



Research article

Facilitators and barriers to a contingency management alcohol intervention involving a transdermal alcohol sensor



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ABSTRACT

Research on contingency management is limited due to feasibility issues with monitoring adherence. Incentives usually depend on objective measures to verify compliance; therefore, biological markers for identifying alcohol use are not as dependable for the use of financial contingency studies. The Secure Continuous Remote Alcohol Monitor (SCRAM) is an objective alcohol biosensor that can be locked onto a person's ankle to address these limitations. In preparation for a large, contingency management study for HIV-positive and HIV-negative persons with heavy drinking, the aims for the study were to (1) explore barriers and facilitators to participating in a contingency management intervention using the SCRAM ankle monitor as the potential alcohol measure for the intervention; (2) explore levels of appropriate compensation for using the SCRAM and for study assessments as part of a contingency management intervention study; and (3) attitudes and beliefs on lifestyle changes as a consequence of wearing the SCRAM among HIV-positive and HIV-negative heavy drinkers in Florida. Five focus groups were conducted and we collected qualitative data from thirty-seven individuals (18 men; 19 women). During the analysis, six themes were identified as barriers and facilitators for participation in a contingency management intervention using the SCRAM sensor to measure alcohol use: (1) health assessment, (2) monetary incentives including payment structure and levels of compensation, (3) stigma associated with wearing the SCRAM sensor, (4) aesthetics and other related concerns with wearing the SCRAM sensor, (5) motivation to stop drinking, and (6) social support. Stigma was a major barrier for wearing the SCRAM sensor; however, if participants were motivated to change their behavior then the monetary incentives became a facilitator to wearing the sensor. In addition to the financial contingency method, social support may further increase the odds for participants to change their behaviors.

1. Introduction

Contingency management is one of the most-supported strategies for increasing treatment retention and drug and alcohol abstinence (Dutra et al., 2008; Lussier et al., 2006). The purpose is to incentivize and reinforce positive behavior change by providing incentives that are of value to the person making the change (Barnett et al., 2017; Marques and

McKnight, 2009) For example, substance-misusing people receive tangible positive reinforcers (e.g., monetary payments) for objective evidence of behavior change (e.g., alcohol abstinence) but the positive reinforcers are withheld when the target behavior does not occur (Neale et al., 2015). Target behaviors must be clearly defined and easily measured to be able to detect violations of behavior change goals should they occur (Barnett et al., 2017; Neale et al., 2015). Incentives for

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contingency management interventions depend on objective measures to verify compliance (Petry et al., 2005). Biological markers for identifying alcohol use have been limited by reliance on breath and urine alcohol tests and self-reported measures (Barnett et al., 2017; Higgins et al., 1994). These tests have been used as the main objective for measuring alcohol use (Alessi et al., 2007; Helmus et al., 2003; Petry et al., 2000); however, they have limitations. For example, breath alcohol tests cannot detect drinking after 12 h, and urine tests can only detect alcohol use up to three days after drinking (Barnett et al., 2017; Swift, 2003). Consequently, for the most part, research has relied on self-report to measure alcohol outcomes. However, there are also limitations in this approach, including recall bias and social desirability bias (Higgins et al., 1994). Some research has suggested that people who use substances might under-report their use during contingency management interventions (Boniface et al., 2014).

