Community Ment Health J (2018) 54:171–179
DOI 10.1007/s10597-017-0094-y

ORIGINAL PAPER

'I Got it off my Chest': An Examination of how Research Participation Improved the Mental Health of Women Engaging in Transactional Sex

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Received: 20 September 2016 / Accepted: 9 January 2017 / Published online: 2 February 2017

Abstract Ecologic momentary assessment (EMA) is a form of close-ended diary writing. While it has been shown that participating in a study that incorporates EMA improves mental health of participants, no study to date has examined the pathways through which benefits may occur. For 4-weeks, twice-daily EMAs and weekly interviews captured mood, daily activities and HIV risk behavior of 25 women who engage in transactional sex. Qualitative analysis of exit interviews was performed to examine how participation impacted women's mental health. The majority of participants felt that EMAs heightened awareness of emotions and behavior. Most reported experiencing catharsis from the interviews; specifically, from having a non-judgmental, trusting listener. Participants felt responsible for completing tasks, a sense of accomplishment for completing the study, and altruism. This study demonstrates there are direct benefits associated with participation in an EMA and interview study.

Keywords Mental health · Electronic diaries · Sex workers · Catharsis · Ethics

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Introduction

High rates of psychological distress (el-Bassel et al. 1997), depression (Alegría et al. 1994; Surrat et al. 2005) and anxiety (Surrat et al. 2005) have been reported by women who engage in transactional sex, defined as the exchange of favors, gifts or money for sexual activity (Choudhry et al. 2015). One study examining differences between female drug users who engaged in sex work versus those who did not found that sex workers were significantly more likely to meet criteria for current depression than non sex workers (Gilchrist et al. 2005). Surratt et al. reported that 37.4% of street-based female sex workers in Miami, Florida were classified with moderate or severe anxiety, and over half had symptoms of moderate or severe depression (Surrat et al. 2005). Decreases in mental health status have been associated with sexual and drug-use risk behaviors, leading to an increase in susceptibility to sexually transmitted infections (STIs) (Kalichman et al. 1994; Khan et al. 2009; Latkin and Mandell 1993; Lehrer et al. 2006). Consequently, women who engage in transactional sex are at increased risk for acquiring HIV and other STIs (Prüss-Ustün et al. 2013); it is estimated that HIV among sex workers worldwide is 12 times greater than the general female population (UNAIDS 2009).

While programs to improve mental health among women who engage in transactional sex are needed, there may be ways that participation in health research confers similar benefits (Gunn et al. 2015). Taking part in in-depth interviews and discussing life experiences has been shown to increase self-awareness and empowerment even when the research was not designed to be therapeutic (Campbell et al. 2004; Hutchsinson et al. 1994; Kurtz et al. 2013). Diary-keeping has been shown to increase self-reflection, resulting in heightened self-awareness across persons from

diverse social classes and racial/ethnic groups (Lyubomirsky et al. 2006; Pennebaker and Graybeal 2001). When used as a data collection tool, diary-keeping has been shown to increase self-reflection and promote healthy behaviors among participants (Stopka et al. 2004). Stopka et al. (2004) found that injection drug users who wrote in diaries for 5–7 days about their injection use events expressed desire to quit using drugs (Stopka et al. 2004). While the study was not designed to be therapeutic, three out of 28 participants in their study enrolled in a drug treatment program during or shortly after the study.

Electronic diaries are one variation of ecological momentary assessment (EMA), a research method that measures specific phenomena of interest (i.e., substance abuse relapse or condom use) in close approximation to when it occurred while subjects go about their daily lives (Shiffman and Stone 1998). The typical EMA study collects data about subjects' mental states and behaviors either at random times throughout the day or at specific intervals (i.e., each morning and night) throughout the study's duration. EMA is particularly well suited for studying highly contextual behavior because it allows researchers to measure transient states such as mood, intoxication, or geospatial locations that impact how individuals interact with others or their environment. (Shiffman 2009; Shrier et al. 2007; Dawson et al. 2008). While it has long been known that diary writing as a data collection method may increase self-reflection (Stopka et al. 2004), recent data suggests participating in a study that incorporates EMA may have direct benefits for participants, including, as an example, improved participant mental health (Gunn et al. 2015). While the field of EMA is burgeoning, few studies have been designed to assess the impact of EMA on participants and no study to date has examined the pathways through which these benefits may occur.

