

Interpersonal theory of suicide

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**A test of the Interpersonal-Psychological Theory of Suicidal Behaviour in a sample of mental health outpatients**

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### **Abstract**

Tests of two key hypotheses of the Interpersonal-Psychological Theory of Suicidal Behaviour (IPTB) were conducted in a cross-sectional sample of 239 psychiatric outpatients. Results of regression analyses indicated that thwarted belongingness (TB) and perceived burdensomeness (PB) were independently associated with death ideation, with some degree of death ideation being reported by all participants who obtained higher than mean scores on measures of PB and TB. After controlling for demographic covariates and depressive symptoms, the main effects of TB, PB, hopelessness, and all two-way interactions, suicide ideation was significantly predicted by the interactive effects of high levels of: TB, PB, and hopelessness. The findings are discussed in terms of their implications for future research on the theory and the clinical context.

*Keywords:* suicide ideation, interpersonal theory, belongingness, burdensomeness, hopelessness.

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The World Health Organization (WHO; 2014) estimates that more than 800,000 people die by suicide every year, with 75% of these deaths occurring in low- and middle-income countries. In addition, approximately 10 to 20 times more individuals attempt suicide each year. Suicidality is a multifaceted phenomenon, and is indisputably the outcome of a complex interplay of factors, with the precise inter-relationships between these factors varying from person to person (Rudd, 2000). However, in spite of it being a global mental health care problem, there has been relatively little empirical advancement in the conceptualization of suicide in recent years.

A relatively new theory, the Interpersonal-Psychological Theory of suicidal behaviour (IPTS: Joiner, 2005; Van Orden, Witte, Cukrowicz, Braithwaite, Selby, & Joiner, 2010) proposes a causal pathway to lethal suicidal behavior, in which death ideation (thoughts of death without reference to suicide) arises from perceptions of burdensomeness and thwarted belongingness (*Hypothesis 1*), and in the presence of high levels of hopelessness in relation to both of these distressing states, death ideation transforms into suicide ideation (*Hypothesis 2*).

This paper: (a) briefly outlines the first two hypotheses of the IPTS, (b) highlights some methodological concerns relating to extant research on the IPTS, and (c) reports on findings from a local study, which was designed to provide a test of the aforementioned IPTS hypotheses.

### ***Risk factors for death ideation***

In terms of the model, *the sufficient proximal causes of death ideation are the presence of high levels of either perceived burdensomeness (PB) or thwarted belongingness (TB) (Hypothesis 1)*. According to Van Orden et al. (2010), this hypothesis can be falsified if studies do not document: (a) independent associations for both TB and PB with death

ideation, and (b) the presence of death ideation among all individuals with a completely thwarted sense of belongingness or a global sense of perceived burdensomeness.

Studies that have examined associations between IPTS risk factors for death ideation have produced few consistent findings, with some studies reporting that death ideation is associated with PB but not with TB (Cukrowicz, Jahn, Graham, Poindexter, & Williams, 2013; Van Orden, Witte, Gordon, Bender, & Joiner, 2008) and other studies finding that high levels of TB are associated with death ideation, but only in the presence of high levels of PB (Murariu, 2016). Moreover, there has, to date, been no systematic attempt to falsify the hypothesis that death ideation will be present among all individuals with a completely thwarted sense of belongingness and/or a global sense of PB.

### ***Risk factors for suicide ideation***

According to Van Orden et al. (2010), *the sufficient proximal causes of suicide ideation are high levels of both PB and TB, in the presence of high levels of hopelessness in relation to both of these distressing states (Hypothesis 2)*. This hypothesis can be falsified if studies do not document: (a) a significant two-way interaction in terms of which suicide ideation is more severe at high levels of both PB and TB, (b) a significant three-way interaction in terms of which suicide ideation is more severe at high levels of: PB, TB and perceived hopelessness, and (c) that individuals with high levels of hopelessness regarding PB and TB are more likely to report suicide ideation than they are to report death ideation.

