Designing Digital Safe Spaces For Peer Support and Connectivity in Patriarchal Contexts

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This paper explores the opportunities and challenges in designing peer-support mechanisms for low-income, low-literate women in Pakistan, a patriarchal and religious context where women's movements, social relations and access to digital technologies are restricted. Through a qualitative, empirical study with 21 participants we examine the cultural and patriarchal framework where shame and fear of defamation restrict the seeking of support for personal narratives around taboo subjects like abortion, sexual harassment, rape and domestic abuse. Based on our qualitative data we also conduct a second qualitative study using a technology probe with 15 low-income, low-literate women to explore the specific design of peer-support technologies for support seeking and the sharing of sensitive and taboo narratives in a deeply patriarchal society. The design concerns raised by our participants regarding privacy, anonymity and safety provide CSCW researchers with valuable guidelines about designing for social connections and support for vulnerable populations within a particular context.

CCS Concepts: • **Human-centered computing → Human computer interaction (HCI)**.

Additional Key Words and Phrases: patriarchy, IVR, mental health, women

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1 INTRODUCTION

This paper explores peer-support mechanisms for deeply taboo narratives in patriarchal and low-resource communities. Pakistan is a deeply conservative country which along with Syria places second to last in the gender gap index ranking 148 out of 149 countries in the *Global Gender Gap Index 2018* report. Women in Pakistan have few safe spaces to share traumatic experiences of abuse, rape, assault and harassment [27, 52]. Our work explores the existing social and peer support mechanisms leveraged by women in Pakistan, the challenges and barriers to the use of existing digital social technologies and alternate ways of thinking about the design of social connectivity applications which are cognizant of the constraints and context of low-literate, low-income women in Pakistan. We present a framework to navigate and design around these challenges, to allow women access to safe digital spaces in Pakistan but that has broader implications for designing for marginalized populations in general.

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Depression is one of the most significant contributors to the global burden of disease, and is the most frequently encountered women's mental health problem [69]. Cross-cultural research across different countries like the United States of America, Canada, Germany and Hong Kong, has reported that women predominate over men in lifetime prevalence rates of major depression [65, 69]. This disparity has also been found in studies in India and Pakistan [20, 39, 56–58] and major risk factors that particularly affect women include gender based violence, socioeconomic disadvantage, low income or income inequality, low or subordinate social status, and rank [69]. In Pakistan, the strongest risk factors associated with depression and anxiety in women are physical, sexual and verbal abuse [40]. In a context like this, it is increasingly vital to understand and explore mechanisms of connectivity and support for women that allow them to share their narratives and lived experiences in non-judgmental, safe spaces. Studies show that an inability to express and share negative emotions and trauma underlies many of the psychological and physical disorders people develop [16]. Similarly, studies support the idea of a direct positive impact on mental health resulting from the ability to share your story, and openly expressing unpleasant feelings often referred to as "distress disclosures" [16, 19, 74]. The sharing of stories in support groups leads to not just an emotional catharsis, but also the empathetic witnessing of injustice [37]. In general peer support has been defined by the fact that people who have faced similar experiences can better relate to, and offer more authentic empathy and validation. This is particularly true for women in patriarchal cultures that experience the same daily struggles surrounding loss of agency and empowerment.

Our work is at the intersection of CSCW and feminist HCI. We explore the existing mechanisms women leverage for support, the use of existing social media technologies and the unique challenges and constraints in access to and use of such technologies. Research that focuses on women's health, exploring the multiple unique needs associated with female bodies has become more common in Human Computer Interaction (HCI), as it becomes evident that technologies have come to play a pivotal role in women's health care [6, 22, 84, 89]. However, there still exists a vacuum in understanding the unique social connectivity, mental health and peer support needs of women who live in communities where access to mental health services are limited, where women live in joint family systems with their husband's family [35] and where there are strict restrictions on discussing issues related to depression, physical intimacy, sexual harassment, domestic violence, female intimate health, menstruation and pregnancy [20, 59]. In our work, we have aspired to take an intersectional and holistic approach [44] to both understand our target users and to design for them. Our work builds upon Kumar et al.'s [44] work to create an intersectional awareness for HCI researchers designing for women's well-being in patriarchal contexts.

Existing social media voice platforms for women have so far been unsuccessful in this specific context because of a lack of understanding of how to design specifically for women in patriarchal and religious societies. Two of the most popular voice based social platforms in India and Pakistan (Baang and Sangeet Swara) were unsuccessful in attracting female members as they both did not focus on designing for self-disclosure or advocacy from the feminist HCI framework and were severely limited in design due to a lack of participatory design processes with the target populations [86]. The fact that the most widely used voice response (IVR) [66, 72, 85] systems have abysmally low rates of female participation and that women experience harassment and abuse on those platforms is a glaring gap in prior work in this field [86]. We highlight this gap and explore the perspectives of our participants to shed light on why this might be occurring, and offer design ideas to allow women in patriarchal contexts to participate in such communities in ways that protect their identity and create safe spaces for them to engage in. It is essential that our target population self-determine the shape and form of what they perceive to be safe spaces and so we employed a technology probe

to illicit their thoughts and perceptions of a digital space for creating connections and sharing narratives.

As such, our work aims at offering a threefold contribution to the field of CSCW and its increasing interest in technology-based community building and health support. First, we provide a description of the support seeking behavior of 21 low-iterate, low-income women who live in patriarchal contexts and who have experienced mental health issues. We aim to understand and explore not just the experiences of oppression and constraint but the existing methods of coping and support in these settings and the use of existing social media technologies, if any, and the barrier to use. Second, we identify design implications for technologies that could provide social support to these women. Traditional text-based applications fit poorly into this context where the overall literacy rate is 59 percent and just 47 percent amongst women [64]. Third, to understand the possibilities of design in this context we employ a technology probe and a feminist lens [9] to explore specific features for a voice based peer-support system with 15 low-income, low-literate women. We discuss specific design guidelines originating from our participants themselves that illuminate how to approach design for women's digital social connection and peer-support in deeply patriarchal cultural situations where users are digitally literate but are not proficient in reading or writing. These design guidelines also have wider implications for women in developing and patriarchal contexts.

2 RELATED WORK

Our research connects and extends several active areas of research within HCI, including health informatics, feminist HCI, HCI for Development (HCI4D), online group dynamics, and mental health. Given these vast areas of research, we focus our related work specifically on the structures of patriarchy that directly impact a woman's support seeking behaviours, factors that affect a woman's mental health, and existing peer-support and mental health technologies. Lastly, we also discuss work that examines the use of technology for the exploration and discussion of deeply sensitive and taboo topics.

