Psychiatry Research 246 (2016) 453–460

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

'Flash-forwards' and suicidal ideation: A prospective investigation of mental imagery, entrapment and defeat in a cohort from the Hong Kong Mental Morbidity Survey

Roger M.K. Ng[a,*], Martina Di Simplicio[b], Freda McManus[c], Helen Kennerley[d], Emily A. Holmes[e]

[a] Department of Psychiatry, Kowloon Hospital, 147A, Argyle Street, Hong Kong
[b] MRC Cognition and Brain Sciences Unit, Cambridge, UK
[c] Oxford Centre for Cognitive Therapy, University of Oxford, UK
[d] Oxford Centre for Cognitive Therapy, University of Oxford, UK
[e] MRC Cognition and Brain Sciences Unit, Cambridge, UK and Department of Clinical Neuroscience, Karolinska Institutet, Sweden

ARTICLE INFO

Keywords:
Suicidal ideation
Imagery
Suicide
Risk factors
Cognition

ABSTRACT

'Flash-forwards' - mental images of suicide - have been reported in selected Caucasian samples. Perceptions of defeat and entrapment are considered to be associated with suicidal ideation. We aimed to investigate (1) the presence of suicidal flash-forwards in people with recent suicidal ideation versus those without such ideation in an Asian sample, and (2) associations between suicidal flash-forwards, and perceptions of entrapment accounting for suicidal ideation.

Eighty two suicidal and 80 non-suicidal participants from the Hong Kong Mental Morbidity Survey completed questionnaires including suicidal ideation, presence of suicidal flash-forward images, defeat and entrapment, at baseline and seven weeks later.

Suicidal 'flash-forwards' were present only in suicidal cases. People with recent suicidal ideation and suicidal flash-forwards had more severe suicidal ideation than those without flash-forwards. Compared to those without suicidal ideation, people with recent suicidal ideation reported higher entrapment and defeat levels. Resolution of suicidal ideation over time was associated with fewer suicidal flash-forwards and reduced entrapment perceptions. At baseline and seven weeks, suicidal ideation was predicted by an interaction between suicidal flash-forwards presence and perceptions of entrapment.

Mental imagery of suicide appears to be associated with suicidal ideation, and may represent a novel target in suicidal risk assessment and prevention.

1. Introduction

Suicidal risk assessment focuses on suicidal ideation in verbal form and seldom explores the presence of cognitions in the form of mental images. Mental images are the subjective experience of a sensory percept in the absence of an external percept, i.e. 'seeing in the mind's eye' (Holmes and Mathews, 2010). Mental imagery elicits greater emotional responses than does our verbal thought (Holmes et al., 2009; Mathews et al., 2013; Carroll, 1978), and is underpinned by neural circuits involved in perception (Kosslyn et al., 2001). Maladaptive mental imagery occurs across psychiatric disorders (Holmes and Mathews, 2010). Compared to controls, individuals with previous suicidal ideation or attempts have more frequent negative prospective images (Crane et al., 2011). These individuals with past suicidal ideation or attempts also report specific vivid imagery featuring suicide or the aftermath of death (suicidal 'flash- forwards'; Crane et al., 2011; Holmes et al., 2007; Hales et al., 2011). As mental imagery is thought to drive behaviour (Libby et al., 2007; Pictet et al., 2011), it is important to investigate suicidal flash-forwards as a possible marker of suicidal risk. The existing literature on suicidal flash-forwards is limited to cross-sectional retrospective studies in small clinical selected samples of Caucasian populations. Such studies report high frequencies of suicidal flash-forwards during past depressive episodes, and associations between flash-forward characteristics (e.g. compellingness) and severity of suicidal ideation at the worst points of times (Crane et al., 2011; Hales et al., 2011).

There are various theories about suicide (Wasserman and Wasserman, 2009). Among psychological theories relevant to suicidal

* Corresponding author.
E-mail addresses: ngmk@ha.org.hk (R.M.K. Ng), martina.disimplicio@mrc-cbu.cam.ac.uk (M. Di Simplicio), f.v.mcmanus@stir.ac.uk (F. McManus), helen.kennerley@btinternet.com (H. Kennerley), emily.holmes@mrc-cbu.cam.ac.uk (E.A. Holmes).

http://dx.doi.org/10.1016/j.psychres.2016.10.018
Received 27 October 2015; Received in revised form 9 August 2016; Accepted 15 October 2016
Available online 18 October 2016

flash-forwards is research on violent daydreaming (Joiner et al., 2005): fantasies around death by suicide pictured as clear, vivid videos (Rudd et al., 2001; Shneidman, 1996). Overlaps and differences exist between suicidal daydreaming and suicidal flash-forwards: both involve subjective perception of the events in the mind's eye; both can produce short-term positive affect (comfort or triumph feelings), and can increase suicidal ideation (Holmes et al., 2007; Selby et al., 2007). However, daydreaming involves voluntarily conjured movie-like sequences of action leading to suicide. Instead, suicidal flash-forwards are involuntary, intrusive 'snapshots' of the suicidal acts ('blood oozing out from the wrist') or the aftermath of suicide much like traumatic 'flashbacks' (Holmes et al., 2007; Hales et al., 2011). Therefore, these two overlapping but distinct phenomena might complement each other to amplify suicide risks.

Another recent theory on the development of suicidal risk is the integrated motivational-volitional model, a three-phase psychological model of suicidal behaviour (IMV; O'Connor, 2011). This model is based on Williams (1997) and Baumeister (1990) and conceptualizes suicide attempts as health behaviours with motivational factors (i.e. related to the development of suicidal thoughts) and volitional factors (i.e. translating suicidal thoughts into suicide attempts; O'Conner and Nock, 2014). Within this model, a defeat circumstance is characterized by a failed struggle against subjugation by a triggering event or circumstances (Price et al., 1994). The sense of entrapment on the other hand results when the attempt to escape from defeating circumstances is blocked ('arrested flight model'; Gilbert and Allan, 1998; Williams, 1997; Williams, 2001). Entrapment is postulated to serve as the central motivating force to escape from defeating circumstances and to drive the search for solutions to end the psychological pain. As entrapment increases and no solutions are identified, the idea of suicide as an escape strategy intensifies (O'Connor, 2011; Taylor et al., 2011). This model would predict that a sense of entrapment mediates the relationship between perception of defeat and the development of suicidal ideation.