Research on risk factors for suicide ideation has failed to provide consistent support for IPTS hypotheses. While some studies have documented a significant two-way interaction in terms of which suicide ideation is more severe at high levels of both TB and PB (Cuckrowitz et al., 2013; Murariu, 2016; Van Orden et al., 2008) other studies have failed to document a significant two-way interaction between TB and PB in predicting suicide ideation (Christensen, Batterham, Soublet, & Mackinnon, 2013; Chu, Buchman-Schmitt, Hom,

Stanley, & Joiner, 2016). In addition, there are studies that have provided only qualified support for IPTS predictions, with Hagan, Podlogar, Chu, and Joiner (2015) finding that high levels of both PB and TB were strongly predictive of suicide ideation in a college student sample but not in a clinical sample, and Barzilay et al. (2015) finding that TB interacted with parental belongingness, but not with peer belongingness, in predicting suicide ideation.

Additionally, there has, to date, been no systematic attempt to falsify the hypothesis that individuals with high levels of hopelessness regarding PB and TB are more likely to report suicide ideation than they are to report death ideation.

### **Methodological Issues in Research on the IPTS**

Inconsistent findings that have emerged from research on the IPTS may reflect differences in sample characteristics, with available studies having focused on a variety of samples including: secondary school and college students (Barzilay et al., 2015; Ream, 2015; Van Orden et al., 2008), clinical samples (Hagan et al., 2015; Van Orden et al., 2008), and samples drawn from the general population (Christensen et al., 2013; Chu et al., 2016; Cukrowicz et al., 2013; Hagan et al., 2015; Murariu, 2016).

A lack of consistent findings regarding IPTS predictions may also reflect the use of measures which fail to adequately capture key constructs. This would appear to be particularly true regarding measures that have been used to assess *hopelessness* as a risk factor for suicide ideation. In the absence of an instrument that is specifically designed to assess hopelessness in relation to both PB and TB, researchers have either not included a measure of hopelessness in their study (e.g., Barzilay et al., Chu et al., 2016; Van Orden et al., 2008, 2012), or have tended to rely on measures that are designed to assess negative expectations about the self and the world (e.g., Cuckrowitz et al., 2013; Hagan et al., 2015) or generalized social hopelessness (e.g., Murariu, 2016). As Van Orden et al (2010) point out,

such measures fail to adequately capture precisely what it is that individuals are hopeless about. And in this regard, Van Orden and her colleagues (2010, p. 590) clarify that:

*“It is only hopelessness regarding complete and pervasive TB and PB that will cause active suicidal desire because it is only at this juncture of mental states that individuals see no possibility of positive change”.*

A further confounding issue in research on the IPTS relates to the fact that suicide ideation has, at times, been assessed using measures which do not clearly distinguish between suicide and death ideation (e.g., Van Orden et al., 2008, 2012; Christensen et al., 2013). suicide ideation that contain items relating to both death and suicide ideation (see e.g.,

### **The Present Study**

In an attempt to address some of the limitations of previous research, this study tested selected IPTS hypotheses in a mixed sample of psychiatric outpatients. It was expected that psychiatric patients would evidence a high variability of scores on measures of IPTS constructs, which would permit meaningful tests of IPTS hypotheses. Two hypotheses were entertained:

*Hypothesis 1: Death ideation will be independently associated with high levels of either PB or TB;*

*Hypothesis 2: Suicide ideation will be associated with high levels of both PB and TB in the presence of high levels of perceived hopelessness in relation to both of these distressing states.*

## **METHODOLOGY**

### **Participants**

Two hundred and thirty-nine participants aged 18 to 68 years ( $M = 36.49$ ,  $SD = 11.95$ ) were recruited from State and private outpatient psychiatric sites located in the Durban Metropolitan area of KwaZulu-Natal, in 2015. The sample contained 161 females and 78

males, with participants' highest level of education being: no formal schooling (2.1%), completed primary school (2.5%), completed secondary school (61.9%), or completed a tertiary degree or diploma (33.5%). Forty percent of participants were African, 26% Indian, 21% White, and 13% Coloured<sup>1</sup>.