2.1 Pakistan and it's Women

Pakistan has deeply religious and patriarchal structures that constrain women's movements, social behaviours, personal relationships and health care [18, 52]. Societal attitudes and norms such as child marriages, exchange marriages, the normalization of domestic violence have played a key role in women's mental health in Pakistan [24, 61]. Intimate partner violence is prevalent and often deployed to secure male dominance within the marriage [70, 91]. A study based on a sampling of 218 women in three different hospitals in Pakistan revealed that 97% of the interviewed women had experienced either verbal abuse, physical abuse or sexual violence [80]. Another study examining psychological abuse among women in Pakistan found that of the 373 married women, 60.8% had experienced severe psychological violence and 15% reported past psychological violence. The percentage of women being subjected to psychological violence surpassed the percentage of women subjected to sexual or physical violence, and as a result, 54% of the women self reported being in a poor state of mental health [92]. None of these studies however explored the existing mechanisms that women employ to find support or seek redress. We apply a South Asian Feminism lens to our work [75], which helps us see women as actively responding to forces of oppression, rather than powerless victims, something that Western Feminism has been criticized of in its view of women of the Global South [34, 53]. Our work in particular focuses on understanding the existing support-seeking practices amongst low-literate, low-income women. Their current outlets for the sharing of deeply personal and taboo narratives, who they trust and how they create social connections in such a restrictive context. Designing in this context means being aware of

very unique constraints, and any design solutions must work within the framework of their lives. A recent study by Sultana et al. [82] highlights the need for designing within the local contexts and existing patriarchal structures. A key point their study makes is that for meaningful change to take place, technological interventions have to work around existing limitations and support mechanisms women already employ to navigate their lives.

2.2 Risk Factors in Women's Mental Health

One of the most important and consistent determinants of common mental disorders is being female, with a low-income and low socioeconomic status [13, 68]. Numerous studies have revealed that women are one-and-a-half, to two times more likely to suffer from common mental disorders (CMD) as compared with men [41–43, 47]. A 10-country World Health Organization (WHO) study that interviewed a total of 2409 women revealed that women who experience domestic violence at least once in their lifetime are more depressed, face more emotional distress and suicidal thoughts/attempts, than women who have no experience of domestic violence [21]. In Pakistan these risk factors are exacerbated due to restrictions on work outside the home, living in joint family households, relational problems with in-laws, and a high rate of intimate partner violence [51]. Similarly, the practice of dowry in Pakistan and other South Asian countries is directly linked to domestic violence, which in turn is linked to a woman's mental health [36].

2.3 Digital Technologies and Support Seeking

The use of digital technologies for the discussion and support of sensitive and taboo topics has long been a focus of the HCI and CSCW communities. A study by Birnholtz et al. [14] revealed that university students used the anonymity of Facebook Confession Boards (FCBs) to discuss and gain knowledge about taboo topics including sex, illegal substances, mental health, and bodily functions. Similarly, Andalibi et al [7] studied the use of Reddit for support seeking in stigmatized contexts like sexual-abuse. They found that users used 'throwaway' accounts to ensure greater anonymity and that those using 'throwaway' accounts were more likely to engage in seeking support than those using identified accounts. Studies exploring the use of anonymous apps versus other online social communities show that anonymous applications allow more honesty, openness, and diversity of opinion than other social media platforms [38]. However, in patriarchal contexts where there are limited avenues to seek support for online abuse and harassment, there are potential downsides to anonymity, as it can embolden online oppressors to hide behind a keyboard. A recent study found a wide prevalence of sexual harassment on anonymous social networks in Bangladesh [62]. Related work also explores the reluctance to share taboo topics online in Iraq, where users appropriate ICTs for managing other people's impression of themselves and prefer ICT where they have full control over their audience, it's perception of them and their real world identity [79]. Similarly, Evans et al. [23] analyze the perceived value and types of social support received in online discussion groups and reveal that online support forums provide women experiencing postpartum depression a safe place to connect with others, and receive information, hope, and motivation.Studies exploring the link between psychological empowerment and technologies for narrative sharing like blogging have found that personal journaling empowers users by inducing a strong sense of community [81]. One of the reasons for this is the way blogs function; they allow women to express themselves freely and in this repeated self-expression they develop a voice of their own which in turn is leads to a sense of self-efficacy and empowerment [45]. Unfortunately, there has been little focus on designing such technologies for psychological well-being and empowerment for low-literate women in patriarchal and oppressive contexts. Typically women from our target population have limited access to technologies including mobile phones and when they do have access it is shared by the entire family and there is no expectation of privacy [60, 77]. A recent study across Pakistan,

India and Bangladesh by Sambasivan et al. [75] reveals that even when women do have access to technologies they regularly experience online abuse in the form of cyber-stalking, impersonation, and personal content leakages. The resulting consequences of this abuse includes emotional harm, reputation damage, and physical and sexual violence. The harassment that is met by women on online platforms, alongside cultural factors, patriarchy, perceived futility and lack of hope, have been identified among the reasons why female social media users in Bangladesh chose not to be a part of the global MeToo movement.[54]. However, a recent study by Younas et al. [90] found that in closed, moderated, women-only Facebook-groups that permit anonymous posting of narratives, rules of patriarchy are suspended, and Pakistani women not only share stories of harassment and abuse, they also provide each other with both emotional and material support to help deal with situations of active abuse. However, the women that were surveyed for the study in Bangladesh and the women that were part of the closed Facebook-group in Pakistan, were literate and had ready access to Internet and an internet-connected device.

Lack of literacy in our context is an additional challenge technology design needs to account for. Studies on literacy and user interface design in developing regions has revealed literacy to be a multifaceted concept where functionally illiterate or semi-literate (able to read only with difficulty and effort) users are also usually numerically literate [83]. In recent years there has been an effort to create social voice-based platforms targeted to low-income, low-literate users [72, 85]. While these forums have a large number of male users and have encouraged sharing of content by men, they have failed to encourage female participation and have not been designed for specific female constraints within deeply patriarchal contexts [86]. In contrast we apply a feminist lens and engage a technology probe to enable our participants to be active contributors to design [26, 55]. Our commitment to engage in participatory design activities and focus on designing for self-disclosures is motivated by the feminist HCI framework presented by Barzdell incorporating feminist interaction design qualities such as pluralism, participation, advocacy, ecology, embodiment, and self-disclosure [10, 11].

