Relationships Between Different Dimensions of Social Support and Suicidal Ideation in Young People with Major Depressive Disorder

Introduction

Suicide is the world's second leading cause of death among young people (World Health Organization, 2018). In high income countries such as Australia, more young people die by suicide than by any other cause (Australian Institute of Health and Welfare, 2019). The personal, social and economic costs of youth suicide are immense, in part due to the substantial loss of productive capacity associated with death at a young age (Kinchin and Doran, 2018). With appropriate prevention and early intervention approaches, suicide deaths might be preventable but first, it is necessary to identify clear and modifiable targets. Death due to suicide represents the extreme end of a spectrum of suicidality, encompassing suicidal ideation, planning, and attempt (Bridge et al., 2006; Bursztein and Apter, 2009). Suicidal ideation involves having thoughts about ending one's life; this might encompass general thoughts about dying, or more specific thoughts about methods through which one intends to die (Nock et al., 2008). Suicidal ideation is associated with suicidal behaviour, however it is not a reliable predictor of future suicide (McHugh et al., 2019). The majority of young people with suicidal ideation do not attempt suicide (Wilkinson et al., 2011). There is, nonetheless, a substantial disease burden associated with suicidal ideation and non-fatal suicidal behaviour, due to psychosocial morbidity, secondary psychological distress to others, lost productivity, and health service usage (Whitlock et al., 2014). It is therefore important to consider intervention targets for suicidal ideation, rather than focus solely on prevention of suicide deaths.

Depression is one of the most common psychiatric disorders among young people and is closely linked with suicide (Beautrais, 2000). Nevertheless, depression lacks specificity as a predictor of suicidal ideation or attempt (Franklin et al., 2017). Social support is an important determinant of psychological wellbeing. It can be defined as the perceived or received assistance that an individual receives from other people (Schaefer et al., 1981). Existing evidence concerning relationships between social support and suicidal ideation points towards the need to consider social support as a multi-dimensional construct (Hetrick et al., 2012). Evidence shows that assessing social support as a unitary construct fails to detect important differences in the potential protective qualities of

different domains of social support (Matlin et al., 2011). Much of the existing evidence regarding social support and suicidal ideation in young people is derived from non-clinical samples, such as university or high-school students. To date, there is scant evidence pertaining to how different dimensions of social support influence suicidality in young people with clinically diagnosed mental health conditions such as depression. The aim of this study was to investigate associations between three dimensions of social support and suicidal ideation (SI) in young Australians with major depressive disorder (MDD).

Method

Study Design

In this cross-sectional study, we utilised data from two randomised placebo-controlled treatment trials for young people with moderate to severe MDD; the Youth Depression Alleviation – Augmentation with an Anti-Inflammatory Agent (YoDA-A) study (Quinn et al., 2018) and the Youth Depression Alleviation – Combined Treatment (YoDA-C) study (Davey et al., 2014). Primary outcomes for both studies, including CONSORT participant flow diagrams, have been reported elsewhere (Berk et al., 2020; Davey et al., 2019). Only baseline data is considered in the current analysis; no data collected after commencement of the study interventions is included. All procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. The Melbourne Health Human Research Ethics Committee (HREC/12/MH/148 and HREC/12/MH/151) approved all procedures involving human participants. Both trial protocols were registered with the Australian New Zealand Clinical Trials Registry (ACTRN12612001281886 and ACTRN12613000112763).

Participants

Young people between 15 and 25 years of age, with a Structured Clinical Interview for DSM-IV Axis I Disorders, Patient Edition (SCID-I/P; First et al., 1997) diagnosis of MDD, and a score ≥ 20 on the Montgomery-Åsberg Depression Rating Scale (MADRS; Montgomery and Åsberg, 1979) were

recruited into the YoDA-A and YoDA-C studies. Recruitment occurred from early 2013 to late 2016 and was conducted across six youth-specific outpatient mental health services in Melbourne and Geelong, Australia; namely the Youth Mood Clinic at Orygen in Melbourne, Jigsaw Youth Mental Health in Geelong, and *headspace* centres in Sunshine, Glenroy, Werribee, and Geelong. All participants provided written informed consent. Where appropriate, written consent was also obtained from a parent or legal guardian if the participant was aged younger than 18 years.