### **Instruments**

**Interpersonal Needs Questionnaire (INQ).** Developed by Van Orden et al. (2008), the INQ is a 12-item scale designed to measure TB (5 items: e.g., "I feel disconnected from other people") and PB (7 items: e.g., "I feel I am a burden to the people in my life"). Items are scored on a 7-point Likert ranging from 1 (*completely untrue*) to 7 (*completely true*). In validation studies involving both clinical and non-clinical samples (Van Orden et al., 2008, 2012), the INQ has been found to have satisfactory levels of construct and criterion-related validity, as well as high levels of internal consistency for both the TB ( $\alpha = .85$ ) and the PB ( $\alpha = .89$ ) subscales. Descriptive statistics for TB in this study were: range = 5-35,  $M = 17.53$ ,  $SD = 8.34$ ,  $\alpha = .86$ , skewness (statistic = .263,  $SE = .157$ ,  $z = 1.68$ ), and kurtosis (statistic = .895,  $SE = .314$ ,  $z = 2.85$ ); with comparative statistics for PB being: range = 7-49,  $M = 22.59$ ,  $SD = 12.50$ ,  $\alpha = .80$ , skewness (statistic = .452,  $SE = .157$ ,  $z = 2.88$ ), and kurtosis (statistic = 1.011,  $SE = .314$ ,  $z = 3.22$ ). These statistics indicate that both subscales of the INQ were characterized by high levels of variability and internal consistency, with score distributions not differing significantly from what would be expected under the normal curve.

**Interpersonal Hopelessness Scale (IHS).** In the absence of an appropriate measure of hopelessness in relation to both PB and TB, the authors developed the IHS to assess for interpersonal hopelessness in this study. With respect to participants responses to each of the 12 items on the INQ, participants were asked to indicate whether they believed that things would get better or worse in the future, with responses being scored on a 5-point Likert scale

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<sup>1</sup> Racial category in South Africa referring to person of mixed racial background

ranging from 1 (*things will get a lot better*) to 5 (*things will get a lot worse*). Responses for each of 12 items were then summed, with higher scores representing greater interpersonal hopelessness. Descriptive statistics for the IHS in this study were: range = 12-60,  $M = 30.45$ ,  $SD = 12.76$ ,  $\alpha = .947$ , skewness (statistic = .431,  $SE = .157$ ,  $z = 2.75$ ), and kurtosis (statistic = -.372,  $SE = .314$ ,  $z = 1.18$ ). Taken together these statistics indicate that IHS scores were characterized by high levels of variability and internal consistency, with the distribution of scores not differing significantly from what would be expected under the normal curve.

**Death ideation.** Death ideation was assessed using four items taken from the Beck Scale for Suicidal Ideation (BSS; Beck, & Steer, 1991): “I have no wish to live”, “I wish I was dead”, “I have strong reasons for dying”, and “I would not avoid threats to my life”. Each of these items were scored on a graded 3-point scale ranging from 0 to 2, with higher scores indicating greater death desire. In this study, 131 participants (54.8%) reported some degree of death ideation, with descriptive statistics for the sample being: range = 0-8,  $M = 2.52$ ,  $SD = 2.53$ ,  $\alpha = .916$ . Estimates of skewness (statistic = 1.026,  $SE = .157$ ,  $z = 6.54$ ) and kurtosis (statistic = -.257,  $SE = .314$ ,  $z = 0.82$ ) indicated that the distribution of scores for the death ideation measure differed significantly from what would be expected under the normal curve. However, when scores were subjected to a nonlinear (square root) transformation, estimates of skewness (statistic = .374,  $SE = .157$ ,  $z = 2.38$ ) and kurtosis (statistic = -.788,  $SE = .314$ ,  $z = 2.51$ ) indicated that the distribution of transformed scores did not differ significantly from what would be expected under the normal curve. Transformed scores for death ideation were consequently used in all analyses for which a normal distribution of death ideation scores was assumed.