One approach that can address these limitations is the use of transdermal alcohol monitoring, which provides a continuous measure of alcohol excreted through the skin (Marques and McKnight, 2007). Since individuals who drink alcohol may not always accurately report amounts consumed, these wearable body sensors overcome limitations of breath, and urine, and self-report measures and provide valuable data that can be used for diagnosis, treatment and research (Barnett et al., 2014; Sakai et al., 2006; Swift et al., 1992). In a contingency management setting, accurate transdermal monitoring can corroborate participants' self-reported drinking behaviors and provide a more accurate assessment of alcohol consumption (Wang et al., 2018). A body sensor that has been primarily used in the criminal justice system is the Secure Continuous Remote Alcohol Monitor (SCRAM; Alcohol Monitoring Systems, Inc., Littleton, CO, USA). The SCRAM is an ankle bracelet that can be secured on a person's ankle and has a transdermal electrochemical sensor that samples alcohol vapors near the skin (Barnett, 2015). It is worn continuously and takes reading regularly throughout the day. The device collects samples approximately every 30 min and sends the data to a secure central server for analyses; however, if potential tampering with the device or increased drinking occurs, samples are collected more frequently (Alessi et al., 2019). Transdermal readings provide a nearly continuous estimate of blood alcohol levels, improving the information on the timing and quantity of drinking (Dougherty et al., 2014). According to Barnett et al. (2017), the accuracy of the device to detect drinking increases with at least two standard drinks and may be higher in women compared to men when an episode involves 4 or fewer drinks (Barnett et al., 2014). The SCRAM sensor can be used to detect drinking episodes and drinking days and can distinguish between drinking episodes with different amounts of alcohol consumed (Barnett, 2015) See Figure 1. The application of this device in clinical and research intervention settings is limited. These limitations may be due to the aesthetics of the device and/or social stigma, since the SCRAM sensor is also used to

monitor alcohol abstinence for people convicted of alcohol-related offenses (Wang et al., 2018).

This paper reports on the qualitative data collection and analysis that informed implementation strategies to improve participation in a contingency management intervention using alcohol sensor data from the SCRAM ankle bracelet as the primary objective measure for alcohol use among HIV-positive and HIV-negative heavy alcohol users. The study included HIV-positive persons, since it is well documented that people living with HIV (PLWH) consume alcohol at greater levels than the general population (Galvan et al., 2002), with the prevalence of unhealthy alcohol use (heavy drinking and/or alcohol use disorder) ranging between 8% to 42% (Williams et al., 2016). Similarly, stigma associated with living with HIV is a significant contributor to alcohol and drug use (Felker-Kantor et al., 2019; Devine et al., 1999); thus, we wanted to be sure to gain the perspective of PLWH regarding the planned study procedures. The aims of the study were to (1) explore barriers and facilitators to participation in a contingency management intervention using the SCRAM ankle monitor as the potential alcohol measure for the intervention; (2) explore levels of compensation for using the SCRAM ankle monitor and completing other study assessments as part of a contingency management intervention; and (3) to describe attitudes and beliefs related to lifestyle changes as a consequence of wearing the SCRAM ankle monitor.

2. Methods

2.1. Participants

Five focus groups were conducted, with a total of 37 participants living in Florida (Table 1). A total of 18 participants were from Miami, and 19 were from Gainesville. Participants were grouped by language preference, with one group for Spanish-speakers ($n = 6$) and four groups for English-speakers ($n = 31$), each focus group had a range between 6 to 8 participants. A total of 19 (51%) women and 18 (49%) men participated in the focus groups. The research protocol was approved by the Institutional Review Board at Florida International University and all participants provided signed informed consent prior to participating in the study.

2.2. Procedure

Focus group participants were identified through advertising flyers distributed at HIV-related community agencies and clinics, from referrals by clinical staff and members of community-based organizations, and from a contact registry of persons with HIV who had consented to be contacted for any future studies. For this study, we sought to enroll persons who would be eligible for an actual contingency management intervention study. Therefore, potential participants that might benefit from a contingency management intervention were screened over the telephone and based on the eligibility criteria, were invited to attend the focus groups. The eligibility criteria were: adults age 18 or older, HIV-positive or negative, and currently self-reporting drinking as defined by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) as men who report more than 4 drinks on any single day or 14 drinks per week and women who report more than 3 drinks on any single day or 7 per week.