In our recent longitudinal study of women engaging in transactional sex work, participants disclosed information about their behavior and emotions surrounding sexual events twice daily via electronic diaries, and participated in in-depth interviews weekly (Roth et al. 2014). While this was not a therapeutic study, self-esteem improved significantly overall, and for particularly vulnerable women (e.g. less educated, histories of abuse, younger initiation of sex work) participation resulted in decreased depression and anxiety scores using previously validated mental health measures (Gunn et al. 2015).

The current study seeks to understand previous work by qualitatively exploring the pathways through which participating in a study that incorporated both EMA and weekly in-person interviews facilitated positive mental health outcomes for participants. Furthermore, the study sought to tease apart how two methods (daily EMAs and qualitative interviews) work in distinct ways. Research questions included, "How did repeated assessment of behavior and metal states via EMA result in psychological benefits for participants?" and "How did the qualitative interviews, in addition to EMA, confer psychologic benefits to participants?".

Methods

Data for this study were taken from the *Urban Women's Health Study*, a longitudinal study of the sexual lives of women engaging in transactional sex in Indianapolis, Indiana (Roth et al. 2014). Data were collected from May to August of 2012. In total, 25 women were enrolled in and completed the study. They were (1) at least 18 years of age; who (2) reported engaging in sex in exchange for drugs, money or items of daily living within the preceding 90 days; and (3) capable of safely storing and charging a cell phone regardless of their housing situation. Participants were recruited by targeted outreach, venue-based recruitment, and incentivized snowball sampling.

Over 4-weeks participants disclosed information about their lives (i.e., mood, alcohol/drug craving and use, and the occurrence of any partnered sexual interaction) twice daily via a closed-ended electronic diary completed on a study-provided cell phone. Specific prompts assessed HIV risk behavior such as the occurrence of any partnered sexual interaction including partner/relationship characteristics, condom use, and the location of the sexual event (Roth et al. 2014). When no sexual activity was reported, participants completed additional questions about daily activities to minimize differences in diary completion time based upon responses. Participants were allowed up to 240 min to complete diary entries, and mean time to completion was 19.6 min for those reporting sexual behavior, and 11.3 min for diaries containing no sexual behavior data (Roth et al. 2014). In addition, the research team (AMR and JKLG) was available daily to provide technical assistance and troubleshooting about the submission of the electronic cell phone diaries.

Participants also completed weekly face-to face interviews that lasted approximately 60 min with a female public health researcher that explored the participants' cell phone diary responses (AMR and JKLG). The researchers had completed extensive training in qualitative interviewing as well as human subjects considerations for working with vulnerable populations. Participants underwent four interviews total; the first three focused on understanding the geographic context of participants' sexual lives (i.e., where sexual events occurred from, such as a bar, park, car, hotel, private home) and their decision-making processes about where sexual events occurred and how this impacted HIV risk behavior

such as condom use. The final interview included questions to understand the participation experience. Questions about the research experience include: *Tell me about how being involved in the Urban Women's Health Study affected your relationships with other people; tell me a little bit about what it was like to complete the daily surveys; tell me about your experience with the weekly interviews; and Pretend I was a friend of yours. What would you tell me about the Urban Women's Health Study?*

Interviews were conducted in a private room at community based organizations, public libraries, an HIV prevention organization, a public health clinic, and a local community court. Participants were compensated up to $145 in honorarium for the aspects of the study we describe here: $0.75 for each diary they completed (up to $45), $20 for each weekly interview (up to $100). Further, they were provided with an internet-enabled smartphone to use during the study and to keep after the study ended. During the study period, participants had access to unlimited data, and domestic calls/texts. Phone service beyond the study period could be obtained at their own cost. Due to prostitution and drug use being illegal in the study setting, the investigators obtained a Certificate of Confidentiality (CoC) from the National Institutes of Health (NIH 2016). CoCs allow researchers to refuse to disclose names or other identifying characteristics of research subjects in response to legal demands.

For the present study, participant characteristics were obtained from a baseline survey. These data include age, race, history of transactional sex, substance use, history of arrest, social support, self-esteem, depression and anxiety. Information regarding the participant experience was obtained from the exit interviews.

