










Research and Applications

Assessing the acceptability of using patient portals to recruit pregnant women and new mothers for maternal-child health research

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Abstract

Objective: Electronic patient portals (PP) allow for targeted and efficient research recruitment. We assessed pre- and postnatal women's recruitment methods preferences, focusing on PP.

Materials and Methods: We conducted 4 in-person focus groups with new and expecting mothers. Participants reported demographics, health status, and comfort with technology including PP. We used descriptive statistics to characterize quantitative data and a quasi-deductive approach to analyze qualitative data.

Results: Participants ($n=32$) were an average age of 31.9 years, mostly White (65.6%), married (90.6%), and had a 4-year degree or higher (71.9%). Although they preferred PP for research recruitment over other methods (eg, in-person, physical mail), participants suggested potential barriers, including high message frequency, messages feeling like spam, and concerns about confidentiality. Participants suggested solutions, including enhancing autonomy through opt-in methods; integrating their healthcare provider's feedback; sending personal and relevant messages; and assuring their PP data are confidential.

Discussion: PPs are a promising recruitment method for pre- and postnatal women including for maternal-child health studies. To ensure engagement with the method, researchers must respond to known patient concerns and incorporate their feedback into future efforts.

Conclusion: Although PP were generally viewed as an acceptable recruitment method, researchers should be mindful of barriers that may limit its reach and effectiveness.

Lay Summary

We looked at using patient portals (PP) to invite pregnant women and new mothers to join research studies about their baby. PP are online tools where people can manage their healthcare and talk to their doctors. We held focus groups to ask women if they would be okay with getting research invitations through PP. Most preferred PP over other ways, like in-person invites. They said PP would be easier and less annoying. They also trusted PP as a source of health information. But they had some concerns. They worried about getting too many messages, making it feel like spam. They also wanted to be sure their health details stayed private. They shared ways to improve PP for research recruitment. For example, patients could choose if they want to get messages and how often. Researchers could also make sure messages clearly explain what the study is about and why they were invited. We found that PP can be a good way to recruit people for research if these concerns are addressed.

Key words: decision making; electronic health records; health information technology; patient preferences; recruitment methods.

Background and significance

Traditional recruitment methods, such as mail and in-person approaches, are often slow, costly, and ineffective.¹ Further, not meeting recruitment targets may deplete resources, weaken generalizability of findings, and end studies prematurely.² Although the pre- and postnatal periods represent critical windows in maternal and child health that are a target for

ongoing research (eg, improving obstetrics care, informing newborn screening expansion), it has been challenging to recruit women to participate in such studies.^{3,4} One study found direct (ie, face-to-face) recruitment is more effective than indirect (eg, flyers, emails) for enrolling pregnant women, and their healthcare provider's support of the research was "vital" to their willingness to participate.⁵ However, direct

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contact may not be feasible for studies seeking large sample sizes or those recruiting across geographic areas. Expectant and new mothers increasingly seek health-related information to benefit themselves or their babies from web-based sources,^{6,7} with one study reporting 95% of pregnant women accessed health information related to pregnancy and birth online.⁸ This makes them an ideal population for exploring innovative recruitment strategies, such as PP messages, to enhance research engagement.

National initiatives to digitize the health industry have resulted in hospitals and other care settings increasingly giving patients access to their health information through PP technology.⁹ PP, including the online patient-facing side of electronic medical records, allow patients to schedule visits, pay bills, and communicate with healthcare providers.¹⁰ Research has demonstrated the value of analyzing communication strategies to enhance patient engagement with medical education tools, highlighting the need to tailor these strategies to patient needs and preferences.¹¹ Similarly, PPs offer an opportunity to optimize recruitment efforts by providing secure and convenient communication channels for participants. Although many patients prefer in-person conversations with their healthcare providers as a trusted source of health information, PP usage for accessing health information is increasing.^{12–14} Pregnant women and mothers who have recently given birth often have frequent medical visits as part of standard maternal and child health services and have demonstrated high rates of PP usage.^{15,16} Thus, research recruitment messages sent through a PP may be an effective recruitment approach for women during pre- and postnatal periods.