2.3. Data collection

An interview guide was developed to ensure that all focus group discussions explored the same topics in a systematic manner. Prior to conducting the focus groups, the interview guide was reviewed with a qualitative research colloquium consisting of faculty and graduate students conducting qualitative research. The guide was translated into Spanish for monolingual Spanish speakers and pretested by the staff. The data collection took place during June and July 2016. Each focus group



Figure 1. Secure continuous remote alcohol monitor (SCRAM).

Table 1. Demographic characteristics among persons participating in focus groups regarding a contingency management alcohol intervention.

Location (n = 37)	
Miami, FL	18 participants
Gainesville, FL	19 participants
Characteristics	
Sex, No (%)	
Men	18 (49%)
Women	19 (51%)
Race, No (%)	
African American	16 (43%)
White	18 (49%)
Multiracial	3 (8%)
Hispanic, No (%)	
Yes	11 (30%)
HIV status (%)	
HIV-positive	15 (40%)
HIV-negative	3 (8%)
Unknown	19 (52%)

lasted approximately 1 h, with an average of six participants per group. The groups were held in private spaces in clinics and/or convenient locations. Individuals attending the focus groups were identified using a participant number during the group discussions to help facilitate anonymity. Participants received an information statement describing the aims of the study and informed consent forms in their language of preference. Since a written consent form was the only record of participant involvement, verbal consents were obtained after allowing for questions and answers about the study. Each focus group was co-facilitated by experienced researchers assisted by a trained research assistant who took notes during the discussions. Facilitators obtained permission from participants to record the group discussions using a digital recorder. Prior to starting the discussions, participants were asked to complete a short demographic survey that included age range and gender identification. No HIPAA identifiers were associated with a participant's name. Participants were compensated with a \$25 gift card for their participation at the end of each focus group. The major topics explored included attitudes and perceptions about wearing the SCRAM ankle bracelet sensor, including stigma and other factors that could influence study participation. We also explored level of compensation on using the SCRAM for 30 days, more specifically escalating payments versus consistent payments. We also inquired about what would be fair compensation related to the time commitment for various health assessments that would be part of the research study and that could take up to 8 h to complete (e.g. blood testing, questionnaires, cognitive assessments, MRI scans). The specific questions used in the interview are included in the appendix. Please see "Obtaining Input on Research Related to Alcohol and HIV."

3. Data analysis

The analytical process was guided by the steps of thematic analysis described by Braun and Clark (2006). The recommendations for number of focus groups ranges between 4-6 to achieve saturation of codes (Guest et al., 2017; Hennink et al., 2019). Given that the goal of this research was to identify the issues related to SCRAM use, and move towards meaning and theoretical saturation, we felt that five focus groups across a range of settings would be sufficient to provide information on the proposed research questions.

Digitally recorded focus group discussions were transcribed verbatim, and the Spanish focus group discussion was translated to English. One focus group with a total of six participants was conducted in Spanish while the remainder of focus groups were conducted in English. Two transcripts were reviewed line by line by two of the authors (KV, CC) to

check for accuracy and initiate the development of the codes. After the development of the initial codes, codes were refined and collapsed into categories. The coding was facilitated by using the NVivo qualitative data analysis software (QSR International Pty Ltd. Version 10, 2012). Recordings were transcribed by graduate students and verified prior to analysis. NVivo qualitative data analysis software (QSR International Pty Ltd. Versions 11 & 12, 2012) was used to manage the data and analytical processes. During initial coding, authors (KV and CC) first read through the transcripts and coded the data within the conceptual constructs of the semi-structured question guide. After this initial coding, the authors (KV and CC) collapsed codes into broader categories and created a codebook. To ensure rigor in the perceptive interpretation of the data, a second wave of coding was completed by two students (CN and EO) who independently coded the data using the codebook and identified new codes not previously identified. Authors (KV and CC) reviewed the secondary coding and developed the final categories which were collapsed into broader themes.

