



Evaluation of the 113Online Suicide Prevention Crisis Chat Service: Outcomes, Helper Behaviors and Comparison to Telephone Hotlines

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Recognizing the importance of digital communication, major suicide prevention helplines have started offering crisis intervention by chat. To date there is little evidence supporting the effectiveness of crisis chat services. To evaluate the reach and outcomes of the 113Online volunteer-operated crisis chat service, 526 crisis chat logs were studied, replicating the use of measures that were developed to study telephone crisis calls. Reaching a relatively young population of predominantly females with severe suicidality and (mental) health problems, chat outcomes for this group were found to be comparable to those found for crisis calls to U.S. Lifeline Centers in 2003–2004, with similar but not identical associations with specific helpers' styles and attitudes. Our findings support a positive effect of the 113Online chat service, to be enhanced by practice standards addressing an apparent lack of focus on the central issue of suicidality during chats, as well as by the development of best practices specific for online crisis intervention.

Crisis telephone helplines, or “hotlines,” are a valuable resource in community suicide prevention (WHO, 2014), and a growing

body of evidence has consistently shown that helplines reduce distress and suicidality in many callers (Coveney, Pollock,

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Armstrong, & Moore, 2012; Gould, Cross, Pisani, Munfaks, & Kleinman, 2013; Gould, Jimmie, Munfakh, Kleinman, & Lake, 2012; Gould & Kalafat, 2009; Gould, Kalafat, Harris-Munfakh, & Kleinman, 2007; Lester, 2012; Mishara et al., 2007b). Recognizing the importance of digital communication, major crisis helpline organizations began to offer online help services via chat (instant messaging) and e-mail (Drexler, 2013; Mishara & Côté, 2013; Murphy, 2013). As the rollout of these emerging online services preceded research, the need for evaluation of processes and outcomes is of great importance (Christensen, Batterham, & O'Dea, 2014; Luxton, June, & Kinn, 2011; Mishara & Côté, 2013).

Since its opening in 2009, the Dutch suicide prevention organization 113Online provides several online services to persons in suicidal crisis, ranging from volunteer-operated helplines to an online self-help course (van Spijker, van Straten, & Kerkhof, 2014), self-assessment tests, and brief online psychotherapy (Mokkenstorm, Huisman, Kerkhof, & Smit, 2013). These services can be used by 113Online visitors anonymously and free of charge.

To evaluate the 113Online crisis chat service, we applied the methods and measures used in the Silent Monitoring Study of Telephone helplines (SMST; Mishara et al., 2007a,b). This approach was chosen because it does not interfere with active 113Online helpline functioning and ensures a naturalistic observation of helpers' and chat visitors' behaviors. In addition, replication of the use of SMST instruments allows for a direct comparison of the crisis chat service with outcomes of crisis telephone helpline services observed in 2003 and 2004. In this period, Mishara et al. (2007a, b) monitored 1,431 crisis calls, including 503 suicidal crisis calls, to 14 centers of the U.S. National Lifeline Centers (which at that time were referred to as U.S. 1-800-SUICIDE Lifeline Network Centers). Through silent listening, Mishara et al. rated visitors' emotional states and suicidal ambivalence in the first and last 2 minutes

of calls using the Crisis Call Outcome Rating Scale outcomes (CCORS; Bonneson & Hartsough, 1987) at the end of calls; and scored helpers' behaviors and attitudes throughout the call. Overall, Mishara et al. (2007b) observed a modest positive effect of telephone crisis calls, with many variables not changing significantly from the beginning to the end of the call. When change did occur, it was much more likely to be in the direction of improvement, with deterioration sometimes occurring. Mishara et al. (2007a) described four helper styles based on factor analysis of helper behaviors observed during hotline calls: (1) supportive approach and good contact, (2) collaborative problem solving, (3) active listening, and (4) negative approach. The first two styles, together with empathy and respect, were significantly related to positive outcomes. Active listening was not significantly related to positive outcomes. A mixed score of helpers' directivity yielded better outcomes than high levels (completely leading the course of the call) and low levels (totally following the lead of the caller) of directivity, respectively.

The goals of this study were to assess the reach of the 113Online chat service; to determine to what extent the 113Online crisis chat outcomes and their relation to helper styles are comparable to those found for telephone crisis calls; to identify areas for improvement of this service; and to formulate directions for future research.

METHODS

Sample

113Online chat logs were recorded automatically in real time and without further processing on a secure dedicated server in the 113Online medical records database. From this database, 526 chat logs of interactions with 78 volunteer helpers were retrieved from a total of 1,732 consecutive chat logs recorded between April 1 and June 1, 2013. The inclusion criteria were first chat visits per IP address with a

duration of 20 minutes or longer pertaining to visitors who were in crisis. Not included were chats too short in duration to make a proper assessment ($n = 512$), repeat chats with visitors whose first chat in the study period was already included ($n = 666$), chats with people seeking help for someone other than themselves and/or those bereaved by suicide ($n = 24$), and noncrisis chats referred to 113Online professionals ($n = 4$) (see Figure 1). Among visitors whose chats had been included, the mean number of chats during the 2-month study period was 2.2 ($SD = 3.7$, range 1–31).

