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Effects of suicide awareness materials on individuals with recent suicidal ideation or attempt: online randomised controlled trial

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Background

Awareness materials featuring ways of coping with suicidal ideation can reduce suicidal ideation, the so-called Papageno effect. All of the previous experimental studies on this subject have been conducted with individuals not at risk of suicide.

Aims

To assess effects of suicide awareness materials in a sample of individuals with recent suicidal ideation. Trial registration: German Clinical Trial Registry ID number DRKS00013613.

Method

Adults ($n = 266$) with recent self-reported suicidal ideation or attempt were randomised to read an educative article featuring a lay individual with personal experience of suicidality ($n = 86$), a similar article featuring a mental health expert ($n = 90$), or an unrelated article ($n = 90$) in a double-blind online randomised controlled trial. Questionnaire data were collected before (T_1) and immediately after exposure (T_2) as well as 1 week later (study end-point, T_3) and analysed with linear mixed models. The primary outcome was suicide risk as assessed using the Survival and Coping Beliefs subscale of the Reasons for Living Inventory (RFLI); secondary outcomes were suicide-prevention knowledge and mood.

Results

There was an immediate beneficial effect on suicide risk in the intervention group exposed to the message delivered by the individual with personal experience (group 1) as compared with the control group that was maintained until the study end-point (study end-point: RFLI score mean difference from baseline within group 1 MD = −0.36 (95% CI −0.66 to −0.06), mean difference compared with control group MD = −0.71 (95% CI −1.27 to −0.14); $d = -0.18$). The effect was particularly pronounced for individuals with recent suicide attempt (RFLI score at T_3, compared with control group: MD = −1.55 (95% CI −2.52 to −0.57); $d = -0.23$). Participants in this group also showed increased prevention-related knowledge compared with the control group.

Conclusions

Individuals with a recent suicide attempt appear to benefit from a printed narrative of positive coping with suicidal ideation. The intervention materials do not increase short-term suicide risk.

Declaration of interest

None.

Keywords

Suicide; media; health education; Papageno effect; Werther effect.

Over the past few decades, strong evidence has accumulated that sensationalist portrayals of suicide cases, particularly celebrity suicides, can trigger further suicides,[1–3] the so-called Werther effect.[4] This effect seems to be most pronounced among individuals with some vulnerability to suicide, who identify strongly with the deceased individual.[5] Recent research shows, however, that by far not all media portrayals increase suicidal ideation; on the contrary, some media stories appear to decrease suicidal ideation in the audience, the so-called Papageno effect.[6] In the first study describing a possible Papageno effect, portrayals of ways of constructively coping with suicidal ideation were found to be associated with a subsequent decrease in suicide rates.[6] In accordance with this finding, several randomised controlled trials (RCTs) on the effects of fictional films,[5] suicide-educative websites[7] or newspaper articles[8,9] indicated that the portrayal of constructive coping with suicidal ideation reduced short-term suicide risk in study participants. The effect appeared to be partially maintained over a period of 1 week.[7]

These findings suggest that educative messages on suicide prevention might have positive effects on suicide risk, but it remains unclear whether previous findings generalise to individuals with some risk for suicidal behaviour.[10] All previous studies were conducted with individuals from the general public, and individuals with suicidal ideation were not represented in these trials.[5,7–9] This is particularly relevant because individuals with suicidal ideation are the main target groups of any media initiatives, and might be most prone to adverse events.[10] Furthermore, the inclusion of individuals with personal experience of suicidal ideation and attempt has been recommended as the way forward for suicide preventive messages targeting individuals with suicidal thoughts.[11]

On the basis of the previous finding that awareness materials were safe to use in low-risk individuals,[5,7–9] the present study aimed to test the effects of prevention stories on individuals who reported recent suicidal ideation or a suicide attempt. Because narratives delivered by individuals with personal experience of suicidality might resonate better with individuals with own experience of suicidal ideation or suicide attempts, we also aimed to assess whether the effects varied when the media message was delivered by an individual with personal experience compared with a mental health expert.

Specifically, we tested the following hypotheses with regard to the primary outcome, suicidal ideation:

(a) suicide-educative media stories featuring ways of coping with suicidality decrease suicide risk in an audience with recent suicidal ideation
(b) the effect is more pronounced among individuals with stronger vulnerability to later suicide, as indicated by a recent suicide attempt
(c) the effect is more pronounced if the story is delivered by an individual with personal experience of suicidal ideation than if it is delivered by a mental health expert.

