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You've got to have friends: The predictive value of social integration and support in suicidal ideation among rural communities

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Abstract

Purpose: To explore the role of social integration and support in the longitudinal course of suicidal ideation (SI) in a rural population.

Methods: Baseline and 12-month data were obtained from participants within the Australian Rural Mental Health Study (ARMHS), a longitudinal study of community residents within rural and remote New South Wales, Australia. SI was assessed using the Patient Health Questionnaire (PHQ-9). Individual psychological factors, family and community characteristics were examined alongside personal social networks (Berkman Syme Social Network Index), availability of social support (Interview Schedule for Social Interaction) and perception of local community (Sense of Community Index).

Results: Thirteen hundred and fifty-six participants were included in the analysis (39% male, mean age 56.5 years). Sixty-one participants reported recent SI at baseline, while 57 reported SI at follow-up. Baseline SI was a strong predictor of SI at 12 months (OR = 19.0, 95% CI 8.6-42.3); significant effects were also observed for baseline values of psychological distress (OR = 1.4, 95% CI 1.0-1.9) and availability of social support (OR = 0.76, 95% 0.58-1.0) on 12-month SI. The emergence of SI at 12-month follow-up was predicted by higher psychological distress (OR = 1.8, 95% CI 1.3-2.4); there was a marginal effect of lower availability of support (OR = 0.74, 95% CI 0.55-1.0); neither of these variables predicted SI resolution.

Conclusions: This study investigated factors associated with SI over a 12 month period in a rural cohort. After controlling for known risk factors for SI, low availability of social support at baseline was associated with greater likelihood of SI at 12-month follow-up.

Introduction

It is a consistent international finding that rates of suicide are higher in rural than urban populations [1-4], with this rate continuing to rise in accordance with the degree of rurality. For example, in Australia suicide rates are 33% higher in rural areas than major cities, rising to 189% higher in very remote areas [5]. Although mental illness is one of the strongest determinants of suicidal behaviours [6], the prevalence of common psychiatric disorders differs little across geographic areas, and may in fact be lower in rural populations [7]. This implies that mental illness alone is not a sufficient explanation for the increased rural suicide rate, and that secondary factors may be influencing this disproportionate finding. Despite this, the majority of research has adopted a descriptive approach, investigating the extent of the urban-rural suicide difference rather than the factors associated with suicide [4].

Rural areas are diverse [8], varying in population density, socio-economic characteristics and availability of services. One potential area of difference between urban and rural areas is the nature of social networks and, potentially, availability of sources of social support. Some studies have indicated a relationship between the loss of rural services and infrastructure with levels of psychological distress [9]. While there is evidence of higher “social capital” in some rural districts, other research has demonstrated that social support fails to provide the same protective role on mental health outcomes that is demonstrated in urban settings [10]. The geographical remoteness of many rural areas is often paired with a consequent social isolation, which may limit the accessibility of social support for residents, with reliance on smaller social networks. For some this may be cohesive, while others may be disadvantaged through limited connection with others in their community [11]. Many rural regions are faced with depopulation [9], which has been associated with diminishing local support networks [12], an increasing sense of loneliness, and loss of primary relationships and sense of community for those residing in rural areas [13]. Social isolation has been

related to suicide in a number of studies [14,15], and may therefore be a key contributor to the disproportionate rural suicide rate.

Suicidal ideation (SI) acts as a major predictor for future suicide planning and attempts [16]. Therefore establishing the factors associated with SI may increase the opportunity for prevention of suicide attempts [17], and may be a viable means to reduce the rural suicide rate. Although there is a small body of research focusing on SI, many existing studies target urban residents, and their findings may be of limited relevance to rural populations [18]. Additionally, the majority of previous studies on SI are cross-sectional, and therefore causal inferences cannot be made [19]. Previous research has found an association between SI and a range of characteristics, including mental illness, hazardous alcohol use, unemployment, and low level of social support. Investigating these factors in a rural setting may provide a clearer picture of the determinants of suicidality specific to these geographical regions [20].

