

Identifying preferences for mobile health applications self-monitoring and self-management: focus group findings from HIV-positive persons and young mothers

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ABSTRACT

Objective: Self-management of risk behaviors is a cornerstone of future population health interventions. Using mobile phones for routine self-monitoring and feedback is a cost-efficient strategy for self-management and ecological momentary interventions (EMI). However, mobile health applications need to be designed to be highly attractive and acceptable to a broad range of patients. To inform the design of an adaptable mobile health application we aimed to identify the thematic similarities and differences in preferences for application features by different patient groups. **Methods:** Five focus group interviews were conducted with HIV+ persons (n=29) and young mothers (n=24) to inform design of the “AndWellness” mobile EMI application. Thematic analyses were conducted on the focus group sessions’ notes and transcripts. **Results:** Both groups considered customization of reminders and prompts as necessary and goal setting, motivational messaging, problem solving, and feedback as attractive. For HIV+ participants, automated and location-based reminders for medication adherence and sharing data with healthcare providers were both acceptable and attractive features. Privacy protection and invasiveness were the primary concerns, particularly around location tracking, illegal drug use, and sexual partner information. Concerns were ameliorated by use scenario or purpose, monetary incentives, and password protection. Privacy was not a major concern to mothers who also considered passwords burdensome. Mothers’ preferences focused on customization that supports mood, exercise and eating patterns, and especially using the mobile phone camera to photograph food to increase self-accountability. **Conclusions:** Individualization emerged as the key feature and design principle to

reduce user burden and increase attractiveness and acceptability. Mobile phone EMI uniquely enables individualization, context-aware and real-time feedback, and tailored intervention delivery.

Keywords: ecological momentary intervention, mobile health, behavioral self-monitoring, self-management, HIV, young mothers.

1. Introduction

Mobile phones are already embedded deeply in our daily lives; the average American consumer uses their phone nearly three hours per day (1). The next generation of “telemedicine” tools will be mobile technologies that improve patient care (2). Ecological momentary interventions (EMI), that is, real-time and context-aware interventions that occur with minimal disruption in individuals’ daily lives, are a key innovation (3). Mobile EMI has the potential to both supplement existing clinical care, (e.g. through mobile monitoring between clinic visits), and offer behavioral self-management. While the potential impact of mobile health applications, their success is dependent on their scalability and adaptability to be acceptable and attractive to diverse patient populations and priorities. In this paper we report on findings from five focus group interviews with two groups: young mothers focused on diet, stress, and physical activity; and people living with HIV (PLH) focused on medication adherence, stress, substance use and sexual risk behaviors. The focus groups were presented with hypothetical mobile health application features and use scenarios related to EMI to seed discussion of their preferences and concerns in order to inform the design of a mobile health application platform called “AndWellness.”

1.1 Background

Healthcare costs are continuing to rise due to increasing burdens of chronic disease, which are the largest causes of death globally (4) and account for the majority of health care costs, for example, 78% of health care costs in the U.S. (5). Changing daily routines for eating, exercising,

stress, medical adherence, disease transmission risks, and alcohol, tobacco and other drug use can significantly improve health and reduce health care costs over time. Preventive behavioral interventions, based mostly on face-to-face counseling models, have had limited diffusion due to relatively high costs, logistical barriers, and high stigma associated with counseling (6). Thus, self-management or self-directed interventions are increasingly advocated to address these challenges (7). Self-management interventions have been found to have positive impacts with a wide range of behaviors and patient populations such as improved eating, physical activity, and stress management (i.e., relaxation, mood and coping) with people managing diabetes and heart disease risk (8-11) and increased stress-management behaviors and adherence to medication regimens, reduced substance use and transmission risk behaviors, and improved quality of life for patients with HIV (12, 13).

Self-management and healthy lifestyle promotion for the prevention of disease require similar cognitive processes to transform intentions into behavior: capacity for self-evaluation; self-managed action with task- and time- specific, outcome-focused goal setting; and behavioral analysis to identify triggers (antecedents) and reinforcers for desired and undesired behaviors (14, 15). Thus, self-monitoring and feedback are the two most critical components of self-management (16, 17). Mobile phones offer the potential to broadly and cheaply diffuse more intensive self-management and clinical support interventions using methods of ecological momentary assessment and intervention for self-monitoring and feedback than has been possible previously.