2.4 Prior Use of Probes

Probes in the form of cultural probes [25], Mobile Probes [31] and Cognitive Probes [48] to name just a few, have been used ubiquitously within the HCI community to support participant engagement with the design process [15]. One key aspect that has been central to the adoption of probes is their flexibility for divergent uses and derivations. Technology probes in particular have been particularly influential and have been used extensively in a wide range of studies ranging from health-related technologies, technology designs to support intimate acts and using technology probes to understand how data scientists interpret machine learning models [30, 48, 87]. Typically, technology probes are low-fidelity, simple, flexible and adaptable applications designed to be used to explore usability issues, collect information and most importantly in our case to provide inspiration for and open up new design spaces. The authors of the technology probe lay out three main inter-disciplinary goals for a successful probe: understanding the needs and desires of users in a real-world setting, field-testing the technology, and inspiring users and researchers to think about new technologies [32]. Given this understanding of the value and flexibility of technology probes coupled with our digitally low-literate target population, we also choose to employ a simple technology probe to allow participants to envision what might work for them and to introduce them to the potential for design that would fit well with their world view and particularly their unique constraints.

3 METHODOLOGY

Our study comprises of two distinct phases. In phase 1 we conducted twenty one semi-structured, in-depth interviews of low-income low-literate women in a large urban city in Pakistan. Women between the ages of 18-44 were interviewed, with an average age of 35 years. Most of the participants from phase 1 were married with a median household income of 92 USD and less than 8th grade education level (Table. 1). We used the findings from Phase 1 to conduct a qualitative research activity using a technology probe with 15 low-income, low-resource women participants to design and prototype 4 distinct features for a potential interactive voice response based safe space platform. Women between the ages of 23-45 were engaged in the technology probe activity, with an average age of 29 years. Most of the participants from phase 2 were married with a median household income of 92 USD and less than 8th grade education level (Table. 2).

3.1 Participant Access and Recruitment

As part of this research, we performed a thorough ethics review and obtained an IRB to inform our methods and reporting for both phases of this study. Given that we are interested in understanding how women in Pakistan find support for distressing narratives, participant well-being was vital to our study design and we worked to shield participants from undue harm and from recalling painful memories, while also balancing our research goals of understanding participants support seeking mechanisms and access to outlets for the sharing of their traumas. To accomplish this, we conducted semi-structured interviews designed to elicit stories about their daily lives, social connections, access to new connections, access to and use of technologies, who they disclose their stories and traumas to, how these disclosures take place and if they have a feeling of connection and shared experiences within their social connections. We made sure the interviews and technology probe activities were conducted wherever was convenient for the participant (e.g., in their homes, outside in public spaces).

The inclusion criteria for both phases was for the participants to be female, 18 years or older, mobile phone user (feature or smart phone), low income (<200 USD per month income),low literate (at least numerically literate), and able and willing to give consent for participation in the activity. Access to low income and low resource community of women for both phases was facilitated through a combination of convenience and snowball sampling. One of the authors used prior personal contacts to recruit initial participants for the first study, and used snowball sampling to recruit other participants. All interactions with participants were conducted in Urdu as well as in their local language "Punjabi". Consent was obtained from all participants for both phases orally since many women were low-literate and had trouble reading and understanding a written informed consent form. We took detailed notes and audio-recorded the interviews with permission from the participants.

3.2 Qualitative Data Analysis: Phase 1

Approximately 9 hours of audio recordings and 40 pages of field notes were collected from phase 1. The interviews were transcribed and transcripts were labeled with an alias (P1, P2, etc.) and personally identifiable information within the transcripts was anonymized. Two researchers conducted each interview, one led the interview and the other took notes and asked occasional follow up questions. All interviews were led by the same female researcher.

A thematic analysis was performed on the transcribed data. The thematic analysis was conducted by two researchers separately and then the codes combined. The codes were then iteratively refined and combined under related themes like ‘existing support mechanisms’, ‘technology use’, ‘social media access’ and ‘domestic abuse’.

3.3 Technology Probe Design Sessions: Phase 2

We held one-on-one technology probe evaluation sessions between one of the authors, and 15 low-literate, low income women. Each of the fifteen sessions lasted between 15 and 25 minutes, with an average session duration of 18 minutes. Participants were given a brief introduction about the session, and oral informed consent was collected before the start of the audio recording. 9 sessions were audio-recorded while the remaining 6 participants declined consent for audio-recording. Only one of the authors (female) was present with the participant during the technology probe design session, and the data for these 6 interviews is synthesized from her notes. The recordings were stripped of any personally identifiable information, and the analysis documents was labeled with an alias for each participant.

These sessions were vital in understanding and creating a framework that would work for these women and their unique constraints. However, this was also an extremely challenging context to work in given the closed nature of these communities, the lack of trust for and fear of outsiders and the limited amount of time we were able to get with each participant given their fear of being discovered by a family member. We were also very cautious in thinking about the design of these session given the vulnerability of our target population: the participants were low-literate, low-income with low digital literacy, had suffered some form of domestic abuse, were afraid of their male family members hearing of their interaction with us and had restricted movements outside the home. In order to maximize this time and to get an understanding of their perspective we used a technology probe and used a semi-structured approach where we encouraged discussion on key features that had emerged from the Phase 1 study. We focused on three key features of a prospective interactive voice based safe-space platform for women: registration, authentication, and voice filters. These features were shortlisted from a number of IVR features because they are central to participant anonymity, privacy and safety - key requirements identified for such a service from our findings in phase 1. As Batool et al. [12] found while co-designing with community health workers in Pakistan, it becomes difficult to practice co-design and elicit meaningful dialogue with paper mock ups when users fear using technological artifacts or have a limited understanding of technology. Given that a majority of our participants in phase 1 either did not own a smartphone, were low-literate, or non tech-savvy, we use a high fidelity prototype to allow participants to envision the design space [32]. We created a functioning IVR prototype on Plivo (an existing IVR development platform) to be used as the probe [33]. The IVR prototype prompts were recorded in the voice of one of the authors, and the prompts emanated from scenarios familiar to users with any kind of customer service hot-line use experience. All of our participants for this activity who said they were familiar with an IVR service, had previously used an IVR service linked to their mobile phone service - either for talking to a customer service agent, or to check their balance, load value added services, etc. Based on this the prompts were formulated in a similar tone and language. The author called in to the Plivo IVR prototype, and played previously recorded prompts around registration, authentication, and voice filters, and used them as a means to discuss appropriateness of existing design and suggestions for future designs. Two of the authors went through the recordings from the technology probe sessions and extracted themes and key findings for the design of such a service. The findings from the technology probe activity are highlighted in phase 2 of the findings section.