4. Results

Six themes were identified as barriers and facilitators for participation in a contingency management intervention using the SCRAM sensor to measure alcohol use: (1) health assessment, (2) monetary incentives, including incentive payment structure and levels of compensation, (3) stigma associated with wearing the SCRAM sensor, (4) aesthetics and other related concerns with wearing the SCRAM sensor, (5) motivation to stop drinking, and (6) social support. Each theme is described below, accompanied by descriptions from transcripts of participants' group discussions.

4.1. Health assessment

Participants who were employed described the time of day for the health assessments as a barrier to participation in the intervention. Participants who were currently employed suggested Saturdays as the preferred date since it did not interfere with their work schedules. On the other hand, participants who were currently unemployed did not have a conflict with the time of day for the assessments as presented in the following transcript from a participant in Gainesville.

"For someone who is unemployed, it may be the middle of the week and they need that money for transportation or food. (Multiple people in agreement), so that may not be good for everyone" (Participant number 9 from the GAAP Group, Gainesville, FL).

Several participants who were currently working recommended that the monetary incentive to participate in the contingency management intervention should be greater than what they were earning at work.

"I think it depends on whether the person has a job if they have to take time off. So you would need to compare it to how much money do they make on their job or do they have to use a vacation day to participate or do they have to go unpaid, that will vary very widely and if it's worth it" (Participant number 3 from the Health Street Group, Gainesville, FL)

4.2. Monetary incentive

The research team proposed two payment structures for wearing the SCRAM sensor. The first option was simple and straight forward, \$5 per day for not drinking. The second option included an escalating scale with a base of \$5 per day with \$1 increments per day if abstinent and a weekly bonus. However, if drinking occurred, the incremental payment would drop to \$5 per day. The majority of the participants were not in favor of the first option. The second option was more attractive to many, but some were concerned with having to keep track of their earnings.

"Increasing \$1 a day for not drinking is complicated. You're doing all of this math, and if I drink for this day, I won't get paid this day and the next day. Our brains can't negotiate all of that stuff. We want it flat and easy." (Participant number 6 from the Borinquen Group, Miami, FL).

A few participants suggested a third option, making the monetary incentive a flat rate of \$10 a day to stay abstinent and withhold the incentive for two-days if they failed.

"My worst times are when you're going through those emotional triggers and that \$10 isn't going to stop me from drinking that night. But \$20 might" (Participant number 9 from the GAAP Group, Gainesville, FL).

4.3. Stigma associated with wearing the SCRAM sensor

Attitudes towards wearing the SCRAM sensor around family, friends, or coworkers were mixed, with some participants expressing feelings of embarrassment and fear, especially those who had problems with the justice system. Participants who were contemplating changing their alcohol drinking behavior were more inclined to wear the SCRAM sensor and participate in the contingency intervention.

"I will be around too many important people for them to judge me and, I have been arrested and (people) will ask questions, and that's too much. That labels me". (Participant number 12 from Borinquen Group, Miami, FL).

"Wearing (SCRAM) means more stigma around us; there's the whole stigma with alcoholism without the HIV on top of it" (Participant number 3 from the GAAP Group, Gainesville, FL)

"What I'm doing I'm doing it for me. What I'm going through, I'm going through on my own. I don't care if you can see this ankle bracelet on me" (Participant number 6 from the Health Street Group, Gainesville, FL)

Several participants indicated more significant concerns with police encounters if wearing the SCRAM sensor; they were afraid of police harassment or misconduct.

"(I would not wear this device) because I have had a lot of problems with the law and those who know me already know my issues with the police" (Participant number 2 from the Borinquen Spanish Group, Miami, FL).

"You walk around with that on your ankle and somebody sees you, right off the bat they're gonna target you like if you're some kind of criminal" (Participant number 4 from Borinquen Spanish Group, Miami, FL).