Procedure and Analyses

Each of the included chat logs was coded by two independent coding research assistants: one coded outcomes and one coded helpers' behaviors and attitudes. Research assistants were working on a voluntary basis, with no previous experience as a 113Online helper. They were trained in the application of the SMST coding manual and coding forms using representative chat

logs drawn from the 113Online medical record database. Their level of education varied from masters-level students to masters in Psychology, Social Sciences, or Health Sciences who had graduated. Total training time amounted to approximately 100 hours per research assistant (nine training sessions each lasting 6–8 hours with 2–4 hours of preparatory homework).

In the chat logs, firstly, the visitors' characteristics (gender, age, nature of problems) were registered. Because chat visitors are anonymous, only the apparent gender and age could be determined. Chi-square statistics were used to test whether the nature of the visitors' problems differed across gender and age group. Secondly, chat outcomes were studied by coding (1) the CCORS at the end of chats and (2) visitors' emotional states and suicidal ambivalence at the beginning and end of chats, using a translated version of the SMST coding manual that was received directly from the primary investigator of this study. We estimated the amount of information on visitors' emotional states in a 2-minute telephone time frame to be about equal to the number of interactions in a 10-minute chat log fragment. The 2-minute SMST observation time frame for rating emotional states at the beginning and end of the intervention was extended to 10 minutes to obtain enough information to score these states in chat logs. Observed improvement, no change, or deterioration in visitors' emotional state at the end of the chat was calculated by subtracting start scores from end scores for each emotional state variable. Thirdly, helpers' behaviors and attitudes were scored throughout the chat and related to both the CCORS and visitors' emotional states. One-way ANOVAs were conducted to reveal significant differences between helper behaviors (empathy, respect, directivity) in chat outcomes. Bivariate linear regression analyses were carried out to assess the relationship between helper behaviors and total CCORS score and the number of improvements in the visitors' emotional states.

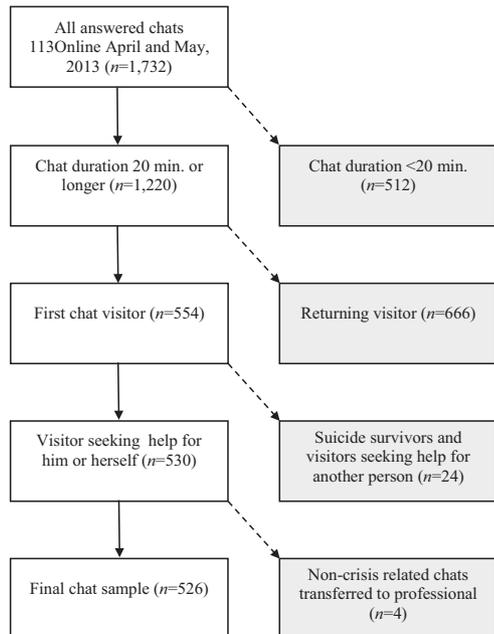


Figure 1. Chat log inclusion.

Measures

Chat and Chat Visitor Characteristics. The visitors' apparent age and gender and the presence of suicidal crisis were coded based on chat content as well as on the visitors' answers to a noncompulsory prechat questionnaire (Table 2). The nature of problems was coded according to the SMST problem inventory, to which the new problem category "rumination about, or not able to stop thinking about suicide" was added.

Chat Outcomes. The CCORS (Bonneson & Hartsough, 1987) is a validated 26-item rating scale. Items reflect visitors' positive and negative experiences and behaviors (e.g., "visitor said thanks"; "visitor went round in circles when talking"; or "visitor said the helper did not listen") rated on a 7-point Likert scale with a sum score ranging from 26 to 182, higher sum scores indicating more successful outcomes. The CCORS had a good internal consistency in this study (Cronbach's α 0.87).

Contrasting emotional states (apprehensive/confident; sad-happy; helpless/resourceful; tired/dynamic; hopeless/hopeful; confused/decided) were scored on a 5-point Likert scale in the first and last 10 minutes of the chat (see Table 1). In addition, coders scored whether or not a visitor was crying, desperate, and/or depressive. Suicidality was rated on a 3-point Likert scale: "wants to die," "is ambivalent about suicide," and "wants to live," with an additional option for coding the absence of information pertaining to suicidality, which was regarded as a missing value in the statistical analyses.