4 FINDINGS PHASE 1: SEMI-STRUCTURED INTERVIEWS

Our semi-structured questions focus on understanding the existing access our participants (Table 1) have to support mechanisms, the topics and narratives they share, or do not share, the social connections they trust and the mechanisms (if any) for creating new connections. From our sample

Age (years)	18-24:5 25-34:14 35-45:2
Marital Status	Single: 4 Married: 15 Divorced: 2
Household income ($)	Min: 78 Median: 92 Max: 178
Education Level	No formal schooling: 6 Less than Primary: 3 Completed 8^{th} grade: 2 Completed 12^{th} grade: 3
Occupation	Housewives: 6 Handicraft maker: 6 Gym Janitor: 3 House Maid: 2 Security Guard: 4
Phone Ownership	Smartphones : 6 Feature phone: 9 Shared phone: 6 (3 Feature phone and 3 Smartphone)
Social Media Usage	WhatsApp : 8 Facebook: 3 Youtube: 4 WhatsApp & Facebook: 3 Non-users : 6

Table 1. Demographics of the 21 low-income, low-literate participants.

71% of the participants reported experiencing depression, 43% reported experiences of domestic violence, and 29% reported being subjected to sexual harassment. The causes for depression ranged from failed marriages, loss of reputation, domestic abuse or not having any support mechanisms in place for stressful times. The married participants all live in joint-family systems, where several family units live together in the same house. In Pakistan and in parts of India and Bangladesh, when a woman gets married, she leaves her parents house and moves in with her husband, and his family members [49], limiting her social connections. Our participants expressed fear of talking about mental health concerns and seeking help due to the negative societal perception around mental health. Our data reveals that in this cultural context, depression is not considered a legitimate health concern and it is difficult to find support for it. As one participant explained:

> *In our society, a woman seeking medical help for mental health is considered straight psychotic. Once I told my friend about my depression and she started judging me and gave advice about my love life and other matters. She suggested that if I offered regular prayers then I would be alright* - P7

In the following sections we discuss the prevalent mental health stresses our participants face, the taboo topics they can not discuss and their respective coping mechanisms and support systems.

4.0.1 Financial Issues. 12 participants complained about their husbands not taking on financial responsibility for the family where drug addiction was the main cause of their husbands apathy. As a result, the women had to search for a job and were forced to limit their children's education. Leaving such a marriage is not a realistic option for these women, as divorce is stigmatized in these circles, and children suffer as a consequence. As one participant explains:

> *If I knew before marriage that my husband is a drug addict, [I'd question] why would my parents marry me with that person? I got to know about his [drug taking] habit after I*

> *had 3 children, and at that point I was not thinking about leaving him as my children would become victims. I was helpless at that point in my life.*-P1

The culturally accepted practice to cope with this issue is to accept it as their fate, start earning themselves, or ask faith healers to pray for them.

4.0.2 Domestic Violence. 10 participants from our sample experienced domestic violence. The women cite disputes around financial responsibilities leading to physical assault. One woman further explained:

> *I am beaten by my husband because I asked him to go to work. Now I can't tell my parents because we had a love marriage [as opposed to an arranged marriage which is the local norm], so now all I can do is cry at night and have patience for the sake of my children.* -P5

For the women in our sample the only possible support system for domestic violence are immediate family members. But for fear of social humiliation and loss of family respect, the final outcome is always that the women are made to go back to abusive marriages with no outlet for emotional or mental support. As a result they choose to accept a beating instead of disrupting their parents repeatedly, especially because that they are advised to stay in their husband's house as that is their *real home.* Another participant explains further:

> *Initially, I used to tell my parents about my husband's behavior. Family elders often acted as negotiators and were helpful in settling matters. But after a few days he again starts punishing me. So, I thought I shouldn't disturb my parents as it is considered a social humiliation to stay in your parents home no matter what the reason behind it is.* -P3

4.0.3 Sexual Harassment. From our sample, 29% of the women discuss experiencing sexual harassment and reported instances such as catcalling, staring, eve teasing, and unwanted calls and messages. From these only 1 participant revealed asking her family to intervene to stop the harassment. When asked if she was aware of the formal mechanisms for reporting harassment, she explained:

> *I know the formal mechanism of reporting sexual harassment, but in our society, it is discouraged to seek help externally as it affects the family's reputation and outsiders should not intervene in these kinds of private family matters.* -P7

Family honor is a big part of life in these communities, and is often tied to the chastity of the women, and there is a risk of reported sexual harassment being tied to a woman's character or chastity. Our data shows that women prefer not to talk about their traumatic experiences of sexual harassment for fear of causing more problems for themselves, especially when their families become aware of such experiences. Invariably this leads to more mental stress and anxiety for the women. The socially accepted practice of dealing with cases of sexual harassment is to accept them as casual matters that are part of a woman's daily life and burden. One participant explains:

> *Being girls, we are taught to be silent for the fear of getting negative reputation. Once I was passing by a police van and one police officer started saying "Let's go somewhere". As a result, I quit that path because these cases mentally torture me.* -P14

4.0.4 Existing Support Structures and Relationship conflicts. The existing support structures and coping mechanisms for women in our sample relied heavily on their religious and spiritual beliefs. Pakistan is a predominantly Muslim country with Islam being the largest and the state religion of the Islamic Republic of Pakistan. One of our participants, depressed about her divorce mentioned:

> *I pray and while praying I can cry...*-P1

Another participant who was facing relationship issues was told by everyone in her social circle:

> *Pray for yourself and your children...* -P5

Participants also relied on existing social connections like siblings and friends for support seeking around non-taboo and non-sensitive subjects:

> *When I wanted to discuss the arranged marriage of my children I did not want to talk to family members...instead I prefer talking to a friend* -P8

However, our participants were reluctant to share sensitive issues with their families or their friends:

> *when I talk to my brothers about my in-laws they tell me to stay silent and pass the time* -P3

Similarly, another participant shared with us:

> *I do not share because the village people tell each other everything and my situation gets worse.* -P1

We found this reluctance to share to be particularly strong when it came to issues around female sexuality and particularly sexual harassment:

> *I can not talk to my family about harassment because I am afraid that they will not believe in me (trust me)*-P7

Similarly, 57% of our participants talked about their marital relationship conflicts and 2 of them also shared their stories of divorce and forced marriages. Respondents said sharing or learning about other people's problems helped them put their own lives in perspective and made them feel more motivated to handle their own problems. But they had difficulty in reaching women who could maintain the anonymity of their shared narratives. As one woman explains:

> *I don't share my experiences because I don't have access to like-minded people. Whenever you tell your secret to someone, even your friend, she will tell that secret to someone else, and things will get worse. -P1*

Our analysis reveals that anonymity and trust are important factors for these women in how and with whom they chose to share their stories. One woman tells us:

> *If I am very worried and anxious I will find someone who is not associated with my family and discuss my worries with them.*-P7

There are also few outlets available to women in low-income, low-literate communities that guarantee anonymity and empathetic support. The women revealed that they are unable to talk about their marital problems and conflicts with family members or people they know as these problems then become known within their social circle and lead to a loss of respect and social status for them. One woman explained:

> *There are some issues in my marital life because of which I am very worried and stressed. But I am unable to talk to anyone about them.*-P8

We find that the burden of maintaining social status, family reputation and respect further hamper a woman's ability to seek help, to share stories of her experiences and to find empathetic support for deeply personal and sentivie subjects.