PP has shown promise as a novel, targeted recruitment approach.¹⁷ However, limited data exists on the acceptability of PP recruitment, particularly among pre- and postnatal women. Understanding the preferences and concerns of this population is essential to optimize recruitment efforts for maternal-child health studies. Thus, we conducted focus groups to elicit their views on research recruitment for studies targeted at themselves or their babies and, in particular, assess the acceptability of PP for research recruitment.

Materials and methods

Study design

We conducted focus groups with pre- and postnatal women in April 2019.^{18,19} Participants included pregnant or postpartum women (last 12 months) who spoke English, excluding those who participated in >2 research studies recently to avoid sampling biases. A local market research recruitment firm recruited and scheduled participants for in-person focus groups (2 comprised of prenatal women and 2 comprised of postnatal women). We collected verbal consent before starting the focus groups. Participants completed self-report questionnaires following each focus group. The RTI International Institutional Review Board approved the study.

Data collection

We conducted 4 focus groups with 8 participants per group ($N=32$) and equal participation by pre- and postnatal women. A moderator (S.M.A.) and note-takers (D.T. and A. G.) with qualitative methods expertise facilitated the focus groups. We structured the interview guide around barriers and facilitators to engaging with research recruitment

methods, including in-person, mailed letters, email, social media (eg, Facebook, blogs), and PP. The moderator introduced Early Check as an example research study, which we referenced throughout the focus groups.²⁰ Early check was described as an expanded newborn screening research study for babies born in North Carolina. At the time of the focus groups, North Carolina mothers could enroll their babies in Early Check from their 12th week of pregnancy until the baby was 1-month old. The moderator showed participants 2 different formats of an automated email from PP that could alert them of a research invitation available to view in the portal ([Figure 1](#)). Both notification formats were in use by a large local health system. One notification was more generic: “You have a new message to view in [PP]... Sign in to [PP hyperlink] and go to Messaging.” The second notification option was research-focused: “You may be eligible for participation in a research study based on information in your medical record... Sign in to [PP hyperlink] and select the Research Studies menu item to see your personal invitation and learn more about the study.”

Participants answered questions on (1) demographics (age, ethnicity, race, marital status, education, employment, household income); (2) technology and PP use (comfort, frequency, access, and purposes); (3) Likert-type ratings of comfort with recruitment methods (In person, Phone, Letter, Email, Social Media, PP). Participants received a \$100 gift card for their time. Each 90-minute focus group was audio-recorded, transcribed, and then proofread to be verbatim.

Analysis

We managed the qualitative interview data using NVivo 12.0 (Lumivero, United States). The study team developed a codebook based on the interview guide and applied a quasi-deductive analysis approach.²¹ We based deductive codes on the interview guide, including preferences for different methods of research recruitment, and barriers and facilitators to adopting PP for recruitment. For example, we applied the overarching barrier “recruitment decision factors” during this stage. Next, an inductive approach was applied to identify sub-themes within the data. An example of an inductive sub-theme added is “recruitment as spam.” Codes were developed, and coding was reviewed and refined in an iterative process among analysts (S.M.A., A.F., D.T., S.N.H.). To ensure consistency and rigor in the coding process, coding disagreements were resolved through a consensus-building approach.²² Analysts met to review and discuss codes, with any discrepancies in code application addressed collaboratively. During these discussions, the team referred to the original transcript data and the codebook to ensure alignment with the study’s objectives. Iterative refinements to the codebook were made as necessary, with final decisions documented to maintain transparency and reproducibility.

We entered and analyzed quantitative data in SAS software (version 9.4, SAS Institute, Cary, NC). Descriptive statistics were used for the full sample and categories of focus groups (ie, pregnant women and women who had recently given birth). Next, we used Wilcoxon Rank Sum Exact tests for continuous and ordinal data, and Fisher’s Exact test for categorical data to compare the groups. There were no statistically significant differences in demographic characteristics between the prenatal and postnatal participants. Therefore, we analyzed and reported all focus group data together.