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Method

Participants

A web-based double-blind RCT was conducted from January to June 2018. German-speaking individuals aged 18 or above were invited to participate in an online study of the effect of health-related awareness material. Flyers of the invitation were posted at different locations in Vienna, Austria, including supermarkets and university departments, and in online settings. The invitation disclosed that the study would bring up topics such as suicide, without giving specific details. The announcements also stated that only individuals with recent suicidality (i.e., suicidal thoughts or suicide attempts within the past year) were eligible. At the beginning of the online trial, before randomisation, individuals interested in participation were asked whether they had experienced suicidal thoughts in the past year (yes/no) or attempted suicide in the past year (yes/no). A brief definition was added explaining that suicidal thoughts were 'thoughts to take one's own life', and a suicide attempt was 'a non-fatal attempt to take one's own life'. Individuals who indicated that they had not experienced suicidal thoughts or attempted suicide within the past year were excluded from participation.

Power analysis

A power analysis using G*Power 3.1.9.2[12] indicated that an ANOVA model with three repeated measures, six groups (study groups: group 1, group 2, control group; vulnerability: recent suicidal ideation versus suicide attempt) and an assumed correlation of 0.70 among repeated measures would require a total sample size of 120 participants to detect an effect size of 0.3 based on previous studies.[5,7] Similarly, a sample size calculation using GLIMMPSE 2.2.4[13] estimated that an equivalent linear mixed model would require a sample size of 120 participants.

Randomisation and masking

We conducted an online RCT with two intervention groups and one control group. Once informed consent was given and inclusion criteria were checked, the participants were automatically randomly allocated to one of three groups using urn randomisation. In the urn design, a random draw related to group assignment can be carried out without replacement. For the present purpose, the urn contained three ballots with group assignments. After the last ballot in the urn was drawn, the urn was automatically refilled. The urn design forces a small-sized trial to be balanced but approaches complete randomisation as the size of the trial increases.[14] The allocation ratio was 1:1:1 to achieve similar group sizes. Participants and researchers were masked to group assignment.

Materials and procedure

Participants in group 1 were asked to read an article headlined 'Coping with suicidal crisis', with the subheadline 'Martina was among the many suicidal callers who received help from the telephone crisis service. She speaks about how to cope with a suicidal crisis'. In the article, Martina describes the circumstances that contributed to her past suicidal crisis, putting an emphasis on the relevance of the social environment in helping her cope with suicidal ideation and on the multifactorial aetiology of suicidal behaviour. The body of the article emphasises her preparations for suicide and her 'lightbulb moment' just before her planned attempt, when she decided to call a telephone crisis line. She then describes how she worked with the counsellor to work through her suicidality.

Participants in group 2 were asked to read a news article featuring an interview with a suicide prevention expert. In the interview, the expert states that suicidal ideation is prevalent, offers advice on how to cope with suicidal thoughts and how families and friends can support individuals in crisis. The article had the same headline as the group 1 article ('Coping with suicidal crisis') and included an adapted subheadline ('Suicide prevention expert Prof. Martina Reisch talks about how to get help in a suicidal crisis from a telephone crisis line'). Similar to the messages in the article for group 1, the expert outlines some important triggers and traumatic events that might result in suicidal ideation; explains that no single factor is sufficient to explain suicidal behaviour, but that social support is key in preventing it; and highlights an example of one of her patients who managed to cope with suicidal crisis by calling the local telephone crisis line. The narrative related to the patient was equivalent to Martina's story presented to group 1.

In the control article, similar stylistic elements were used, but the topic was unrelated to suicide prevention. The featured protagonist, Martina, describes her citizens' initiative to rebuild a railway track on the shoreline of a lake. Similar to both other groups, the article included the logo and a text box promoting the telephone crisis line. This text box was included in the control article in order to provide a 'minimal intervention' in form of contact information for help services for all participants independent of their group assignment.

All three articles comprised two pages (length of articles: group 1, 497 words; group 2, 685 words; control group, 519 words) and were written by T.N. and B.T. on the basis of articles published in an Austrian daily newspaper by the same journalist.

Participants' suicide risk was measured before they read the articles. After reading the articles, we measured suicide risk again as well as the secondary outcomes: suicide-prevention-related knowledge and mood. We also administered an item to assess masking success. All participants were invited to leave an email address to be contacted again 7 days later for a follow-up (T_3). At the study end-point T_3, all outcome measures were assessed again.

Primary outcome measure

RFLI Survival and Coping Beliefs subscale

Suicide risk was assessed using the 23-item Survival and Coping Beliefs subscale of the Reasons for Living Inventory (RFLI).[15] This subscale has been used before to measure media-induced changes of suicide risk.[7,9] Respondents rated reasons for not wishing to die by suicide (e.g. 'I still have many things left to do') on a scale ranging from 1 (not at all important) to 6 (extremely important). Scale scores were reverse-coded, resulting in higher scores indicating higher suicide risk, and mean scores across all 23 items of the scale were calculated (score range: 1–6) (Cronbach's $\alpha = 0.95$).