Prospective mental imagery often represents goals (Conway et al., 2004) and is associated with increased level of conviction about the likelihood of imagined outcomes (Libby et al., 2007). Within an IMV framework, it is plausible that suicidal prospective images, e.g. jumping off a cliff, might encapsulate the desired goal of escape from the sense of entrapment in individuals with previous suicidal ideation or attempts. Suicidal flash-forwards may thus represent motivational moderators towards amplified suicidal ideation (Crane et al., 2011). Specifically, suicidal flash-forwards might serve as goals of escape encapsulated in the form of prospective imagery that facilitate the transition of entrapment to suicidal ideation/intent.

Our study aimed first to extend previous retrospective findings in selected clinical samples to people with and without current suicidal ideation from a representative sample from the general population in Hong Kong (the Hong Kong Mental Morbidity Survey, HKMMS; Lam et al., 2014). Notably, understanding the role of suicidal imagery is topical for the Hong Kong context, given the debate around local media coverage of suicide acts using graphic pictorial representations (Fu et al., 2011). Second, we aimed to examine the phenomenology of suicidal flash-forwards by exploring their relationship with perceptions of defeat and entrapment. Third, we used a prospective design to test whether a reduction in suicidal flash-forwards would be associated with a resolution of suicidal ideation over time.

We predicted that at both baseline and 7-weeks follow-up (1) people with current suicidal ideation would report suicidal flash-forwards whereas people without such ideation would not, and critically that compared to people with current suicidal ideation but without flash-forwards, those with flash-forwards would have more severe suicidal ideation; (2) people with current suicidal ideation would report greater levels of defeat and entrapment than those without; (3) resolution of suicidal ideation at follow-up would be associated with less frequent suicidal flash-forwards and lower levels of defeat and entrapment; (4) we also explored how the interaction between suicidal flash-forwards, defeat and entrapment may contribute to suicidality.

2. Material and methods

2.1. Sample recruitment and procedures

Participants were recruited from a territory-wide epidemiological study sample (N =5700) (HKMMS; Lam et al., 2014). Inclusion criteria for the current study were: (1) being part of the HKMMS; (2) aged 18–75; (3) Chinese ethnicity; (4) a score of ≥1 on both questions 4 ('desire to kill myself') and 5 ('taking a chance on life or in a life-threatening situation') of the 19-item version of Beck Scale for Suicidal Ideation-Current (BSS, Beck et al., 1979) for people with current suicidal ideation (suicidal group); and 0 on both questions 4 and 5 of the SSI-C for those without current suicidal ideation (control group). Exclusion criteria included: (1) incapable of giving informed consent, and (2) symptoms demanding immediate psychiatric attention.

Eighty two participants were recruited as they were having current suicidal ideation (these participants were also called suicidal cases or the suicidal group in the current manuscript). For every ten participants recruited into the suicidal group, gender distribution and mean age were calculated and ten matching non-suicidal participants were then randomly contacted from the remaining pool (N=5618) until N=82 participants with current suicidal ideation and N=80 control participants without suicidal ideation were recruited. These age- and gender-matched individuals without current suicidal ideation as measured by BSS were also called as non-suicidal controls or the control group in the current manuscript). Demographic and clinical characteristics were collected at baseline; measures of cognition (see below) were collected at baseline and at 7-week follow-up, based on previous literature on duration of trait-like and state-like factors associated with suicidal risks after suicidal crisis (Pollock and Williams, 2004). The Research Ethics Committee of Kowloon Central and Kowloon East Clusters of Hospital Authority approved the study (KC/KE-11–0204/ER-3). All suicidal participants were advised to seek further psychiatric care; all those who were successfully contacted for follow-up had been in contact with mental health services.

2.2. Measures

2.2.1. Demographic and clinical characteristics

Gender, age, years of education, marital status, and past and current psychiatric illness were recorded at baseline via the HKMMS (Lam et al., 2014).

2.2.2. Cognition

2.2.2.1. Suicidal ideation. The 19-item version of Beck Scale for Suicidal Ideation-Current (BSS, Beck et al., 1979) is a well-validated scale measuring levels of suicidal ideation in the past seven days. BSS has high internal consistency (Cronbach's α=0.84), and is moderately correlated to past suicidal attempts (Beck et al., 1997). In order to increase the sensitivity of BSS in identifying people with current suicidal ideation, the participants were invited to respond to all questions in the BSS. To identify participants with current suicidal ideation, we used the validated Chinese version, which has good internal consistency (Cronbach's α=0.88) (Zhang et al., 2007), and cross-cultural reliability and validity (Zhang and Norvilitis, 2002). A person with current suicidal ideation was defined by scores =1 or above on *both* questions 4 and 5, while a potential non-suicidal control was defined by scores =0 on the same questions. As question 5 asks about passive wish for death due to fate and such fatalistic view is common among Chinese people without current suicidal ideation (Kwok and Sullivan, 2006; Liang et al., 2008), more than 20% of people were screened as positive for the presence of suicidal ideation in HKMMS if

question 5 alone was used. Hence, only those participants who rated 1 or above for both questions 4 and 5 were recruited so as to ensure that the suicidal group was made up of participants with clinically significant suicidal ideation. This led to a more restrictive selection of participants with suicidal ideation than previous studies (Beck et al., 1997). For the current study, the BSS had a good internal consistency (Cronbach's α=0.87).

2.2.2.2. Cognitions associated with suicidal ideation. The Impact of Future Events Scale (IFES, Deeprose and Holmes, 2010) contains 24-items measuring the emotional impact of intrusive prospective imagery, with acceptable test-retest reliability (Pearson's r=0.73) and good internal consistency (Cronbach's α=0.87). The Chinese version of IFES was based on the Chinese version of Impact of Events Scale-Revised (Wu et al., 2003) and was validated on a group of healthcare workers (N=20). It achieved good internal consistency (Cronbach's α=0.86) and good test re-test reliability (intra-class correlation =0.84) (Ng et al., 2016). Participants were asked to write down as many prospective images (flash-forwards of any type) experienced over the past 7 days as they could recall, and rate them as either positive or negative. They then rated 24 items (from '0= *not at all*' to '4= *extremely likely*') referring to the emotionally most arousing prospective images among those they listed. Participants were not required to report any prospective images related to suicide, to avoid social desirability or interviewers' biases. For the current study, the translated version of IFES has a good internal consistency (Cronbach's α=0.88).

The main variable of interest was extracted from the IFES:

Mental imagery: suicidal flash-forwards. Descriptions of prospective images listed in the IFES were coded as 'suicidal' or not based on Hales et al. (2011). Raters achieved excellent inter-rater reliability in categorizing prospective images as suicidal flash-forwards or not (weighted kappa =0.98), and as 'imagined suicidal acts' or 'the aftermath of imagined suicide' (weighted kappa =0.95).