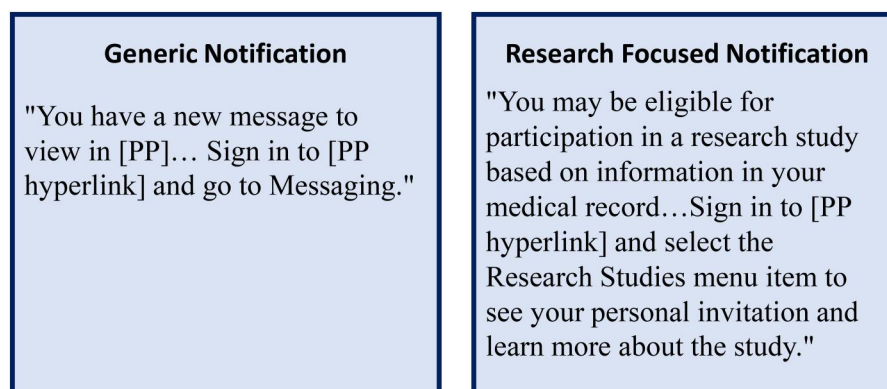


Figure 1. Comparison of notification formats for research recruitment.

Results

We organize the results first by describing the sample, followed by preference for recruitment methods. Next, we present overarching themes of barriers and their associated solutions for using PP for recruiting pre- and postnatal women into research studies. We include representative quotes throughout.

Participants

Across groups, the average age was 31.9 years old. Most participants were White (65.6%), married (90.6%), college-educated (71.9%), and employed full time (62.5%) (Table 1). We found no statistically significant differences between demographics for the prenatal and postnatal groups. Both groups reported very high levels of comfort when using technology in their daily life on a 5-point scale (mean = 4.9). Most prenatal moms used PP weekly (62.5%), whereas most postnatal moms used PP monthly (62.5%). Both groups used PP for viewing appointment notes, communicating with healthcare providers, paying medical bills, and scheduling appointments.

Preferences for research recruitment methods

Both pre- and postnatal women preferred PP recruitment (Table 2) and were comfortable with in-person and physical mail approaches. Prenatal women were significantly more comfortable with social media and email recruitment than postnatal women.

Qualitative data provided additional insights into why PP was preferred. Reasons included believing PP was trusted for clicking on message/links, convenient, taken seriously, allows addressing it in their own time, and less environmental impact (eg, reduced paper use) compared to mailed letters. On trust, one participant elaborated “I just feel the portal is more comfortable all around. I mean, everything else we have to think about [security] before you actually access, but the portal you already know it’s definitely about you” (P103).

Another participant described her PP as an important and frequently used tool in managing her child’s healthcare, such that she takes any messaging from the portal seriously: “...everything in my portal...it’s like linked to my son’s [healthcare]. Like I follow everything that’s in there. I go to my billing, everything. I just want to make sure everything’s completed, all my follow ups, medication lists, everything. So, I would definitely take this serious[ly] if it came through my portal” (P202).

Participants were reassured knowing that a research invitation through their PP was affiliated with their healthcare provider, which made the invitation more trustworthy: “I would probably not trust an email from anyone, but if it came like an email for the portal, I would definitely trust it” (P206). This was in contrast to other methods (mailed letter, email, social media) in which their trust and/or interest in engaging further with the recruitment message would depend on their assessment of the sender’s credibility. Additionally, compared to phone or in-person recruitment, which some participants viewed as intrusive, PP recruitment was appreciated for allowing them act on the invitation at any time. The convenience of being able to click on a hyperlink in the PP message to learn about next steps was seen as a benefit as opposed to receiving a paper letter and having to type in a web address.

Though PP was the top choice, convenience and being taken seriously were also reasons some preferred in-person or physical mail recruitment over other methods. About in-person recruitment, one participant stated, “I don’t know if your doctor bringing it up to you at that time [when you are in the hospital] would be the best time so you could say yes at that point in time... I’m not even gonna pay that any attention after” (P105). A summary of participant reflections on pros and cons of recruitment methods is presented in Table 3.