Helper Behaviors and Attitudes. To observe helper behaviors, the SMST scoring manual was used, consisting of nine sections of helper behaviors, developed and tested by Mishara et al. (2007a) and based on models of active listening and collaborative problem solving (Table 1). Items were coded on a scale of 0 (*behavior was absent*), 1 (*present once or twice*), and 2 (*present three times or more*) or were coded dichotomously (absent/present).

Following Mishara et al., helper behaviors were coded into four helpers' styles: (1) supportive approach and good contact: moral support, good contact, offers call back, reframing, validation of emotions, talks about own experience; (2) collaborative problem solving: factual questions about the problem, questions on resources, suggests ways to solve the problem, questions on precipitating events, proposes no-harm contract, suggests plan for action, offers referrals; (3) active listening: re-formulation, reflection of feelings, questions on emotions, empowers accessing of resources, empowers to develop plan of action; and (4) negative approach: tells caller what to do, reads information, challenges the caller, makes value judgments.

Furthermore, raters scored the level of empathetic understanding, respect, and helper directivity on a 5-point scale. Ratings of empathy and respectfulness were recorded into low (levels 1 and 2), medium (level 3), and high (levels 4 and 5). Ratings of directivity were recorded into nondirective (levels 1 and 2), mixed (level 3), and directive (levels 4 and 5).

Interrater Agreement. Ten research assistants coded chat visitors' emotional states. Nine other research assistants rated helper behaviors. Research assistants were trained until interrater agreement percentages were comparable to those reported in the SMST. Table 1 lists the interrater agreement percentages, Kappa's, and weighted Kappa's. Reaching acceptable interrater agreement proved hardest for the visitor emotional state variables Helpless/Resourceful in the beginning and end of the chat; for Confused/Decided at the end of the chat; and for the helper behavior intervention variable "Questions on resources."

Ethical Considerations and Funding

This article reports on the retrospective study of 113Online files of de-identified anonymous online help seekers to inform 113Online about processes and outcomes of the chat service. 113Online platform users

TABLE 1
Interrater Agreement of Visitor Emotional States and Helper Behaviors

	Agreement (%)	Kappa	Weighted Kappa
Contrasting Visitor Emotional States			
Apprehensive/Confident (initial)	89.8	0.70	.72
Sad/Happy (initial)	98.0	\$	\$
Tired/Dynamic (initial)	90.8	0.43	.46
Helpless/Resourceful (initial)	67.3	0.38	.33
Hopeless/Hopeful (initial)	89.8	0.74	.74
Confused/Decided (initial)	82.7	0.43	.45
Crying (initial)	99.0	0.88	X
Depressive Mood (initial)	89.8	0.24	X
Desperate (initial)	89.8	0.73	X
Suicidal/Ambivalent (initial)	81.6	0.71	X
Apprehensive/Confident (final)	74.5	0.59	.66
Sad/Happy (final)	71.4	0.48	.56
Tired/Dynamic (final)	99.1	0.80	.79
Helpless/Resourceful (final)	56.1	0.27	.31
Hopeless/Hopeful (final)	70.4	0.49	.54
Confused/Decided (final)	61.2	0.31	.41
Crying (final)	100.0	1.0	X
Depressive Mood (final)	83.7	0.67	X
Desperate (final)	81.6	0.62	X
Suicidal/Ambivalent (final)	79.6	0.59	X
Helper behaviors			
Making contact	95.8	.27	X
Factual questions on problems	99.2	0.85	.74
Direct questions on emotions	85	0.70	.69
Reframing	79.8	0.43	.46
Validating of emotions	96.6	0.39	.39
Moral support	90.8	0.38	.44
Why questions	90.8	0.58	.55
Challenge	99.2	\$	X
Own experience	94.2	0.64	.61
Reformulation	67.2	0.50	.58
Reflection	82.4	0.62	.63
Value judgement	77.5	0.43	X
Empowers resources	83.3	0.44	X
Suggests ways to solve the problem	70.0	0.54	.63
Questions on resources	63.3	0.39	.47
Tells visitor what to do	88.3	0.21	.22
Reads information to visitor	99.2	\$	\$
Suggests plan for action	88.3	.40	X
Empowerment action plan	95.0	.48	X
Agreement action plan	92.5	.37	X
Offers referrals	84.2	.62	X
Chatter asks for referrals	96.7	-.01	X
No referrals	98.3	-.01	X
Appointment	100	1.00	X
No-harm contract offer	98.3	\$	X

(continued)

TABLE 1
(continued)

	Agreement (%)	Kappa	Weighted Kappa
Seeks no-harm contract	100	\$	X
Agreement on follow-up	95.0	.55	X
Chatter will chat again	95.8	.92	X
Helper interrupts chat	85.8	.66	X
Empathy rating	80.8	.60	.61
Respect rating	69.2	.02	.06
Directivity rating	78.3	.31	.31

X – not calculated, no ordinal variable; \$ – not possible to compute, because one of the variables is a constant.

are informed that their data or files can be used for quality assurance and service improvement purposes. Thus, this study does not fall within the scope of the Dutch Medical Research Involving Humans Act (WMO). Under Dutch law, no medical ethical committee consent for doing this study or publishing the results hereof is required (see CCMO, 2015).