The Defeat Scale (Gilbert and Allan, 1998) contains 16 items measuring perceptions of failed struggle and low social rank rated over the past week (from '1= *never*' to '5= *all the time*'). The Chinese translated version was validated on a sample from community participants attending a mental health education talk (N=60) and it showed good internal consistency (Cronbach's α=0.94) and a good test-retest reliability (intra-class correlation =0.94). For the current study, the translated version had good internal consistency (Cronbach's α=0.95).

The Entrapment Scale (Gilbert and Allan, 1998) contains 16 items assessing the perception of being trapped and desire to escape, rated from '1= *not at all like me*' to '5= *extremely like me*'. The Chinese translated version was validated as the Defeat Scale above, showing good internal consistencies (Cronbach's α=0.92), and good test-retest reliability (intra-class correlation =0.93) on a sub-sample (N =25). For the current study, the translated version had good internal consistency (Cronbach's α=0.92).

3. Statistical analyses

STATA Version-12 was used (STATA, 2011). Sample size was estimated based on a cross-sectional study by Rasmussen et al. (2010). The sample size was calculated based on the differences in entrapment and defeat total scores between the casualty attenders with first-episode self-harm attempts and the hospital controls without any history of self-harm (entrapment: 33.53 [SD =17.16] vs. 7.95 [SD =10.59]; defeat: 34.14 [SD =16.56] vs 10.49 [SD =10.07]). A minimum of at least eight participants was needed in each group in order to detect statistically significant differences of the defeat and entrapment total scores between the suicidal and control groups at an alpha level of 0.05 and a power of 90%. The predictor and outcome variables were first examined for normality. For variables that were not normally distributed, they were first normalized by square root or logarithmic transformation. For example, data like BSS total scores, entrapment and defeat total scores at baseline were found to be normally distributed while the entrapment total scores at follow-up were log-transformed. Baseline demographic and psychiatric illness data, and measures of cognition, were compared between groups using two-tailed Chi-square and independent t-tests. For highly skewed data, non-parametric analyses were used for comparisons. Any demographic or clinical variables which were significantly different between the two groups would be entered into subsequent multi-variate analyses as co-variates. Bootstrap method was adopted in view of the limited sample size.

To determine whether reduction in suicidal ideation from baseline to follow-up was associated with change in cognitions, participants with suicidal ideation at baseline and follow-up were compared to those with suicidal ideation at baseline but not at follow-up. Separate repeated measure analyses of variance (rmANCOVA) were conducted with cognitions (presence of suicidal flash-forwards, entrapment and defeat scores) as dependent variables: cognitions in both groups ('remained suicidal' vs. 'became non-suicidal' = between-group factor) were analysed at two time points (baseline vs. follow-up = within-group factor). Significant group x time interactions indicated a difference in change in cognitions over time between the groups and were followed by post-hoc planned pairwise comparisons between the dependent variables at baseline and follow-up for each group separately.

To explore the inter-relations between baseline defeat and entrapment, and the presence of suicidal flash-forwards at baseline, as well as suicidal ideation at baseline and at seven weeks, mediation analyses were performed, following Baron and Kenny (1986). Based on a hypothesized model of entrapment mediating the relationship between defeat and suicidal ideation, we conducted a regression analysis using the PROCESS method (Hayes, 2013) with 5000 bootstrapped resampling and with defeat as the independent variable, entrapment as the potential mediator and gender, age, marital status, and the presence of past and present psychiatric illnesses, and status as suicidal/control groups as covariates. The same method was used with suicidal ideation at seven weeks as the dependent variable.

Further, to explore the predictive value of the interaction between perception of entrapment and the presence of suicidal flash-forwards over suicidal ideation at baseline, hierarchical linear regression models were conducted with BSS total scores as the dependent variable. Predictive factors were entrapment total score and the presence of suicidal flash-forwards or defeat total score and suicidal flash-forwards, and two-way interaction variable computed by multiplying the dichotomous variables of entrapment (high vs low entrapment based on median split of the entrapment total scores) and the presence of suicidal flash-forwards (yes vs no) (i.e. entrapment X suicidal flash-forwards), or defeat (high vs low defeat based on median split of the defeat total scores) X suicidal-flashforwards. The conversion of the continuous variables of entrapment and defeat total score into dichotomous variables of high vs low entrapment / defeat based on median split was performed and used in step 4, as the multiplicative term of the interaction [entrapment / defeat total score X presence of suicidal flash-forwards] was highly skewed and could not be normalized for regression analyses.

4. Results

4.1. Demographic and clinical characteristics

The baseline cohort comprised 162 participants from the HKMMS (Lam et al., 2014): 82 participants with current suicidal ideation and 80 control participants without. (Table 1).

Seven weeks (M =7.2 weeks; SD =1.38) later, 70% of the baseline

Table 1
Demographic and clinical measures between the suicidal cases and non-suicidal controls at baseline.

	Suicidal cases (N=82)	**Non-suicidal controls** (N=80)	**Statistic** (p value)
Male gender N (%)	24 (29.3)	22 (27.5)	χ^2 =0.06, df=1, p=0.80
Age Mean (SD)	45.9 (15.27)	45.6 (15.35)	t=0.12, df=160, p=0.90
Years of education Mean (SD)	12.7 (5.28)	13.5 (4.90)	t=0.99, df=160, p=0.32
Marital status:			χ^2=20.83; df=6; p=0.002
Single N (%)	20 (24.4)	23 (28.8)	
Married/cohabited (%)	32 (39.)	50 (62.5)	
Divorced/separated (%)	19 (23.2)	5 (6.2)	
Widowed (%)	11 (13.1)	2 (2.5)	
Past psychiatric illness (%)	40 (48.7)	7 (7.8)	χ^2=31.51; df=1; p < 0.001
Current psychiatric illness (%):	38 (46.34)	4 (5)	χ^2 =36.04; df=1; p < 0.001
Depressive disorder (%)	27 (32.9)	0	
Anxiety disorder (%)	35 (42.7)	1 (1.2)	
Schizophrenia (%)	1 (1.2)	0	
Scale for Suicidal Ideation-Current	12.80 (6.56)	0.25 (1.45)	z=11.42, p < 0.001

Table 2
Demographic and clinical measures between the suicidal cases and non-suicidal controls at 7 weeks follow up.

