest that the further we are from a target (in this case the doctor) the more abstract and superordinate our goals become (Ulkümen and Cheema, 2011). Similarly, we could not replicate the effect that a shared social identity leads to more subordinate goals. To better understand this from a theoretical perspective, future work should focus more on the factors influencing the choice to engage in virtual activities, irrespective of abstraction levels and keeping in mind that social identity does not play a strong role in the online environment.

Practical implications

From a practical perspective, as eHealth grows in popularity, understanding the effects of an online environment on the level of abstraction in individuals will be important to better tailor information to users. Construal level theory has consistently informed consumer behaviour decisions and

preferences from a theoretical perspective over the past decades (Dhar & Kim, 2007). To continue informing decisions in marketing and eHealth targeting, it is important to gain a deeper understanding of the mindset in which users engage in mobile health and menstrual tracking apps.

Again, as the world is becoming increasingly virtual, it is important to understand the extent to which the lack of effect of social identity in the online world impacts on group mentality. From a general perspective, this can be particularly important for companies that are working in remote environments and education systems moving towards distance learning. If similarities in social identity are not able to decrease social distance in the online environment, other methods may need to be identified to tackle this issue. Specifically for eHealth, it will be important to gain a better understanding of how to overcome the interpersonal barrier that influences users' willingness to share information through apps. Moreover, the level of social identification was not affected by the health service, which may suggest that physical distance does not change how much a social group is relevant for identity. This may suggest that the broader categorization associated to higher construal level may not occur in the online health setting, at least for groups that are subject to prejudice in health services depending on their ethnic group.

There are indeed implications of continued lower levels of trust and desire to seek help for health issues online. The women's health app market is expected to grow at an annual compound market growth rate of 19.45% from 2022 to 2030 (Women's Health App Market Size & Share Report, 2022-2030, n.d.). While functionalities and scope of services in menstrual-tracking and other female health apps may increase, it is still true that many women lack trust in the health advice they receive from these apps. Participants in the survey were given a commentary box to provide comments or feedback. One of the comments mentioned this issue: "If I have an issue I would always rather go to a doctor in person… I would feel more secure in the diagnosis in person where things can be discussed together". This is one of the main challenges these apps will have to deal with moving forward. Identifying ways in which digital health could be more integrated with in-person doctor visits or vice versa could transform the industry. Digital health can bring a lot of knowledge wealth to patients, but competing with physical clinics when it comes to health concerns will remain a hurdle if trust in the technology does not improve.

On the aspect of social identity, in our limited sample of black women, the feeling of similarity with a doctor can bring huge benefits, particularly in the offline environment. Health apps will

benefit from improvements in diversity of representation within the apps, diversity in the doctors providing information to these apps, and an acknowledgement of physiological differences in different ethnic groups (Doshi, 2018; Harlow & Campbell, 1996). Our findings show that similarities in social identity between doctor and patient is an even stronger determinant of help-seeking behaviour in the offline context of an in-person doctor visit. While this study did not focus on the pre-conceptions towards healthcare services, potential negative past experiences such as discrimination or a dismissal of one's experiences could certainly influence this. When an individual perceives that the doctor may share the same experiences, beliefs, or values as they do, they are likely to trust the information that they get from this person more. These findings strongly support the need for a diverse workforce in the healthcare industry, particularly at the physician level. In the US in 2020, just 2% of physicians were black females, while in the population, black women make up about 13% of the population (Roy, 2020). Our findings show the importance of equal representation in the healthcare industry, and women's overall gynaecological health could drastically improve if help-seeking behaviour could be increased through diversity of professionals[12].

Again, from a managerial and practical perspective, it will be important for companies to gain a better understanding of why users are interested in their products, if they maintain the overall level of goals in the offline and online environment. Identifying this reasoning will improve understanding as to why women are interested in eHealth and how apps can better cater to user's needs.

Future Work and Limitations

The main limitation of the first study was the reduced number of items on the BIF. It is possible that this had an impact on the results and conclusions drawn from this analysis on construal level. To further explore the results of no effect on construal level and abstraction, it would be useful to conduct the study with a larger sample size and using a full-length BIF or other measures of construal level such as a how and why task (Freitas et al., 2004). Furthermore, the classic BIF

[12] We consider it important to note that this is true regardless of the ethnicity or race of individual patients and/or doctors; such considerations of "psychological distance" or construal level should not be taken as prima facie evidence of racism or discrimination.

contains standardised behaviours which are unrelated to the scenario of using female health-related services. It would be interesting to assess the efficacy of adapted BIF's, in which behaviours are applicable to the situation participants find themselves in, e.g. relating to health information seeking. This may have a stronger effect as participants would not be distracted from the scenario by the seemingly unrelated behaviours.