Secondary outcome measure

Revised Facts on Suicide Quiz

To determine participants' suicide-prevention-related knowledge, we administered items 1, 3, 5, 6 and 7 of the Revised Facts on Suicide Quiz.[16] All items were answerable from the information provided in the articles of the intervention groups. We presented the statements (e.g. 'Most suicidal individuals do not want any help') to the participants and asked them to rate the accuracy of the respective statement (true/false/don't know). Correct responses were coded as 1, whereas incorrect responses and 'don't know' answers were coded as 0. Higher scores indicate more suicide-prevention-related knowledge. Mean scores across all five items of the scale were calculated (score range: 0–1) (Cronbach's $\alpha = 0.42$).

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Mood subscale

Mood was assessed using the mood subscale of the Affective State Scale,[17] which uses responses to eight adjectives describing the person's mood, such as 'merry' or 'sad', scored on a scale from 1 (not at all) to 4 (highly). Higher scores indicate better mood. Mean scores across all eight items of the scale were calculated (score range: 1–4) (Cronbach's $\alpha = 0.85$).

Additional measures

Masking success

To assess masking success, at the end of T_2 we asked respondents to indicate what group they thought they had been allocated to (intervention group/control group/don't know).[18,19]

Data analysis

The scores for the primary outcome variable (i.e. suicide risk) were subjected to a group (group 1, group 2, control group) × time (pre-exposure T_1, post-exposure T_2, 1 week later T_3) × vulnerability (measured as suicide attempt versus no attempt) model using linear mixed models with individual group differences tested using contrast tests. All analyses were adjusted for age and gender. Linear mixed models account for correlations between repeated measures and missing data.[20] For the secondary outcome variables, we applied a group (group 1, group 2, control group) × time (post-exposure T_2, 1 week later T_3) × vulnerability (suicide attempt in past year versus no attempt) analysis. Group differences were tested using contrast tests. We report Bonferroni-corrected *P*-values for contrast tests to correct for multiple comparisons.

Sensitivity analyses

We conducted two sensitivity analyses to check whether the findings were different if only a subset of participants was included in the analysis: we reanalysed the data (a) only with data of individuals with complete participation ($n = 126$) and (b) only with data of individuals who were exposed to their respective media article for longer than 119 seconds ($n = 236$), as indicated by the time they spent on the respective survey webpage. The time spent on the webpage was automatically saved in the database for each individual. The sensitivity analyses indicated that patterns were similar to the presented findings from the full sample (results available on request).

Ethics statement

We assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human participants were approved by the research ethics board at the Medical University of Vienna (study protocol 2102/2017, date: 5 December 2017). Informed consent was obtained from all participants online. The trial was registered with the German Clinical Trial Registry (https://www.drks.de) as DRKS00013613 (registration date: 9 January 2018).

Results

In total, 413 individuals were assessed for eligibility; 144 dropped out before randomisation, leaving 269 individuals who were randomised (group 1: $n = 89$; group 2: $n = 90$; control group: $n = 90$). A protocol error occurred in three cases, because three individuals in group 1 started the questionnaire only to check whether they could access the study on their respective devices. These individuals had highly inattentive response patterns and left a note in the comments section disclosing that they were just testing the website/not participating in the study. These individuals were subsequently excluded. No further inattentive response patterns were evident. All of the remaining randomised individuals ($n = 266$, group 1: $n = 86$; group 2: $n = 90$; control group: $n = 90$) were included in the final analysis, following a strict intention-to-treat principle.[21] In total, 140 participants did not provide data at the study end-point T_3, resulting in 126 who completed the survey (47.4%). Figure 1 shows the study flowchart.

Differences between individuals who dropped out and study completers

There were no differences in baseline suicide risk ($t(282) = -0.34$, $P = 0.73$), age ($t(348) = -0.23$, $P = 0.82$), gender ($\chi^2 = 3.32$, d.f. = 2, $P = 0.1$), education ($\chi^2 = 6.34$, d.f. = 4, $P = 0.18$) or group assignment ($\chi^2 = 0.41$, d.f. = 2, $P = 0.82$) between individuals providing the respective data who dropped out before randomisation and those randomised. A similar comparison between randomised participants who completed the survey ($n = 126$) and those who did not ($n = 140$) revealed no difference in baseline suicide risk ($t(264) = 1.21$, $P = 0.23$), age ($t(264) = -0.26$, $P = 0.80$), gender ($\chi^2 = 2.96$, d.f. = 2, $P = 0.23$), education ($\chi^2 = 6.21$, d.f. = 4, $P = 0.18$), time exposed to the respective media article ($t(264) = -0.91$, $P = 0.36$) or group assignment ($\chi^2 = 2.05$, d.f. = 2, $P = 0.36$).