Barriers and solutions to using patient portal for research recruitment

When participants were asked to reflect on the possibility of PP more broadly as a recruitment method (ie, extending beyond the use of the Early Check study example), barriers and solutions were identified in 3 areas: frequency of recruitment messages, recruitment as spam, and concerns about confidentiality (Table 4).

Barrier—Frequency of recruitment messages

Participants were concerned about the number of recruitment messages they may receive. One said, “If I was getting this weekly, that might get annoying. Um, so I think just making sure that it was really relevant to what was going on for me. And um, it’s not too frequent” (P304). Another similarly stated, “as long as MyChart doesn’t start sending unnecessary things frequently” (P208).

A solution to frequent emails included purposefully targeting to ensure the relevance of the study to the prospective participant, as described by one participant: “Like let them know that...like you have cancer, and you have like a survey or

Table 1. Participant demographics.

Characteristics	Total Sample (<i>n</i> = 32)	Focus Group		<i>P</i> -value ^b
		Prenatal (<i>n</i> = 16)	Postnatal (<i>n</i> = 16)	
Age (years), mean (SD)	31.9 (4.3)	31.3 (3.0)	32.6 (5.3)	NS
Race				NS
White	21 (65.6%)	11 (68.8%)	10 (62.5%)	
Black/African American	8 (25.0%)	4 (25.0%)	4 (25.0%)	
Other	3 (9.4%)	1 (6.3%)	2 (12.6%)	
Hispanic	2 (6.3%)	—	2 (12.5%)	NS
Education				NS
High school	—	—	—	
Trade/tech certification	1 (3.1%)	1 (6.3%)	—	
Some college	5 (15.6%)	3 (18.8%)	2 (12.5%)	
2-year degree	3 (9.4%)	2 (12.5%)	1 (6.3%)	
4-year degree	15 (46.9%)	5 (31.3%)	10 (62.5%)	
Grad/professional degree	8 (25.0%)	5 (31.3%)	3 (18.8%)	
Employment status				NS
Not working	6 (18.8%)	3 (18.8%)	3 (18.8%)	
Working	26 (81.3%)	13 (81.3%)	13 (81.3%)	
Part time	6 (18.8%)	4 (25.0%)	2 (12.5%)	
Full time	20 (62.5%)	9 (56.3%)	11 (68.8%)	
Household income				NS
<\$25K	1 (3.1%)	1 (6.3%)	—	
\$25 001-\$50K	2 (6.3%)	—	2 (12.5%)	
\$50 001-\$75K	6 (18.8%)	3 (18.75%)	3 (18.8%)	
\$75 001-\$100K	6 (18.8%)	4 (25.0%)	2 (12.5%)	
\$100 001-\$150K	11 (34.4%)	4 (25.0%)	7 (43.8%)	
>\$150K	6 (18.8%)	4 (25.0%)	2 (12.5%)	
Marital status				NS
Single/not married	3 (9.4%)	—	3 (18.8%)	
Married	29 (90.6%)	16 (100.0%)	13 (81.3%)	
Comfort in technology, ^a mean (SD)	4.9 (0.3)	4.87 (0.4)	4.94 (0.3)	NS
Frequency of PP use				<.01
Yearly or less	—	—	—	
Couple times a year	3 (9.4%)	—	3 (18.8%)	
Monthly	15 (46.9%)	5 (31.3%)	10 (62.5%)	
Weekly	13 (40.6%)	10 (62.5%)	3 (18.8%)	
PP use				
To pay medical bills	21 (65.6%)	10 (62.5%)	11 (68.8%)	NS
To view appointment notes	30 (93.8%)	15 (93.8%)	15 (93.8%)	NS
To communicate with providers	27 (84.4%)	12 (75.0%)	15 (93.8%)	NS
To schedule appointments	19 (59.4%)	8 (50.0%)	11 (68.8%)	NS
To request prescription refills	14 (43.8%)	7 (43.8%)	7 (43.8%)	NS
Other	1 (3.1%)	—	1 (6.3%)	NS
PP device				
PP app	7 (21.9%)	4 (25.0%)	3 (18.8%)	NS
Phone	11 (34.4%)	8 (50.00%)	3 (18.8%)	<.05
Laptop or desktop	20 (62.5%)	7 (43.8%)	13 (81.3%)	<.05
Other	—	—	—	