In the second study, it would be important to further develop the theory on social identity and social distance from a perspective that is unrelated to construal level. If these findings can be replicated with a larger sample size, then a need for analysis of these theories that separates distance from abstraction will be necessary to understand why behaviour changes when construal level stays the same. Similarly, replicating the study with a group of only white women or male doctors and comparing the results will help us understand if the dynamics change when the patient is in an ethnic group that has a different level of power. Regarding sample size, the application of results from these studies are constrained by the small sample sizes. Replicating these studies on a larger scale would help to further validate the conclusions drawn in this study and would extend the applicability to the population at large.

In Study B we had a sample of only black women. Future work that looks at different ethnic groups to understand the differences in their attitudes towards different types of health services would help us achieve a better view of different women's attitudes to these services. The importance of collecting racially disaggregated data remains, as the experiences of women across different ethnic groups varies to an extent that no fair comparison can be made across ethnic groups. In this respect, future research would also benefit at looking at attitudes to health services on a country-by-country basis, as the treatment, accessibility to healthcare and safety of data hugely varies across countries.

We restricted the study to female black and white doctors, noting the complex and multiply confounding issues which would have arisen if we had also included black and white male doctors. It is possible that the effects of different genders on construal level and on psychological distance would produce very different results. We suggest that this is something which should be addressed in further studies.

In these studies, we focussed on cisgender women and did not explore transgender women (assigned male at birth) or transgender men (assigned female at birth) seeking female healthcare services. These are groups that still face violence and discrimination in healthcare in much of the

world. There is also a lack of focus on how to cater to these groups in many female health apps. Future research should aim to focus on transgender people, but also separately look at different groups of queer womxn[13], to understand the factors governing their help-seeking behaviour, so that we can improve services to be more inclusive for all LGBTQIA+ people seeking female healthcare services.

Finally, a closer look at the attitudes towards eHealth and pre-existing experiences in health institutions will shed further light on our findings. Help-seeking behaviour is strongly influenced by pre-existing attitudes, particularly in the case of previous bad experiences and resulting trauma. Breaking down the analysis will help us to understand better how to cater to the needs of women who have had different past experiences with healthcare services. Analysing overall attitudes to eHealth and mobile apps will also help improve understanding on the reasons why women choose to use such services or not.

Conclusion

While the eHealth market is growing rapidly, there is still much to be learned about what promotes users to engage in these services and what deters them. Interest in women's sexual and reproductive health overall has increased over the past few years, with more women trying to take control of their periods and hormones and improve their health literacy. However, there are still large gaps in research, particularly from an intersectional perspective. Women around the world do not share the same experiences, be that due to racial discrimination, poverty, disability, gender identity, or professional power dynamics, to name a few. Despite a growing trend in menstrual-tracking and female health apps, this study shows that the preference for face-to-face consultation remains. Our findings emphasise specifically the need for representation in face-to-face health services, where direct contact with the doctor is necessary for gaining health information. This research sheds light on the factors that govern help-seeking behaviour and social distance in women and particularly in black women and aims to contribute to future work that focusses more attention on marginalised groups and an intersectional understanding of female health overall.

[13] Womxn is an alternative spelling of woman, used often in intersectional feminism, that is meant to be inclusive of also transgender and non-binary women

Appendix

Health Related Goals

In Study B we formed a set of six goals, three of are classified as being abstract and three of which are classified as concrete. Abstract goals are more superordinate and focus on the "why", whereas concrete goals are more concrete and focus on the "how". We ranked the goals in order from most abstract (6) to most concrete (1). The following table shows the six goals:

Table 2 Health related goals

Health seeking goals
Improving my holistic wellbeing
Maintaining my vaginal health status
Improving my vaginal health understanding
Reading about vulvovaginitis
Reading information about how to treat vaginal swelling
Going to a health website and finding the name of an ointment

Tables of Means

Table 3 Means for Ease of Imagination

Health Service	N	Mean	Std. Deviation	Std. Error Mean
Online	37	5.27	1.52	0.25
Offline	43	5.70	1.44	0.22

Table 4 Interaction of Health Service and Social Identity on Trust

Health Service	Doctor	Mean	Std. Error
Online	Black	4.05	0.33
	White	3.91	0.29
Offline	Black	6.10	0.34
	White	5.00	0.30

Table 5 Interaction of Health Service and Social Identity on Willingness to Use

Health Service	Doctor	Mean	Std. Error
Online	Black	4.10	0.37
	White	3.75	0.41
Offline	Black	6.10	0.37
	White	4.70	0.41

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