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Developing a Brief Suicide Prevention Intervention and Mobile Phone Application: a Qualitative Report

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Abstract

Suicide is the second leading cause of death among youth and has become a serious public health problem. There has been limited research on strategies to decrease the likelihood of reattempt in adolescents. As phase one of a treatment development study, clinicians, parents and adolescents participated in qualitative interviews in order to gain new perspectives on developing a targeted intervention and a safety plan phone application for suicide prevention. Participants indicated that transition of care, specific treatment targets and safety planning were important parts of treatment. In addition, all participants endorsed the use of a smartphone application for these purposes.

Keywords

Mobile Technology; Qualitative Interviews; Suicide; Adolescents

Introduction

The use of mobile technology in youth continues to rise. As of 2013, an estimated 78% of American youth today have mobile devices, of whom 47% have a smartphone. Approximately 25% of all teens are "cell-mostly" internet users, and this number is significantly higher in teens that own a smart phone (50%; Madden et al., 2013). With the rapid growth of personal technology, there is an increasing demand for its utilization in the health care field. Mobile devices, and specifically smart phones, have the capacity to extend interventions through text messaging, mobile-ready web pages, and phone applications (Gaggioli & Riva., 2013; Patrick, Griswold, Raab & Intille, 2008). Though the literature mostly examines the use of this technology based intervention within the fields of physical medicine (e.g. obesity), there is a growing literature that supports it's applicability to the field of mental health (Aboujaoude, Salame & Naim, 2015).

Recently, the use of mobile phone applications have begun to be integrated into technology based applications for suicide prevention. A 2013 review article by Aguirrea and colleagues, found a total of 27 pre-existing phone applications that were related to suicide prevention (Aguirrea et al., 2013). Despite the number of available phone applications, there are few specific to suicide prevention and even fewer designed for children and adolescents. Researchers have begun to develop protocols that include the use of text messaging (Pollock, Armstrong, Coveney & Moore, 2010) and phone applications in suicidal adults (National Center for Telehealth & Technology, 2015; Stanley & Brown, 2012) but the efficacy of these programs still remains unknown. Thus, there is still much work to be done in order to develop phone applications as a therapeutic tool for suicide prevention in youth.

In order to incorporate technology into a suicide focused intervention, it is imperative to understand what a suicide prevention program must consist of and how the technology should best be incorporated. Research suggests that there are a few key factors to consider when developing such a protocol. The first consideration is timing of the intervention. The World Health Organization suggests that effective and collaborative communication during the transition of care, the time directly following their discharge from inpatient unit and early into one's outpatient treatment (Appleby, et al., 1999; Brent, et al., 2009; Ho, 2003), is a patient safety imperative (World Health Organization, 2014). Breakdowns in hand-over communication between treatment units and amongst care teams have been found to result in discontinuity of care, inappropriate treatment, and serious adverse events (Fernandes & Flak, 2012). Based on success in other transitioning populations, such transferring from pediatric to adult care in those with chronic illnessses, the utilization of technology may help make this transition smoother and encourage continuity of care (Huang et al., 2014; Applebaum, Lawson & von Scheven, 2013).

Treatment targets also play a key role in a successful intervention. In general, effective interventions include elements related to improving family support (Diamond et al., 2010; Pineda & Dadds, 2013; Rossouw & Fonagy, 2012), motivation to change, and addressing substance use (Esposito-Smyther, Spirito, Kahler, Hunt & Monti, 2011). Addressing sleep habits to improve mood and distress tolerance is an additional promising treatment target, but has not yet been extensively evaluated (Brent et al., 2013). An additional therapeutic element in this population is an emphasis on safety planning. In the Treatment of Adolescent Suicidal Attempters (TASA) study, interventions specific to suicidal behavior, including developing a safety plan with the adolescent, decreased the incidence of suicidal events in the open trial as compared to naturalistic samples (Brent et al., 2009). Studies conducted in adults suggest that safety planning is a promising intervention to reduce the risk of suicidal behaviors, (Brown et al., 2005; Stanley et al., 2009; Stanley & Brown, 2012). Additionally, one quasi-experimental study has tested the impact of safety planning on suicidal outcome, supporting the efficacy of safety planning (Rotheram-Borus & Bradley, 1991). However, although safety planning is an important aspect of treatment, traditional paper and pencil safety plans may be inaccessible or misplaced, thus, portability and accessibility may be contributing factors to safety-plan effectiveness, particularly among teens.

In this report, we present the results from phase one of a treatment development study, which included qualitative methods to gather information from clinicians, families, and

teens to assist in the development of a brief intervention for youth who have been hospitalized for suicidality (i.e. ideation with a plan and intent or actual suicide attempt). Following the stage model of treatment development (Rounsaville, Carroll & Onken, 2001), we used qualitative methods to assess feasibility to deliver the intervention and acceptability to patients and parents. In particular, we sought to understand clinician, parent, and teen perspectives on transition of care, targets for intervention, safety planning, and using technology to increase safety.