Data analysis included thoroughly reading transcripts to obtain an overall perception of the data. Next, we created a coding framework, focused on understanding the process of benefiting from research participation, which consisted of *a priori* codes corresponding to domains in the interview guide, and "emergent codes," that reflected unanticipated themes from the interviews. Then, we applied the codes to the data and in subsequent readings of the text, we grouped codes into themes with sub-themes. In the final phase of analysis, exemplars of each theme were selected, participants' ID numbers were changed to self-selected pseudonyms, and a theoretical framework for understanding the participation experience was developed. Two researchers (MF and AMR) discussed findings at each phase of analysis and discussed any differences of opinion in the application of the codes or the coding process. All authors certify responsibility for the manuscript and that there are no known conflicts of interest. This study was approved by the Indiana University Institutional Review Board and all participants provided written informed consent.

Results

Participant Characteristics

Participants (n = 25) were primarily Black (75%) with a median age of 42.5 years. In the 90 days preceding enrollment, 58% of women engaged in transactional sex at least once a week. Substance abuse was prevalent; 25% of the sample consumed four or more alcoholic drinks per day; 25% also used marijuana daily; and 42% used cocaine weekly. Forty-two percent initiated sex work before age 18, and 37% of participants reported receiving little social support from family or friends, as measured using the 12-item Multidimensional Scale of Perceived Social Support (Zimmet et al. 1990), where social support scores in the bottom quartile were considered low.

Based on our analysis, we identified three overall aspects of the participation experience, common across participants, that contributed to positive mental health changes among participants (see Fig. 1). These are increasing self-awareness, experiencing catharsis, and feeling responsible, which are represented within the circles of Fig. 1. Each aspect of participation was informed by one or more intra- or interpersonal processes represented by the rectangles. Each of these domains and related processes are described in the following sections.

Self-Awareness

Participants reported that the twice daily electronic diaries increased self-reflection, which heightened self-awareness. For some, self-awareness led to intention to change behavior and, for others, increased self-awareness led to actual behavior change including engagement in more health-promoting behaviors.

Self-Reflection

The majority of participants reported that completing the twice daily diaries caused them to reflect on their emotions, drug use, daily activities and sexual behavior. Self-reflection thereby heightened their sense of self-awareness. For many, being in touch with their feelings and behavior on a daily basis was a benefit of being in the study. Diana stated, "*The experience has been rewarding, it was enlightening. I appreciated it. It gave me the opportunity to pay closer attention to my behavior… I've been more in touch with my feelings over the last month than I probably ever been*." For some participants, this was their first experience devoting time to really think about their life experiences. Julie reflects, "*[The daily*

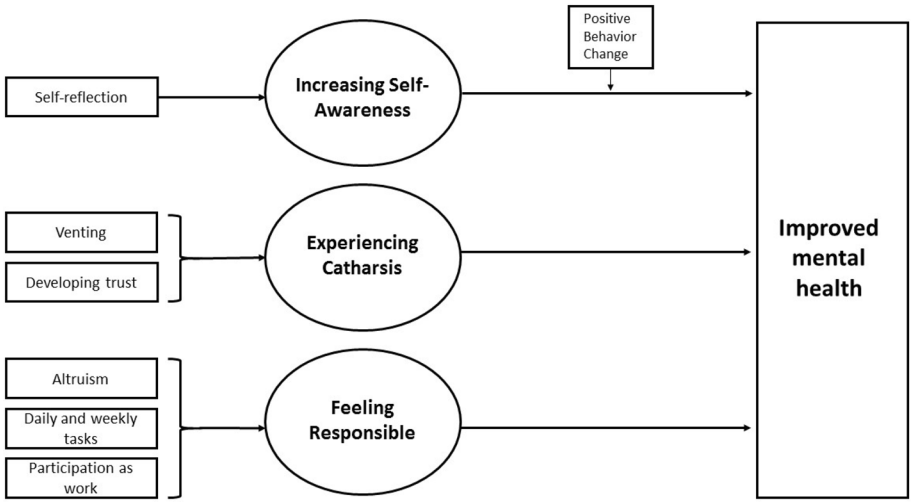

Fig. 1 Aspects of the participation experience contributing to improved mental health

diaries] made me really have to think, 'cuz I never thought about it before…'Well, how do I get my money in order to survive?' Or it made me think about what I'm doin' or not doin' to have the funds in order to survive, and other stuff that might be more beneficial for me."