1.2 Literature Review of Feasibility Studies

The evidence-base on feasibility and user preferences for mobile health applications is relatively limited and nascent. Researchers have conducted out acceptability and feasibility studies for ecological momentary assessment (EMA) with personal digital assistants and mobile phones

more recently, in which users are instructed and prompted to complete several assessments a day. Reviews of the EMA literature demonstrate that electronic EMA is acceptable and feasible for a variety of populations and health domains, even for marginalized populations and those with special needs, such as the elderly, individuals of low socioeconomic status, children, drug users, and individuals suffering from psychopathology (18).

Mobile phone-based EMA studies, on the other hand have only really begun in the past few years (18) and mobile-EMI is even more innovative (3). Thus, there is not a large research literature published on user preferences for mobile EMI. Therefore, we use literature derived from pen-and-paper and pocket computer-based EMA studies, as well as several recent mobile EMA studies to identify key domains to consider when studying user preferences around mobile-EMI. Although different end user populations may have very different needs and preferences for mobile EMI support, we hypothesize that there are robust and essential features of mobile phone EMI support tools that can be tailored to design preferences across and within target populations and health domains: participation incentives, self-monitoring or survey burden, user input modality, image capture, and privacy and data security.

Incentives. Regardless of preferences, participant buy-in is a necessary first step, whether through promise of material incentives or other motivations. For example, Conner Christensen et al. (19) have successfully used monetary incentives of \$20 per week, small tokens (e.g. candy), and weekly prize drawings beyond a week to increase compliance to EMA. Beyond money and gifts, Hektner et al. (20) have found that information and feedback are also valued incentives.

Self-monitoring burden & prompt frequency. Another key concern in application design is the avoidance of participant fatigue that is more likely with frequent assessment in EMA. In their review of studies where participants were prompted from a signal such as a beeper, Reis and Gable

(21) found the average number of signals to be between 56 to 168 over one to two weeks, translating to between 4 and 24 prompts per day on average. Shiffman, Stone, and Hufford (18) found three to five assessments per day to be common across EMA studies and therefore likely to be feasible and acceptable. Yet, for some domains or populations only once daily “diary” reports are needed for effective self-monitoring or to inform subsequent EMI triggering. The length of assessment is also crucial. Hektner et al. (20) recommend an assessment that takes one to two minutes to complete, once participants are familiar with the format.

User input modalities. Text messaging, and especially multi-media messaging, has been found to be attractive to groups of mobile users (22; 23). Horvath, Beadnell, Bowen (24) found positive reactions to regular web-based diary assessment among predominately white gay men who were recruited through a chat room, reflecting their communication platform usage patterns. Wiehe et al. (25) found that adolescent women enrolled from a clinic-based setting were comfortable making diary entries on their mobile phones, but were less comfortable in using the Internet and texting functions regularly on the phone.

Cameras and image capture. Another common mobile phone feature to capture context is the camera. Visual information has been appealing to participants in some settings. For example, Martin et al. (26) found high satisfaction among participants to assess energy food intake by taking pictures of their meal selections and plate waste over a three day period.

Privacy, Data Security, & Geo-location. Privacy issues also need to be considered in the expanded and often intrusive features offered by mobile EMA, especially in marginalized or special populations. For example, in their study of adolescent women, Wiehe et al. (25) also found that few of their participants were threatened by having their location monitored through their GPS-enabled phones.

2. Methods

In 2010 we conducted focus groups with two populations of mobile phone users: People living with HIV and young mothers. The focus groups were presented with hypothetical mobile health application features and use scenarios (i.e., for research, clinical support, and self-management purposes). Focus group participants were queried by the focus group facilitator about the feasibility, acceptability, and attractiveness of potential features of the “AndWellness” mobile health application platform being developed by the authors. Questions also covered topics related to mobile phone assessment including user burden, prompts and reminders, and privacy; and to mobile phone based intervention including goal setting and motivational messaging. Thematic analyses (27) were conducted from the qualitative data that included the audiotaped recordings of the focus group interviews and extensive notes taken during the interviews by the study’s first author and research assistants. The Institutional Review Board of the University of California at Los Angeles reviewed and approved the focus group protocols.