Abbreviations: NS, non-significant; SD, standard deviation.

^a 5-point Likert scale: 1 = Not at all, 2 = A little bit, 3 = Somewhat, 4 = Quite a bit, 5 = Extremely.

^b Statistical significance of $P < .05$ was conducted using a 2-sided, Wilcoxon Rank Sum Exact test for continuous/ordinal data and Fisher's Exact test for categorical data.

maybe optional drug that fits into your category. That'd be like a good way to profile people" (P208). A second solution discussed was providing autonomy in whether and how often participants receive research study invitations. This autonomy included the ability to opt in to receiving information about research studies broadly before being invited to participate in specific studies. One participant stated, "If I opt in to receive research studies that I may be eligible for, I'm okay with those coming to me, even if it's ten or whatever. But I need to say "yes, you have permission to review my record and give me information about the studies" (P404).

Barrier—Recruitment as spam

Some participants expressed concern that receiving unexpected recruitment messages through PP could feel like "spam" that they receive frequently through mail, email, phone, and text. Participants said that they would not react positively to being surprised by a research invitation sent via the platform they have been using to engage in official communication about their healthcare. This was discussed alongside the issue of frequency of messages. One participant said, "Even though I'm using the patient portal more through pregnancy...I don't get new messages every day or every week. And so, I think I would feel like it was more of an invasion of that health care portal if it felt like I was getting

Table 2. Preferences for different recruitment methods—questionnaire responses.^a

	Total sample (<i>n</i> = 32)	Focus group		<i>P</i> -value ^b
		Prenatal (<i>n</i> = 16)	Postnatal (<i>n</i> = 16)	
PP	6.6 (0.8)	6.4 (1.0)	6.7 (0.6)	NS
In-person	5.8 (1.4)	5.9 (1.0)	5.8 (1.7)	NS
Mail (physical)	5.2 (1.5)	5.4 (1.4)	5.0 (1.6)	NS
Email	4.4 (1.8)	5.1 (1.2)	3.6 (2.1)	<.05
Social media/blog	4.3 (1.7)	5.3 (1.7)	3.3 (1.1)	<.0001
Phone	2.5 (1.5)	2.4 (1.2)	2.6 (1.8)	NS

Abbreviations: NS, non-significant; SD, standard deviation.

^a 7-point Likert scale: 1 = very uncomfortable, 2 = moderately uncomfortable, 3 = slightly uncomfortable, 4 = neutral, 5 = slightly comfortable, 6 = moderately comfortable, 7 = very comfortable.

^b Statistical significance was conducted using a one-sided, Wilcoxon Rank Sum Exact test.

Table 3. Reflections on pros and cons of recruitment methods—qualitative responses.