4.0.5 Technology Usage. A small percentage of women from our sample share a phone with their husbands and family members (Table. 1). These women also reported that their husband was the one who kept, controlled, and primarily used the phone. The participants also had varying levels of proficiency in using phones where six participants were only able to use their phones to receive a call by pressing the green button, 12 were able to make and receive calls by themselves. Nine women

who had access to smartphones, whether individually owned or shared, were familiar with different social media apps like Facebook and WhatsApp, and some were using these apps to connect with their family and friends (Table 1). Given that most of the women in our sample are low-literate, they relied on a family member to download and install the applications on their phones. WhatsApp was only used for message forwarding and picture sharing. Facebook users liked pages related to cooking, beauty salons, online clothing, religion and entertainment. Although some participants were using social media apps (Table. 2), their perception of Facebook was not entirely positive. They believed it was fake and could only provide entertainment value. One participant explains:

> *I don't post my personal narratives on Facebook because I believe Facebook is only for entertainment.I think it's full of fake people and some people will not guide you right* -P8

One participant, who is also the only active social media user used a fake Facebook profile:

> *When I decide to post on Facebook any critical or my personal matter, I use my fake Facebook profile as I have so many family members and then people that I'm sort of in touch with. I have to always make really careful decisions about what to post from my original Facebook profile vs. what to post from fake profile* - P15

4.1 Insights and Design Implications from Phase 1

Our study points to the systematic suppression of women's voices and immense family and societal pressure to not speak out against the injustices they face in their married lives, and within society at large. We further reveal the multifaceted economic, educational and social challenges that women face along with domestic abuse, and insufficient or non-existent emotional support. Based on our interviews we explore technology designs for creating digital interventions that allow these women access to safe, anonymous, non-judgmental spaces for sharing their narratives and finding emotional support. Given that the literacy rate in Pakistan is exceptionally poor; the overall adult literacy rate is 58 percent, with literacy rate for women at 47% [63] a large percentage of the female population in Pakistan has little to no access to online social support networks. In contrast our analysis reveals that these women are not entirely *digitally* illiterate; most of them have access to a phone, while a certain percentage have access to WhatsApp (38%) and YouTube (19%). Our findings also reveal the need for anonymous, non-judgmental safe spaces to allow women to share their stories and narratives and find support. Spaces where the cultural norms, notions of family shame and family respect are suspended and these women no longer feel the intense pressure to not speak up. In the following subsections we explore possible design implications from our findings.

4.2 Interactive Voice-Based Social Media Communities

We suggest using interactive voice based forums to create digital all-women communities of similar minded peers. Voice-based applications have three main advantages over a smartphone application: firstly a voice based platform would not require women to download applications on their phones (as we've seen from our interviews women themselves do not install applications themselves) and could potentially ensure complete privacy on shared or monitored phones, secondly it would not require ownership of a smart phone and lastly it would not require literacy. Women would be given a phone number they can place a missed call on. The number would call back (immediately) and the women would have access to an interactive social network where they could leave voice messages with their stories and narratives, listen to previous messages left by other women and leave supportive replies/comments. The interaction would be based on key press (DTMF) navigation: users would listen to an audio menu and indicate their selection by pressing a digit. To ensure privacy, their voices would be modified using voice filters. Since a system like this would not need

to be downloaded onto a woman's phone, and would be speech based in the native language, it would be accessible to low-literate women.

Similar voice based systems have been used in India and Pakistan to leverage social connectivity for creating social networks, crowd-sourcing and data collection, and information dissemination [67, 71, 72]. None of these however have been designed for the specific needs of women in India or Pakistan. Baang is a voice based social networking service deployed in Pakistan that had only 31 female members compared to 376 male members. Similarly, Sangeet Swara is a voice based community forum launched in India and also had only 31 female members compared to 419 male members. In both these forums once connected, women faced harassment, abuse, threats, and systemic marginalization [86]. Both these platforms ignored the loaded patriarchal context the female users operate in, and the translation of these patriarchal structures to online communities where men tend to dominate and operate with impunity.

4.3 Privacy and Anonymity

One of the most profound design implications that has emerged from our study is the essential need for creating *women only* social support systems that allow *anonymous* posting of content for low-literate populations. Literate users around the world have access to multiple platforms for the sharing of their narratives and stories around abuse, depression and violence [7, 8]. Low-literate women in Pakistan do not have this access, are socially isolated and as participants in our interviews explained, told to stay quiet and bear the burden of being the care-takers of the family's honor and shame. It is imperative to think about designing mental health support systems that allow anonymity and complete privacy to encourage the support seeking mechanisms that women in patriarchal contexts desire.

5 FINDINGS TECHNOLOGY PROBE DESIGN SESSIONS: PHASE 2

Our technology probe sessions were designed to engage low-literate women to elicit useful design features for a social network. We were particularly interested in design of privacy and security features given the extreme sensitivity of the topics and the vulnerability of the target population as discovered in Phase 1 of the study. The key design implications from phase 1 were to create a women-only interactive voice-based social network that ensured the privacy and anonymity of the members. As a first step towards designing such a women-only digital safe-space, we needed to determine (a) how to verify the identity, and the gender of our users, (b) how to create anonymity and privacy within the platform that allowed members to have a voice, while still being able to protect their identity, and (c) how to create such features targeted to a low-literate audience. In order to answer these questions, we used a simple technology probe to allow women to envision a digital space for their narratives particularly how best to register, authenticate, and anonymize users to protect their identity. We initiated our sessions with questions about phone type and installation and use of applications that the participants were using (Table. 2). Among the 5 women who had smart phone access, only 1 (P7) downloaded and installed applications on her own. One woman installed no non-native application and the other three asked a close family relative (brother, sister and niece) to install applications for them. When asked if any of the participants had used a voice-based service before, 9 users (5 smartphone users, 4 feature phone users) said yes, and 6 (feature phone users) said no.

The following subsections present our findings for each of three key features: registration, authentication, and anonymization.