Measures

Social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) The MSPSS is a 12 item self-report measure, comprising three subscales assessing perceived support obtained from Family, Friends, and a Significant Other. Each item is rated on a seven-point Likert scale from (1) *very strongly disagree* to (7) *very strongly agree* and all item scores are summed to provide a total score. Subscale scores for each type of support (Family, Friends, Significant Other) comprise four items each, which are averaged to provide a score ranging from 1 to 7; higher scores indicate higher levels of perceived social support. The MSPSS exhibits good test-retest reliability, construct validity (Zimet et al., 1990), and high internal consistency, demonstrated across a range of participant samples, including young people (Canty-Mitchell and Zimet, 2000; Edwards, 2004; Zimet et al., 1990). The MSPSS is designed to be multidimensional, and both exploratory and confirmatory factor analyses support a three-factor structure of the scale (Clara et al., 2003; Edwards, 2004; Zimet et al., 1990).

The Quick Inventory of Depressive Symptoms – Self Report (QIDS-SR) was employed to assess depression severity. The QIDS-SR assesses for both frequency and intensity of depressive symptoms. It comprises 16 items, rated on a scale of zero to three, that map onto the nine DSM-IV symptom criterion domains for MDD (Rush et al., 2003). The total QIDS score provides an indication of depression severity according to the following ranges: 1-5 = no depression; 6-10 = mild depression; 11-15 = moderate depression; 16-20 = severe depression; 21-27 = very severe depression (Rush et al., 2003). A recent meta-analysis of the psychometric properties of the QIDS

suggests that it exhibits acceptable internal consistency and moderate to high concurrent validity with other commonly used depression scales (Reilly et al., 2015). Prior to conducting any analyses, item 12 of the QIDS assessing "Thoughts of Death or Suicide" was removed, to avoid the circularity of using a measure of suicidal ideation to predict suicidal ideation. This reduces the maximum possible QIDS score from 27 to 24.

Suicidal ideation was assessed using the Suicidal Ideation Questionnaire (SIQ; Reynolds, 1988). The SIQ is a self-report measure of SI, specifically designed for use with young people (Mazza and Reynolds, 1998). The measure comprises 30 items, ranging from general thoughts about death to more specific cognitions about suicide, including plans regarding suicidal method and timing. Each item is scored on a seven-point Likert scale ranging from (0) *I never had this thought*, to (6) *almost every day*. Scores across all items are summed to provide a total score. The maximum possible SIQ score is 180, with higher scores indicating more frequent and pervasive SI. A cut-off value of 41 is used to indicate the need for further evaluation of potentially significant psychopathology and suicide risk (Reynolds, 1988). The psychometric properties of the SIQ have been extensively reported, with the measure demonstrating good internal consistency, construct validity, criterion validity, and concurrent validity (Boege et al., 2014; Mazza and Reynolds, 1998; Pinto et al., 1997).

Statistical Analysis

All data analyses were conducted using IBM® SPSS® Statistics, version 26. Unless otherwise stated, type I error or alpha (α) was set at the .050 level for all analyses. Exact *p* values are reported, with the exception of values < .001. Assumptions of linear regression were assessed for all variables in accordance with Tabachnick and Fidell (2018). The dataset was initially screened for missing data and outliers. There was < 5% missing data across all variables and Little's Missing Completely at Random (MCAR) test was non-significant (χ^2 (7) = 4.398, p = .733), suggesting that the data were missing completely at random. Only complete cases were included in the final analysis; partial cases were removed through listwise deletion. The presence of univariate outliers was assessed using interquartile range, with outliers defined as values either larger than the 75th percentile plus 1.5

