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Relevance of the interpersonal theory of suicide in an adolescent psychiatric inpatient population

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ABSTRACT

The interpersonal theory of suicide (IPTS) has been widely studied in adults, but not adolescent populations at acute risk for suicide. Accordingly, this study aimed to evaluate IPTS clinical utility in a high-risk sample of suicidal adolescent inpatients. We assessed whether constructs of the IPTS (1) are associated with suicidal thoughts and behaviors (STBs) on admission to a psychiatric hospitalization, and (2) prospectively predict suicide attempt (SA) or psychiatric rehospitalization 90 days after discharge. On admission, adolescent patients self-reported recent STBs, perceived burdensomeness (PB), thwarted belongingness (TB), and depression. Parents reported their child's rehospitalization and suicide attempts 90 days after discharge. Generalized linear regression modelling was used to determine how key constructs of the IPTS are associated with STBs prior to admission and whether they prospectively predict SA or rehospitalization 90 days after discharge. IPTS constructs did not predict rehospitalization or SA within 90 days of discharge. Although PB and TB interacted to associate with prehospitalization SI frequency, and PB, TB and NSSI interacted to associate with prehospitalization SA, the nature of these interactions were not as the IPTS predicts. IPTS constructs are relevant proximal predictors of prehospitalization STB in adolescents, but may operate differently than in adults.

1. Introduction

Suicide is the second leading cause of death in adolescents, and the suicide death rate has risen in the US in all age groups between 2000 and 2016 (Centers for Disease Control and Prevention, 2017; Hedegaard et al., 2018). For many adolescents, severe episodes of suicidal thoughts or behaviors (STB) result in inpatient hospitalization for crisis stabilization and psychiatric care. Psychiatric hospitalization, an objective marker of acute psychiatric crisis, is a significant disruption for youth and their families. The three months following discharge are among the highest risk periods for suicidal behaviors and/or psychiatric crisis requiring rehospitalization in adolescents (Fontanella, 2008; Prinstein et al., 2008). Unfortunately, we have limited understanding of the psychological constructs that account for STB risk, psychiatric crisis and the subsequent need for psychiatric hospitalization among youth. A better understanding of these constructs could help to identify patients at risk, lead to treatment targets during hospitalization, and ultimately reduce the need for rehospitalization. Thus, it is crucial that we develop ways to identify youth most likely to attempt suicide or be hospitalized for high-risk STB.

The interpersonal-psychological theory of suicide (IPTS) attempts to explain the emergence of suicidal ideation (SI) and suicide attempt (SA) and, thus, provides constructs that may influence STBs that increase risk for psychiatric hospitalization. The IPTS hypothesizes that the constructs *thwarted belongingness* (TB; the perception that one does not belong in valued social groups), and *perceived burdensomeness* (PB; the perception that one is a burden to friends and family) interact to increase the *desire to die* or SI. The theory further hypothesizes that *acquired capability* (AC; an undermined self-preservation instinct) interacts with SI to result in SA (Van Orden et al., 2010).

Although not without critics (Hjelmeland and Knizek, 2019), the IPTS may be useful for clinicians trying to predict risk, intervene and

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prevent negative clinical outcomes like SA and rehospitalization particularly for adolescents hospitalized for STB. In fact, a recent review of studies using proxies or constructs closely related to the IPTS indicated preliminary support for the theory in adolescents (Stewart et al., 2017). However, studies that investigate the IPTS in adolescents are scarce. For example, a meta-analysis (Chu et al., 2017) of 122 IPTS studies identified only four studies of adolescents that met inclusion criteria for the study. Notably, the effect sizes of IPTS constructs in this meta-analysis were minimal to moderate, comparable to other established predictors of STB, and statistically significant. The meta-analysis generally found support for IPTS hypotheses, but highlighted the need to study the theory in younger populations (Chu et al., 2017).

The few adolescent studies that explicitly test the IPTS provide mixed support for its hypotheses and its utility in clinical adolescents. Studies of clinical and general adolescent samples have generally found cross-sectional associations between STBs and IPTS constructs (Barzilay et al., 2015; Horton et al., 2016; King et al., 2017; Miller et al., 2016; Opperman et al., 2015; Podlogar et al., 2017). PB is frequently associated with STBs whereas associations between TB and STBs are weak or are only found with respect to family TB and not peer TB (in the one study that measured family vs. peer TB; Opperman et al., 2015). Additionally, nearly all cross-sectional studies fail to find that TB and PB interactions or that TB, PB and AC interactions are associated with STB as the IPTS posits (Barzilay et al., 2015; Horton et al., 2016; Opperman et al., 2015; Podlogar et al., 2017).