Age (years)	18-24: 3 25-34: 10 35-45: 2
Marital Status	Single:2 Married:12 Divorced:1
Household income ($)	Min:96 Average:128 Max:172
Education Level	No formal schooling:3 Less than Primary: 2 Less than Middle: 4 Completed 12^{th} grade: 2
Occupation	Housewives: 5 Seamstress: 3 Home Tuition: 2 House Maid: 4 Baby sitter: 1
Phone Ownership	Smartphones:5 Feature phone:10 Shared phone: 5 (4 Feature phone and 1 Smartphone)
Social Media Usage	WhatsApp : 4 Facebook: 1 Tiktok: 1 Youtube: 2 Use WhatsApp & Youtube: 1

Table 2. Demographics of the 15 low-income, low-literate participants for the technology probe.

5.1 Registration

All 5 smartphone users were familiar with the concept of sharing some private information for registering of an account. They had either registered for a service themselves or had a relative register them for a service. Among the 10 feature phone users, only half (5 users) were familiar with registration because of the necessity of registering their SIM card for cellular service provision.

After basic questions about familiarity with the registration process, one of the researchers called the prototype IVR service from her phone, and the service played the following prompt in Urdu, the local language:

> *For the first time in Pakistan, a unique service has been launched where women can anonymously share their problems and get feedback from each other. If you'd like to use this service, you will have to register for it. To register, press 1.*

Following this the researcher engaged the participant on what the entry to such a safe space might look like and how they would envision gaining access to such a space. 9 out of 15 (67%) of the participants said they would feel comfortable talking to a real person in order to verify their identity. The participant did not elaborate further but we would argue that this comfort with speaking to real person is a reflection of the fear or technology by digitally low-literate users coupled with the comfort of the known. One woman (P6) mentioned that she would feel comfortable talking to a real person, so long as she could ensure that the number from which the authentication call originated was authentic and linked to the service. Another participant (P2) thought that this was a great way to verify the gender of the user registering for the service, however, she felt uncomfortable sharing personal information such as location or a National Identification Card number. The concern among some participants was that the phone-based verification would happen at a later, unscheduled time and such a call would originate from a call center. This is a valid concern and fear amongst our target population given their restrictive context and the monitoring of their movements and interactions. One participant (P8) who used a shared device explained that there could be a timing

clash in terms of the call to verify identity. She elaborated, *what if someone else attended the phone when you called?* Eight out of the 15 respondents mentioned being vary of fraudulent calls where the caller asks for sensitive information such as the National ID Card, or bank pin. Two participants (P5 and P12) didn't pickup calls from random numbers, or people claiming to call from different companies, mostly because they see such calls as pointless. Most participants felt comfortable sharing their name and having their phone number recorded. 4 out of the 5 smartphone users were also comfortable with the name of their city being recorded, while the fifth smartphone user (P4) did not feel comfortable sharing any information without first getting permission from her husband.

5.2 Authentication, Privacy and User Safety

To understand the design of security features we first explored the existing pin/password protections our participants were using. All smartphone users used a lock on the home screen, three of the five used a pattern lock, while the other two used pin codes. Two out of the five did not share their password with anyone, while the remaining three had shared it with their spouse, sibling, or everyone in the household. Among the feature phone users, none of the ten participants had a password to unlock the phone. Three out of the ten users had secured their phone against accidental dialing by using a native feature to press the asterisk key after pressing the home button to unlock the phone. This is not a security feature, as the system prompts the user to press asterisk after the home button is pressed. One participant expressed that she did not know how to lock the phone, while another mentioned that her husband kept an eye on her call logs. The researcher then revisited the IVR prototype on her phone and the participants went through the registration process. In the functioning probe, the participants had to enter their phone number and a 4-digit PIN, in order to register themselves. Once the participants had walked through the process of creating a 4-digit PIN, the researcher used this experience to facilitate a dialogue about authentication and privacy.

5.2.1 Passwords: for whom, and for what? When asked if they would prefer to have a password for this service, 4 out of the 15 users said no (2 smartphone users, 2 feature phone users), with varying reasons for each type of participant. The smartphone users (P1 and P7) said no because they felt that their phones were secure as is, and one of the two participants (P1) explained that she would *place the app on a hidden folder within her phone so that no one from her family can accidentally discover it while using her phone.* On the other hand, the two feature phone users (P10 and P14) did not feel the need to secure the app. P14 said that only her kids play games on her phone while P10 mentioned that nobody uses her phone. All three smartphone users (P2, P4, and P6) among the 11 women who wanted to use a password on the service, strongly felt that they needed the password to protect their use of the service. P2 mentioned that *since the service was for women only, there should always be a password.* Six out of the 8 feature phone users who preferred to have a password for the service, also wanted it for similar reasons: to protect their use from their husband, their in-laws, and generally to protect the stories that they intended to post on the platform.

5.2.2 Dual PINs and Tiered Privacy. In order to understand the use of PINs for privacy and security we asked our participants about the possibility of using two different pins. The researcher explained the concept of two different pins, a variation on the Nirapod prototype of tiered privacy presented by Ahmed et al. [4], whereby a user can have a private PIN that she never discloses to anyone and a public PIN that she can share with someone if she is coerced or forced to do so. The public PIN, if entered, would take the user to an innocuous application, while only the private PIN would take her to her account on the service. All fifteen users understood the concept of dual pins; 7 out of 15

said they would use both pins while the remaining 8 users said they would not. P2 particularly liked the idea of 2 pins, explaining:

> *I like the idea of two PINS. That way, at least one won't come across as suspicious, especially since men in our society are very distrustful and suspicious.* - P2

When the author asked participants for reasons as to why they would not use the two PIN concept, P3 felt that she would not remember both PINs, while P8, P11, and P12 felt that they did not need two PINs because they would not disclose their PINs to anyone for any reason. P4 and P15 further went on to give an alternate design choice where P4 suggested, *don't introduce two PINs. But if anyone enters a wrong PIN, just take them to the other service*, meaning use only 1 pin for authentication, and any other sequence of numbers to direct users to an innocuous platform. P15 further elaborated:

> *Don't enforce remembering two passwords, rather give users a choice between 1 PIN and 2 PIN. That way, they can choose depending on their [household] situation.* - P15

When asked about suggestions for an innocuous application that can be played when the Public PIN (or a wrong PIN as suggested by P4) is entered, a channel about jokes, news, or music were the most popular options selected. P9 suggested playing a program about *tips for a successful married life, and the rights of the wife.* An innocuous women-only application that is unveiled through a dual-PIN could help overcome the issue of women feeling the need to disclose their PIN to their husbands in order to verify that the digital community is in fact gender-segregated.