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RESULTS

Chat and Chat Visitor Characteristics

The average chat duration was 54.0 minutes (*SD* 18.3, range 20–144 minutes). Most chat visitors appeared to be female ($n = 382$, 72.6%); 97 (18.4%) were male, and in 47 chats (8.9%) the apparent gender could not be determined. In total, 22.2% of the visitors were aged less than 18 years, 53.6% were between 18 and 34 years, and 17.7% were between 35 and 54 years. A small minority (1.7%) was apparently aged over 55. The apparent age category could not be determined for 4.8% of the chat visitors. With progressive age categories, the male-to-female ratio changed gradually from 1:8 in visitors aged

under 18 to approximately even numbers of males and females in visitors aged over 55.

Suicidal Crisis and Presenting Problems

Table 2 shows the nature and acuity of suicidal crisis chats, and the nature of the visitors' presenting problems, by gender and age groups. Most visitors were in suicidal crisis (86.1%), with 61.1% expressing suicidal intent without plans, 21.2% expressing both suicidal intent and plans, and 3.8% contacting 113Online during or just after a suicide attempt. The average number of problems visitors presented with was 2.0. Mental health problems (defined as having psychological problems and/or receiving treatment for psychiatric disorders such as depression, anxiety or psychosis, or post-traumatic stress disorder) were mentioned most frequently by 59.7% of the visitors, followed by problems with family or partners (23.4%) and rumination (18.6%). Females were more often in suicidal crisis and mentioned mental health problems, death of a person close to them, and physical violence significantly more often than males. Males mentioned relationship problems and being a perpetrator of physical or verbal violence significantly more often than females. Visitors aged under 18 mentioned family problems with parents or children, school/professional problems, and being a verbal violence victim significantly more

TABLE 2
Type of Suicide Crisis and Nature of the Problems Presented by all Chatters (N = 526)^a

	Total		Female		Male		<18 years		≥18 years		p
	n	%	n	%	n	%	n	%	n	%	
Type of Suicide Crisis											
Suicide crisis	451	86.1	341	89.7	79	81.4	105	89.7	330	86.2	.32 ^b
Attempt in progress	20	3.8	17	4.5	1	1.0	10	8.5	8	2.1	
Has attempt plan	111	21.2	81	21.3	21	21.6	15	12.8	91	23.8	
Expressed intent	320	61.1	243	63.6	57	58.8	80	68.4	231	60.3	
Nonsuicide crisis	73	13.9	39	10.3	18	18.6	12	10.3	53	13.8	
Total crisis calls ^c	524	100	380	100	97	100	117	100	382	100	
Nature of Problem											
Mental health problems	314	59.7	235	61.5	49	50.5	57	48.7	243	63.3	.005
Family problems with parents or children	123	23.4	97	25.4	18	18.6	47	40.2	75	19.5	<.001
Rumination	98	18.6	75	19.6	16	16.5	21	17.9	70	18.2	.95
School/professional problem	97	18.4	68	17.8	19	19.6	35	29.9	59	15.4	<.001
Relationship problems (partner, sexual problems)	8	15.4	55	14.4	24	24.7	12	10.3	68	17.7	.05
Loneliness	79	15.0	59	15.4	15	15.5	14	12.0	62	16.1	.27
Physical violence victim	53	10.1	48	12.6	4	4.1	9	7.7	42	10.9	.31
Death of a close person	34	6.5	31	8.1	2	2.1	11	9.4	21	5.5	.13
Verbal violence victim	34	6.5	29	7.6	4	4.1	21	17.9	13	3.4	<.001
Severe physical illness	32	6.1	20	5.2	6	6.2	3	2.6	23	6.0	.14
Physical or verbal violence perpetrator	8	1.5	3	0.8	5	5.2	1	0.9	6	1.6	.57 ^d
Abortion/pregnancy	3	0.6	2	0.5	0	0.0	1	0.8	2	0.5	.68 ^d
Trouble with police	2	0.4	0	0.0	2	2.1	0	0.0	2	0.5	.43 ^d
Other	101	19.2	62	16.2	26	26.8	19	16.2	79	20.6	.30
Average number of problems	2.01		2.05		1.96		2.15		1.99		.16

^aIn 47 chats, gender was unknown, and in 25 chats, the age was unknown.

^bSuicide crisis (Yes; No) versus gender (Female; Male) and suicide crisis (Yes; No) versus age (<18 years; ≥18 years).