Method	Pros	Cons
PP	<ul style="list-style-type: none"> Trusted for clicking on message/links Convenient Taken seriously Allows addressing it in their own time Less environmental impact (eg, reduced paper use) compared to mailed letter 	<ul style="list-style-type: none"> Feels like spam if too frequent Extra step to log into portal Concerns about confidentiality of medical records Challenging for those not comfortable with the technology
In-person	<ul style="list-style-type: none"> Taken seriously May include endorsement from a trusted healthcare provider Able to ask questions in the moment Convenient 	<ul style="list-style-type: none"> Can feel like a sales pitch Disruptive if done during healthcare provider's visit Makes appointment longer Healthcare provider may not have time to answer questions
Mailed letter	<ul style="list-style-type: none"> More trusted than a "random email" Physical letter serves as a good reminder Seen as credible depending on source 	<ul style="list-style-type: none"> Inconvenient to go to a computer and type in a website as the next step May question authenticity May not pay attention depending on the source May put aside to look at later and forget
Email	<ul style="list-style-type: none"> Comfortable with receiving a higher volume of email (eg, compared to phone calls) Convenient to view recruitment messages without additional steps Seen as credible depending on source 	<ul style="list-style-type: none"> May question authenticity May feel like spam Common to delete emails without reading or ignore Privacy concerns
Social media/blogs	<ul style="list-style-type: none"> Effective in conjunction with other recruitment methods (ie, increases awareness or serves as validation source) Ability to seek out info in their own time Endorsement by peers on group sites (eg, closed Facebook group) seen as particularly meaningful Seen as credible depending on source 	<ul style="list-style-type: none"> May be curious but not click May not pay attention depending on the source Targeting of advertisements raises concerns about confidentiality of health data
Phone	<ul style="list-style-type: none"> Acceptable for follow-up after initial contact via some other method, or if opted in Text messages more acceptable than phone calls 	<ul style="list-style-type: none"> Intrusive/inconvenient Feels like spam Not ideal for first contact Does not answer phone calls from unknown numbers/return calls People do not check voicemails

spammed there" (P304). Another said "I'm thinking like if [receiving PP maternal child health research invitations] is something that starts at 12 weeks, and it keeps going, then I'm going to have a problem. Because that's way too many times. . . After a while, I would treat it as spam. I would stop opening them after a while" (P402).

As with frequency of messages, a solution to research invitations being perceived as spam included the ability to opt-in to receiving recruitment notices. Other solutions revolved around being made aware ahead of time that they might receive a recruitment message through the portal, with the most preferred option being to hear about studies from their healthcare provider or affirm their healthcare provider's

approval of the study. One participant exemplified this by saying: "I know it's less likely to be spam in your MyChart, but it's still kind of random. So, unless someone sort of gives you a heads up: 'You might see this, and we've vetted it. We know who these people are,' you know, then, then I would trust it more. Otherwise, I would just delete it" (P203). Another suggestion was a button in the research invitation to "ask my doctor" about the study. Finally, participants suggested that the wording of recruitment notices and invitations could affect whether they were perceived as spam. For example, one participant said that the wording of the research-focused notification format which included "you may be eligible" sounded like junk email. Rather than language that

Table 4. Barriers and solutions to using PP for research recruitment.

Barrier	Solution
Frequency of recruitment messages	<ul style="list-style-type: none"> • Allow only targeted, condition specific recruitment • Require patient opt-in to research recruitment and/or ability to control the number of messages participants receive
Recruitment as spam	<ul style="list-style-type: none"> • Require patient opt-in to research recruitment • Only recruit for studies that their healthcare provider has approved • Use descriptive messaging about the study topic rather than generic “eligible for research” language
Confidentiality	<ul style="list-style-type: none"> • Ensure that PP is confidential • Only recruit for studies that their healthcare provider has approved

could be sent to anyone about any study, it was preferred that the research-focused notification be explicit about the topic of a study and its relevance to the recipient, as explained by a participant who said: “So, I don't know, just hearing what's in it for you or for someone else makes a difference” (P407).

Barrier—Confidentiality

Participants expressed general concerns about confidentiality related to their health and status as a pregnant woman or new mom, with one participant giving the example: “you get the [infant] formula sent to your house and you're like, ‘How did you even get my name?’” (P106). Likewise, another participant reflected on the possibility of receiving a hypothetical PP recruitment message and wondered how they would be identified to receive the message: “Well, it would mean that my information that's confidential has been shared with someone...I'd wonder how they got that information” (P307).

Ultimately, participants would want to understand how their information came to be shared with recruiters through PP to reassure them of the confidentiality of their health records. One method, as described above, would be to explicitly state recruitment messages were approved by their doctor.