Behavior Change

For nearly half of the participants, their increased self-awareness became a cue to action that resulted in actual behavior change or increased intention to change behavior. Actual behavior change came in many forms, such as decreasing commercial sex work, remaining sober, "weeding out" people in their social network who they viewed as negative, and consistently purchasing condoms. Ruth describes her experience of behavior change: "*[Reflecting on my experiences] was motivation for me. I wasn't trying to purposely change while I was doing the study, but it happened. I haven't been engaging in commercial sex work. It sort of was like an inspiration to get me to look at some things and ask where was my mindset at*."

For others, the increased self-awareness increased intention to change behavior. Sissy describes, "*Having to do this survey on a daily basis made me stay in tune of the emotions I'm really going through… and let me know that I need to get my butt back into the mental health system so nothing really bad happens. Because I do have mental issues that I'm not addressing and that could be detrimental to me*."

In sum, daily reflection, vís-a vís the daily EMAs, positively influenced participants in this study. Increased awareness of their mental states, daily activities and social influences led to reduction in perceived negative behaviors or a desire to reduce these behaviors.

Catharsis

Participants primarily reported experiencing catharsis as a result of the weekly in person interviews. Two aspects of the interview experience facilitated catharsis. These included the ability to vent their feelings, often for the first time, and developing a trusting relationship with the research staff.

Venting

In the weekly interviews, participants described that they were able to verbally express their thoughts and feelings that they had previously kept secret because of the stigma associated with transactional sex. Having someone to talk to made participants feel unburdened. Tracy said, "*[Talking about my experiences] was something that I needed to go through. [I had] some things that I needed to vent and get off my chest. Some things that I had been holding in. Whether you understood I or not, I said it to another human being. In other words, I got it off my chest*."

For some, this was the first time participants were able to vent and talk about troubling experiences and emotions. For many of these participants, they disclosed aspects of their intimate lives they felt they would never be able to tell friends or family. Some participants commented that they do not have people in their lives who they can trust with their personal information. Nita remarked, "*The stuff I tell you I ain't never gonna tell [anyone else]. I ain't got to worry about you judging me. Just by comin' to talk to you every week is big. I leave here it's just like I ain't got to think about it no more. I feel relieved. Instead of holdin' it inside, it's like damn, I just got it out*."

Furthermore, participants were able to reach the interviewer by telephone throughout the day/evening to discuss technical difficulties with completing daily EMAs.

Some participants used the opportunity to vent to the interviewer outside of the weekly interviews. Happy describes how much the 24/7 interviewer availability meant to her, "*I enjoyed talking to you…Like I told you on the phone, I just really needed to hear your voice because I was going through something…Please keep doing what you are doing because you are really doing a divine purpose."*

Developing Trust

Many participants described that they were able to trust the interviewer, and that feeling listened to and not being judged fostered a trusting relationship that made participants feel comfortable with sharing their personal stories.

Feeling listened to helped participants trust the interviewer. Nita states, "*The biggest thing [that helped me trust you] is that you actually listened. Sometimes I go on about a certain conversation too long, but you never cut me off. You let me get it out. That's what made me trust you*."

One way that the participants felt listened to was when the interviewer emotionally reacted to what she heard. For example, Bodytalk describes:

> *I don't know if I would have trusted [you] if it had been somebody else that was just here doing their job. It's like you were understanding and a couple times, I seen you tear up when I was telling you about my life so that made me feel like you care about what you are doing. That made me trust you because you're not here just 'cuz you getting paid. It's like you really care about what's going on out here and you trying to help people and that's why I trust you…With this type of stuff, you can't be just professional, you have to be a little compassionate*.