^cIn two chats, type of suicide crisis was unknown.

^dAbout 25% or more of the expected frequencies below 5.

often than visitors aged over 18. Visitors aged over 18 mentioned mental health problems and relationship problems significantly more often than visitors aged under 18.

Chat Outcomes

Crisis Call Outcome Rating Scale. The mean CCORS score was 114.1 ($SD = 16.8$, range 61–150). Looking at individual CCORS items, a mixed picture emerges. Visitors were rated to be (somewhat to very) dissatisfied for 27.6% of chats and in 28.7% to be (somewhat to very) satisfied. Scores on the item “visitor said he/she felt better” revealed that 33.1% did not seem to feel better, while 20.2% felt (somewhat, to a lot) better. With the item “visitor said thanks to the helper,” raters scored “disagree” in 26.9% and “agree” in 71.9% of the chats. In 46.3% of chats, visitors were coded to have mentioned new or more effective forms of coping during the chat.

Change in Visitors’ Emotional States. Table 3 shows the number and percentage

of chats with observed improvement, no change, or deterioration in visitors’ emotional states at the end of the call. Improvement in a visitor’s emotional state was observed frequently (36.1%–48.5%) with respect to every variable, except tired/dynamic, crying, and suicidal ambivalence. No change was observed more frequently in 43.2%–64.2%. Deterioration in a visitors’ emotional state occurred incidentally (0.4%–13.4%). Suicidal ambivalence was observed to improve in 3.4% and to deteriorate in 2.8% of chat visitors, with missing values in 64.1% of the chats.

Chat Outcomes in Relation to Helpers’ Attitudes and Styles

CCORS Scores and Emotional State Improvement Related to Helpers Styles and Attitudes. Significant differences were found between the three levels of empathy (low, medium, high) and CCORS score, $F(2, 518) = 4.469$, $p = .012$. Post hoc tests revealed that low levels of empathy were associated with a lower CCORS score

TABLE 3
Outcomes for the Overall Sample (N = 526), Direction of Change

	Direction of change							
	Deterioration ^a		No change ^b		Improvement ^c		Missing data	
	N	%	N	%	N	%	N	%
Apprehensive/Confident	14	2.7	254	48.3	257	48.9	1	0.2
Sad/Happy	2	0.4	282	53.6	241	45.8	1	0.2
Tired/Dynamic	25	4.8	465	88.4	29	5.5	7	1.3
Helpless/Resourceful	65	12.4	255	48.7	197	37.5	9	1.7
Hopeless/Hopeful	18	3.4	252	47.9	255	48.5	1	0.2
Confused/Decided	70	13.4	227	43.2	221	42.0	8	1.5
Crying	8	1.5	498	94.7	18	3.4	2	0.4
Depressive Mood	5	1.0	328	62.4	190	36.1	3	0.6
Desperate	14	2.7	281	53.4	229	43.5	2	0.4
Suicidal Ambivalence	15	2.9	156	29.7	18	3.4	337	64.1

Note. ^aDeterioration: there was a change for the worse along this dimension.

^bNo change: there was no change measured between the beginning and end of the chat along this dimension.

^cImprovement: there was a change toward an improvement along this dimension.

compared to medium ($p = .011$) and high empathy ($p = .009$) ratings. Significant differences were also found between the three levels of respect and CCORS score, $F(2, 519) = 5.099$, $p = .006$. Post hoc tests revealed that low levels of respect were associated with a lower CCORS score compared to high-level respect ratings ($p = .027$). Analysis of the CCORS scores and the three levels of directivity showed no significant differences, $F(2, 520) = 1.745$, $p = .176$. No differences were found in number of improvements between the three levels of empathy, $F(2, 519) = 0.226$, $p = .798$; respect, $F(2, 520) = 1.483$, $p = .228$; and directivity, $F(2, 521) = 1.081$, $p = .340$.

Table 4 shows the results of bivariate regression analyses with the CCORS and the number of improvements in visitor emotional state as dependent variables and helper styles as independent variables. Both the total CCORS score and the number of improvements in visitors' emotional states were significantly associated with all helper styles, except negative approach.

Four one-way ANOVAs were conducted to compare scores on the four helper styles between chatters whose suicidal ambivalence deteriorated, did not change, or improve during the call. There were no statistically significant differences found for the helper styles supportive approach and good contact, $F(2, 186) = 0.768$, $p = .466$; collaborative problem solving, $F(2, 186) = 1.545$, $p = .216$; active listening, $F(2, 186) = 0.362$, $p = .697$; and negative approach, $F(2, 183) = 0.095$, $p = .909$.