2.1 Persons living with HIV (PLH)

Two focus groups with (n=9) and (n=20) PLH (total n=29) were conducted as part of a pilot study to inform the design of a mobile phone application to self-monitor and self-manage four inter-related health behaviors and risk factors among PLH: medication adherence, drug use, sexual behaviors, and emotional distress. The focus group participants were ethnically diverse (about one third in each ethnic group: African American, Latino, and White) and ranged in age from about 30 to 60. Most participants were men (75%) and just over half were men who have sex with men (55%). About ten percent of participants were transgender and 10% were injection drug users. The participants were economically disadvantaged food bank recipients recruited at a large AIDS service organization in Los Angeles. Given the sensitive nature of the domains of interests, the focus group

discussion was framed around participants' anticipated comfort level with reporting and sharing data and receiving feedback on the proposed mobile phone application in different use contexts: research, self-management, and clinical support and counseling (i.e., medical care, therapy, substance abuse or risk reduction counseling).

2.2 Mothers (moms)

Three focus groups with (n=6), (n=8) and (n=10) moms (total n=24) were conducted as part of a larger study to inform the design of a mobile application to study cardiovascular risk factors in moms: diet, stress, and exercise. Basic measurement parameters include participants' daily exercise routines, diet, and stress and mood levels throughout the day measured by survey; and a participant's mobility recorded continuously using our automated mobility classifier. The moms ranged in age from 18 to 35 years old, were ethnically diverse (10 Caucasian/Asian, five African American, four Latina, and five Mixed/Other) women, with about one half employed outside the house. Participants were recruited and screened from medical practices, hospitals, parks, farmers markets, churches, and other community gathering spots.

3. Results

Salient themes in the discussions varied significantly across the two user populations. PLH discussions focused on issues of privacy, purpose of application, incentives, and a reminder system to assist with medication adherence. Discussions with moms focused on features to support further user participation; they were concerned that the many benefits of the health monitoring mobile phone application not be out shadowed by the burden involved in responding to the surveys.

Despite different focal points, there was a fair degree of overlap in discussion themes, presented in Section 3.1 below. Themes that were especially relevant for PLH are presented in Section 3.2 and

for moms in Section 3.3. Table 1 summarizes the common and distinct themes emerging from the focus group discussions.

3.1 Themes relevant to PLH and moms

Prompts. Both groups agreed that three to four surveys per day were acceptable; controlling timing of surveys was attractive and necessary to all, but especially so to mothers. PLH discussions broadly noted that more frequent surveys were less acceptable, but that incentives increased acceptability of heavier survey burden (e.g., “it depends on how much you pay me”) as did potential personal benefits for some participants. In addition to frequency, the timing of survey prompts was an important consideration. PLH considered it acceptable to respond to surveys in the moment, especially given incentives and ability to customize prompts. Many moms were willing to respond in the moment, especially if it was a brief survey. Moms were also interested in some form of end of day survey: some moms wanted to report on the events of the day only at the end of day (i.e., akin to a diary and for reflection), while many wanted to respond briefly in the moment and then elaborate at the end of the day.

Reminders were important across both groups, primarily for medication adherence for PLH and general assessments for mothers. PLH discussions primarily focused on the following issues around a reminder system: 1) Reminders to take medication and refill prescriptions would help improve adherence to onerous medication regimens; a few participants already had experience with their doctors programming reminders into the mobile phone’s alarm feature or as part of an SMS system. 2) Location based triggers would make it easier for participants to remember to take medication when they were at home, which is the only time they would like to take their medication for reasons of privacy and convenience. 3) Reminders and encouragements about safe sex (e.g. condom use) would be helpful if provided prior to a potential sexual encounter but not after.

Customization of prompts and reminder schedules was considered necessary by all. This was especially true for moms, who agreed that surveys must be timed to be convenient (while researchers focused on the need to time surveys to capture specific events like eating, or regular sampling). The most common barrier listed by moms was completing surveys at an inconvenient time, especially during a stressful event, while driving, or while kids were around. Random reminders, or having to remember to complete a survey after every meal (without a reminder) were also felt to be problematic.

Goal setting, motivational messaging, and problem solving were considered attractive to both groups. The ability to set, manage, and monitor progress towards goals was an important motivation for using a mobile EMI tool. PLH found the concept of motivational messages and goal reminders to be potentially valuable to help “keep them on track” with medications, sexual risks, stress management, and substance abuse, although not all domains were applicable to all participants. Some PLH recognized the value of problem solving support as part of “keeping you on track”. Many moms said they would participate in a mobile EMI if it was part of a goal setting regimen; and wanted the progress monitoring and motivational messages to occur daily or weekly, with some divergence in opinion regarding the specific content of the messages to help them achieve a goal. Moms wanted helpful tips (e.g. recipes, “no sugar day”, alternative food options) or motivational messages possibly even in comparison to others. Support for problem solving was important for some moms, wanting questions like “Did you handle the situation to the best of your ability.” or “What could you have done differently.”