**Suicide ideation.** Suicide ideation was assessed using five items from the BSS: “I have a strong desire to kill myself”, “I often think about killing myself”, “I continually think about killing myself”, “I accept the idea of killing myself”, and “I cannot keep from killing



myself". Each of these items was scored on a graded 3-point scale ranging from 0 to 2, with higher scores indicating greater suicidal desire. In this study, 96 participants (40.2%) reported some degree of suicide ideation, with descriptive statistics for the sample being: range = 0-10,  $M = 2.06$ ,  $SD = 2.98$ ,  $\alpha = .937$ . Estimates of skewness (statistic = 1.074,  $SE = .157$ ,  $z = 6.84$ ) and kurtosis (statistic = -.193,  $SE = .314$ ,  $z = 0.61$ ) indicated that the distribution of scores for the suicide ideation measure differed significantly from what would be expected under the normal curve. However, when scores were subjected to a nonlinear (square root) transformation, estimates of skewness (statistic = .377,  $SE = .157$ ,  $z = 2.40$ ) and kurtosis (statistic = 1.015,  $SE = .314$ ,  $z = 3.23$ ) indicated that the distribution of transformed scores did not differ significantly from what would be expected under the normal curve. Transformed scores for suicide ideation were consequently used in all analyses for which a normal distribution of suicide ideation scores was assumed.

**Categories of death and suicide ideation.** In order to facilitate the comparison of risk factors for different forms of ideation, three mutually exclusive ideation groups were formed: (a) *a no ideation group*, who did not endorse any items relating to either suicide or death ideation, (b) *a death ideation group*, who endorsed one or more items relating to death ideation but did not endorse any items relating to suicide ideation, and (c) *a suicide ideation group*, who endorsed one or more items relating to suicide ideation (regardless of whether items relating to death ideation were endorsed or not). In this study, 105 participants (43.9%) fell into the no ideation group, 38 (15.9%) into the death ideation group, and 96 (40.2%) into the suicide ideation group.

**Depressive symptomatology.** Depressive symptoms were assessed using the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). Each item on the BDI-II is scored on a graded 4-point scale (0-3), with higher scores indicating more severe depressive symptoms. In psychiatric and non-psychiatric samples, the BDI-II has been found to have

adequate levels of internal consistency ( $\alpha = .93$  and  $.89$  respectively) (Joiner et al., 2008). Descriptive statistics for the BDI-II in this sample were: range = 0-63,  $M = 25.23$ ,  $SD = 15.93$ ,  $\alpha = .953$ , skewness (statistic =  $.426$ ,  $SE = .157$ ,  $z = 2.71$ ), and kurtosis (statistic =  $-.791$ ,  $SE = .314$ ,  $z = 2.52$ ). Taken together, these statistics indicate that the BDI total scores were characterized by high levels of variability and internal consistency, with score distributions not differing significantly from what would be expected under the normal curve.

### **Ethical considerations**

Ethical clearance for the research was obtained from the Biomedical Research Ethics Committee at the University of KwaZulu-Natal in 2015. Assistance with the research was sought from mental health professionals employed at three public hospitals and from a number of mental health professionals running private practices in the Durban area. Following the provision of written informed consent by all participants, the research questionnaire was administered by the first author or by one of two registered clinical psychology trainees in the privacy of the attending practitioner's consulting rooms.

### **Data analysis**

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) (version 22).

## **RESULTS**

### **Preliminary analyses**

A series of preliminary analyses were conducted in order to identify control variables for the study and in order to explore univariate associations between IPTS constructs. From Table 1 it is evident that BDI scores accounted for a significant proportion of the variance in scores for both IPTS outcomes (i.e., death ideation and suicide ideation), with race (being Black or Coloured) and a younger age accounting for a unique proportion of the variance in suicide ideation scores. Given that each of the regression models presented in Table 1

produced high  $R^2_{adj}$  values (.511-.545) and large  $f^2$  effect sizes, significant predictors of each of the two IPTS outcomes were entered as covariates in all subsequent analyses.

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Table 1 about here

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Zero-order correlations between covariates, risk factors, and outcome variables considered in the study are presented in Table 2. Consistent with expectations, there were significant positive correlations between all IPTS constructs.