	Suicidal cases (N=33) Mean (SD)	**Non-suicidal controls** (N=77) Mean (SD)	**Statistic** (p value)
Male gender (%)	9 (27.3)	24 (31.2)	χ^2=0.34, df=1, p=0.56
Age	45.8 (15.28)	45.5 (15.36)	t=0.08, df=108, p=0.94
Years of education	12.3 (5.56)	13.7 (5.37)	t=1.26, df=108, p=0.21
Marital status:			χ^2= 13.42, df=6, p=0.040
Single (%)	19 (57.6)	15 (19.5)	
Married/cohabited (%)	2 (31.1)	36 (46.8)	
Divorced/separated (%)	5 (15.2)	4 (5.2)	
Widowed (%)	7 (21.2)	2 (2.6)	
Past psychiatric illness (%)	16 (48.5)	18 (23.4)	χ^2= 5.67, df=1, p=0.017
Current psychiatric illness (%):	16 (48.5)	16 (20.8)	χ^2=7.33, df=1,p=0.007
Depressive disorder (%)	10 (30.3)	6 (7.8)	
Anxiety disorder (%)	16 (48.5)	8 (10.4)	
Schizophrenia (%)	1 (3.0)	0 (0)	
Scale for Suicidal Ideation-Current	12.5 (7.66)	3.9 (6.78)	z=9.34, p < 0.001

cohort (N =110) was included in the follow-up interview. The follow-up cohort comprised of 33 suicidal and 77 control participants (22 individuals who were no longer suicidal at follow-up, plus 55 from the baseline non-suicidal group) (Table 2). At baseline, the two groups were not significantly different on any demographic variable (all p > 0.05) except for a lower proportion of married or cohabiting individuals in the suicidal cases than in non-suicidal controls (37.8% vs. 61.3%; χ^2 =8.91, df =1, p=0.003) and the presence of past and current psychiatric illnesses (past illness: 48.5% vs. 23.4%, χ^2 =5.67, df =1, p=0.017; present illness: 48.5% vs. 20.8%, χ^2 =7.33, df =1, p=0.007). Marital status, presence of past psychiatric illness, and presence of current psychiatric illness were therefore entered as the covariates in subsequent ANCOVA analysis and regression analyses that involved the suicidal and control groups. As no significant main or interaction effects were found between marital status and other variables, this is not reported further. At follow-up the two groups did not differ in any variables (all p-values > 0.1).

Table 3
Imagery and clinical measures between suicidal cases and non-suicidal controls at both baseline and at 7-week follow-up.

	Baseline		**7-week follow up**	
	Suicidal cases (n=82)	**Non-suicidal controls** (n=80)	**Suicidal cases** (n=33)	**Non-suicidal controls** (n=77)
Mental imagery: suicidal flash-forwards				
Suicidal flash-forwards N (%)	30 (36.6)	0	9 (25.7)	0
Mental imagery: general prospective imagery characteristics				
IFES total score Mean (SD)	41.35 (15.74)	24.54 (11.28)	48.7 (17)	28.2 (14.41)
IFES total images (N images; N images/N subjects)	211; 2.57	136; 4.12	206; 2.57	138; 1.79
IFES negative images Mean (SD) and % of total	1.1 (1.05) 41.7%	0.5 (0.8) 40.4%	1.1 (1.1) 19.9%	0.5 (0.7) 17.4%
IFES positive images Mean (SD)	1.5 (1.07)	2.1 (0.88)	1.2 (1.22)	2.0 (1.05)
Entrapment and defeat				
Entrapment score Mean (SD)	37.3 (13.18)	8.3 (8.88)	39 (18.95)	14.6 (14.29)
Defeat score Mean (SD)	54 (11.48)	29.9 (7.89)	49.6 (13.04)	34.6 (12.35)

Thirty-two percent (N =27) of cases and twenty-eight percent (N =23) of controls either declined or could not be traced for follow-up ('dropouts'), with no significant difference in the proportion of dropouts between the cases and controls. There were no significant differences between the dropouts and the non-dropouts in any demographic variable or in current/past psychiatric illness (all p-values > 0.05). The missing data at follow-up could thus be regarded as missing completely at random.

4.2. Cognition

See Table 3 for mental imagery, defeat, and entrapment measures at baseline and follow-up.

4.2.1. Mental imagery: suicidal flash-forwards

Thirty images at baseline and nine at follow-up were coded as suicidal flash-forwards. No participant reported more than one suicidal flash-forward at either time point. Consistent with the first hypothesis, suicidal flash-forwards were exclusively present in suicidal participants.

At baseline, suicidal participants with suicidal flash-forwards (30/82) had more severe suicidal ideation than suicidal participants without flash-forwards (BSS total scores: corrected ANCOVA model = F[4,77] =13.37, p < 0.001). The main effect of Group was significant (F[1,81] =27.17, p < 0.001). At follow-up, the suicidal participants with (9/35) and those without suicidal flash-forwards (26/35) had no significant differences in suicidal ideation (BSS total score; corrected ANCOVA model = F[3,31] =3.08, p=0.04; Group: F[1,34] =0.02, p=0.95). Fifty-three percent of the suicidal flash-forwards at baseline were about the aftermath of imagined suicide (e.g. living peacefully with my parents in Heaven), of which 81.3% were rated as positive.

Some of these suicidal flash-forwards had a general negative connotation, but were perceived as positive by the participants (e.g. my wife would touch my corpse in the coffin and showed how much she missed me'). The remaining forty-six percent of suicidal flash-forward at baseline were about the imagined suicidal acts (e.g. cutting wrists with a razor in the bathroom), of which 35.7% were rated as positive (e.g. flying off from a skyscraper like a Superman). Those suicidal participants with positive suicidal flash-forwards and those with negative ones were not significantly different in gender distribution, age, years of education, and the presence of past and present psychiatric illness. However, those with negative suicidal flash-forwards were more likely to be single or divorced (p=0.005). The participants with positive suicidal flash-forwards were not significantly different from those with negative ones in terms of levels of suicidal ideation (BSS total score: 17.7[*SD* =6.75] vs 17.2 [*SD* =7.54]; corrected ANCOVA model: F[2,27] =0.16, p=0.86; Group: F[1,29] =0.01, p=0.91; marital status: F[1,29] =0.28, p=0.60).