Methods

We recruited the following participants through two psychiatric treatment programs located in university medical centers at each site: five clinicians experienced in management of suicidal youth, five teenagers with reported suicide attempts or severe ideation, and five legal guardians of these teenagers (5/5/5 per site, total n=30). We developed a script for a semi-structured interview relating to transition of care from inpatient to outpatient treatment, effective treatment targets, safety planning, and the development of a safety plan telephone application (see Table 1). The questions included in the interview were both exploratory (asking open ended questions to elicit the participants own thoughts and ideas) and confirmatory (eliciting the participants opinions on ideas that the study staff already believed to be important). All questions asked were to help solidify a brief inpatient intervention for suicidal adolescents. The exploratory questions were given to the participants in order to determine ways to edit or refine the existing interventional plan. The confirmatory questions, specifically the treatment targets, were based off of the initial intervention which aimed to target common concerns in suicidal youth, specifically sleep, sobriety and social support. The study was approved by both university Institutional Review Boards.

Clinicians were selected based on their clinical experience and treatment setting. The legal guardians were approached in the outpatient clinic and informed of the study. Prior to the interview, informed consent was obtained from clinicians, parents, and teens. Teens and parents were interviewed separately for 30 to 60 minutes. Each participant was provided a gift card in acknowledgement of their time.

Investigators individually reviewed each transcribed interview, and then conducted a cross-case comparative analysis (Bradley, Curry & Devers, 2007; Miles & Huberman, 1994; Morse, 2004). First, the team randomly selected a single transcript from each participant group, reading each against the other to determine possible themes. Working from that initial list, two research assistants coded the remaining transcripts, annotating any additional themes that emerged. A research coordinator then reviewed their work to identify any coding discrepancies. Discrepancies between members of the study team were flagged and reviewed by the group as a whole to reach consensus (Cohen & Crabtree, 2008; Silverman, 1993). Similarly, participant responses diverging from common themes were discussed.

Results

Of the interviewed clinicians, five worked in an inpatient setting, four worked in an outpatient setting, and one individual split time between the two settings. Six clinicians were female, and all had masters or doctoral degrees. Their roles included medical director, social worker, nurse practitioner, clinical evaluator, clinical manager, therapist and psychologist. One clinician interview was dropped from the analysis, as it was not completed. Of the parents, nine out of ten were female, and nine out of ten were Caucasian. Adolescents ranged in age from 14 to 17 with a mean age of 15.5 (SD=.92). Eight were female and nine were Caucasian. All results can also been seen in table 1.

Transition of Care

More than half of the clinicians reported that communication between providers is the most important component of a successful transition to the next level of care. Most clinicians suggested provider to provider phone call as the best method of communication. The majority of clinicians reported limited clinician time and availability as primary barriers in communication.

Almost half of the parents reported that accessing care quickly is important in reducing suicidal risk during the transition period. Other parents identified an established transition plan, support, supervision of teen, and communication as necessities for a successful transition. Scheduling issues and lack of relationship with the next therapist were the most common barriers in treatment. Half of the teens reported that having a safety plan is the most important component of a successful transition between programs. Other responses included rapid access to care, engaging in therapy, and social support. Low motivation, limited time and program proximity, lack of information and communication by providers were cited as the most common barriers to treatment. Regarding transitions to another level of care, all teens reported that it would be important for providers to communicate with each other about treatment, either before or during discharge. In addition, half of the teens made reference that communication between providers would limit the need to retell their story.

Treatment Targets

All of the clinicians endorsed the importance of learning skills about better sleep, abstaining from drugs and alcohol, and obtaining appropriate social support. Half of the parents endorsed the importance of teaching sobriety and the other half endorsed both sobriety and sleep skills. All teens emphasized the importance of learning better sleep strategies and half endorsed sobriety as important treatment targets. With respect to social support, parents and teens emphasized the importance of identifying support and having support readily available for the teen as needed.

Safety Planning

Most clinicians cited patient motivation, appropriate skills and contacts, and accessibility of the safety plan as key factors to a successful safety plan. An additional barrier reported by clinicians included emotional dysregulation on the part of the teen, interfering with the

teen's ability to use the safety plan when significantly distressed. Clinicians were divided on whether patients actually followed the safety plan once discharged.

The majority of parents stated that they had no involvement in the development of their child's safety plan and almost half did not know the content of the safety plan. Parents were split on whether they should have a bigger role in the safety plan. The majority of parents reported their child's safety plan to be helpful; however, more than half of the parents did not know the whereabouts of the plan. Parents agreed with clinicians that emotional dysregulation was a major barrier.