Of the 266 included individuals, 196 were women (73.7%) and 67 men (25.2%) (3 of other gender), and mean age was 33.3 years (s.d. = 11.5). Among them, 95 participants (35.7%) indicated that they had no high school diploma, 93 (35.0%) reported high school as the highest completed level of education, and 78 (29.3%) indicated that they had a college degree.

Differences between suicide attempters and non-attempters

Participants with a recent suicide attempt differed from participants without a recent attempt in terms of baseline suicidality (suicide attempters ($n = 51$): mean 4.20, s.d. = 1.06; non-attempters ($n = 215$): mean 3.79, s.d. = 1.12; $t(264) = 2.35$, $P = 0.02$) and they were less educated ($\chi^2 = 10.71$, d.f. = 4, $P = 0.03$). Attempters did not differ from non-attempters in terms of age ($t(264) = -0.72$, $P = 0.47$), time exposed to the respective article ($t(264) = -0.49$, $P = 0.63$), gender ($\chi^2 = 0.72$, d.f. = 2, $P = 0.70$) and group assignment ($\chi^2 = 2.93$, d.f. = 2, $P = 0.23$).

Baseline characteristics per study group

Table 1 gives an overview of the characteristics of participants in each group. There were no significant differences in terms of the participants' gender, highest completed education, recent suicide attempt, time exposed to the article (time spent reading it), or baseline suicide risk across the three groups, as indicated by χ^2 and ANOVA tests. The only significant difference was related to age: individuals in group 1 were older compared with the other groups ($F(2,263) = 8.24$, $P = 0.001$). The mean values and their corresponding 95% confidence intervals for suicide risk after article exposure (T_2) and 1 week later (T_3), as well as mean changes from baseline, are shown in Table 2. Table 3 shows corresponding mean values and 95% confidence intervals for the secondary outcome variables.

Masking

Of the 213 participants who completed the item to assess masking success, 68 participants (31.9%) correctly guessed their group allocation, 37 (17.4%) guessed incorrectly and 108 (50.7%) responded with 'don't know'. More than half of the participants in each group were either uncertain or incorrect about their group

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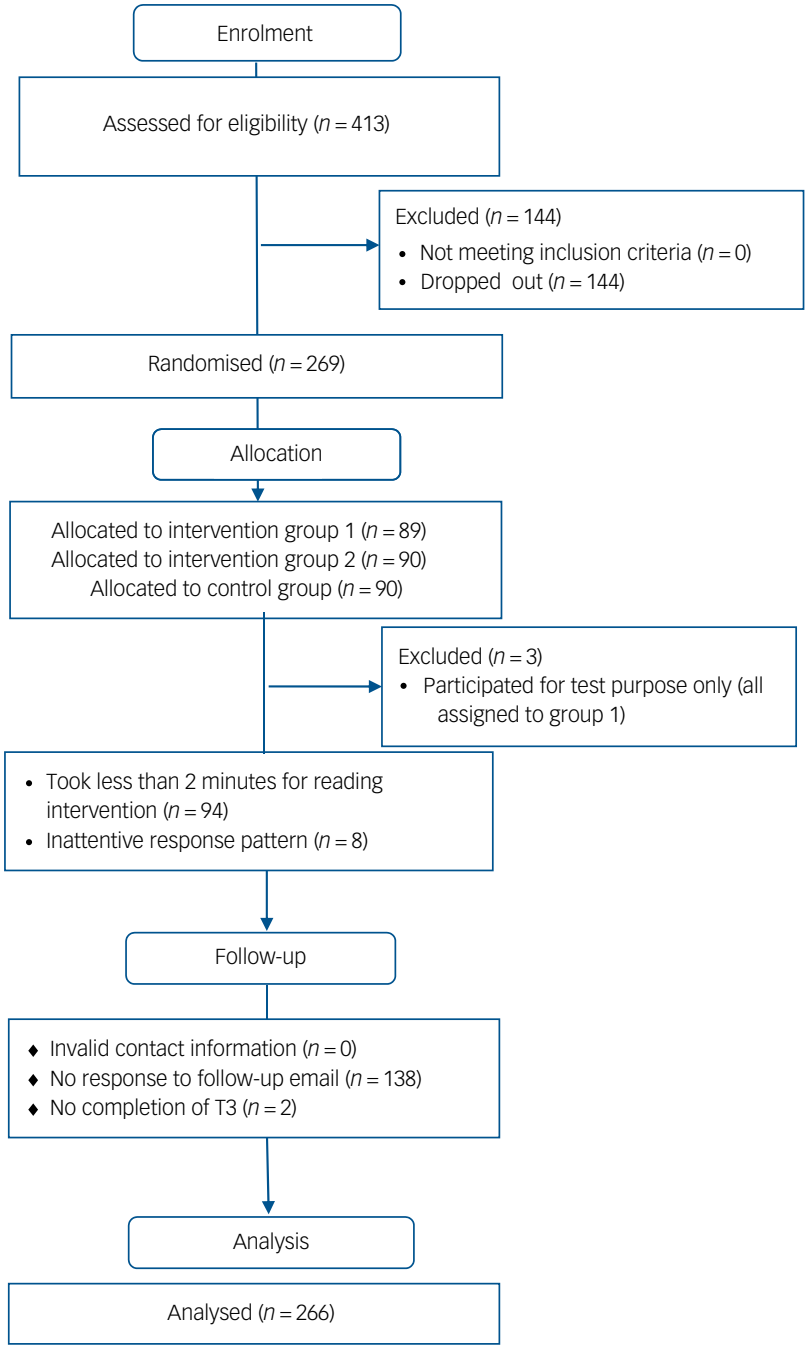