Participants also valued that the interviewer did not make them feel judged. Not feeling judged made it easier to recall and discuss difficult feelings and experiences. Leza describes how the interviewer acted to make her feel not judged, *"I know you don't judge me because you engage in the conversation. You don't just sit back there typing, like, 'I'm not really interested and I want to get this over with.' You engage. You smile. You do eye contact. It just makes me feel more comfortable, and…it makes me think, 'I'm gonna bring it.'"*

By trusting the interviewer and being able to vent, many participants perceived the weekly interviews to be like a mental therapy session. Tina remarked, *"I used [the weekly interviews] as a therapy session. I have a lot of trust issues with people, but I feel like I could talk to you. I really don't like to tell people my business… but I just feel like I could talk to you...I feel like you are counseling me."* When asked how she described the study to her friends, Girly replied, *"I call you the counselor to people I talk to. I say, 'I'm going to see the counselor once a week.'"* Sissy points to the multiple perceived roles of the interviewer as an interviewer, friend and counselor when she says, "*I know that you're not a counselor, but you've always listened and not judged. I don't feel like you've judged me at all, and that's hard to find. It's hard to find a friend like that. It's hard to find a counselor like that. You'd make a wonderful counselor, you really would*."

In addition to helping participants open up to the interviewer, having a trusting relationship with the interviewer also may have assuaged any privacy concerns prominent in most technologically-based data collection methods. In this study, most participants were not concerned that the sensitive information that they shared would be used inappropriately. While a few participants mentioned that a sense of security came from informed consent documents or the belief that the data was safely stored, the majority of participants felt that their information was secure because of their personal trust with the interviewer. When asked if she worried about her information being used inappropriately, Pretty-Kitty said, "*No, because I think if it was gonna be like that, I think you would have told me, you know? Cuz, I thought you was always honest with me. And I trusted you*."

Being Responsible

Participating in research fostered a deep sense of pride for being responsible. This sense of pride stemmed both from feeling that their participation would help others (altruism) and completing daily and weekly tasks as assigned (aka meeting deadlines) which women often likened to feeling employed or "working a program".

Altruism

Participants felt that by sharing their expertise via daily diaries and weekly interviews, they would be helping women in their community. Pandora stated, "*Answering [daily diary] questions, it made the think that it's going to help somebody. I had a part of it, and that makes me feel good. I'm all about not just helping myself but helping others who came from, or who still are in the midst of, where I've been*. Julie described how her participation might result in programs or services women need saying, "*I like that [the daily diaries] are getting a feel for women and how they live so that [the researchers] can help them. Hopefully down the road, they can help them with clinics or whatever else they might need out there."* Finally, for some, their contribution reminded them of the person they are when they are not using drugs/alcohol. Girly stated "*If I can help anybody, I would love to help them. If me being in your study helps another addict or helps another prostitute,*

I would love to do that. That's what I do. When I'm clean and sober, I help people as much as I possibly can."

Participants felt that by sharing their information, they were helping the research team, who they had grown to appreciate and respect. Participants' trust that the research team would use findings to create programs that benefit women furthered their desire to contribute. Gina described, "*I liked doing the surveys because I feel like I can be an asset to [the study*.]" and Karen asserts, "*One way or another, hopefully I can help your program more*."

In this way, being altruistic and feeling like they were helping others made the participants feel good about themselves for their contribution to the study, to science and to the wellbeing of other women.

Daily and Weekly Tasks

Participants enjoyed being assigned daily and weekly tasks and reported feeling proud of their ability to be responsible and accountable. Pretty-Kitty, in response to being asked why she liked being a participant, stated:

> *I liked [being a participant] because I was just from incarceration in March and I don't really have any responsibilities right now. It made me feel like I have a responsibility to do this at a certain time, be at a certain place to meet you at a certain time…it just made me feel a little bit responsible because I don't have anybody in my life to be responsible for.*

Many participants found the study questions to be interesting, amusing, and positive activities to keep them busy when they were bored. Leza describes how she finds the participation experience entertaining, "*It's amusing. It's also interesting because it makes me stop and think, wow, about some of the questions that it asks. It makes you think. That's all I'm trying to say, it makes you think."* For some participants, being involved in the research gave them something positive to do when they were bored. Jordan states, *"[Being involved in the project] was kind of cool. I mean, if you ain't got nothing else to do, why not? It gives you something to do instead of doing nothing and being bored, or going out there, trying to get in trouble*."