5.2.3 Recovering Accounts. When participants were probed about account recovery options in the case of a lost password, most participants said that there should be a phone number where they can call to recover a password. When asked what information can be used to authenticate the owner of the account, 9 out of the 15 participants suggested a subset of the information collected at registration, namely name of the user, phone number, and city name. It is important to note that this information is generally known by spouses and other close family members. As Havron et al. point out, this kind of vulnerability in user authentication has been exploited by abusers in case of intimate partner violence (IPV) [29]. Three of the feature phone users (P3, P9, and P14) suggested they would share whatever information was asked from them. This is also concerning, as spouses or other abusers, could impersonate the service and exploit this trusting attitude towards a service to recover personal details and PIN codes from their partners.

5.3 Anonymity

Anonymity is a key feature for a number of online communities that discuss sensitive or taboo topics [8, 14]. While an audio-based digital safe-space overcomes the hurdle of low literacy, it makes it harder to enforce anonymity as participants leave an audio footprint when recording their messages. Applying voice filters to modify voice allows the possibility to make the modified voice unrecognizable from the original recording. In order to test the possibility of using voice filters on this platform, we used an existing voice modification app called *Voice changer with Effects.* The author recorded her own voice on the app, and used three different modifications on the app, namely: Cave (adds a bit of echo), Deep Voice (makes the voice sound robotic) and Telephone (applies a bit of noise). After playing the modified voices, the author engaged participants in a conversation around anonymity and privacy on the platform and the potential utility of such a feature.

11 out of 15 participants agreed that they found the voice modification feature useful. We received a range of responses when we asked how they would actually use the feature itself. P4 said that she would use the feature initially, but *once she developed trust in the platform, she would stop modifying [her voice].* P10 suggested that she would use the voice modification *only for serious*

posts that contained extremely sensitive content. A number of other participants said that the voice modification would make them feel more secure using the platform. However, the most interesting responses came from women who declined to use the voice modification feature. A few women explained that modifying the voice distracted from the seriousness and the emotional content of the post itself. One participant said adding voice filters made the recordings sound 'funnier' which is disturbing given the content of the posts. Similarly, P3 (a feature phone user) explained that *there is no point of changing your voice when the actual words [content] will remain the same, and the story will be recognized by close relatives anyways.* While this is an insightful observation, if the size of the platform becomes large enough, it becomes harder to tie the author of the story to the story itself - unless sensitive details such as names or locations are mentioned.

5.4 Overall Feedback

When asked if the participants had any concerns about using this service, P2 responded that she wanted to be able to limit the number of people who could listen to her recordings. She did not want anyone in her city to be able to hear her story, even if her voice was modified and wanted the possibility of having the platform make her story available only outside of her city. P11 suggested that she would not trust the service immediately, she would use the service to just observe at first, and if she felt the need to share her narrative only then would she record her story. This type of behavior is similar and analogous to posting behavior on other user generated content websites and peer-support platforms, where you are able to learn a fair bit even without having to post once. Other feedback that we received included adding an option to type in a story in case a woman felt uncomfortable recording due to being shy [P1]. When asked for the feedback on a potential *missed-call* feature where users flash the number of the service and the service calls back, P4, P6 and P7 suggested that they would much rather prefer a toll-free number to a *missed-call* feature. P8 suggested that there should be some fun, or less serious section to the service, that could *refresh these depressed women.* Lastly, two users had feedback about the prototype - make the prompts shorter, and reduce the lag between one recording and the other.

6 DISCUSSION

The aim of our work is to explore the existing peer support mechanisms low-literate women in patriarchal and resource constrained contexts access to share their narratives around taboo subjects like marital rape, domestic abuse and sexual harassment. Our work provides some key insights into the mental health problems that women in patriarchal contexts face and how to potentially design for a creating support networks within this context. Particularly because Pakistan is a context where self-disclosures and the sharing of taboo narratives around abuse are discouraged and associated with a loss of 'respect' and social stigma [2]. Our findings reveal the isolation women in this context feel, the silence they are expected to maintain about their experiences around harassment and violence and the lack of outlets they have access to for sharing their stories. It is then no surprise that 71% of the women in our sample reported experiencing depression. In contrast literate women in Pakistan have access to and use closed, women-only Facebook groups (some with a membership of over 144,000 women) for this catharsis, emotional peer-support, having their narratives witnessed and a feeling of being heard and belonging [1]. The women we studied in both our interviews and technology probe activities want to have access to similar safe, non-judgmental spaces to share their narratives but fear the lack of privacy and anonymity. In this section we outline our main findings and highlight specific design recommendations based on our technology probe activity for creating safe non-judgmental voice based forums for women.

6.1 Designing within a Patriarchy: Connectedness

Sulatana et al. [82] in their study present a framework for designing within patriarchal contexts by empowering within, enabling the tactics women already employ and designing beyond the users to include people around them. We expand this framework to include an understanding of designing for connectedness within patriarchal contexts like Pakistan. There is little we as designers can do in terms of concrete solutions to the systematic abuse and trauma these women experience. We can however design for connectedness to include those vulnerable populations that are not literate, do not have access to smartphones or to Facebook, Reddit, Instagram or other social media platforms for sensitive discussions and disclosures. We argue that designing for connectedness helps empower women in patriarchal contexts by giving them access to spaces to share their narratives, belong to a larger non-judgmental community of peers, find emotional support and a collective voice thereby empowering them in the process [93]. Designing for connectedness is also supported by the psychological component of the Empowerment in HCI framework presented by Schneider et al. [78], where they suggest a system focusing on (a) *knowing* connecting users to new information, (b) *feeling* providing positive feedback to improve the users self-esteem, and (c) *doing* providing action opportunities they would not have without technology. Our work particularly focuses on the feeling component of empowerment within this framework where access to a safe, non-judgmental space would allow women to feel safe to not only narrate their own experiences and discuss their concerns but also experience other women's lives and stories with the opportunity to contribute.

Connectedness as a design choice is not restricted only to social voice based platforms but all applications looking to design for vulnerable,isolated populations. We reveal that a large percentage of women in this context rely on family members to download and install applications for them. This also points to opportunities to provide "backdoor" features in other applications to support connectedness. For example a health application for women within such a context should include features that allow low-income, low-literate women to be able to connect to other women for health related discussions. Similarly an application for encouraging women micro-entrepreneurs should also think about features for supporting 'connectedness' within the community of women.