Almost all teens stated that at least some involvement from their parents would be helpful in developing their safety plan. When asked about the content of their safety plan, the most common responses provided by teens were social support and distraction strategies. Other strategies listed were reasons for living, mindfulness, and cognitive skills. All teens reported that their safety plans were helpful and the majority knew the location of their safety plan. Barriers to using the safety plan included lack of motivation, not wanting to involve others, accessibility of safety plan, and emotional distress.

Usability of a Smart Phone Application

All of the clinicians indicated that a smart phone safety plan app would be a useful tool as part of treatment. Most clinicians confirmed they would feel comfortable helping their patient input treatment information into a smart phone. Clinicians identified privacy or confidentiality concerns as a potential barrier to the use of a safety plan application and were concerned with situations where phone use is restricted, such as school or due to loss of privileges. All clinicians were positive about their patients' reaction to the phone application.

All of parents reported that their children use their cell phone almost all of the time and that the majority of the time on their phone is spent on texting and using apps. All parents thought that a smart phone application for safety planning would be convenient and easily accessible and would improve safety. When asked about their concerns regarding the app, parents were concerned about privacy.

Most of the teens reported owning a smartphone and spending the majority of time on their phone texting, accessing the web, and using phone apps. Most teens thought that the phone app would be helpful. All teens reported that they would feel comfortable using the mobile app at school, home, during a crisis, when their mood is down, or when they are bored. Half of the teens reported discretion and privacy as important concerns.

In summary, clinicians, parents, and teens report that a smooth transition of care is an important component that requires communication between providers and a transition plan. Barriers to care during transition include clinician time, proximity of patients to outpatient provider clinic, and adherence to treatment. Clinicians, parents, and teens all agreed that targeting sobriety, sleep, and social support in treatment would be beneficial. Similarly, safety planning is seen as an essential component of treatment, with barriers to use being access to the plan and emotional dysregulation of teen. While parents were frequently not

involved in the development of the safety plan, many teens reported that parental involvement would be helpful. All participants were positive about the helpfulness of technology in safety planning, however confidentiality and privacy must be taken into consideration.

Discussion

Analysis of our qualitative interviews revealed the need for increased collaboration of care in two critical areas: open communication among treatment providers during the transition of care and a team-based approach to safety planning. In particular, parents and teens agreed that communication was essential prior to or during discharge from inpatient units and should include enough information to minimize the need to retell their stories. Clinicians stressed the need to collaborate with the youth in order to individualize the safety plan. Teens and parents enforced the need for youth engagement and parental involvement during safety planning. However, in practice, only 2 out of 10 parents had participated in their child's safety planning. Given that collaboration has been shown to increase quality of care and use of action plans for other disease processes (Katon et al., 2010), this suggests potential benefits from greater collaboration with parent during the safety planning process.

Social support, sleep, and sobriety were perceived as important areas of intervention to maintain safety in suicidal youth during transitions of care. In agreement with past research findings showing family cohesion as a strong protector against recurrent suicidal behavior, social support was universally agreed to be a helpful treatment target by parents, teens, and clinicians alike (Brent, et al., 2009).

There were, however, contradicting responses to perceptions of sobriety and sleep skill development with teens placing a greater importance on sleep intervention and parents placing a higher value on sobriety. Though past research has shown the clear need for interventions geared toward both sobriety and improving sleep in the treatment of suicidal youth (Emslie et al., 2012; Goldstein, Bridge & Brent, 2008; Goldstein et al., 2009; McMakin, et al. 2011), there is a need for further research to effectively assess how sleep problems and drug and alcohol use may relate to maintaining safety during transition of care.

Overall, one of the most significant barriers to using a safety plan, reported across all participant groups, was emotional reactivity. The presence of affective dysregulation, characterized by intense emotional reactions, has been associated with suicidal behavior in adolescents (Mann et al., 2009). To mitigate the effects of this barrier, the safety plan app will include strategies to manage distress. On questions related to accessing next level of care and on use of safety plan, motivation was identified as a common barrier. Motivational Interviewing (MI) is an effective strategy in addressing ambivalence to change (Miller & Rollnick, 2012). We will use MI strategies to address motivation during transition of care as it has a strong evidence base for improving psychiatric treatment adherence in youth in both inpatient and outpatient settings (Swanson, Pantalon & Cohen, 1999).

All participants endorsed a phone application to improve accessibility and portability of the patient's safety plan. Teens and parents indicated a high degree of use and comfort with smartphones and phone apps. A personalized safety plan phone application would allow for greater availability of individualized and targeted skills.

Our study is limited by the use of a small, homogeneous sample (mostly Caucasian, females) who provided input on our treatment intervention and the development of a phone application. Another limitation of our study is that participants may have given socially desirable answers to our questions. We tried to reduce this tendency by emphasizing the confidentiality of their responses, and that their answers would not affect their care or treatment at their respective health systems. While we used qualitative methods with a small sample, we collected important data concerning collaborative treatment, safety planning, and use of technology during transition of care for suicidal adolescents to effectively optimize treatment development.