4.2.2. Defeat and entrapment

Consistent with the third hypothesis, compared to the control group, the suicidal group had higher levels of defeat (baseline defeat: ANCOVA model: F[4157] =95.50, $p < 0.001$; Group: F[1161] =105.37, $p < 0.001$; follow-up defeat: ANCOVA corrected model: F[4107] =16.54, $p < 0.001$; Group: F[1111] =18.06, $p < 0.001$) and entrapment at baseline and follow-up (baseline entrapment: ANCOVA model: F[4157] =74.28, $p < 0.001$; Group: F[1161] =73.65, $p < 0.001$; follow-up entrapment: ANCOVA corrected model: F[4107] =20.14, $p < 0.001$, Group: F[1111] =35.06, $p < 0.001$). Further sub-group analyses of entrapment and defeat total scores between the suicidal participants with positive suicidal flash-forwards and those with negative ones at baseline did not reveal any significant differences (Entrapment total score: 41.1[*SD* =9.54] vs 44.5[*SD* =9.18], corrected ANCOVA model: F[2,29] =0.85, p=0.44, Group: F[1,29] =0.18, p=0.68, marital status: F[1,29] =0.72, p=0.40; Defeat total score: 60.9[*SD* =12.28] vs 60.3[*SD* =8.01], corrected ANCOVA model: F[2,27] =0.37, p=0.60, Group: F[1,29] =0.32, p=0.58, marital status: F[1,29] =0.71, p=0.41). No significant differences were detected for the two groups with positive and negative suicidal flash-forwards were found at seven weeks as well.

4.2.3. Change of suicidal flash-forwards, entrapment and defeat perceptions and suicidal ideation over time

Among fifty-five participants with suicidal ideation at baseline being successfully traced for follow-up, 33 remained suicidal and 22 became non-suicidal after 7 weeks (Table 4). Consistent with the fourth hypothesis, participants who became non-suicidal at follow-up did not report suicidal flash-forwards (McNemar test: $p < 0.001$). There was no significant reduction in the proportion of participants having suicidal flash-forwards among those who remained suicidal at follow-up compared to baseline (McNemar test: p=0.24).

Univariate analysis and chi-square tests revealed that gender distribution, years of education, marital status, presence of past and present psychiatric illness were not significantly different between the two groups. A rmANOVA for entrapment showed a significant Group (remained suicidal vs. became non- suicidal) x Time (baseline vs. follow-up) interaction (F(1,53) =8.71, p=0.005). Main effects of Group and Time were both non-significant. Planned pairwise analysis showed a significant reduction in entrapment perception only in those who became non-suicidal at follow up (F[1,22) =9.95, p=0.005) while those who remained suicidal had persistent perception of being entrapped. A rmANOVA for defeat showed that the Group X Time interaction was non-significant. The main effect of Group was also non-significant. However, the main effect of Time was significant (F[1,52] =12.24, p=0.001). Planned pairwise analysis revealed that the perception of defeat declined in both groups over time (remained suicidal: F[1,32] =5.97, p=0.02; became non-suicidal: F[1,20] =6.04, p=0.02).

Table 4
Differences between suicidal cases who remained suicidal (n=33) and those who were no longer suicidal at 7-week follow-up time point (n=22).

	Baseline		**7-week follow up**	
	Suicidal cases *later* remaining suicidal (n=33)	**Suicidal cases *later* becoming non-suicidal** (n=22)	**Suicidal cases remained suicidal** (n=33)	**Suicidal cases become non-suicidal** (n=22)
Scale for Suicidal Ideation-Current Mean (SD)	13.0 (6.01)	13.5 (7.23)	13.6 (6.75)	0.9 (1.22)
Mental imagery: suicidal flash-forwards				
Suicidal flash-forwards N (%)	14 (42.4)	9 (40.9)	9 (27.3)	0
Mental imagery: general prospective imagery characteristics				
IFES total score Mean (SD)	42.4 (16.19)	42.1 (17.25)	48.7 (17)	35.9 (15.7)
IFES negative images Mean (SD)	1.2 (1.9)	1.1 (0.94)	1.1 (1.1)	0.8 (0.8)
IFES positive images Mean (SD)	1.4 (1.11)	1.6 (1.26)	1.2 (1.2)	1.8 (1.1)
Entrapment and defeat				
Entrapment score Mean (SD)	35.9 (12.98)	38.2 (14.54)	39 (18.95)	29.1 (13.79)
Defeat score Mean (SD)	53.8 (11.18)	53.5 (13.15)	49.6 (13.04)	47.7 (13.47)

4.2.4. Entrapment and suicidal flash-forwards as potential mediators of the defeat and suicidal ideation relationship

Regression modelling was performed for the whole sample with BSS total score at baseline as the dependent variable and controlling for gender, age, marital status, the presence of past and present psychiatric illnesses, and the status of suicidal vs. control groups. Defeat significantly predicted suicidal ideation with a significant standardized regression coefficient (0.08, p=0.020) between defeat total score and BSS total score. Unstandardized indirect effects were computed for each of 5000 bootstrapped samples: the bootstrapped unstandardized indirect effect was 0.02, and the 95% confidence interval ranged from −0.03 to 0.09. Thus, the indirect effect was not statistically significant. In other words, entrapment was not a mediator of the relationship between defeat and suicidal ideation at baseline.

To test further for the moderating effects of suicidal flash-forward on the relationships between entrapment and baseline suicidal ideation, another series of hierarchical regression analyses were conducted. Gender, age, marital status, the status of suicidal/control group, and the presence of past and present psychiatric illnesses were first entered as step 1, and then entrapment was entered in the second step of each regression. At step 3, presence of suicidal flash-forward was included, whilst in the final step, the relevant multiplicative term to test for interaction (i.e. entrapment median split [high/low] X suicidal flash-forwards [yes/no]) was entered. In the first regression, entrapment total score was a significant predictor of baseline suicidal ideation (*beta* =0.15, t=1.97, p=0.05). In step 3, the presence of suicidal flash-forwards was also significant (*beta* =0.30, t=6.34, $p < 0.001$). In step 4, the interaction factor of entrapment and the presence of suicidal flash-forwards was also significant (*beta* =0.23, t=4.91, $p < 0.001$).

Interestingly, similar hierarchical regression analyses were conducted to investigate the interaction factor of defeat total score X the presence of suicidal flash-forwards. Defeat total score and the presence of suicidal flash-forwards were both significant predictors of baseline

suicidal ideation (defeat: *beta* =0.15, *t*=2.00, *p*=0.005; suicidal flash-forwards: *beta* =0.32, *t*=56.60, $p < 0.001$). Furthermore, the interaction factor of the defeat X suicidal flash-forwards was also significant (*beta* =0.19, *t*=3.39, $p < 0.001$). The above results combine to suggest that defeat and entrapment at baseline were independent predictors of baseline suicidal ideation. Both types of perceptions would amplify baseline suicidal ideation in face of the intrusion of suicidal flash-forward images. To explore the above results further, we conducted correlations between entrapment total score and BSS total score, and defeat total score and BSS total score in the two groups with and without suicidal flash-forwards at baseline. The group without suicidal flashforwards showed a significant positive correlation between total BSS scores and defeat (Pearson's correlation [*P*] =0.69, $p < 0.001$), and between total BSS scores and entrapment (*P*=0.70, $p < 0.001$). Instead no significant correlation was present in the group with suicidal flashforwards (BSS scores and defeat: *P*=−0.06, *p*=0.74; BSS scores and entrapment: $P < 0.001$, *p*=0.97).