A one-way ANOVA revealed that CCORS scores were significantly different in the three suicidal ambivalence groups, $F(2, 185) = 4.164$, $p = .017$. Post hoc analysis showed that CCORS scores of visitors whose suicidal ambivalence deteriorated during the chat were significantly lower compared to visitors with no change in suicidal ambivalence ($p = .014$) or change in the direction of wanting to live ($p = .005$).

TABLE 4
Helper Styles Related to CCORS and Improvements in Visitor Emotional State

	<i>B</i> (\pm SE)	<i>p</i>
Association with CCORS ^a		
Support. approach and good contact	4.58 (\pm 0.95)	<.001
Collaborative problem solving	1.98 (\pm 0.44)	<.001
Active listening	2.37 (\pm 0.53)	<.001
Negative approach	2.60 (\pm 1.42)	.07
Association with Number of Improvements in Visitor Emotional State ^{a,b}		
Support. approach and good contact	0.47 (\pm 0.13)	<.001
Collaborative problem solving	0.23 (\pm 0.06)	<.001
Active listening	0.18 (\pm 0.07)	.02
Negative approach	0.32 (\pm 0.19)	.10

^aBased on bivariate linear regression analyses.

^bThe variable number of improvements in the chat visitor behavioral ratings is based on 8 of the 10 dimensions of Table 3. The dimensions tired/dynamic and crying were not included in this variable.

DISCUSSION

Reach

The 113Online crisis chat service reaches a predominantly female and relatively young population, of which a significant proportion is return visitors. The ability to engage with young people is an asset of chat services, as telephone hotlines are shown to be relatively underused by youths (Gould & Kalafat, 2009). Given their elevated risk, it is also paramount to reach middle-aged and male suicidal individuals who were underrepresented in our sample.

Compared to the callers that Mishara et al. (2007a) investigated in the SMST, 113Online chat visitors seem to be experiencing a suicidal crisis more than twice as often (86.1% vs. 35.2%). They have to cope

with more types of problems (average 2.0 vs. 1.3) and suffer from mental health problems twice as often (59.7% vs. 28.4%). The prevalence of mental health problems in our sample is comparable to the prevalence Gould et al. (2007) reported for a subsample of suicidal callers to the U.S. Lifeline Network. In line with the SMST findings, no significant difference in the number of problems between males and females was observed.

Chat Outcomes

Our findings indicate that the outcomes of the 113Online crisis chats in 2013 are generally comparable to the outcomes of crisis telephone calls of U.S. Lifeline centers in 2003 and 2004 that were reported by Mishara et al. (2007b). The 113Online mean CCORS score (114.1, $SD = 16.8$) was higher but within the standard deviation of the mean U.S. Lifeline centers score of 102.4 ($SD = 18.5$). With respect to the key variable, our results are to be interpreted with great caution as a consequence of the high number of missing values (64.1%). Compared to callers in the SMST, 113Online visitors' suicidal ambivalence was observed to have moved in the direction of "want to live" less often (113Online: 3.4% vs. U.S. Lifeline: 11.5%) and to have moved toward "want to die" more often than in the SMST (3.4% vs. 1.7%). Comparing the other emotional state variables, more improvement and less deterioration were observed for the variables desperate, depressive mood, sad/happy, apprehensive/confident, and hopeless/hopeful. Less improvement and more deterioration were observed for helpless/resourceful and confused/decided.

The CCORS score and the number of improvements in emotional state variables were significantly associated with the three positive helpers' styles that Mishara et al. (2007a) have proposed. This conclusion is intuitively unsurprising; albeit Mishara et al. (2007b) did not find a significant association between positive outcomes and

active listening and did find an association with a mixed level of directivity which was not found to be significant in the current study. Higher levels of respect and empathy were associated with the CCORS score but not with the number of improvements in emotional state variables. This difference may be explained by the fact that the CCORS, compared to the emotional state variables, better captures the visitors' subjective experience with the helper and is methodologically more sensitive to levels of empathy and respect. Still, these mixed findings and differences with the SMST raise the question to what extent helpers' styles and attitudes associated with better results in telephone counseling are valid and can be translated into best practices for crisis chat counseling.

The outcomes of the current study and the SMST appear to be in negative contrast with those found by Gould et al. (2007) on the outcomes of telephone calls to U.S. Lifeline centers in 2003 and 2004. However, limitations of this study, as well as methodological differences and differences in reporting hamper a direct comparison of results. Gould et al. used questionnaires at the beginning and end of 1,085 calls and found statistically significant changes for intend to die, hopelessness, and psychological pain. These effects are likely to be skewed toward the positive due to selection bias. Intoxicated or belligerent callers, chronic callers, callers that hung up, and callers not in a mental state fit to complete assessment were excluded a priori. From the eligible sample of 1,739 callers, 654 (37.6%) were not assessed because their suicidal risk status was too high. Moreover, the implementation of the research protocol in their study may have influenced the nature of the interaction with the caller, limiting the generalizability of their findings (Kalafat et al., 2007).