For some, doing the weekly interviews was seen as a motivating factor to engage in general life activities which may have been particularly important for those with depression (n = 17/25). Perry reports, "*[Doing the weekly interviews] gave me a reason to get up, put some clothes on, take a bath and put on a dress. Other than Sundays, it's the only reason I put clothes on."* Similarly, Karen describes her participation experience, *"It's been cool, it's been discipline for me. I have something to look forward to, and it's been bringing me out of my stupor."*

In addition to enjoying the assigned tasks and responsibilities, participants indicated feeling a sense of accomplishment for completing them. Gina said, "*I wanted to keep on doing the survey. I didn't want to fall back and not complete. I never complete things [I start] in my life. I always start doing something and stop for whatever reason. So now I'm just working on completing things in my life, it feels better to do those kinds of things*." For some, this was the first time they felt like they were actually able to complete something. Karen reflects, "*I knew I had something to do, and I took care of it. For the first time in my life I completed something, you know. I completed it."*

Participation as Work

Being compensated for their participation, both in the form of money and the cell phone, was beneficial to participants. Pretty-Kitty, "*I liked doing the [daily diaries]. I liked being dedicated to doing something like a part-time job*." Receiving money for their participation was highly valued by participants. Pandora described, *"[The weekly incentive] helped me because it helped my family. Whatever I made either went for some groceries or it went towards a bill. All my money went to something in my household, under my roof*." For some the small incentive (up to $30.50 per week with 100% diary completion and an interview) was enough to allow them to not engage in transaction sex. Happy stated, "*[The weekly incentives] helped me to where I didn't have to worry about OK, 'I got to get this $2 so I can catch the bus, go to the hood, turn a trick, because I know I'm going to start my period this week and I'm going to need tampons. The small incentive allowed me to abstain from sex work*." Finally, women appreciated having a phone with unlimited service and a reliable phone number. Julie said, "*This phone, fully unlimited, kept me to be in contact with my family. Let them know how I'm doin'. Whether they care or not, I was able to keep in contact with my child. So that helped out good, in case of emergency*."

Discussion

This study suggests that participation in a 4-week study of their sexual lives facilitated direct mental health benefits among 25 women engaging in transactional sex. Twice-daily electronic diaries and weekly in-person interviews increased women's self-awareness about their feelings and behaviors; providing an opportunity in which they were able to demonstrate responsibility and have their expertise recognized; and finally, by facilitating catharsis through being able to openly discuss transactional sex and sex work–highly stigmatized behaviors participants felt they had to keep secret. Importantly, we found data collection

methods (daily EMAs and qualitative interviews) had distinct impacts on women's mental health.

In this study, electronic diaries fostered self-reflection about daily behavior and emotions, which in turn lead to an increased sense of self-awareness. Thus, electronic diaries, a form of EMA, confer similar therapeutic benefits as traditional (open-ended) diary writing. Pennebaker and Seagal (1999) posit that forming a personal story is at the core of therapy and when people put their emotional upheavals into words, their physical and mental health improves. Furthermore, they suggest that when people confront emotionally upsetting events, they experience improved physical and psychological health (Pennebaker 1993). In our study, despite being almost exclusively closed-ended, the twice-daily electronic diary facilitated self-reflection and self-awareness by guiding participants to reflect on their daily experiences and mood. Similar to the positive health effects of traditional diary writing, participants reported that completing the daily electronic diaries was beneficial for them because the questions prompted them to examine their lives, often for the first time.

In this study, weekly interviews fostered catharsis through participants' ability to release their emotions to a trusting listener. This supports research demonstrating that participation in qualitative interviews can be a healing process for participants, even when the interviews themselves are not intended to be therapeutic (Campbell et al. 2004; Dyregrov et al. 2000; Kurtz et al. 2013). Phenomenologically, the explanation is that sharing personal experiences helps individuals gain a sense of control and better manage their emotional reaction to an experience (Kurtz et al. 2013; Lyubomirsky et al. 2006; Pennebaker and Graybeal 2001). In our study, this phenomenon manifested through participants' ability to vocalize their personal stories and feelings, often for the first time, and without shame, to an interviewer with whom they had formed a trusting relationship. The ability to emote and unload stories previously associated with shame and embarrassment produced feelings of catharsis which the participants viewed as beneficial.