4.4. Aesthetics and other related concerns with wearing the SCRAM sensor

The majority of participants did not like the appearance of the SCRAM sensor. They were also concerned that the data from the device could produce false positive results, and some questioned whether the use of perfumes or drinking wine during church communion would trigger the monitor. Other issues raised were related to skin rashes and interference with water activities such as swimming. Some of the participants suggested using other wearable devices such as a wrist sensor that was not as "bulky and hideous" as the SCRAM sensor

"I can walk right into Wal-Mart (wearing the SCRAM). But I want to be able to decorate it. If it's going to be ugly and black like that, I don't know" (Participant number 4 from the Borinquen English Group, Miami, FL)

"Since we live in Florida. We should not do it during certain seasons. We shouldn't be doing it around the summer when everyone is jumping in pools" (Participant number 8 from the GAAP Group, Gainesville, FL)

Some participants were less concerned with the aesthetics of the SCRAM sensor. They seemed to be prepared to move forward and change

their behavior; moreover, they were looking for a program to empower them to take the next step.

"I want to benefit from this because I'll be honest, I don't think I have a drinking problem. And that's a problem. I would accept a little bit of help. When I first stopped my addiction, I found help. It came to me in a form similar to this. So, I definitely look to benefit right here because it could help me. I need a goal or something to help me put something together rather than just say I'll stop and not replace it with anything" (Participant number 1 from the Borinquen English Group, Miami, FL).

"You know for 30 days, I'd wear it because it's an incentive and you know what? My wife would want me to do whatever I have to do to stop drinking. So it would actually help me" (Participant number 3 from the GAAP Group, Gainesville, FL).

4.5. Motivation about drinking or abstinence

During the focus group discussions, participants shared their motivation to either abstain from alcohol or continue drinking. Many reflected on their experiences and their determination to stop drinking while others described their lack of desire or motivation to stop drinking. Participants expressed that if a person is honest and has made a commitment to stop drinking, then this intervention can motivate them to take the next step. However, if they are not ready to stop drinking, neither the money nor the program would be able to provide the motivation to abstain from alcohol use. One participant noted that his goal was to stop drinking because he knew that alcohol would kill him, although he felt he did not have the willpower to stop.

"I've lost my son and my mother. No amount of money is going to make me stop that. The medication that is supposed to work, is actually, in my mind, is encouraging me to drink more" (Participant number 3 from the GAAP Group, Gainesville, FL).

Another participant introduced the lack of support from family and friends. He related his experience to his social circle and the fact that in his environment, alcohol was the drug of choice, which made it difficult to stop drinking.

"Maybe we just can't stop being around people (that drink) and our family members may drink a lot and certain cultures have alcoholic families maybe that is why we just can't stop" (Participant number 5 from the Borinquen English Group, Miami, FL)

For the participants who were contemplating the idea of drinking less or abstinence, the contingency intervention was seen as the next logical step in their recovery process. They felt empowered and confident to make the commitment to stop drinking and were not worried about the monetary incentive or with the idea of having to wear the SCRAM sensor for 30-days. These are some of their descriptions.

"I had an appointment to see my doctor and because I was drinking the day before I had a blackout, and they found me in North Miami lying on the street. Someone could have killed me, or I could have hit my head because of the alcohol. If an opportunity like this appears, how can I not take it?" (Participant number 4 from the Borinquen Spanish Group, Miami, FL).

"I think that if you are participating in the study to stop drinking and you're being compensated \$5 to not drink, they're paying you to do something for yourself" (Participant number 1 from the Borinquen English Group, Miami, FL)

"This is an incentive. It's gonna help me because you know what? I don't have the willpower, so I'm 100% for it. I really am" (Participant number 2 from the Borinquen Spanish Group Miami, FL).

For this participant below, the social environment did not affect his decision, possibly because he has support from his immediate family.

"If I have to do this to help myself, that's what I'm gonna do. I don't care what other people think of me. I really don't. My family knows everything about me, so it doesn't matter, and I live alone" (Participant number 5 from the Spanish Borinquen Group, Miami, FL).

4.6. Social support for the contingency management intervention

All groups proposed a social support system to help them accomplish abstinence for 30 days. Participants suggested that in addition to receiving text messages to inform them about their daily earnings, more important support was to either add daily calls or texts offering support to stop "that one drink." They felt that a strategy to stay sober for at least a 30-day period was best achieved with a support group.