Fig. 1 Study flowchart.

assignment, and there was no significant difference between the groups in the number of participants who were correct, incorrect or uncertain ($\chi^2 = 5.99$, d.f. = 4, $P = 0.20$), indicating that the ability to make correct guesses did not depend on group assignment.

Suicide risk

Table 4 gives an overview of the results of the linear mixed models. Results of Bonferroni-corrected contrast tests with regard to suicide risk are shown in Table 2. The analysis revealed a significant group × time interaction for suicide risk. Compared with the control group, participants exposed to the suicide prevention article featuring an individual with personal experience of suicidal ideation (group 1) showed an immediate decrease in suicide risk after reading the article. This small decrease was maintained until the study end-point 1 week later. Participants reading the material featuring a suicide expert (group 2) did not show a significant effect compared with the control group. Participants in the control group experienced a short-term increase in suicide risk, which was not maintained until the study end-point. There was also a significant group × time × vulnerability interaction (Table 4), indicating that all effects described above were more pronounced in participants with a recent suicide attempt (Table 2).

Secondary outcome variables

There was a significant group × time interaction in terms of suicide-prevention-related knowledge (Table 4). Results of Bonferroni-corrected contrast tests with regard to suicide-prevention-related knowledge and mood are shown in Table 3.

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Table 1 Descriptive demographic statistics, baseline suicide risk, suicide attempt in past year and time exposed to the intervention (reading time)[a]

Variable	Group 1: personal experience	Group 2: no personal experience	Group 3: control group	χ^2/F
Female, *n* (%)	64 (74.4%)	68 (75.6%)	64 (71.1%)	0.93[b]
Age, mean (s.d.)	37.3 (13.1)	31.3 (10.0)	31.4 (10.3)	8.24[c,f]
College/University, *n* (%)	33 (38.4%)	23 (25.6%)	22 (24.4%)	5.12[b]
High school, *n* (%)	24 (27.9%)	32 (35.6%)	37 (41.1%)	3.84[b]
Below high school, *n* (%)	29 (33.7%)	35 (38.9%)	31 (34.4%)	0.49[b]
Baseline suicide risk, mean (s.d.)	3.8 (1.2)	3.9 (1.1)	3.9 (1.0)	0.62[c]
Suicide attempt in past year	3.7 (1.2)	4.5 (1.0)	4.4 (0.9)	2.80[d]
No suicide attempt in past year	3.8 (1.2)	3.8 (1.1)	3.8 (1.0)	0.11[e]
Suicide attempt in past year, *n* (%)	16 (18.6%)	13 (14.4%)	22 (24.4%)	2.93[b]
Reading time, s: mean (s.d.)	165 (260)	205 (356)	183 (187)	0.46[c]

a. Values are frequencies (n), percentages (%), means and standard deviations (s.d.) provided for each group, as well as χ2-values that are calculated from χ2-tests and *F*-values that are calculated from analyses of variance (ANOVAs) testing group differences.
b. χ^2-test result, d.f. = 2.
c. ANOVA result, $d.f._1 = 2$, $d.f._2 = 263$.
d. ANOVA result, $d.f._1 = 2$, $d.f._2 = 48$.
e. ANOVA result, $d.f._1 = 2$, $d.f._2 = 212$.
f. $P < 0.001$.

Participants in group 1 reported better suicide-prevention-related knowledge compared with the control group at the end-point of the study (T_3), which was primarily due to better knowledge in the subgroup of suicide attempters. Participants in group 2 showed no better knowledge compared with the control group at the study end-point. There were no significant group differences regarding mood.

Discussion

This is the first study testing the effects of suicide awareness materials targeting suicidal individuals in a group of individuals with increased baseline suicidality. Individuals with recent suicidal ideation or suicide attempt benefited from a brief intervention that included reading a news article featuring a lay individual with past suicidal ideation describing her story of coping and recovery. The effect sizes were small and particularly pronounced among individuals with a recent suicide attempt. Individuals with a suicide attempt also benefited in terms of an increase of suicide-prevention-related knowledge. The patterns were similar but less pronounced and not statistically significant in the group exposed to a similar article that featured a mental health expert instead of an individual with personal experience of suicidal ideation.