times the interquartile range, or smaller than the 25th percentile minus 1.5 times the interquartile range. No univariate outliers were detected on the SIQ Total Score. Three univariate outliers were detected on the MSPSS Total Score, with three participants scoring marginally lower than the 25th percentile. Four univariate outliers were detected on the QIDS, with four participants scoring marginally lower than the 25th percentile. Listwise deletion of these cases produced no substantial change to model estimates and did not affect the interpretation of results, thus data from these participants were retained in the model for the final analysis.

Multivariate outliers were screened for using Mahalanobis distance with the critical value of χ^2_{crit} (3) = 16.27 at the .001 level of alpha; no cases exceeded this χ^2_{crit} value, suggesting that no multivariate outliers were present. No multicollinearity was detected, as tolerance values exceeded 0.10 (the lowest tolerance value was 0.99) and the Variance Inflation Factor did not exceed 10 (VIF = 1.01) across all variables. Examination of residual scatterplots satisfied assumptions of normality, linearity, and homoscedasticity.

Univariate between-group comparisons of age, living situation, depression severity (QIDS), suicidality severity (SIQ), and social support subscales were performed by sex, using independent samples *t*-tests for parametric quantitative variables and χ^2 tests for differences in proportions. Bivariate correlations were examined for all predictors; Pearson correlation coefficients between pairs of continuous variables, phi coefficients between pairs of categorical variables, and point-biserial correlation coefficients between continuous and categorical variables. The absence of any significant interaction effects between the independent variables was also confirmed by calculating interaction terms and performing a series of exploratory multiple linear regression analyses with SIQ as the dependent variable (see Supplementary Tables available online). A four-step hierarchical regression analysis was then conducted to determine the proportion of variance that each social support dimension contributed to suicidal ideation, above that contributed by demographic factors (age, sex, living situation) and depression severity (QIDS minus item 12). Age and sex were entered in the first step, living situation was entered in the second step, and depression severity was entered

in the third step. The three MSPSS subscales were added in the fourth step of the regression model. From the regression models, the following parameters were considered: the unstandardised and standardised regression coefficients (*B* and β) and the intercept, the squared semi-partial correlations (sr^2), and the R^2 and adjusted R^2 for each step and the full model with all predictors.

Results

Data were collected from 283 participants; 168 females (59%) and 115 males (41%). Further comprehensive descriptive details of the participants are reported elsewhere (Berk et al., 2020; Davey et al., 2019). Of the 283 participants, 19 were excluded due to missing data, leaving a total of 264 for the proceeding analyses. Table 1 provides a summary by sex of means and standard deviations for continuous variables and proportions for categorical variables. There was substantial variability in the total SIQ score, with scores ranging from 0 to 172, although only two participants scored a total of 0. The SIQ interquartile range was 73, with $Q_1 = 42$, median = 74, and $Q_3 = 115$. The mean SIQ of 78.09 was well above the typically employed cut-off of 41 used to indicate heightened suicidal risk (Reynolds, 1988), and 76.5% of cases (*n* = 202) exceeded this cut-off value. The mean QIDS total score was likewise high, falling in the "severe depression" range of 16-20 (Rush et al., 2006). The majority of participants (69.5%) reported living with their parents, while 9.5% were living with friends, and 6.8% were living with a significant other, such as their spouse or *de facto* partner. Female participants were significantly more likely than male participants to report living with a significant other ($\chi^2(1) = 6.93$, $p = 0.008$). The level of perceived support received from a significant other was likewise significantly higher in females compared to males ($t(205.983) = -2.738$, $p = .007$). There were no significant differences between males and females on any other measures.