Feedback to identify anomalous behaviors and connections between behaviors was of interest to some across both groups. Interested PLH spontaneously recognized the value of self-directed reflection on summaries of data visualized by time, location, and in association with the

other domains assessed. Some moms wanted to see trends, patterns, and anomalies highlighted over time, see trends or connections across behaviors, and identify people or social contexts that trigger negative behaviors. There was a noted lack of enthusiasm for feedback in the form of data summaries, which was surprising as this tends to be the most common feature provided by data collection services (including our own). Although some PLH recognized the value of data summaries as part of an overall support program, and for self-reflection and self-awareness, they did not have strong opinions about the feedback format. Moms agreed that simple quantifications of data, without supplemental analyses to highlight trends, patterns, or anomalies, would not be that useful.

3.2 Themes especially relevant to PLH

Privacy was especially important for PLH. While some PLH understood the value of data sharing, and were willing to share data in specific instances (such as with a coach), they expressed many concerns about privacy, especially given the sensitive nature of the data being collected (including location traces, and questions regarding alcohol or illegal drug use).

Key findings regarding privacy protection features included:

1) 'Nondescript' wording of question and reminder text in case somebody was snooping on their phone use or oversaw the survey while the participant was responding.

2) Control over location tracing was considered necessary because location tracing was a controversial subject for most participants, particularly around illegal drug use and to a lesser around sexual behaviors. Acceptability was heavily dependent on the use scenario and purpose. Factors associated with acceptability of sharing sensitive data included being for research having a societal or personal benefit, the latter being study incentives. Participants recognized the potential

value and positive impact of location based prompts and reminders for clinical and self-management support while expressing concerns about privacy and intrusiveness.

3) Anonymized data for sharing was necessary to make it acceptable to share data with a counselor, coach, or medical provider; though some found it acceptable to share data even if it was not anonymized. The other factor that mediated participants comfort with sharing data was the content of the data. Participants were generally comfortable reporting and sharing medication use data. Emotional distress data sharing was acceptable if the reports were not taken out of context to result in intervention by a healthcare provider. Sexual behavior data sharing was generally acceptable but not name-based reporting of sexual partners. Data related to illegal drug use was of most concern due to potential for police intervention and incrimination by getting data off the phone. Password protections, immediate data transfer off of phone, and data encryption ameliorated privacy concerns. Moms did not specifically express concerns about privacy.

PLH discussed either *password protection* on the phone and/or password protection for accessing the application as a necessary feature due to the sensitive nature of the data that would be collected. By contrast, moms did not feel the data on diet, stress, mood, or physical activity were particularly sensitive and so did not consider password protection necessary or even beneficial. In fact, moms considered password entry upon completing each survey to be a barrier to participation.

3.3 Themes especially relevant to mothers

Image capture. The ability to capture and tag pictures of food was especially engaging for moms. Images provided accountability that could not be attained through surveys responses ('Pictures don't lie'). Almost all moms were excited or motivated by taking pictures of their food on the phone, making this a powerful tool for engagement. Images were seen to represent accountability, increasing one's adherence to a plan and to 'decrease cheating,' with mom's using

phrases like ‘The picture doesn’t lie’ to indicate the additional weight they placed on images of food as compared to surveys. Interestingly, moms did not find it acceptable to take pictures of anything else other than food. PLH had difficulty identifying the utility or value of image capture for the domains of interest, in addition to privacy concerns around sexual behavior/partners and especially substance use.

Modality to access data. Most moms felt it would be inconvenient to have to access a computer or log on to a website, and wanted all or most of their interaction to take place directly on the smartphone. Several thought they would be willing to visit a website to do one-time configuration, but after that wanted only phone interaction, and a few moms said they wanted to access a webpage monthly. Preferences for web or phone based data access varied across PLH but the overall discussion suggested that multiple ways to access data were preferred.