The above mediation analysis was then repeated using the above cognitive variables at baseline to predict suicidal ideation at seven weeks. Defeat significantly predicted suicidal ideation with a significant standardized regression coefficient (0.12, *p*=0.03) between defeat total score and BSS total score at follow up. Unstandardized indirect effects were computed for each of 5000 bootstrapped samples: the bootstrapped unstandardized indirect effect was < 0.001, and the 95% confidence interval ranged from −0.09 to 0.10. Thus, the indirect effect was not statistically significant. In other words, entrapment was not a mediator of the relationship between defeat and suicidal ideation at follow up.

Repeating the above moderation analyses revealed that interaction factor of entrapment X suicidal flash-forward was again a significant predictor of suicidal ideation at seven weeks (*beta* =0.19, *t*=2.24, *p*=0.03). However, the interaction factor of defeat X suicidal flash-forward was no longer a significant predictor (*beta* =0.18, *t*=1.68, *p*=0.10).

5. Discussion

This is the first prospective cohort study to investigate the relationships between mental imagery, perceptions of defeat and entrapment, and suicidal ideation. With regards to our hypotheses we confirmed that: 1) only suicidal participants, but not controls, reported experiencing suicidal flash-forwards at baseline and follow-up. Critically, suicidal cases with suicidal flash-forwards had higher severity of suicidal ideation than those without flash-forwards. At both time-points, the suicidal group reported 2) higher levels of defeat and entrapment, than controls. Of crucial interest, 3) suicidal flash-forwards and sense of entrapment were reduced among those suicidal participants at baseline who became non-suicidal at follow-up. Last, 4) entrapment did not appear to be the mediator of the relationship between defeat and suicidal ideation; instead, baseline suicidal ideation was predicted by the interaction factor between the presence of suicidal flash-forwards and perceptions of defeat and entrapment. The interaction of baseline perceptions of entrapment and suicidal flash-forwards also predicted suicidal ideation at seven weeks.

5.1. Suicidal flash-forwards and suicidality

We report that in a group of currently suicidal participants from the general population, the presence of suicidal flash- forwards is associated with more severe suicidal ideation. As mental images may represent goals (Conway et al., 2004) and are more likely to be acted upon than verbal thoughts (Carroll, 1978), these data suggest that suicidal flash-forwards may signal risk of impending suicidal acts (Crane et al., 2011; Hales et al., 2011). This is striking in a context where the population is exposed to graphic images of suicide by the media (Fu et al., 2011). Clinicians may therefore assess the presence of intrusive and involuntary 'snapshots' of suicidal flash-forwards, as well as of voluntarily conjured 'videos' of suicidal daydreaming (Selby et al., 2007). Given that the current study did not measure actual suicide attempts, whether suicidal flash-forwards may act as the catalyst of the transition from suicidal ideation to suicide attempts awaits further replication studies. Nevertheless, suicidal imagery may have its strongest effect as a volitional motivator, facilitating the transition from suicidal ideation to suicidal attempts.

Our study indicates that suicidal flash-forwards are a cross-cultural phenomenon. Some meanings associated with the imagery, for example, images of a desirable after-life, may be unique for Asian populations with strong beliefs in life after death. Such imagined positivity could serve as an effective escape from a current entrapping predicament (Chan et al., 2005). Interestingly, previous studies in Caucasian samples reported that comfort rating of suicidal imagery was associated with previous suicidal ideation severity (Crane et al., 2012). The current study did not find more serious suicidal ideation among those suicidal participants who rated suicidal flash-forwards as positive rather than negative. A more detailed and in-depth qualitative analysis may investigate whether specific types of emotions and meanings (e.g. comfort, triumph, shame, anger etc.) associated with flash-forwards could predict suicidal ideation severity. Understanding the idiosyncratic meanings of suicidal flash-forwards may still be crucial for risk assessment (Crane et al., 2012; Holmes et al., 2007), with positive valence possibly indicating greater clinical risk.

Further, a significant reduction in suicidal flash-forwards occurred only in those suicidal participants becoming non- suicidal at follow-up. Future studies should investigate if suicidal flash-forwards are also associated with greater risk of acting on suicidal ideation, and inform trials of imagery-focused interventions for suicide risk prevention. As the efficacy of psychological approaches for suicide prevention lacks conclusive evidence (Mann et al., 2005; van der Feltz-Cornelis et al., 2011), targeting a modifiable cognitive target such as suicidal imagery might be a promising strategy for reduction in suicidal flash-forwards.

5.2. Defeat, entrapment, suicidal flash-forwards and suicidal ideation: a model of psychological escape

Consistent with previous research (O'Connor and Nock, 2014; O'Connor et al., 2013; Taylor et al., 2011) we confirmed that sense of defeat and entrapment plays an important role in the IMV model (O'Connor, 2011), with reduction of defeat and entrapment perceptions over time in the suicidal sub-group that became non-suicidal. However, our study did not replicate previous findings that entrapment served as a mediator of the relationship between defeat sense and suicidal ideation. Rather, entrapment and defeat perceptions independently predicted suicidal ideation. That is, feeling defeated and feeling entrapped might be independent but closely related concepts associated with suicidal ideation. In addition, the current study further builds on the IMV model of suicide (O'Connor and Nock, 2014) by suggesting that the combination of emotionally charged, real-like suicidal flash-forwards together with strong feelings of entrapment or feelings of defeat can amplify current suicidal ideation and even predicts future suicidal ideation. This specific finding provides preliminary support that suicidal flash-forwards represent possible motivational moderators from entrapment to suicidal ideation, in the form of images of escape and of triumph over failed social struggle and defeat perception. Our exploratory results suggest that in the presence of suicidal flashforwards, higher perceptions of entrapment are not associated anymore with levels of suicidal ideation. However, this could be due to a ceiling effect in our small sample of participants with suicidal flashforwards mostly presenting with high scores of suicidal ideation: replication in larger populations is needed to understand the mechanism underpinning the exact relationship between suicidal flashforwards, entrapment cognitions and suicidal ideation.