In conclusion, the reporting on change in mean emotional state scores reveals to a lesser extent a sobering reality that is observed in the SMST and the current study: to a certain degree, lack of effect

is to be expected from very brief interventions delivered by volunteers via chat or telephone to suicidal individuals in crisis, struggling with multiple (mental health) problems.

There is, however, ample room for improvement. Gould et al. (2013) showed the positive impact of the implementation of the Applied Suicide Intervention Skills Training (ASIST) on helpers' behaviors and call outcomes. Callers were significantly more likely to feel less depressed, less suicidal, less overwhelmed, and more hopeful by the end of calls handled by ASIST-trained versus non-ASIST-trained counselors. While in a sizeable portion of calls, little or no change in callers' suicidality was observed (ASIST: 40%, non-ASIST; 54%); generally, the outcomes on suicidality were observed to be more positive than the outcomes of our study, the SMST, and Gould et al. Callers were reported to be a lot less suicidal at the end of 22% (non-ASIST) and 28% (ASIST) of calls. This may be explained by more effective lifeline interventions as a result of the standardization of risk assessment practices which has taken place over the years (Dra- per, Murphy, Vega, Covington, & McKeon, 2015), on top of which the ASIST training has improved volunteers' exploration of suicidal callers' reasons to live and reasons to die as well as their ability to identify informal sources of support (Gould et al., 2013).

Areas for Service Improvement

Given the general notion that more positive styles and attitudes lead to better outcomes, the question remains as to which elements in these styles and attitudes need to be further developed or strengthened to improve chat outcomes. Here, negative observations regarding individual CCORS items, mood states, and missing values provide valuable clues for improvement.

As reported, scores on individual CCORS items illustrate that a portion of service users are critical of the help

provided. On the one hand, this may reflect help visitors' ambivalence in seeking help or negative attitudes toward helpers, fueled by their state of suicidality, crisis, and despair (Deane, Wilson, & Ciarrochi, 2001; Wilson & Deane, 2010). Due to the online disinhibition effect (Suler, 2004), these ambivalent or negative attitudes may be expressed online in an heightened and sometimes provocative fashion, resulting in a less productive dialogue. On the other hand, visitors' criticism may reflect genuine dissatisfaction with the quality and outcome of the exchange with volunteers. During the period observed in this study, volunteers were specifically trained in the use of solution-focused therapy principles (Mokkenstorm et al., 2013). For well-trained therapists, this approach is a fruitful way to work with suicidal individuals (e.g., Fiske, 2008). From reading the chat logs, it became clear that this approach can have drawbacks in its application by volunteers. For example, a volunteers' one-sided focus on "what's strong" rather than on "what's wrong", steering attention away from the exploration of problems, may evoke a sense of lack of validation and disorientation in the visitor. This could explain why 12.4% of the 113Online visitors felt more helpless and 13.4% more confused at the end of calls.

Seen in this light, the high percentage of missing values in the observation of suicidal ambivalence is of great concern. Missing values are the result of chat logs lacking explicit textual information regarding visitor suicidal ambivalence in the first and/or last 10 minutes of chats. Observation of suicidal ambivalence in these time frames only may be less sensitive than observation during the entire interaction, as carried out by Gould et al. (2013). Still, the high number of missing values indicates a suboptimal helpline practice with volunteers not focusing enough on suicidality at the beginning and the end of the conversation. This problem, which has been highlighted by studies examining telephone crisis services (Coveney et al., 2012; Gould et al., 2007, 2013; Kalafat

et al., 2007; Mishara et al., 2007b), may be even more prominent for crisis chats that are known to drift toward exploration of problems more than toward their solution (Bambling, King, Reid, & Wegner, 2008; Chardon, Bagraith, & King, 2011).

113Online helpers were trained to be patient and to allow conversation to flow, but to keep the chat duration within 1 hour where possible. Studying the chat logs, it became apparent that this instruction was too ambiguous. Sometimes helpers were observed to introduce the ending of the chat conversation in the last 10 minutes of the hour, when at that point in time the visitor was about to open up on suicidality. Starting, structuring, and ending conversations with those seeking help in a productive manner are more complicated in chat than in telephone or face-to-face interventions (Stommel, 2012; Stommel & Molder, 2015) and require special attention in volunteer training and supervision. As Drexler (2013, p. 97) pointed out, it is key to be transparent about the focus and the purpose of the chat at the beginning and throughout the chat. As our study shows, chat duration is almost three times longer than call length reported in the SMST. While chat is a slow medium, it is important for helpers to be patient yet also to be assertive in the process and, if needed, gently remind the visitor to focus on critical issues within the available time without observing time limits in a forced manner.