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Table 2 about here

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### **Tests of *Hypothesis 1***

The first test of *Hypothesis 1* was to determine whether PB and TB were independently associated with death ideation. To this end, a hierarchical linear regression analysis was conducted, with a covariate (BDI scores) being entered in the first step, PB and TB scores being entered in the second step, and transformed (square root) death ideation scores being entered as a criterion variable (see Table 3). In step 1, BDI scores accounted for a significant proportion of the variance, with the model significantly predicting death ideation scores, [ $F(1,237) = 158.23, p = .000$ ] and accounting for 39.8% of the explained variance. The inclusion of PB and TB in step 2 was associated with a significant increase in explained variance,  $\Delta R^2 = .233, p = .000$ , with there being significant main effects of PB [ $\beta = .549, t(235) = 8.74, p = .000$ ] and TB [ $\beta = .115, t(235) = 2.00, p = .046$ ]. This finding provides support for the hypothesis that PB and TB are independently associated with death ideation.

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Table 3 about here

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The second test of *Hypothesis 1* was to determine whether death ideation was present among all individuals with a completely thwarted sense of belongingness or a global sense of PB, with support for this hypothesis being provided by the data presented in Figure 2. Consistent with IPTS predictions, the presence of death ideation was significantly associated with mean item scores for both PB ( $r = .76, p = .000$ ) and TB ( $r = .63, p = .000$ ), with some degree of death ideation being present among all individuals who reported a completely thwarted need to belong (i.e., mean item scores  $> 6$ ) or global PB (i.e., mean item scores  $> 6$ ).

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Figure 1 about here

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### **Tests of *Hypothesis 2***

The first test of *Hypothesis 2* was to determine whether a regression analysis would produce: (a) a significant two-way interaction in terms of which suicide ideation is more severe at high levels of both TB and PB, and (b) a significant three-way interaction in terms of which suicide ideation is more severe at high levels of: PB, TB, and perceived hopelessness. In order to test these predictions, a hierarchical linear regression analysis was conducted with three covariates (age, race: Black or Coloured, and BDI scores) being entered in the first step, IPTS risk factors (PB, TB, and hopelessness) being entered in the second step, and all 2- and 3-way interactions between IPTS risk factors being entered in Step 3 (see Table 4). In step 1, BDI scores and race (Black or Coloured) accounted for a significant proportion of the variance, with the model significantly predicting suicide ideation, [ $F(3,235) = 83.62, p = .000$ ] and accounting for 51% of the variance. Scores on the BDI were the single best predictor of suicide ideation. The inclusion of main effects for IPTS risk factors (TB, PB, and hopelessness) in step 2 was associated with a significant increase in the proportion of

explained variance ( $\Delta R^2_{\text{adj.}} = .113, p = .000$ ). Although there were significant main effects of PB and hopelessness, TB did not unequally predict suicide ideation. The inclusion of interaction effects for IPTS risk factors in step 3 was associated with a small but significant increase in explained variance ( $\Delta R^2_{\text{adj.}} = .021, p = .002$ ). In the final model there were significant main effects of PB, TB, and hopelessness, as well as significant interaction effects for all 2-way interactions and for the 3-way interaction of IPTS risk factors (see Table 4).

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Table 4 about here

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In the analysis of 2- and 3-way interactions, low scores were defined as scores that were  $\leq$  the mean, with high scores being defined as scores that were  $>$  the mean. With respect to 2-way interactions, tests of the simple slope indicated that: (a) high levels of hopelessness were associated with suicide ideation in the presence of high levels of PB ( $\beta = .519, p = .00$ ) but not in the presence of low levels of PB ( $\beta = .066, p = .461$ ), (b) high levels of hopelessness were associated with suicide ideation in the presence of high levels of TB ( $\beta = .504, p = .000$ ) but not in the presence of low levels of TB ( $\beta = .013, p = .888$ ), and (c) high levels of TB were associated with suicide ideation in the presence of high levels of PB ( $\beta = .521, p = .000$ ) but not in the presence of low levels of PB ( $\beta = .036, p = .561$ ). The analysis of the 3-way interaction (Figure 3) indicated that high levels of hopelessness were only associated with suicide ideation in the presence of high levels of both PB and TB. Taken together, these findings are consistent with the IPTS prediction that suicide ideation will be predicted by high levels of both PB and TB in the presence of high levels of hopelessness in relation to both of these distressing states.