Like others, we found that participants expressed a desire to help other women, especially those engaging in transactional sex or those experiencing drug addiction, with whom they felt a close personal connection and desire to protect (Fry and Dwyer 2001; Hutchinson et al. 1994; McDonald et al. 2013; Tatano Beck 2005). Altruism was a strong motivator for study participation and believing that their contribution to the study could help others may have contributed to the real psychological benefits experienced by participants. There is a growing body of literature that shows the beneficial effects of altruism. Helping others is associated with reduction in depressive symptoms (Musick and Wilson 2003; Krueger et al. 2001) and increased happiness and well-being (Schwartz et al. 2003). One possible explanation for the relationship between altruism and health is that positive emotions (kindness, other-regarding love, compassion etc.) enhance health by pushing aside negative emotions (Anderson 2003). In our study, participants felt strongly that the information that they shared would help other women, and participants reported that this made them feel good.

Because of the personal and longitudinal nature of the study, and participants' ability to reach interviewers nearly 24 h a day for technical assistance or trouble shooting diary submissions, participants developed a high level of trust for the interviewers. This trusting relationship helped participants to express previously non-disclosed and personal information about their sexual lives. While trust may facilitate catharsis, it could also lead participants to divulge sensitive information that goes beyond the scope of the study. For us, we remained acutely aware of our responsibility to protect human subjects and put in place multiple safe guards to ensure these protections were ongoing. For example, we obtained a Certificate of Confidentiality to protect against forced disclosure of research records given both drug use and prostitution were illegal in the study setting. Beyond this, we investigated local laws and university regulations around mandatory reporting for study staff which will vary by county, state or country in which the research takes place. Additionally, we made sure study participants were aware of the protections afforded by the certificate of confidentiality, and reminded them often of any mandatory reporting responsibilities which were also outlined in the informed consent. While describing privacy and confidentiality procedures is an integral component of informed consent, within longitudinal studies, it may be critical to repeat this information. For this reason, some researchers recommend a model of continuous consent wherein the researcher reaffirms consent throughout the research process (Byrne 2001; Nunkoosing 2005). Finally, our team was prepared to refer participants to appropriate mental health services if interviews became traumatizing for participants. In sum, conducting intensive longitudinal research on stigmatizing or illegal activities with vulnerable populations requires acute sensitivity to potential risk for participants and reification of protection procedures throughout the study process.

While our findings are encouraging given the recent expansion of EMA and mobile health (mHealth) research more broadly, they must be interpreted in light of the limitations. Our study is exploratory in nature and included only 25 participants who were followed for a relatively short duration (4 weeks) with both EMA and interviews. Findings may not generalizable to other studies using EMA exclusively. Furthermore, our sample consisted of women who engage in transactional sex, which is a highly vulnerable and stigmatized population. Therefore, this population

may have benefited more from participating in this research than other populations would have due to their personal and social circumstances (i.e., having poor mental health) (el-Bassel et al. 1997; Alegría et al. 1994; Surrat et al. 2005). Thus, it may be difficult to generalize the findings of this study to populations who are less vulnerable and stigmatized. While qualitative data was analyzed to understand the impact of research participation on improvements in mental health, there was no experimental manipulation in the parent study. Thus, we cannot conclude with certainty regarding the source and type of benefits. Experimental studies that are designed a priori to test for intervention effects are needed. In this study, data collection ended 4-weeks after data collection started. While not the focus of the current research, studies are needed to understand the duration of observed therapeutic effects in order to assess if the benefits are sustainable after research ends. Finally, it is possible that the participants over-reported positive experiences or under-reported negative ones due to social desirability bias because of their relationships with the research team. However, the interviewers' non-judgmental approach likely promoted honest responses (Mitchell et al. 2007). Further, participants also completed a close-ended assessment of the research experience (Gunn et al. 2015) which confirmed qualitative findings.

Conclusion

Studies incorporating EMA require participants to frequently and repeatedly assess their behavior and emotions. This study demonstrated that frequent contact, both with their own experiences via the daily electronic diary, and with the interviewer via the weekly interviews, promoted mental health benefits among participants. Specifically, study assessments led to increased self-awareness, catharsis, and sense of responsibility. While research is in no way a replacement for the mental health programs needed to support women who engage in transactional sex, researchers should consider the possibility that their research can confer positive mental health among study participants. Larger, experimental studies are needed to confirm effects.

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