Insert Table 1 here

Table 2 displays the Pearson correlation coefficients, phi coefficients, and point-biserial correlation coefficients between predictor variables, zero-order correlations between the predictors and SIQ, unstandardised regression coefficients (*B*), standardised regression coefficients (β), squared semi-partial correlations (sr^2), R^2, and adjusted R^2 after entry of all independent variables. The hierarchical multiple regression revealed that at step one, the demographic variables age and sex did not contribute significantly to the model, $R^2 = .01$, F (2,261) = .96, $p = .38$. Entering the living situation variables in the second step likewise failed to contribute significantly to the model, $R^2 = .01$, F (3,258) = .55, $p = .65$. The entry of depression severity at step three independently predicted 7% of the variation in suicidal ideation severity, and this change was significant, $R^2 = .09$, F (1,257) = 21.14, $p < .001$. Finally, the addition of the three social support subscales to the model in the fourth step explained an additional 3% of the variability in suicidal ideation. With all three social support dimensions in the model, this change in R^2 approached but did not reach significance, $R^2 = .12$, F (3,254) = 2.61, $p = .052$. The full model including all predictors was significant, F (9,254) = 3.70, $p < .001$ and the final adjusted R^2 of .09 suggests that 9% of the variability in SI severity was predicted by the variables in the final model. Considering each variable individually, only depression severity and perceived Family Support were significant predictors of SI in this model. Friend Support and Significant Other Support were not significant predictors of SI. Depression severity was the strongest predictor, uniquely contributing 6% of the variance in SI. Family Support was inversely related to SI and uniquely contributed 2% of the variance. These results were confirmed by a post-hoc exploratory regression analysis using backwards elimination ($F = 14.635$, $p < .001$), which revealed that depression severity and family support were the only significant predictors of SIQ responses.

Insert Table 2 here

Discussion

The findings of this study demonstrate that perceived support received from family members has a small but significant inverse relationship with SI in young people with moderate to severe MDD. Family Support provided a unique contribution of 2% of the variance in SI, after controlling for demographic characteristics and depression severity. Perceived support from friends or a significant other were not significantly associated with SI in this cohort. A young person's living situation likewise did not predict SI, further adding weight to the idea that it is perception of support that is the important factor, not who a young person lives with. These findings further support the multidimensional nature of social support and add to our understanding of the risk and resilience factors underlying suicidal ideation in young people with depression, by identifying a potentially modifiable factor associated with the severity of SI. This finding could help inform the development of intervention approaches for young people with SI. Given that the two significant predictors only explained a relatively small amount of variance, it is clear that suicidal ideation is a complex and multifaceted phenomenon, with numerous contributory factors.

Family Support

The protective effects of perceived family support on suicidality have been documented across a range of countries and settings, in non-clinical (Tseng and Yang, 2015), sub-clinical (Sharaf et al., 2009), and clinical populations of young people (Miller et al., 2015). Several studies report differential effects by gender, suggesting that low social support from family might play a more important role in suicidal outcomes for young females compared to young males (Kerr et al., 2006; Lewinsohn et al., 2001). The current study findings did not support this, as there was no significant interaction effect of sex and the Family Support subscale on SI. The finding that family support is associated with suicidality is also consistent with existing literature on family functioning (Kyron et al., 2019). This concept is closely related to, but is not necessarily interchangeable with, perceived support from family. Variables typically associated with low perceived family support include high family dysfunction (Wolff et al., 2013). Considerable evidence suggests that this is a significant

predictor of suicidality in young people (Hetrick et al., 2012; Kyron et al., 2019). The effect of familial dysfunction on suicidality might be mediated by other factors, such as conduct problems or substance use (Kyron et al., 2019; Prinstein et al., 2000). Other familial characteristics such as poor family cohesion and infrequent communication with parents have also been suggested as significant contributors to suicidality in young people (King and Merchant, 2008).