As the current study has not captured data on actual suicidal

attempts, it is not clear whether suicidal flash-forwards might directly promote actual suicidal attempts. However, given that images might represent important goals (Conway et al., 2004) and might enhance the likelihood of the content of the images being acted upon in subsequent behaviours (Libby et al., 2007), it is possible that suicidal flash-forwards may facilitate the transition from suicidal ideation to suicide attempts as well. From a treatment perspective, if suicidal flash-forwards contain positive pictures about one's after-life (e.g. "becoming wealthy with flashy jewelry in the after-world") they can be appraised as pleasant and their compellingness may intensify suicidal ideation and possibly translate suicidal ideation into suicide acts (Selby et al., 2007). Suicidal prevention might explore targeting suicidal flash-forward images, by modifying their meaning (Arntz, 2012) and reducing their compellingness (Hales et al., 2011).

5.3. Limitations

A limitation of the study is a possible attrition bias (30% attrition rate) in the follow-up sample. Also, suicidal behaviour was not measured and this should be investigated in future studies. Future studies recording suicidal attempts could investigate if suicidal flash-forwards could also represent volitional moderators facilitating the transition from suicidal ideation/intent to suicidal behaviour. Self-report assessment of suicidal flash-forwards using the IFES might have underestimated the presence of imagery compared to previous studies using face-to-face structured interviews (Holmes et al., 2007; Hales et al., 2011). As all suicidal participants who were successfully followed up had attended mental health services, the reduction in suicidal flash-forwards and the levels in entrapment and defeat can be explained by procedures associated with mental health treatment unrelated to the resolution of suicidal ideation.

6. Conclusions

Our study provides some evidence that suicidal flash-forwards may be hallmark cognition of suicidal ideation severity. When present, suicidal flash-forwards may promote suicidal intention by offering a means of escape from current perceptions of entrapment. Therefore, identifying the presence and meanings of prospective mental images might be valuable for the routine risk assessment of suicidal individuals (Hales et al., 2011). Psychiatrists could ask 'what images run through your mind when you feel like life is not worth living anymore? ' (Di Simplicio et al., 2012). Pending future studies investigating if suicidal flash-forwards are also predictors of suicidal behaviour, innovations in psychological treatment protocols could evaluate whether targeting suicidal flash-forwards – especially when coupled with perceptions of defeat and entrapment – might be effective for suicide prevention.

Conflict of interest

No conflicts of interest.

Contributors

RMKN and EAH designed the study. RMKN contributed to the literature review and data collection. RMKN and MDS contributed to data analysis. RMKN, EAH, and MDS contributed to data interpretation. All authors contributed to the final report.

Role of funding source

This study was supported by the Health and Health Services Research Fund: Commissioned Project, the Food and Health Bureau, The Hong Kong Special Administrative Region Government, China [09101601]. The grant was provided for the conduct of the Hong Kong Mental Morbidity Survey, of which this study was a subsidiary one. MDS is supported by a Medical Research Council Career Development Fellowship. EAH is supported by the Medical Research Council (United Kingdom) intramural programme [MC-A060-5PR50], a Wellcome Trust Clinical Fellowship [WT088217], and the National Institute for Health Research (NIHR) Oxford Biomedical Research Centre Programme. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, the Department of Health of the UK, or the Food and Health Bureau of the Hong Kong SAR Government. The authors would like to thank Miss Samantha Li and Miss Katie Chan for assisting in the collection and management of the data, Miss Kian Wong for providing comments on statistical analysis, as well as Stephanie Burnett Heyes and Simon Blackwell for giving comments on the manuscript. The Hong Kong Mental Morbidity Survey Research Team is responsible for the planning and conduct of the Hong Kong Mental Morbidity Survey, of which the current sample of participants was recruited. Funding to pay the Open Access publication charges for this article was provided by the United Kingdom Medical Research Council.

References

Arntz, A., 2012. Imagery rescripting as a therapeutic technique: review of clinical trials, basic studies, and research agenda. J. Exp. Psychopathol. 3, 121–126.
Baumeister, R.F., 1990. Suicide as escape from self. Psychol. Rev. 97, 90–113.
Beck, A., Kovacs, M., Wesissman, A., 1979. Assessment of suicidal ideation: The Scale For Suicidal Ideation. J. Consult Clin. Psychol. 47, 343–352.
Beck, A.T., Brown, G.K., Steer, R.A., 1997. Psychometric characteristics of the Scale for Suicide Ideation with psychiatric outpatients. Behav. Res Ther. 35, 1039–1046.
Carroll, J.S., 1978. The effect of imagining an event on expectations for the event: an interpretation in terms of the availability heuristic. J. Exp. Soc. Psychol. 14, 88–96.
Chan, C.L.W., Chow, A.Y.M., Ho, S.M.Y., Tsui, Y.K.Y., Tin, A.F., Koo, B.W.K., Koo, E.W.K., 2005. The experience of Chinese bereaved persons: a preliminary study of meaning making and continuing bonds. Death Stud. 29, 923–947.
Conway, M.A., Meares, K., Standart, S., 2004. Images and goals. Memory 12, 525–531.
Crane, C., Shah, D., Barnhofer, T., Holmes, E.A., 2011. Suicidal imagery in a previously depressed community sample. Clin. Psychol. Psychother. 19, 57–69.
Deeprose, C., Holmes, E.A., 2010. An exploration of prospective imagery: the impact of future events scale. Behav. Cogn. Psychother. 38, 201–209.
Di Simplicio, M., McInerney, J.E., Goodwin, G.M., Attenburrow, M.J., Holmes, E.A., 2012. Revealing the mind's eye: bringing (mental) images into psychiatry. Am. J. Psychiatry 169, 1245–1246.
Fu, K.W., Chan, Y.Y., Yip, P.S., 2011. Newspaper reporting of suicides in Hong Kong, Taiwan and Guangzhou: compliance with WHO media guidelines and epidemiological comparisons. J. Epidemiol. Community Health 65, 928–933.
Gilbert, P., Allan, S., 1998. The role of defeat and entrapment (arrested flight) in depression: an explanation of an evolutionary view. Psychol. Med 28, 585–598.
Hales, S.A., Deeprose, C., Goodwin, G.M., Holmes, E.A., 2011. Cognitions in bipolar disorder versus unipolar depression: imagining suicide. Bipolar Disord. 13, 651–661.
Hayes, A.F., 2013. Introduction to Mediation, Moderation, and Conditional Process AnalysisA Regression-Based Approach. Guildford Press, New York.
Holmes, E.A., Crane, C., Fennell, M.J.V., Williams, J.M.G., 2007. Imagery about suicide in depression - "Flash-forwards"? J. Behav. Ther. Exp. Psychiatry 38, 423–434.
Holmes, E.A., Lang, T.J., Shah, D.M., 2009. Developing interpretation bias modification as a 'cognitive vaccine' for depressed mood - Imagining positive events makes you feel better than thinking about them verbally. J. Abnorm Psychol. 118, 76–88.
Holmes, E.A., Mathews, A., 2010. Mental imagery in emotion and emotional disorders. Clin. Psychol. Rev. 30, 349–362.
Joiner, T.E., Jr, Brown, J.S., Wingate, L.R., 2005. The psychology and neurobiology of suicidal behavior. Annu Rev. Psychol. 56, 287–314.
Kosslyn, S.M., Ganis, G., Thompson, W.L., 2001. Neural foundations of imagery. Nat. Rev. Neurosci. 2, 635–642.
Kwok, C., Sullivan, G., 2006. Chinese-Australian women's beliefs about cancer: implications for health promotion. Cancer Nurs. 29, E14–E21.
Lam, C.W.L., Chan, W.C., Wong, S.M., Chen, E.Y.H., Ng, R.M.K., Lee, H.M.E., Chang, W.C., Hung, S.F.C., Heung, E.F.C., Sham, P.C., Chiu, H.F.K., Lam, M., Chiang, T.P.J., van Oslau, J.T.F., Lewis, G., Bebbington, P., 2014. The Hong Kong mental morbidity survey: background and study design. East Asian Arch. Psychiatry 24, 30–36.
Liang, W., Wang, J.H., Chen, M.Y., Shibao, F., et al., 2008. Developing and validating a measure of Chinese cultural views of health and cancer. Health Educ. Behav. 35, 361–375.
Libby, L.K., Shaeffer, E.M., Eibach, R.P., Slemmer, J.A., 2007. Picture yourself at the polls-visual perspective in mental imagery affects self-perception and behavior. Psychol. Sci. 18, 199–203.
Mann, J.J., Apter, A., Bertolote, J., Beautrais, A., Currierm, D., Haas, A., Hegerl, U., Lonnqvist, J., Malone, K., Marusic, A., Mehlum, L., Patton, G., Phillips, M., Rutz, W., Rihmer, Z., Schmidtke, A., Shaffer, D., Silverman, M., Takahashi, Y., Varnik, A., Wasserman, D., Yip, P., Hendin, H., 2005. Suicide prevention strategies: a systematic review. J. Am. Med. Assoc. 294, 2064–2074.