The few extant longitudinal studies of IPTS constructs and STBs in adolescents generally find that TB and PB have limited predictive utility over longer timeframes (Czyz et al., 2014; King et al., 2017; Miller et al., 2016). However, it is unclear whether this is due to study limitations. One longitudinal inpatient study found that PB measured at admission was significantly associated with SI at admission but not at time of discharge, and it found no association between TB and SI, or a PB and TB interaction (Miller et al., 2016). Another study of adolescents in an intensive outpatient program similarly found that PB and TB measured at admission were not associated with suicide risk at discharge (King et al., 2017). Only one study has tested whether IPTS constructs prospectively predict SA in adolescents following hospital discharge. This study found no evidence (1) that PB and TB prospectively predict SA on their own, (2) that they interact to predict SA or (3) that PB, TB and AC interact to prospectively predict SA. However, this study did not utilize validated measures of PB and TB (Czyz et al., 2014), providing motivation for research that does. Notably, prospective studies of any STB predictors generally do not find that single constructs measured at one timepoint explain substantial variation of STBs at significantly later timepoints. For example, Franklin and colleagues (2016) conducted a recent meta-analysis of the prior 50 years of long-term predictive STB studies (Franklin et al., 2017). Among the 365 studies in the meta-analysis with an average study length of 10 years, they found that individual predictors of STB were only slightly better than chance. This has motivated recent studies pursuing STB prediction on the order of hours and days instead of months and years (Czyz et al., 2019; Kleiman et al., 2017; Kyron et al., 2018; Ribeiro et al., 2019; Rogers and Joiner, 2019).

Despite this trend in the field, it is notable that only 4.37% of studies in the Franklin and colleagues (2016) meta-analysis featured a study length of 0 to 6 months (Franklin et al., 2017). For clinical populations, this understudied time frame is the most high-risk in the months following psychiatric discharge (Fontanella, 2008; Prinstein et al., 2008). Determination of post-hospitalization STB risk is an important objective for clinicians in psychiatric acute care settings. Identification of post-hospitalization risk factors could identify treatment targets during hospitalization that improve care and reduce negative post-discharge outcomes. IPTS constructs may be especially applicable to post-hospitalization risk, given their theorized relationship to STB. Although these constructs are responsive to intensive treatment (King et al., 2017; Miller et al., 2016), levels of these constructs may revert to prehospitalization levels when adolescents are discharged to their pre-hospitalization environment.

Unfortunately, to date, only one study has examined whether IPTS constructs predict post-hospitalization SA after discharge from an inpatient psychiatric unit and no studies have examined rehospitalization. Although the IPTS makes no claims regarding psychiatric rehospitalization, this is a significant gap, as investigating the relationship between IPTS constructs and rehospitalization may lead to interventions that improve concrete clinical outcomes, thereby reducing a significant burden for adolescents and their families.

To further establish that IPTS constructs are superior predictors of risk, they must explain STB variance above and beyond well-characterized and validated risk factors for STB, such as depression. Interestingly, when some prior studies in this area have controlled for depression severity, IPTS constructs, particularly TB, are no longer significant predictors of STB, suggesting that depression accounts for overlapping STB variance with IPTS constructs (Barzilay et al., 2015; Horton et al., 2016; Mbroh et al., 2018; Miller et al., 2016; Podlogar et al., 2017). Notably, some of these studies do not use validated measures of IPTS constructs. Additionally, at least one other study has found that the interaction of PB*TB measured at exit from an intensive outpatient program explains significant concurrent suicide risk above and beyond depression (King et al., 2017).

Considering prior mixed support for the IPTS in different adolescent populations, it is unclear whether the IPTS has clinical utility in adolescent psychiatric inpatient populations. Of extant adolescent IPTS studies, four have investigated psychiatric samples (Czyz et al., 2014; Horton et al., 2016; King et al., 2017; Miller et al., 2016); only one prospectively tracked patients after discharge (Czyz et al., 2014); only one predicted negative clinical outcomes such as suicidal behaviors (Czyz et al., 2014); and only four used validated measures of both PB and TB (Horton et al., 2016; King et al., 2017; Mbroh et al., 2018; Miller et al., 2016). Importantly, there is no single IPTS study to our knowledge that has all four of these features, and none attempt to predict rehospitalization. To test IPTS clinical utility, the current study sought to include all of these characteristics. The main goals of the current study were to:

(1) Test the association between SI and PB or TB assessed retrospectively on admission to a pediatric psychiatric hospital.
(2) Test the association between SA and interaction of PB, TB, and NSSI (proxy for AC) assessed retrospectively on admission to a pediatric psychiatric hospital.
(3) Test the prospective relationship between SA and rehospitalization (as an exploratory aim) within 90 days after hospital discharge and PB, TB and NSSI (proxy for AC) assessed retrospectively on admission.
(4) To compare models testing these associations and controlling for depression severity with similar models that omitted depression altogether.

2. Methods

2.1. Participants

The study was approved by the study site institutional review board. Patient-reported data were collected on standardized clinical assessments administered to all patients ages 12–19 (n = 724) consecutively admitted to the acute inpatient pediatric psychiatric unit between September 2016 and October 2018 at a hospital in a large northeastern metropolitan area. Beginning in June of 2017, as part of a standard clinical outcomes process, patients' parents (n = 428) were emailed 90-day post-hospitalization surveys assessing whether their children had experienced several negative outcomes (e.g., SA, rehospitalization) since discharge. The response rate for these post-hospitalization parent surveys was 50% (n = 214). Demographic and clinical admission