Barriers associated with the different notification formats

When reacting to the 2 possible notification email formats, most participants preferred an alert of a study invitation to view in the research section of the portal over a generic alert to view the messaging section of the portal. Although participants reported they might be more likely to log into the portal from the more generic notification, they appreciated being able to decide whether they wanted to prioritize learning about a research opportunity in the moment and felt that they would be more likely to engage with the research study after viewing the invitation. One participant exemplified this response, stating:

You get a higher click through rate [with the] ambiguous one, of course. But I think what I've heard people say, and what I agree with, if I clicked on it and I'm like, “Oh, it's a

research study. It's nothing important right now.” Then I would not continue to sign up for the study. Like my brain kind of shuts off and goes “it's really not important. They just wasted my time.” Whereas this one [notification specifying a research study] I would look at it. “Okay, that's really interesting. I will leave it unread.” So then at, whatever, midnight, when I've got free time, I might click on it then. And not only is my interest piqued, but then I'm not angry that you took time out of my regular day when I didn't have time. (P203)

However, participants described that they would be unlikely to act quickly to engage with the research study after receiving the research-focused notification. In fact, the reason that participants favored the more generic notification is that they did not want to ignore studies that might be beneficial to their child. These participants recognized they might act faster with a generic alert than if they received the research-focused notification. One participant who would normally prioritize checking portal messages (including if she had received the generic notification) said that she would be unlikely to visit the portal after receiving the research-focused notification: “If it's something I don't have to do, I'm not even probably going to open it because...I might not be thinking that it's beneficial to my child or something like that” (P306). Similar to their discussion of recruitment messages as spam, participants suggested that this barrier to engagement with the research-focused notification could be addressed by including explicit language about the topic and its relevance to them or their baby.

Discussion

We evaluated which research recruitment avenues pre- and postnatal women preferred, with a focus on PP. Participants preferred PP recruitment, citing its trustworthiness, security, and convenience, as well as the autonomy it provides. While other studies have evaluated PP alongside other recruitment methods and shown that patients find it acceptable,²³ ours is the first to focus on comparison of recruitment methods in pre- and postnatal women, a hard-to-reach target for pre- and postnatal research.

Participants worried frequent unsolicited PP messages could erode trust, feel like spam, and be ignored. However, they suggested solutions including transparent communication from healthcare systems and/or providers regarding potential research messages, empowering patients to opt in/out or regulate message frequency, and crafting research messages that highlight personal relevance. Our findings align with those of another formative study in which community focus group participants highlighted similar concerns and proposed solutions to optimize acceptability of PP research recruitment aimed at transparency and giving patients control and autonomy.²⁴

These findings underscore that healthcare systems must balance leveraging PPs to broaden research outreach with respecting patient preferences. PPs research recruitment efficacy hinges on sustained engagement from prospective participants. Some health systems have proactively implemented measures in consideration of patient preferences and/or ethical guidance regarding research recruitment.²⁵ For instance, Medical University of South Carolina introduced an opt-out model for “cold contact” research recruitment, accompanied

by an informative message campaign outlining how patient records could be utilized for research purposes. Within the first 2 years, after over 4000 patients opted-out, the approach expanded researchers' potential pool of participants and was endorsed as a success by affected researchers.²⁶ Similarly, Duke Health adopted a policy restricting researchers to utilizing research-specific PP messages viewed within a section of PP dedicated to research. While recipients generally found PP recruitment messaging acceptable, they also provided feedback in line with our study, advocating for increased personal relevance, more comprehensive study details in messages and the ability to customize receipt preferences.²⁷ As more health systems adopt PP recruitment strategies, ongoing evaluation of the PP research recruitment experience is crucial. Further research is warranted to compare how acceptable and effective various recruitment approaches are, including the use of generic message notifications vs research-focused notifications.