In response to the preliminary findings of the current study, 113Online has adapted practice policies in line with U.S. Lifeline best practices. Helpers are now instructed to more proactively explore with visitors reasons to live and reasons to die, assessing suicidal behaviors at the beginning of chats and returning to this issue at the end, working with visitors toward safety planning and links to care. In volunteers' training and supervision, due emphasis is given to structuring the chat within reasonable but flexible time limits, with a pragmatic rather than principal use of solution-focused counseling techniques. To optimize

this collaboration and to avoid harm resulting from a disappointing dialogue, volunteers are made aware of the pitfalls of online communication, in particular with visitors who display ambivalent, incongruent, or provocative help-seeking behaviors. The 113Online website look and feel has been adapted to be more inviting and accessible for males, and for middle-aged or older help seekers. Policies have been implemented to guide frequent use visitors, exploring with them potentially effective alternatives to regulate mood, and to link them to other forms of care. To further engage the highly volatile and vulnerable group of young visitors, 113Online is piloting simple therapeutic e-learning modules specifically tailored to problem areas this group frequently presents with.

LIMITATIONS

This study has several limitations. The current study has a naturalistic design, lacking controls, and lacking follow-up to ascertain to what extent immediate call outcomes translate into more adaptive coping and the prevention of suicide (or suicide attempts). Due to age and gender bias, generalization of our findings to also include older and more mixed gender populations is limited. The exclusion of repeat chats with frequent service users prevents analysis of the nature of the function of the service for this group. Measurement of visitors' emotional states was carried out by rating chat visitors' written language, which is assumed to be reflecting visitors' inner states completely and congruently. However, chat language is often fragmented and ambiguous, with visitors using innuendo and over- and understatement that hinder straightforward interpretation and coding. This implies a risk of observation bias and could explain the limited maximal interrater agreement. In addition, rating visitors' mood states in the first and last 10 minutes of chats may have prevented a more sensitive measurement of overall change and reduced the

number of missing values. Finally, our measures are developed to study telephone crisis counseling. Their construct validity and operationalization may be less suitable for a full investigation and understanding of what works in crisis chat intervention.

CONCLUSION

This study shows that outcomes of 113Online crisis chats in 2013 are generally comparable to the outcomes of crisis telephone calls to the U.S. Lifeline Network in 2003–2004, reported in the SMST (Mishara et al., 2007b). Compared to callers studied in the SMST, 113Online visitors were observed to be in suicidal crisis more often; to present with more (mental health) problems; and to be on average younger and more often female. While a substantial number of visitors (36%–49%) were observed to be in a better emotional state at the end of the visit for most variables, no change in emotional state was observed more often (43%–64%), and deterioration incidentally occurred (0%–13%). Suicidality was often not actively addressed in the first and last 10 minutes of chats, resulting in a large number of missing values (64%) for this variable. Along with observations related to structure of the online dialogue, the mixed results and apparent lack of focus on suicidality during chats have been addressed in revised 113Online practice, training, and supervision standards. The study provided valuable information to further develop the 113Online platform and interventions to better reach and serve target audiences.

FUTURE DIRECTIONS

As it is to be expected that online crisis intervention will rapidly grow, it is paramount for service providers, experts, and researchers to develop and share best practices in this field. Chat logs provide an

excellent opportunity to investigate the changes in visitors' emotional states and suicidality, as reflected in written language. An initial objective for future research could be to assess the direct and follow-up impact of the implementation of possible online best practices, starting with best practices for telephone crisis intervention adapted for online use; second, to differentiate the characteristics, needs, and preferences of different types of visitors, for example, single-service users versus repeat service users; and third, to identify which interventions best serve different target populations and types of service users.

Given the distinct features of chat conversation, development of methods and measures specifically suited to investigate process and outcomes of crisis chat are needed. With respect to independent variables, it is to be determined what helpers' behaviors, styles, and attitudes are; what specific content areas they concern; and what typical communication patterns are commonly encountered in chat, and how they relate to outcomes. Here, the emerging field of conversation analysis may help identify typical online interaction patterns associated with better outcomes that are different from patterns known to be effective in telephone counseling (Stommel & te Molder, 2015). Outcome variables should be rooted in a theoretical understanding of the development and prevention of suicidal behavior and be operationalized in a way that allows for the observation of change based on written text only. Based on the integrated motivational-volitional models of suicidal behavior (O'Connor, 2011), the key concept of "entrapment" could be operationalized into outcome measures to be observed in chat logs, as could operationalizations of "perceived burdensomeness" and "thwarted belongingness" that are core to the Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010). In the near future, computerized sentiment mining technologies (Pestian et al., 2012) performing linguistic process and content analyses

may prove suitable to support or substitute research assistants reading chat logs, bringing within reach large-scale studies of

chat logs that could inform helplines to further improve service performance and outcomes.

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