In our upcoming open pilot and RCT, we will incorporate these findings. Specifically we will include tools to improve communication among treatment providers and implement bridging calls to patients and families. We will test sleep, sobriety, and social support as treatment targets, enhanced by motivational interviewing, through a brief individualized intervention on inpatient units. Development is currently underway for a safety plan phone app designed to act as a support for patients as they transition from inpatient to outpatient care, with the intended impact of increasing access, use, and effectiveness of safety plans. This phone app will be used alongside of all aspects of our pilot and RCT with safety plan design occurring during inpatient treatment and used throughout the outpatient maintenance period.

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Table 1

Summary of Responses by Clinician (n=9), Parent (n=10) and Teen (n=10)

Transition of Care			
	Clinicians	Parents	Teens
What makes for a successful transition between levels of care?	Communication between providers (6) Family and patient adherence (2) Follow-up contact (1)	Timing/quick transition (4) Transition plan (2) Support of teen (2) Communication (1) Unsure (1)	Safety plan (5) Immediate after care (2) Therapy (2) Social support (1)
What information should be shared between providers?		Everything (7) Specific targets (2) Unsure (1)	Everything (5) General information (5)
What are barriers to transition of care?	Time/availability (8) Lack of patient information (1)	Scheduling (5) Rapport with a new provider (2)Insurance (1) Patient buy in (1) No barriers (1)	Motivation (4) Lack of communication (2) Time/distance (2) Uncertainty (2)
Safety Plan			
	Clinicians	Parents	Teens
What is your involvement in safety plan development?	Editing/feedback on existing plan (5) Creating/helping patient develop the plan (3) No involvement (1)	No Involvement (8) Moderate Involvement (1) Very Involved (1)	Self-created (5) Collaborative with providers (5)
How involved should the parent be in the safety planning process?		A great deal of involvement (4) Limited involvement (3) Not specified (3)	Unspecified degree of involvement (6) Limited involvement (3) None (1)
What contributes to successfully using the plan?	Commitment (3) Rapport (2) Appropriate skills and contacts (3) Availability (1)		
What are the contents of your/your child's safety plan?		Social support and distractions (4) Does not know (4) Reaching out to others (2)	Social Support (9) Distractions (6) Reasons for Living (1) Mindfulness (1) Cognitive Skills (1)
How helpful is the safety plan on a scale from 0 to 5, where 5 is the most helpful?		0–2 (3) 3–5 (6) Don't know (1)	0–2 (0) 3 (2) 4 (6) 5 (2)
What are patient barriers to	Too distressed (4)	Too distressed (4)	Lack of motivation (3)
using the plan?	Unhelpful skills/content on safety plan (3) Plan lost or not with teen (2)	Lack of appropriate skills or Contacts on safety plan (2) Lost or not with teen (1) Unsure (1) No response (2)	Not wanting to involve others (2) Plan not with them/forgot (2) No barriers/no response (2) Too upset (1)
What happens to the safety plan after it is created or after discharge?	Not utilized(4) Uses plan (3) Varies by patient (2)	Don't know (4) In bedroom (4) No response (2)	In bedroom (8) On mirror (1) Does not know (1)
Treatment Targets			
	Clinicians	Parents	Teens
Include sleep/sobriety strategies in treatment?	Targeting sleep and sobriety would be important (9)	Alcohol only (5) Sleep/alcohol (5) Sleep only (0)	Alcohol only (0) Sleep/alcohol (5) Sleep only (5)
Social support strategies?	Important (9)	Identification of support (5)	Ask for help (8)

		Availability (2) Don't know (3)	Being around others (2)
Applicability of Technology/Phone Application			
	Clinicians	Parents	Teens
What do you think of a safety plan in a smart phone application?/ Rate helpfulness on a scale from 1–5, where 5 is the most helpful	Great idea, would improve practice (9)	5 (8) 4 (2)	5 (5) 4 (3) 3(1) 2 (0) 1 (1)
What are possible drawbacks or problems of a phone application?	Confidentiality (4) Phone restriction (4) No paper copy (1)	Privacy (4) Not as personal (2) None/no reply (4)	Confidentiality (5) No concerns (3) No response (2)
Would you feel comfortable using the phone application?	Yes, with training (6) Comfortable (3)		
Do you think patients/your teens/you would use this application?	Yes (9)	Yes (8) Don't know (2)	Yes (10)
What circumstances would you be most likely to use the application?	As needed (9) No response (1)	At school (3) During a crisis (2) At home (1) At school/home (1) Down mood (1) When bored (1) No response (1)	