Our study found notable differences in recruitment method preferences between pre- and postnatal women; pregnant women were significantly more comfortable with social media and email outreach. While similar differences in recruitment preferences between pre- and postnatal women have not been widely reported, one study reported differing reasons for using digital health resources during pregnancy (eg, to know what is normal during pregnancy) and the postpartum period (eg, help with breastfeeding), and found that pregnant women endorsed more reasons as "extremely important."²⁸ These findings may reflect differing priorities and needs during the prenatal and postnatal periods that are also relevant to research recruitment. For instance, pregnant women, who are anticipating significant life changes, may spend more time online in search of information and support on a broad range of topics related to pregnancy, birth, and caring for a newborn. This was the case in 1 study that reported an increase over the course of pregnancy in time spent on social media and frequency of social media use.²⁹ As such, they may be open to research outreach through digital platforms that they are already relying upon for information. Postnatal women, on the other hand, are often constrained by the immediate demands of caring for a newborn, leading them to potentially spend less time on social media and prioritize communicating with providers in-person or via PP. Our findings highlight the importance of tailoring outreach strategies to align with the unique needs and circumstances of the target populations for maternal-child health studies. For instance, while PP messaging may be equally effective for recruiting prenatal and postnatal women, digital campaigns on social media may be more effective for engaging prenatal women.

While our findings provide valuable insights into the preferences and concerns of pre- and postnatal women regarding research recruitment, it is important to consider how these results might differ in other populations. For example, our sample was predominantly White, married, highly educated, and reported high levels of comfort with technology, which are factors associated with greater use and acceptance of PP.^{12,14,30,31} Populations with lower education levels, limited digital literacy, or reduced access to healthcare technology may face additional barriers to engagement with PP and other digital recruitment methods.¹⁵ Existing research suggests that while parents' preferences for using technology for health management are independent of education and health

literacy, likelihood of using the internet for health management is higher among parents with higher health literacy.³⁰ Furthermore, individuals from underrepresented racial or ethnic groups or those with limited trust in healthcare institutions may prefer recruitment methods that involve personal outreach, community partnerships, or support from culturally aligned organizations.³² In fact, studies, including 1 reporting on prenatal women, have shown Black, Asian, and Hispanic patients to be less likely than White patients to view a PP research invitation or enroll in the study.^{33,34} Thus, studies aiming to enroll large representative samples, including for maternal-child health studies, may not be able to rely exclusively on PP recruitment. Understanding differences in engagement with health information technology are crucial to designing recruitment strategies that are equitable, culturally sensitive, and capable of addressing the needs of diverse populations.

Our study has some limitations. Namely, we relied on self-report from participants about their preferences rather than direct observation of their responses to different recruitment strategies. While we did find similar concerns and solutions reported across our 4 focus groups, it is possible that the responses we received are not comprehensive. Additionally, although the racial and ethnic makeup of our sample approximates that of North Carolina,³⁵ we recruited from a primarily urban area, and our participants were not necessarily representative of the general population in ways that have been previously noted (eg, highly educated). Future research should further explore recruitment preferences and engagement with PP recruitment among women of varying demographic, cultural, and socioeconomic groups to ensure that recruitment methods for maternal-child health studies do not inadvertently exclude underserved populations.

Conclusion

The results from our study suggest that PPs are a preferred method for research recruitment of pre- and postnatal women who represent an important target population in maternal-child health research. To maintain PP acceptability, researchers should incorporate patient preferences and regularly evaluate recruitment experiences.

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Author contributions

Sean N. Halpin (Formal analysis, Investigation, Methodology, Writing—original draft), Rebecca Wright (Project administration, Writing—original draft, Writing—review & editing), Angela Gwaltney (Conceptualization, Investigation, Data curation, Formal analysis, Writing—original draft, Writing—review & editing), Annabelle Frantz (Data curation, Project administration, Writing—review & editing), Holly Peay (Conceptualization, Methodology, Supervision, Writing—review & editing), Emily Olsson (Conceptualization, Writing—review & editing), Melissa Raspa (Conceptualization, Methodology, Supervision, Writing—review &

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Conflicts of interest

None to report.

Data availability

The datasets generated and analyzed during the study are not available due to participant privacy and ethics restrictions.

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