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Figure 3 about here

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A further test of *Hypothesis 2* was conducted using a Multinomial logistic regression analysis, in which: (a) ideation group (no ideation, death ideation, or suicide ideation) was entered as the criterion measure, (b) age, race, and BDI scores were entered as control variables, and (c) hopelessness scores were entered as an independent variable. Findings from this analysis (Table 5) indicate that the likelihood of falling into the *death ideation* group (as opposed to the *no ideation* group) was unrelated to levels of hopelessness. However, individuals who reported high levels of hopelessness were significantly more likely to fall into the *suicidal ideation* category than they were to fall into the *no ideation* category. Taken together, these findings are consistent with IPTS predictions that interpersonal hopelessness exerts its moderating influence primarily in relation to suicide (rather than death) ideation.

## DISCUSSION

Consistent with findings from previous studies, IPTS risk factors were found to account for a significant proportion of the variance in IPTS outcomes (death ideation, and suicide ideation) after controlling for the effects of relevant demographic and mental health variables, with all observed associations being in the direction predicted by the theory.

With respect to death ideation, study findings are consistent with the theoretical prediction that PB and/or TB are proximal and sufficient causes of death ideation. Although previous studies have found that death ideation is independently associated with either PB (Cukrowicz et al., 2013) or TB (Murariu, 2016), this study documented that: (a) *both* PB and TB are associated with the severity of death ideation scores, and (b) death ideation is present among all individuals with a completely thwarted sense of belongingness or a global sense of PB

Findings regarding suicide ideation are consistent with the prediction that the proximal and sufficient causes of suicide ideation are the presence of high levels of both PB

and TB in the presence of high levels of hopelessness. Although some studies have failed to document the significant 3-way interaction suggested by this prediction (e.g., Christensen et al., 2013; Cukrowicz et al., 2013), the present findings are consistent with findings from a recent study conducted among undergraduate students (Hagan et al., 2015), which found that high levels of PB and TB are significant predictors of suicide ideation only at high levels of hopelessness. The central role of hopelessness in the development of suicide ideation was also confirmed in a subsequent test of *Hypothesis 2*, with results suggesting that hopelessness exerts its moderating influence in the suicidal continuum from death to suicide ideation.

The implication of this finding is that targeting interpersonal hopelessness is likely to inhibit the suicidal pathway from death to suicide ideation. The fact that hopelessness is not considered to be “*a stable trait but a variable psychological state that escalates to predictable levels of intensity during times of intrapsychic disturbance*” (Beck et al., 1985, p. 562) implies that although other risk factors (such as mental illness) may be more stable, hopelessness is potentially modifiable (Steege et al., 2016) and therefore amenable to psychotherapeutic interventions.

The cross-sectional design of this study prevents any strong inferences from being drawn regarding the nature and direction of observed associations between IPTS risk and outcome variables; prospective studies are indicated if researchers hope to achieve an adequate test of the predictive (as opposed to descriptive) validity of key IPTS hypotheses. A strength of the study is the use of a hopelessness measure that taps specifically into hopelessness regarding interpersonal needs as proposed by the IPTS. This is the first attempt to test the theory using a specifically designed measure.

## CONCLUSION

Study findings provide compelling support for the descriptive power of the IPTS (Joiner, 2005; Van Orden et al., 2010) in our sample. It would therefore appear that the same mechanisms that underlie suicidality in other contexts, characterize this phenomenon in our context, notwithstanding our unique socio-political and cultural landscape. With regards to the IHS, future validation studies must include inpatient and non-psychiatric samples across multiple cultural contexts.

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Table 1

Demographic and mental health predictors of IPTS outcomes: Linear and binary logistic regression analyses ( $N = 239$ )

Predictors	Death ideation			Suicide ideation		
	<i>Beta</i>	<i>t</i>	<i>p</i>	<i>Beta</i>	<i>t</i>	<i>p</i>
(Constant)		0.95	.344		-0.37	.710
Younger age	.093	1.96	.050	.067	1.98	<b>.047</b>
Female sex	.011	0.24	.811	-0.60	-1.26	.225
Race (Black or Coloured) <sup>a</sup>	.054	1.16	.248	-0.15	3.13	<b>.002</b>
Unemployed	.059	1.30	.195	.002	0.04	.966
Not married/in a relationship	.056	1.19	.235	.007	0.15	.880
Fewer years of education	.016	0.36	.721	.041	0.86	.389
BDI scores	.706	15.42	<b>.000</b>	.686	14.47	<b>.000</b>
Model summary						
Adjusted $R^2$		.545			.511	
$F/\chi^2$ for model		$F = 41.664$			$F = 36.508$	
<i>df</i>		7, 231			7, 231	
<i>p</i>		.000			.000	
$f^2$ effect size		1.198			1.061	
Categorisation of effect size		Large			Large	

*Note.* Significant findings are presented in **bold**,  $p < .05$ .