Light-weight ‘stress button’. The burden and potential bias in survey responses (especially if requested to answer questions about a stressful event immediately after the event) led to the suggestion made by moms for a ‘light-weight’ data collection mechanism in most of the focus groups, and eventually led us to develop the concept of a ‘stress button’. This button would be located on the phone’s main screen, and would be a light-weight mechanism to quickly record the time and location of a stressful event, but would not prompt the user for any additional information. The ‘stress button’ abstraction can be applied to other domains, and has been extremely popular and considered very attractive by end-users. Ideally the application would allow and even prompt further reflection and explanation of the event at a later time that was more convenient. This end of day reflection was especially important because moms felt that their responses might be biased if they were forced to answer a survey while they were stressed.

4. Discussion

Our collaborative inter-disciplinary team is developing an open-source mobile health platform for personal, individual-level self-monitoring and feedback around health behaviors and states that can be tailored to many health problems or domains of interest. Feasibility studies and more in depth exploration of user preferences are an essential strategy to help design broadly scalable mobile EMI platforms. As Heron and Smyth (3) note, most current evaluation of mobile-based EMI has occurred with little communication between researchers and clinicians across disciplines. This is especially problematic if mobile health applications are to be brought to scale in the healthcare field. Our inter-disciplinary team, including researchers from computer science, psychology, social and behavioral sciences, and bio-statistics, brings a unique and integrated perspective to the challenge of developing a broadly scalable and adaptable mobile EMI platform. Our work with two very different populations and domains of interest (i.e., young mothers managing weight and PLH managing medications and risk behaviors) highlights the commonalities and variations in user preferences both across and within these diverse groups.

In this paper, we address preferences that are paramount across EMA, including the incentive structure and survey fatigue. We also address issues that uniquely arise with the introduction of mobile phones, which can collect more sensitive and potentially intrusive data such as images and location, and make this data available frequently and publicly. It is important to recognize that our findings are in reference to hypothetical and early prototype design features of a mobile health application. Preferences, acceptability, and attractiveness of features could vary after a periods of actual application usage. For example, the mothers' lack of concern about password protections might change after actually using the application. Thus, we plan to follow up on moms' and PLH experiences and preferences regarding privacy and other features after they have used the applications

in our pilot studies. Nevertheless, this study provides an important step in informing the design features relevant to mobile EMI, not just features to facilitate data collection that have been the focus of most prior EMA feasibility studies.

It is also important to note that user preferences can depend on multiple sources: the characteristics of the population, the domains under study, and the framing of the focus group questions and resulting discussions. In this study, while the focus groups were conducted and analyzed by the same team and the questions regarding application features were similar, each set of focus group questions were applied to very different domains, and the resulting discussions were framed differently for different populations. Thus, the application features and preferences had different levels of salience in the focus group discussions for the two populations. Moms' questions focused on frequent monitoring of diet, stress, and exercise, and their discussions tended to center around reducing user burden and methods to help them improve these behaviors. PLH questions focused on monitoring sensitive behaviors such as illegal drug use and sexual behaviors so participant discussion centered on privacy and the associated purpose or use of the data. Privacy discussions in this population were further framed based on preferences given different use conditions, such as research, behavior change, and clinical support, and less on acceptability of feature preferences that were not salient to privacy concerns. The variations in question and discussion framing represent a limitation to direct comparisons of specific feature preferences across the two groups while also serving to highlight the importance of the different themes that emerged across and within groups.

Similar to findings from prior EMA studies, we found similar preferences for basic data entry (e.g. three to five surveys and reminders a day) to be acceptable. Another important point that has been raised by other researchers is the different incentive structures that EMI may require.

While PLH, more so than mothers, did suggest that monetary incentives were highly relevant, the additional burden introduced by the mobile phone may increase the need for stronger incentives. Discussion with both groups hinted at very viable incentive structures through the benefit of information on their behaviors and useful feedback. The daily availability of EMI (e.g., for medication reminders for PLH) may offer cost-effective incentives for long-term compliance compared to monetary incentives.

Two novel contributions from this study compared to themes represented in the current literature were the limited desire to interact with other participants and concerns about privacy. Our focus group participants expressed limited interest in interacting with other participants (although some expressed a potential interest in sharing recipes or other tips with each other). Other studies have reported participants having high interest in interacting with others, for example, in a smoking cessation program (22). This difference could be attributable to insufficient focus on behavior change in the focus groups or specificity in the questions on this topic. In addition, while privacy was a significant concern and focus for PLH in our focus groups, consisting mostly of ethnic minorities and gay men, another study of gay men who were regular Internet users were reportedly comfortable recording sexual activity on a web-based diary (28). The difference in our findings with existing literature underscores the need to conduct consumer preference studies in a specific target population early in the design process before deploying a mobile health application.