The participants in the present study had considerably lower mood and higher suicide risk scores at baseline compared with participants in all previous analyses in this subject area.[5,7–9]

Some of the present findings are consistent with previous studies conducted in low-risk samples. First, the identified small decrease in suicide risk was also seen in samples from the general population exposed to suicide-educative websites[7] or when exposed to news articles featuring a mental health professional with and without personal experience of suicidal ideation.[9] Suicide risk factors also decreased after exposure to a Hollywood movie portraying the successful mastery of the protagonist's suicidal crisis.[5] Even in these low-risk samples, beneficial effects appeared more pronounced among participants with higher suicidality scores at baseline compared with the other study participants.[5,7] Although the reduction in suicide risk in the present study was statistically small, this effect is valuable from a public health perspective, given that the intervention was very brief.

Unlike in previous studies,[5,7–9] there was an immediate small increase in suicide risk in the control group in the present analysis, but it was not sustained until the study end-point. This increase contributed to the immediate effect seen in intervention group 1 compared with the control group, but could not explain the significant reduction of suicide risk in group 1, or the difference between the control group and group 1 at the study end-point (Table 2). Possible reasons for this increase in suicide risk in the control group might include the burden related to their participation in a study condition that was not tailored to the needs of suicidal individuals. Participants in the control group might have been upset, because they expected an input that was more tailored to their needs, which might have resulted in disappointment or a worsening of functional capacity, with a resulting short-term increase in suicide risk. The invitation to participate in the trial disclosed that the topic of suicide would be brought up in the trial, but did not provide any details. Although the control group's article included a 'minimal intervention' in the form of contact information for help services, this was very limited in terms of scope and length. It is also possible that this minimal intervention might have been related to the short-term increase of suicide risk in the control group. Trials testing the effects of brief suicide prevention messages are scarce, but two studies suggest that brief messages emphasising the need to seek help when suicidal might have some unintended side-effects, particularly in vulnerable individuals.[22,23] Thus, we cannot entirely rule out the possibility of an unintended negative effect of the minimal intervention in the control group.

Unlike previous findings in non-suicidal samples,[7] the present study did not indicate a deterioration of mood due to exposure to the material. A possible explanation might be the presence of what has been called 'suicidal constriction' in participants, which marks a lack of emotional resonance in the state of suicidality.[24,25] A further difference from previous studies in non-suicidal individuals was the time patterns seen for the effects. Previous studies suggested an immediate effect on suicide risk that was partially maintained over a period of 1 week.[7] In contrast, in the present study, effects in the intervention group were more pronounced at the study end-point 1 week later. Individuals with some degree of suicidal thinking might take longer to experience the full effect on suicide risk compared with non-suicidal individuals. A partially delayed effect might also result from individuals with lower functional capacity being lost to follow-up.[26,27] However, a sensitivity analysis including only individuals who responded at all three time points did not suggest a difference in patterns seen for all participants including those who dropped out. Furthermore, individuals who dropped out did not differ in terms of their suicide risk at baseline from those who completed the study. Still, some unmeasured differences in functional capacity between study completers and those who dropped out cannot be ruled out.

Strengths and limitations

A strength of the present study is that it is the first study to report effects of suicide awareness material providing a narrative of

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Table 2 Suicide risk after exposure to article (T_2) and 1 week later (T_3) among all participants and stratified for suicide attempt in the past year