<sup>a</sup>A preliminary exploration of all possible racial permutations indicated that the “Black or Coloured” category most strongly predicted scores on IPTS outcome measures.

Table 2

Zero-order correlations between covariates and IPTS constructs.

Variable	1	2	3	4	5	6	7	8
Thwarted belongingness	--							
Perceived burdensomeness	.72**	--						
Hopelessness	.51**	.52**	--					
Acquired capability	.20**	.31**	.16*	--				
Death ideation	.62**	.76**	.52**	.32**	--			
Suicide ideation	.62**	.72**	.53**	.30**	.89**	--		
Total BDI scores	.63**	.70**	.43**	.15*	.72**	.72**	--	
Younger age	.12	.10	.02	.09	.11	.10	.01	--
Race (Black or Coloured )	.06	.13	.09	.06	-.12	.19**	.04	.24**

\*Correlation significant at  $p < .05$ .\*\*Correlation significant at  $**p < .01$ .

Table 3

Linear regression model of interpersonal risk factors for death ideation ( $N = 239$ ).

Step	Variable	$\beta$	$t$	$p$	Model summary					
					Model			Change		
					$R^2$	$F$ for model	$p$	$f^2$ effect size	$\Delta R^2$	$p$
1					.398	158.23	.000	.503	.398	.000
	(Constant)		-5.56	<b>.000</b>						
	BDI scores	.633	12.58	<b>.000</b>						
2					.631	136.90	.000	1.019	.233	.000
	(Constant)		-7.17	.000						
	BDI scores	.221	4.27	<b>.000</b>						
	Perceived burdensomeness	.549	8.74	<b>.000</b>						
	Thwarted belongingness	.115	2.00	<b>.046</b>						

*Note.* Significant findings are presented in **bold**,  $p < .05$ . BDI = Beck Depression Inventory-II (Beck et al., 1996).  $R^2$  = Adjusted  $R^2$ . According to Cohen (1988)  $f^2$  effect sizes  $> .35$  represent a large effect.

Table 4

Linear regression model predicting suicide ideation ( $N = 239$ ).

Step	Variable	$\beta$	$t$	$p$	Model summary					
					Model			Change		
					$R^2$	$F$ for model	$p$	$f^2$ effect size	$\Delta R^2$	$p$
1	(Constant)		-2.29	.023	.510	83.62	.000	0.64	.510	.000
	Age	-.067	-1.44	.153						
	Race (Black or Coloured)	-.138	2.96	<b>.003</b>						
	BDI scores	.693	15.27	<b>.000</b>						
2	(Constant)		-.632	.528	.623	66.62	.000	0.89	.113	.000
	Age	-.031	-0.76	.451						
	Race (Black or Coloured)	-.101	2.45	<b>.015</b>						
	BDI scores	.349	5.97	<b>.000</b>						
	PB	.308	4.62	<b>.000</b>						
	TB	.090	1.47	.142						
	Hopeless	.167	3.48	<b>.001</b>						
3	(Constant)		-2.35	.020	.644	44.08	.000	0.95	.021	.002
	Age	-.044	-1.09	.277						
	Race (Black or Coloured)	-.101	2.49	<b>.013</b>						
	BDI scores	.337	5.90	<b>.000</b>						
	PB	.797	2.40	<b>.017</b>						
	TB	.337	5.90	<b>.000</b>						
	Hopeless	.379	2.12	<b>.035</b>						
	TB x Hopeless	.807	2.94	<b>.004</b>						
	PB x Hopeless	.835	2.87	<b>.005</b>						
	PB x TB	1.189	2.54	<b>.012</b>						
	PB x TB x Hopeless	1.210	3.76	<b>.000</b>						

*Note.* Significant predictors are presented in **bold**,  $p < .05$ . BDI = Beck Depression Inventory-II (Beck et al., 1996). Hopeless = Perceived hopelessness in relation to both PB and TB.  $R^2$  = Adjusted  $R^2$ . According to Cohen (1988),  $f^2$  effect sizes  $> .35$  represent a large effect.