Our qualitative study using a technology probe for understanding the features for a voice based platform that supports connectedness had to be modified from traditional PD practices given our context. Women in Pakistan are difficult to separate from their husbands or in-laws for an extended period of time, have a limited amount of time to spare given their household responsibilities and can not be engaged in longer, playful or exploratory PD sessions. In keeping with one of the key elements of feminist HCI to support participation from particularly marginalized users, we used a functioning IVR prototype as a technology probe, and kept the duration of these qualitative research sessions shorter (average duration: 18 minutes) than traditional PD sessions. We found a functional prototype extremely useful in interacting with our participants: it allowed us get to the point quickly as we tried to explain the utility of a prospective digital safe-space community, while also allowing digitally non-literate participants to comprehend how such a service would work. These sessions were extremely valuable in eliciting specific design recommendations that fit with the specific context of the participants. We elaborate on these guidelines below.

6.1.1 Registration:Women-Only. Currently, no voice-based social platform deployed in low-resource, low-literate settings requires registering with the network. All are open systems that allow anyone and everyone to listen to, create, comment on and share posts [72, 73, 85]. Based on our interviews and PD activity, we propose an initial registration before membership to the platform to ensure a closed system. We prototype and test 3 different options for registration with our participants (manual call from a real person, call-back to a missed call from the system, directly calling the system), and the most appropriate was directly allowing women to call the system to record name, city

and to determine the gender of the caller. Women were uncomfortable with the missed-call-back paradigm because most of them had access to shared phone and did not want their husbands to receive the call back. Previous work on IVR systems suggest that although natural language processing techniques would allow the filtering of male posts to create a women-only platform, the problem of passive male listeners is a more challenging one [86]. We believe based on our design activities that including an initial registration would also to a large extent exclude the passive male listener since every member of the platform would first need to be registered. Once the registration process is complete the platform will allow members to create a 4-digit pin.

6.1.2 Privacy: Two Pin System. Privacy is an extremely important aspect for the design of a platform that deals with sensitive subjects and self-disclosures in a vulnerable population. The use of an IVR platform as opposed to an application has the unique advantage of leaving no trace on the phone. Just a dialled number which can be deleted. Our technology probe activity further reveals the two pin system, suggested by our participants themselves, where one is an actual self decided pin and the second is any sequence of numbers other than the decided pin, as one effective way to ensure privacy even in a scenario where a PIN might be coerced; any incorrect sequence of numbers would lead to an innocuous platform for jokes or the weather. This mechanism is grounded in the study presented by Mathews et al. [50] who explore the privacy needs of survivors of intimate partner violence and who suggest that although survivors benefit from access to technologies to maintain communication with their support network they face high levels of stress and risk, which makes it harder for them to handle and manage complicated interfaces and privacy mechanisms. Our two-pin mechanism where one is a self-determined pin and the other any random sequence of numbers which leads to an actual innocuous interface is designed to be simple and intuitive without the added effort of needing to remember two distinct sequences. Although there were some participants who were not entirely comfortable with the pin system, the majority of our participants were familiar with using such a system for security and for maintaining some level of privacy. Also based on the framework presented by Mathews et al.,[50] our system will also prompt users after every post to delete the dialled number from their caller list including instructions on how to do so. Given the importance of providing users control over their own privacy and content [17], an important aspect of the IVR interface would be to allow women to self determine the duration their narratives are stored for and the control over deleting all or specific stored narratives.

6.1.3 Anonymity: Geographic isolation. Previous work has explored the importance of anonymity for self-disclosures and discussions around sensitive topics [8, 14, 46]. However there has been little to no conversation about how to ensure anonymity when designing voice based platforms for low-literate and vulnerable populations. A few key insights have emerged from our work. Firstly, to ensure anonymity with sensitive disclosures voice filters although a viable option is not always preferred by the users as they detract from the seriousness of the narrative and strip it of it's emotional valence. Voice filtering is also suggested by other IVR social platforms as a potential feature to encourage female participation [86], but we find women would not be comfortable using voice filters in this context. Secondly, for narratives on taboo topics, the option to separate the geographic availability of the post from the city of the poster (user) is suggested as a viable means to ensure anonymity and protection from relatives, neighbours and the social circle of the user. Given the target population of low-literate users it is also important to ensure that the users receive regular prompts before and after each post to remind them of not sharing identifiable information including their neighborhoods, cities or real names.

6.2 Designing within a Patriarchy: Privacy and Trust

One main challenge revealed by our work has been the complexities of designing for privacy for women in a patriarchal context where phones and devices are shared. Previous approaches to navigating privacy on shared phones like using secret password protected accounts for pictures are unsuited to our target population who, during the technology probe activities, were reluctant to engage with a system that required them to remember two passwords [5]. Additionally, the operations of the system proposed by Ahmed et al. require a smartphone and a certain level of digital competency (moving photos from the native gallery application to the proposed app, moving photos into the shared account or the secret account) which our target population lacks. Tied to the issue of privacy is the issue of trust in the system. This is particularly important for social support systems that record and store sensitive narratives. For any implemented privacy features and measures to be effective there has to be trust in the promise of privacy and anonymity made by the system itself. There has been a recent shift within the CSCW community to understand the unique privacy challenges of the non-western world [28, 76, 88]. However, little work has focused on the presenting viable solutions to the design of social support and networking sites for low-literate women based on an understanding of their constraints and the importance of how privacy and anonymity functions in this context. The guidelines we present here are grounded in the framework presented by Ahmed et al. [3] who advocate for the use of 'secret' or hidden accounts but we expand this to move beyond 'accounts' with multiple pins, which our data reveals to be problematic, to explore the use of voice based systems that do no require a physical account on the phone and leaves no physical data on the phone.

7 LIMITATIONS

Given the highly fraught and complex landscape we are designing for there are certain limitations to our proposed guidelines. One of the most challenging limitations to the design of such a system is keeping it completely closed and women-only. It is inevitable that some women will include their husbands or give out their pin's. This is similar to fake profiles created by users to gain access to closed female only Facebook groups. The impact of this can be mitigated by ensuring the anonymity of users and also making sure users are aware of the potential risks and able to make an educated decision if the risk is worth the benefit of participation in such a group. In our future work, we plan to engage trans, non-binary and gender non-conforming individuals to understand their perspectives of being part of digital safe-spaces, and identify approaches that are acceptable to these communities. Another concern for us is the understanding of privacy among low-literate users and the storing of sensitive narratives. This is an area we plan to further explore but our current work moves us towards possible solutions to creating inclusive systems for connectivity for low-literate women in patriarchal contexts.

8 CONCLUSION

This paper unpacks opportunities and challenges for designing technologies that support women's mental health seeking behaviors in low-literate populations in Pakistan. Our field study reveals systemic challenges women face while discussing and seeking support for deeply traumatic narratives considered taboo in Pakistani society. We expand existing CSCW knowledge on designing within a patriarchy to include 'connectedness' and present specific and tested design guidelines for privacy, anonymity and safety in designing for connectedness.

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