	Control group ($n = 90$)		Intervention group 1: personal experience article ($n = 86$)				Intervention group 2: no personal experience article ($n = 90$)			
	Mean score (95% CI)	Mean change (95% CI)[a] from baseline	Mean score (95% CI)	Mean change (95% CI)[a] from baseline	Mean difference (95% CI)[b]	Cohen's *d*	Mean score (95% CI)	Mean change (95% CI)[a] from baseline	Mean difference (95% CI)[c]	Cohen's *d*
After exposure (T_2)										
Suicide attempt in past year	4.52 (4.06–4.99)	0.24* (0.02–0.45)	3.37 (2.55–4.20)	−0.32* (−0.59–−0.05)	−1.26** (−2.23–−0.29)	−0.19	4.52 (3.88–5.16)	0.00 (−0.27–0.27)	−0.07 (−1.09–0.95)	−0.01
No suicide attempt in past year	3.83 (3.53–4.14)	0.07 (−0.06–0.19)	3.82 (3.49–4.15)	0.08 (−0.04–0.21)	0.04 (−0.47–0.54)	0.01	3.77 (3.46–4.08)	0.05 (−0.08–0.18)	0.08 (−0.41–0.57)	0.02
Both groups combined	4.01 (3.75–4.27)	0.15* (0.03–0.28)	3.74 (3.43–4.04)	−0.12 (−0.27–0.03)	−0.61* (−1.17–−0.06)	−0.16	3.92 (3.64–4.20)	0.03 (−0.12–0.18)	0.01 (−0.56–0.57)	0.00
1 week later (T_3)										
Suicide attempt in past year	4.34 (3.74–4.94)	0.09 (−0.33–0.51)	3.07 (2.44–3.70)	−0.75* (−1.27–−0.23)	−1.55** (−2.52–−0.57)	−0.23	3.88 (2.74–5.01)	−0.43 (−1.06–0.20)	−0.35 (−1.42–0.71)	−0.05
No suicide attempt in past year	3.74 (3.37–4.11)	−0.09 (−0.36–0.19)	3.71 (3.24–4.18)	0.03 (−0.27–0.32)	0.13 (−0.42–0.68)	0.04	3.44 (3.07–3.81)	−0.12 (−0.39–0.15)	0.07 (−0.46–0.59)	0.02
Both groups combined	3.93 (3.61–4.24)	0.00 (−0.25–0.25)	3.54 (3.16–3.92)	−0.36* (−0.66–−0.06)	−0.71** (−1.27–−0 .14)	−0.18	3.51 (3.17–3.85)	−0.27 (−0.62–0.07)	−0.14 (−0.74–0.45)	−0.04

* $P < 0.05$, ** $P < 0.01$ (two-tailed).
a. Comparison of means with baseline with Bonferroni-corrected contrast tests.
b. Comparison of means for intervention group 1 with the control group with Bonferroni-corrected contrast tests.
c. Comparison of means for intervention group 2 with the control group with Bonferroni-corrected contrast tests.

Table 3 Secondary outcomes after exposure to the article (T_2) and 1 week later (T_3) among all participants and stratified for suicide attempt in the past year

	Control group ($n = 90$)	Intervention group 1: personal experience article ($n = 86$)			Intervention group 2: no personal experience article ($n = 90$)		
	Mean score (95% CI)	Mean score (95% CI)	Mean difference (95% CI)[a]	Cohen's *d*	Mean score (95% CI)	Mean difference (95% CI)[b]	Cohen's *d*
Suicide-prevention-related knowledge							
After exposure (T_2)							
Suicide attempt in past year	0.47 (0.35–0.59)	0.63 (0.51–0.74)	0.17 (−0.03–0.37)	0.13	0.71 (0.59–0.82)	0.24* (0.04–0.44)	0.17
No suicide attempt in past year	0.64 (0.58–0.70)	0.64 (0.58–0.69)	0.00 (−0.10–0.11)	0.01	0.62 (0.55–0.68)	−0.02 (−0.13–0.08)	−0.03
Both groups combined	0.60 (0.54–0.65)	0.64 (0.59–0.68)	0.09 (−0.02–0.20)	0.12	0.63 (0.58–0.69)	0.11 (−0.01–0.22)	0.14
1 week later (T_3)							
Suicide attempt in past year	0.45 (0.34–0.57)	0.68 (0.51–0.85)	0.28* (0.04–0.52)	0.17	0.70 (0.48–0.92)	0.18 (−0.09–0.46)	0.10
No suicide attempt in past year	0.67 (0.59–0.74)	0.65 (0.55–0.76)	0.01 (−0.14–0.16)	0.01	0.63 (0.53–0.73)	−0.02 (−0.16–0.11)	−0.03
Both groups combined	0.60 (0.53–0.67)	0.66 (0.58–0.74)	0.14* (0.00–0.29)	0.15	0.64 (0.55–0.73)	0.08 (−0.07–0.23)	0.08
Mood							
After exposure (T_2)							
Suicide attempt in past year	1.84 (1.60–2.08)	2.02 (1.70–2.33)	0.15 (−0.34–0.63)	0.04	1.64 (1.37–1.91)	−0.20 (−0.71–0.31)	−0.06
No suicide attempt in past year	1.98 (1.83–2.12)	1.96 (1.82–2.10)	−0.02 (−0.28–0.23)	−0.01	1.88 (1.73–2.04)	−0.09 (−0.33–0.16)	−0.05
Both groups combined	1.94 (1.82–2.07)	1.97 (1.85–2.10)	0.06 (−0.21–0.34)	0.03	1.85 (1.71–1.98)	−0.14 (−0.43–0.14)	−0.07
1 week later (T_3)							
Suicide attempt in past year	2.05 (1.60–2.50)	2.09 (1.64–2.53)	−0.05 (−0.71–0.61)	−0.01	2.00 (1.72–2.28)	−0.15 (−0.90–0.61)	−0.03
No suicide attempt in past year	2.06 (1.81–2.30)	2.00 (1.73–2.27)	−0.09 (−0.49–0.31)	−0.03	2.28 (2.02–2.54)	0.09 (−0.28–0.46)	0.04
Both groups combined	2.06 (1.85–2.26)	2.02 (1.81–2.24)	−0.07 (−0.46–0.32)	−0.03	2.24 (2.02–2.47)	−0.03 (−0.45–0.40)	−0.01