The protective role that family support might play in relation to suicidality in young people might, in part, be due to the relative stability of familial relationships, compared with friendships or romantic relationships among young people (Evans et al., 2004). Friendship instability among young people is associated with a range of adverse psychosocial outcomes, including lower academic achievement (Lessard and Juvonen, 2018), social withdrawal (Oh et al., 2008), and non-suicidal self-injury (Santangelo et al., 2017). Putative associations between relational stability and suicidality in young people are speculative but warrant investigation; further research is needed that considers multi-dimensional relational stability, including individual differences in personality traits, with respect to suicidality in young people. The potential adverse effects of pathological levels of parental involvement must also be considered, as over-involvement of parents might detrimentally affect the ability of young people to generate their own adaptive strategies for managing life challenges (Sharaf et al., 2009). Factors such as the quality of parent-child relationships (Pettit et al., 2011) and parental expressed emotion (especially criticism) (Burkhouse et al., 2012), have been shown to be important determinants of psychological wellbeing and suicidality in young people; consideration of these aspects of interpersonal family relationships is vital.

Friend Support

The existing evidence base presents an unclear picture of the role of perceived friend and peer support in suicidality in young people. Some research suggests that perceived family and school support are more important contributory factors to young peoples' suicidal thoughts and behaviours than peer support (Miller et al., 2015). The current study found no significant relationship between perceived support from friends and suicidal ideation, which is congruent with the findings of a

recent meta-analysis (Miranda-Mendizabal et al., 2019). Conversely, numerous previous studies suggest that peer support might actually have an adverse (rather than protective) effect on suicidality in young people (Evans et al., 2004; Kerr et al., 2006; Tseng and Yang, 2015). The modality in which friendships occur, e.g. online or face to face, might be an important contributory factor to perceptions of support and suicidality. Online social interactions with peers can exert both positive and negative influences on suicidality in young people (Memon et al., 2018; Tseng and Yang, 2015). The idiosyncratic characteristics of peer relationships are likely a major influence on whether such relationships are adaptive or maladaptive (Evans et al., 2004; Tseng and Yang, 2015). For some young people, peer influences might reinforce maladaptive coping or behavioural strategies, whereas for other young people, peer influences are a supportive and/or protective factor (Wolff et al., 2013). Associations between peer support and suicidality are complex, and are likely to be influenced by factors such as perceived acceptance and perceived rejection, in addition to psychopathological and behavioural characteristics (Prinstein et al., 2000). The current study did not distinguish between social support from adaptive and maladaptive friendships, thus it is possible that associations between Friend Support and suicidality were clouded by the aggregation of positive and negative peer influences.

Significant Other Support

Adolescence and early adulthood are critical times for the formation and development of relationships with significant others, such as romantic partners. Forming romantic relationships in adolescence is an important normative developmental milestone, however certain stages within relationships might be associated with increased stress and adverse psychological sequelae (Pettit et al., 2011; Price et al., 2016). Failure of a romantic relationship is a commonly reported precipitant of suicidal thoughts and behaviour in young people (Miller and Prinstein, 2019). Yet, relatively few studies report specifically on associations between perceived support received in such relationships and suicidal outcomes in young people. Among a large non-clinical cohort of Taiwanese high school students, support from a significant other actually increased the risk of suicidal planning in females

(Tseng and Yang, 2015). However, this study did not control for potentially maladaptive personality trait-related interactional styles that might underlie this association. The applicability of this previous finding to other settings and to young people with a clinically diagnosed mental health disorder is difficult to determine. No significant association was found between SI and Significant Other Support in the current cohort. However, the actual relationship status of participants was not investigated. Female participants were significantly more likely than male participants to be living with a significant other, and the level of perceived support received from a significant other was likewise significantly higher in females compared with males. The relative importance of these differences with respect to SI is difficult to determine, partly because the proportion of participants living with a significant other was relatively low. Fostering adaptive romantic relationships in young people is important. However, it is clear that questions remain regarding any influences that such relationships might play in suicidal outcomes in young people. Further investigation of both the adaptive and maladaptive aspects of romantic relationships, and the interrelationships of these factors with suicidal thoughts and behaviour, is warranted.