One group specifically suggested creating a support group for the participants in the contingency management research study.

"Can I make a suggestion? We can all benefit from it. It's hard to deal with situations, especially alone, and that's why we self-medicate. So what I propose is, since we're in a group, it would be easier to have that support. We are a part of this circle, and when we need someone else, we have someone to call. That's what AA does." (Participant number 3 from the Borinquen English Group, Miami, FL).

Another group proposed a buddy-system to give support to each other when a trigger to drink would surface.

"I like the buddy system. I've been in programs before with the buddy system works for example: I'm watching a romantic movie, I'm alone, I want to call someone, but no one is home, so I call a buddy. I've been in one of those programs before. But the thing is, I've done these three times. This is another program I could try, I don't know" (Participant number 4 from the GAAP Group, Gainesville, FL).

Another group proposed having daily calls by a therapist, while another suggested a group support meeting led by one of the participants.

"Money is not enough, I need a drink every morning, if I get a call I will probably not have that drink" (Participant number 1 from Borinquen Group, Miami, FL).

"This is a reminder, you know. You know keep strong on what you're doing good, you know and that would maybe hold you back. Positive affirmation." (Participant number 3 from Borinquen Group, Miami, FL).

"We're all in this um study together. And have a phone list. And ask people are you willing Can we put your name on the call list? And you give them a-everybody has a call list so that you can call somebody and say, hey listen I'm in that same study you're in" (Participant number 1 from Borinquen Group, Miami, FL).

5. Discussion

In this study, we explored barriers and facilitators to participation in a contingency management intervention using the SCRAM ankle monitor as the potential alcohol measure for the intervention among HIV-positive and HIV-negative heavy alcohol users. Several relevant themes were identified, including social stigma related to wearing the SCRAM sensor, incentive payment structure, motivation to stop drinking and abstinence, the role of social support, and alcohol use.

The SCRAM ankle bracelet is an innovative approach to monitoring a person's body alcohol level daily (Barnett et al., 2014). It has several advantages: it provides a continuous estimate of blood alcohol level; it is less likely to miss episodes of alcohol use; and it provides accurate information on the timing and quantity of drinking (Barnett et al., 2017; Dougherty et al., 2014). However, the appearance of the SCRAM ankle bracelet is a significant barrier; it is similar to an ankle monitor used by the justice system which is not

an optimal device for a research study, and it may be a deterrent for HIV-positive and HIV-negative individuals.

When the SCRAM ankle bracelet was shown to the focus group participants, two interesting observations were noted. First, they were concerned with the appearance of the SCRAM bracelet; it looked "bulky, it was heavy, and not pleasing to the eye." Consequently, the aesthetic of the bracelet was a limiting factor for the motivation to wear the SCRAM and therefore, participate in the study. The second observation was their perception of the bracelet as another stigmatizing label; they believed that the SCRAM sensor would be looked upon negatively by their social network and social environment. Perceived social stigma is when a person recognizes and believes that their society holds prejudicial beliefs that will result in discrimination against them (Hammarlund et al., 2018). In general, social stigma continues to negatively impact the health and well-being of individuals, alcohol also carries a negative social stigma which could increase the total amount of stigma a person experiences particularly among PLWH (Devine et al., 1999; Sayles et al., 2007; Felker-Kantor et al., 2019). In particular, this type of barrier may significantly affect those who are in need of treatment. These perceived barriers have been initially observed elsewhere, with recent evidence demonstrating that research participants who used the SCRAM bracelet after a few days reported that they no longer noticed they were wearing the bracelet and that they effectively chose clothing that covered the ankle bracelet (Barnett, 2015; Neville et al., 2013).