In this study, individualization and granular control over functionality (hereafter referred to as ‘customization’) emerged as the key feature and design principle to both reduce user burden and increase the attractiveness and acceptability of the mobile EMI platform. In fact, the use of a mobile phone uniquely facilitates customization of features either through manual configuration or automated learning, and is therefore an important and relevant finding for this study. Customization

of reminders, specifically their timing, was important to both groups as a key feature to reduce user burden. PLH were also interested in customized reminders, especially location based reminders for EMI delivery, such as medication reminders which triggered only when the participant is at home. Customization also spans to privacy. PLH wanted the ability to control which data was shared, with whom, and how, especially as pertaining to location data. And while PLH wanted additional security features such as passwords, moms considered frequent password entry to be unnecessary burden and a barrier to participation. Therefore, to enable broad adaptability of mobile health applications to various user preferences, such features should have the ability to activated or deactivated.

Both groups were especially interested in feedback and behavior change mechanisms (e.g. goal setting), an integral part of EMI. Customization is again critical, as preferences on content, frequency, appearance, and delivery modality varied significantly across populations. Moms considered feedback and motivational messages that would allow them a more in depth look at their daily routines to be especially attractive and engaging

The introduction of mobile phones for EMA and EMI uniquely enables customization, real-time feedback, and tailored intervention delivery, and is therefore highly attractive and engaging to participants and researchers alike. The variation in preferences, frequency, and appearance, as well as the direct requests by participants (and researchers) for granular control over functionality indicates the need for a system that supports authoring and configuration by individuals as well as researchers. We were encouraged that the issues brought up were addressable and also highlight the possibility that once participant buy in is achieved, the daily availability of EMI (e.g. for medication reminders), may offer greater potential than traditional behavioral interventions for some behaviors.

Authors contributions

NR, DS, WSC, DE, and MR contributed to the study design. NR and DS conceived the idea for the paper and conducted the focus groups. NR, DS, and WSC wrote the original draft and assisted with the literature review. DE and MR made significant comments on the draft. All authors have read and approved the final manuscript.

Conflicts of interest statement

The authors declare that they have no financial or personal relationships with people or organizations that could inappropriately influence their work.

Acknowledgements

This study was funded by NIH grant #RC1HL099556 and a pilot grant through the Center for HIV identification, Prevention, and Treatment Services (CHIPTS; #P30MH-58107). Comulada was supported by National Institutes of Mental Health grant #K01MH089270.

Table 1. Mobile phone themes and features to facilitate ecological momentary intervention that emerged during focus groups with persons living with HIV (PLH) and mothers.*

Feature	PLH (n = 29)	Mothers (n = 24)
Completing surveys during the day	Considered acceptable, given incentives and ability to customize.	Considered attractive to some, acceptable to most, especially with the ability to elaborate or reflect on events at the end of the day.

Table 1. Mobile phone themes and features to facilitate ecological momentary intervention that emerged during focus groups with persons living with HIV (PLH) and mothers.*

Feature	PLH (n = 29)	Mothers (n = 24)
Completing surveys in the moment	Considered acceptable, given incentives, ability to customize, purpose, and privacy sensitive.	Attractive to some, especially with access to a ‘button’ for quick recording of an event.
Reminders	Important for medication adherence.	Customization important, random reminders problematic
Goal setting/ monitoring	Potentially valuable for medication adherence, reducing risky sexual behavior, drug use, and stress	Opinions differed on content, some wanted in relation to food others wanted motivational messaging
Feedback	Less opinionated on format	Did not want simple data summary
Password Protection	Attractive and necessary, particularly for drug use and sexual behaviors	Not important, some considered it not attractive as they felt it increased user burden.
Image capture	Context dependent but useful tangible examples were difficult to imagine.	Attractive, as long as constrained to capture of food.
Access to data	Less opinionated	Through phone
Stress button	Not discussed	Suggested by mothers.
Peer Support	Attractive to a few.	Considered acceptable, especially with the ability to customize reminder timing.
Data sharing	Attractive to some, especially if anonymized; does depend on question content.	Attractive to some, especially with control over which data will be shared (e.g. a button at the bottom of a screen that keeps responses private).

*Themes were generally classified into one of four categories to identify ‘highest’ level of interest for each feature: attractive, acceptable, not acceptable, not important.

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