Social support in clinical vs non-clinical populations

There is a great deal of diversity across previous studies of social support with respect to participant characteristics, methodological approaches, and definitions of suicidality, which might partially explain the somewhat inconsistent findings reported in the literature. Much of the existing evidence comes from non-clinical populations, such as high-school or university students, that typically exhibit low levels of suicidality (Miranda-Mendizabal et al., 2019) without the degree of variability and level of risk seen in clinical populations. It is clearly important to conduct research in enriched populations of young people, with clinically diagnosed psychiatric disorders, where the risks of suicide are much greater and where the evidence base is more limited. The profiles of those with suicidal ideation, compared with those with suicidal acts, compared with those who die by suicide, are likely to be very different. There is relatively scant evidence regarding how different dimensions of social support influence suicidality in young people who are psychiatrically unwell.

This study provides an important insight into these relationships in a cohort of young people with clinically diagnosed depression of moderate to severe intensity.

Strengths and limitations

This study helps to address a gap in the current literature by providing insights into associations between different dimensions of social support and SI in help seeking young people with clinically diagnosed MDD, enrolled in a clinical trial. We investigated three domains of social support that are of central importance to the lives of young people. However, some potential sources of support, such as school support, were not assessed and remain avenues for further investigation. With respect to Family Support, the measure used (MSPSS) does not capture information about which family members provide support. Development of a social support measure that enables a respondent to specify which family members provide support might allow for more finely grained insights into how support in this domain influences suicidality among young people.

The findings of this study are correlational and, thus, do not provide information about the directionality of relationships between social support and suicidality. While higher perceived Family Support was found to be associated with lower SI, it cannot be conclusively determined that increasing family support would result in decreased suicidality. A longitudinal intervention study of a program designed to support adaptive family functioning and support might be a useful next step to explore how family support might function as a modifiable, protective factor for suicide in young people.

Unlike much of the existing literature, the members of the cohort under investigation in this study were severely depressed and reported a high mean level of SI. This is a real strength of the current study, as it allows investigation of the influences of social support in a severely psychologically unwell population who are at high risk of suicide. These characteristics might be reflective of typical patient cohorts seen in outpatient mental health clinics. However, they might have limited applicability to non-clinical populations, or to less severely depressed young people.

This was a help-seeking cohort who additionally agreed to take part in research, thus the sample might not be entirely representative of depressed young people as a whole. The YoDA studies were conducted in Australia, a relatively wealthy, Western democratic nation, with government-subsidised universal healthcare. Thus, the applicability of these findings to other settings, countries, or cultures might be limited.

Implications

The finding that Family Support had a small but significant association with SI, independent of covariates such as depression severity, living situation, age, and sex, suggests that the family is likely to be an important contributor to the psychological wellbeing of young people with MDD. Involvement of family members might play an important role in treatment approaches for depressed young people. Helping to foster adaptive family functioning and support for young people with moderate to severe depression and suicidal ideation (and perhaps for young people more broadly) might be an important component of suicide prevention efforts. No associations were found between SI and perceived support from friends or a significant other but is it clear that further research is needed to explore ways in which adaptive and maladaptive friend and peer relationships influence young peoples' suicidal thoughts and behaviours. All forms of support in a young person's life are potentially adaptive. Further research investigating social networks and their associations with social support might shed further light on the ways in which interpersonal relationships shape suicidal outcomes. If a causal link between social support and suicidal ideation is established, this work would support caregiver, family and peer group interventions to reduce suicidal ideation, and might potentially contribute to a reduction in suicide. Suicidal thoughts and behaviours in young people are likely to be influenced by a complex interplay of numerous risk and protective factors. Developing a better understanding of these factors, how they vary across settings and developmental stages, and how they interact, will hopefully assist in developing more effective suicide prevention strategies for young people.

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