Mathews, A., Ridgeway, V., Holmes, E.A., 2013. Feels like the real thing: imagery is both more realistic and emotional than verbal thought. Cogn. Emot. 27, 217–229.
Ng, R.M.K., Heyes, S.B., McManus, F., Kennerley, H., Holmes, E.A., 2016. Mental imagery susceptibility and bipolar risk in a representative sample of Chinese adults residing in the community. Int. J. Soc. Psychiatry 62 (1), 94–102.
O'Connor, R.C., 2011. Towards an integrated motivational-volitional model of suicidal behaviour. In: O'Connor, R.C., Platt, S., Gordon, J. (Eds.), International handbook of suicide prevention: Research, policy and practice. Wiley, Chichester, UK, 181–198.
O'Connor, R.C., Smyth, R., Ferguson, E., Ryan, C., Williams, J.M.G., 2013. Psychological processes and repeat suicidal behavior: a four-year prospective study. J. Consult Clin. Psychol. 81, 1137–1143.
O'Connor, R.C., Nock, M.K., 2014. The psychology of suicidal behaviour. Lancet Psychiatry 1, 73–85.
Pictet, A., Coughtrey, A.E., Mathews, A., Holmes, E.A., 2011. Fishing for happiness: the effects of generating positive imagery on mood and behaviour. Behav. Res Ther. 49, 885–891.
Price, J., Sloman, L., Gardner, R., Gilbert, P., Rhode, P., 1994. The social competition hypothesis of depression. BJ Psychol. 164, 309–315.
Pollock, L.R., Williams, J.M.G., 2004. Problem-solving in suicidal attempters. Psychol. Med. 34, 163–167.
Rudd, M.D., Joiner, T., Rajab, M.H., 2001. Treatment Manuals for Practitioners, Treating Suicidal Behavior: An Effective, Time-limited Approach. Guilford Press, New York, NY, US, 274.
Rasmussen, S.A., Fraser, L., Gotz, M., MacHale, S., Mackie, R., Masterton, G., McConachie, S., O'Connor, R.C., 2010. Elaborating the cry of pain model of suicidality: testing a psychological model in a sample of first-time and repeat self-harm patients. BJ. Clin. Psychol. 49, 15–30.
Selby, E.A., Anestis, M.D., Joiner, T.E., Jr., 2007. Daydreaming about death: violent daydreaming as a form of emotion dysregulation in suicidality. Behav. Modif. 31, 867–879.
Shneidman, E., 1996. The Suicidal Mind. Oxford University Press, New York.
STATA statistical software., 2011. Version 12. College station, TX: STATA corp LP.
Taylor, P., Gooding, P., Wood, A., Tarrier, N., 2011. The role of defeat and entrapment in depression, anxiety and suicide. Psychol. Bull. 137, 391–420.
van der Feltz-Cornelis, C.M., Sarchiapone, M., Postuvan, V., Volker, D., Roskar, S., Grum, A.T., Carli, V., McDaid, D., O'Connor, R., Maxwell, M., Ibelshäuser, A., Van Audenhove, C., Scheerder, G., Sisask, M., Gusmão, R., Hegerl, U., 2011. Best practice elements of multilevel suicide prevention strategies: a review of systematic reviews. Crisis 32, 319–333.
Wasserman, D., Wasserman, C., 2009. Oxford Textbook of Suicidology and Suicide Prevention. Oxford University Press, Oxford.
Williams, J.M.G., 1997. The Cry of Pain. Penguin, London.
Williams, J.M.G., 2001. Suicide and Attempted Suicide. Understanding the Cry of Pain. Penguin, London.
Wu, K.K., Chan, K.S., 2003. The development of the Chinese version of Impact of Event Scale–Revised (CIES-R). Soc. Psychiatry Psychiatr. Epidemiol. 38, 94–98.
Zhang, J., Norvilitis, J.M., 2002. Measuring Chinese psychological well-being with Western developed instruments. J. Personal. Assess. 79, 502–521.
Zhang, J., Brown, G.K., 2007. Psychometric properties of the scale for suicide ideation in China. Arch. Suicide Res. 11, 203–210.