Table 5

Multinomial logistic regression model of factors associated with suicide and death ideation  
( $N = 239$ )

Risk factor	Death ideation vs. no ideation			Suicide ideation vs. no ideation		
	$\chi^2_{(1)}$	OR (95% CI)	$p$	$\chi^2_{(1)}$	OR (95% CI)	$P$
Younger age (<40 years)	3.31	2.13 (0.94-4.80)	.069	1.54	1.59 (0.76-3.32)	.215
Race (Black or Coloured)	0.00	1.01 (0.45-2.24)	.984	7.51	0.35 (0.17-0.74)	<b>.006</b>
BDI scores (> mean)	17.07	6.45 (2.66-15.63)	<b>.000</b>	55.73	21.28 (9.65-47.62)	<b>.000</b>
Hopelessness (> mean)	0.07	0.90 (0.34-2.03)	.794	10.97	3.35 (1.68-6.84)	<b>.001</b>

*Note.* Significant predictors are presented in **bold**,  $p < .05$ . BDI = Beck Depression Inventory Inventory (Beck et al., 1996). Reference category = the no ideation group. OR = odds ratio. CI = confidence interval.



Figure 1. Mean item scores for PB and TB and the presence of death ideation

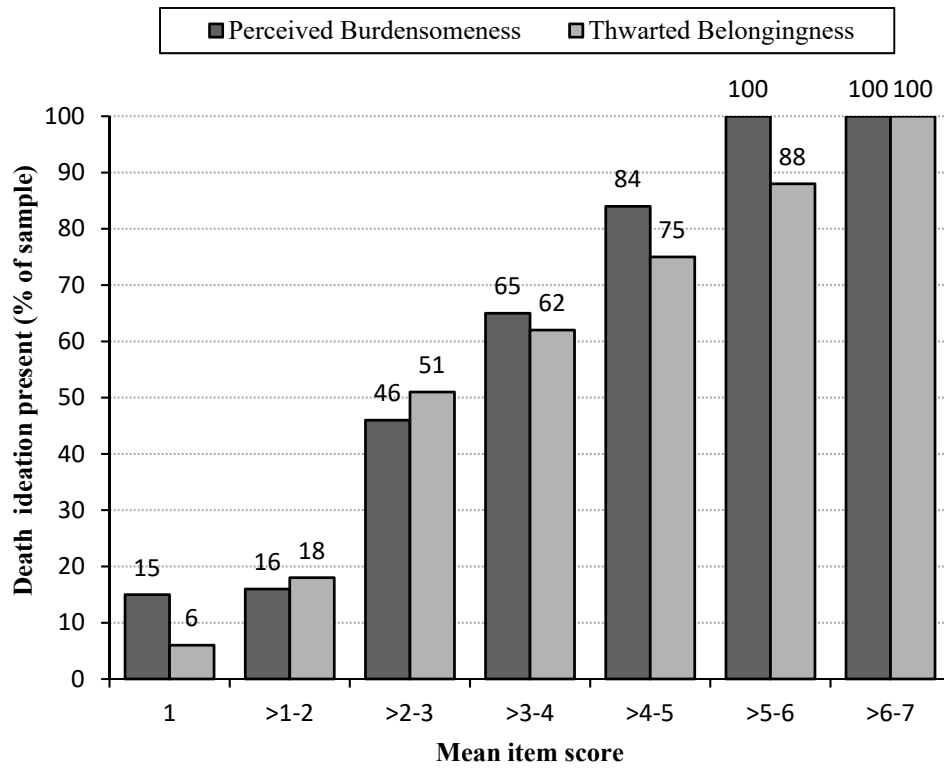


Figure 2. Analysis of 3-way interaction (PBxTB x hopelessness)