On the other hand, participants who were contemplating a change in their behavior, and were aware of the consequences of alcohol abuse but still were weighing their options, felt compelled to take the next step and participate in the intervention. This type of intervention, which includes high-value financial reinforcers, could encourage an individual to attempt a positive behavioral change and to become less ambivalent about wearing the SCRAM sensor. However, for the participants who were employed or had stronger social ties to their community, the monetary incentives did not make a difference in their willingness to wear the device.

To understand the type of payment structures that would incentivize behavior change, two options were presented to the study participants. The first type introduced frequent payments but using a flat rate to motivate alcohol abstinence while the other offered escalating monetary incentives. The overwhelming majority of the participants chose the payment structure with escalating and frequent incentives as the preferred method. Although both monetary incentives are in line with contingency management theory the latter presents, tangible, positive reinforcers for objective behavior change which is preferred by people who abuse drugs or alcohol (Petry et al., 2000). Furthermore, when the selected payment structure was proposed in combination with wearing the SCRAM bracelet for 30 days, many of those who previously objected to wearing the device were more inclined to participate in the intervention. This is significant because studies evaluating the efficacy of contingency management strategies have demonstrated greater positive outcomes compared to more traditional therapies (Barnett et al., 2017).

In general, participants agreed that self-motivation and the desire to stop drinking was the determining factor for a successful outcome. According to the Transtheoretical model, the progression towards changing behavior incorporates five stages, which can result in the long-term maintenance of the desired behavior (Naar-King et al., 2006). In this study, it may be implied that several participants were either in the contemplating or preparation stage, and the financial incentive encouraged the change. They were not as concerned with the aesthetics of the SCRAM sensor; moreover, they proposed different methods to disguise the device.

Another interesting theme that emerged during the focus group discussions was social support as a mediator to successfully achieve abstinence. This theme is supported with evidence showing social support as a predictor for positive alcohol drinking outcomes (Hunter-Reel et al., 2009). Such social support could include having more non-drinking friends (Zywiak et al., 2002) and more significant supportive

relationships influencing the drinking behavior among people with alcohol consumption problems (Booth et al., 1992; Zywiak et al., 2002). Social support was the most common factor associated with promoting abstinence across all the focus groups. Various ideas were suggested, including forming their social support system among the study participants in getting daily support calls from the staff. A recent study analyzed motivation as a mediating factor for the relationship between social support and abstinence; individuals with better support systems were more motivated to become abstinent than those with fewer support systems (Hunter-Reel D1 et al., 2010). Thus, linking social support and motivation may empower the individual to reach a successful outcome.

5.1. Limitations and strengths

This study has several limitations. It had a small sample size and utilized focus groups based on a convenience sample. Therefore, it should not be considered representative of the general population. We sought to minimize this limitation by recruiting a diverse sample that represented several racial and ethnic backgrounds from Florida and offering it in two languages. It is possible, because of the focus group setting, participants may not have felt comfortable sharing detailed information regarding their experiences with alcohol. We tried to minimize this potential limitation by emphasizing confidentiality within the group and by using two trained facilitators and kept group sizes small to make it easier for participants to share.

6. Conclusion

This is a qualitative study exploring types of incentive payment structure for participation in a contingency management intervention using an innovative transdermal biosensor as the measure for alcohol use among HIV-positive and HIV-negative heavy alcohol users. Although the use of the SCRAM bracelet was viewed as an additional social stigma affecting their social environment, many of the participants who were motivated to stop drinking were less concerned with the aesthetics of the SCRAM bracelet. The need for social support to stay abstinent was a theme that had not previously been considered, but that emerged during the focus group discussion. It is well established in the literature that support groups predict positive outcomes. Thus, it may be important to include social support as part of the contingency management strategy to reduce alcohol use.

Declarations

Author contribution statement

K. Villalba: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

C. Cook: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data.

J. Dévieux: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data.

G. Ibanez: Performed the experiments; Contributed reagents, materials, analysis tools or data.

E. Oghogho and C. Neira: Analyzed and interpreted the data.

R. Cook: Conceived and designed the experiments.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

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