* $P < 0.05$ (two-tailed).
a. Comparison of means for intervention group 1 with the control group with Bonferroni-corrected contrast tests.
b. Comparison of means for intervention group 2 with the control group with Bonferroni-corrected contrast tests.

recovery in an audience with some degree of vulnerability to suicide, as indicated by recent suicidal ideation or suicide attempt. A further study strength is the follow-up period of 1 week, which goes beyond earlier studies that tested immediate effects only.[5,8,9] Because we used linear mixed models for statistical analysis, we were able to keep all individuals who were randomised in the analysis,[20] following a strict intention-to-treat principle.[21]

The study also has some limitations. We used a convenience online sample not representative of the general population in terms of age, gender and education, with younger, female and higher educated individuals being over-represented. In total, 140 randomised included participants (52.6%) did not provide data at 1-week follow-up, and 144 participants dropped out before randomisation, which might have resulted in some selection bias, although we did not identify any differences between completers and non-completers in terms of measured sociodemographic variables and baseline suicide risk. The current study participants were considerably more suicidal at baseline than in all previous studies on media effects.[5,7–9]

Even though the sample size was appropriate to detect small- to medium-sized effects, it is possible that our study failed to disclose small but relevant effects and differences between individual groups or subgroups. Follow-up studies with larger samples are warranted. Further, similar to previous studies,[7,9,16] the Cronbach's α estimating the reliability of items for suicide-prevention-related knowledge was low. This is a known psychometric limitation of this and comparable scales assessing suicide-related knowledge.[7,9,16] Finally, all of the measures assessed were based on answers provided online and anonymously. No external assessment was done for suicide risk or other outcome measures. Follow-up studies in clinical populations that capture additional variables, such as those related to diagnoses and mental health treatment, are warranted.

Conclusions

Media articles delivered by individuals with personal experience of suicidal ideation appear to have a protective short-term effect on suicide risk. Given the need of public health agencies to balance the risks and opportunities involved in various suicide prevention messages, the present study highlights that messages with a clear narrative of recovery are safe for use with individuals with recent

Table 4 Findings from linear mixed models for suicide risk and secondary outcome variables[a]

Study variable	Group	Time	Suicide attempt in past year	Group × time	Group × suicide attempt in past year	Suicide attempt in past year × time	Group × suicide attempt in past year × time
Primary outcome							
Suicide risk, F (d.f.$_1$, d.f.$_2$), P	4.16 (2, 248.30), **0.017**	6.43 (2, 162.81), **0.002**	2.43 (1, 246.49), 0.120	3.17 (4, 162.59), **0.015**	4.89 (2, 246.81), **0.008**	2.39 (2, 162.83), 0.095	3.84 (4, 162.59), **0.005**
Secondary outcomes							
Suicide-prevention-related knowledge, F (d.f.$_1$, d.f.$_2$), P	3.80 (2, 196.00), **0.024**	0.01 (1, 130.45), 0.922	0.88 (1, 192.88), 0.350	0.98 (2, 130.33), 0.379	4.31 (2, 193.07), **0.015**	0.04 (1, 130.50), 0.848	0.83 (2, 130.33), 0.441
Mood, F (d.f.$_1$, d.f.$_2$), P	0.27 (2, 220.16), 0.766	5.76 (1, 130.77), **0.018**	1.12 (1, 215.66), 0.292	1.07 (2, 130.75), 0.347	0.57 (2, 216.21), 0.565	0.00 (1, 130.77), 0.986	0.13 (2, 130.75), 0.881

a. F- and P-values with degrees of freedom (d.f.$_1$, d.f.$_2$) given in parentheses were calculated from linear mixed models representing the change of the respective outcome variable with regard to group (intervention group 1, intervention group 2, control group), time (T_1 (only for suicide risk), T_2 and T_3), suicide attempt in the past year versus no attempt (as a proxy of vulnerability), and interactions between these factors were controlled for gender and age. Significant P-values (<0.05) are in bold.

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suicide attempts and might help reduce their short-term suicide risk. Media stories of hope and recovery appear useful for changing the conversation on suicide and putting a stronger emphasis on suicide-preventive aspects.

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Data availability

Both authors had and continue to have full access to the study data.

Author contributions

Both authors: designed the study and participated in data acquisition; performed the statistical analysis; drafted the manuscript; revised the manuscript critically regarding important intellectual content; and approved the final manuscript.

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