Based on existing research, facets of social integration and support may play a role in suicidality in rural populations. We have previously examined cross-sectional determinants of mental health and wellbeing across a rural sample in Australia and demonstrated a significant independent effect of aspects of social networks and support (such as sense of community) on levels of psychological symptoms [21]. The current report examines the role of such variables in relation to SI in order to undertake a more fine grained analysis of the factors underlying rural suicide. The present study aims to explore potential differences in social integration and support in rural residents with and without recent SI. Further, it aims to determine the role of social factors as predictors of future SI, investigating the potential to inform preventive interventions. It was predicted that lower perceived social support would be associated with SI on a cross-sectional level, and that this relationship will extend to the prediction of SI at 12-month follow-up.

Methods

Participants and procedure

Data were obtained as part of the Australian Rural Mental Health Study (ARMHS), a longitudinal population-based study exploring determinants of mental health in rural and remote communities, with a focus on the influence of social factors (see Kelly et al. [22] for a detailed description). The sample consisted of New South Wales (NSW) residents aged 18 or over, who were randomly selected from the Australian Electoral Roll and resided in one of 60 Local Government Areas (LGAs) from the Greater Western, Hunter New England, or North Coast rural health service regions of NSW. These areas cover approximately 70% of the geographic region of non-metropolitan NSW. LGAs were grouped by the Australian Standard Geographic Classification (ASGC) using the Accessibility/Remoteness Index of Australia (ARIA). Metropolitan areas, including capital cities and other urban centres with populations greater than 100,000 were excluded.

All data collection was undertaken via postal survey, and participants were re-contacted after 12 months to complete a follow-up survey.

Measures

The presence of SI was determined by a single item of the Patient Health Questionnaire (PHQ-9) [23], which inquires about the presence of “thoughts that you would be better off dead, or of hurting yourself in some way” during the last two weeks. Response options include “not at all,” “several days,” “more than half the days,” and “nearly every day.” Socio-demographic information including age, gender, marital status, employment status and financial status were assessed by single-item questions.

Mental health and wellbeing variables. Several aspects of mental health and wellbeing were explored; participants completed the Kessler-10 (K10) psychological distress

scale [24], and the Alcohol Use Disorders Identification Test (AUDIT) [25]. A novel 8-item measure was developed to assess distress associated with the perceived changes in rural areas; the measure used a 5-point Likert scale to determine levels of stress associated with community matters such as employment, discrimination and access to services.

Social integration and support variables. The perceived availability of social support was assessed by the Interview Schedule for Social Interaction – Availability of Attachment Scale [26]. The Berkman Syme Social Network Index [27] was used to assess the active involvement of participants in any organised groups within the community, such as social or recreational groups, charity groups, or professional organisations. Sense of belonging in the community was determined by the Sense of Community Index [28]. Predispositional variables included neuroticism items from the Eysenck Scale – brief form [29].

Statistical analysis

Data analysis was conducted using PASW (version 18; PASW, Chicago, IL, USA) and Stata (release 11; College Station, TX: StataCorp LP). The PHQ-9 outcome measure was recoded into a dichotomous variable to determine the presence versus absence of SI, rather than the frequency of these thoughts, therefore responses of “several days” or higher were collapsed. To address missing data in some measures, a method of imputation was developed based on the mean of answered items, as follows: *Psychological distress (Kessler-10)* and *Infrastructure & services distress*: if only one item was missing, the mean of the other items was substituted and the resulting sum rounded to the nearest integer; *Neuroticism (Eysenck Personality Questionnaire)* and *Sense of community*: if no more than 2 items were missing, the mean of the others items was substituted for each missing item and the resulting sum rounded to the nearest integer; *Availability of support (Interview Schedule for Social Interaction)*: if only one item was missing, it was coded as “No” (0).

To aid the interpretation of ORs for continuous variables, all continuous measures were standardised before ORs were calculated; that is, the OR for a continuous variable refers to the risk associated with a one-standard deviation increase in each measure.

Cross-sectional analysis

Univariate analyses were performed on baseline data; categorical variables such as gender and marital status were analysed using a chi-square test, while continuous variables such as age, and psychological distress, and social support were analysed via a one-way analysis of variance (ANOVA).

Longitudinal analysis

The probability of SI at follow-up was assessed by a hierarchical logistic regression, with 12-month SI as the outcome variable. Predictor variables reflecting demographic characteristics were included at step 1 in the model, while mental health and wellbeing, social integration and support, and baseline SI status were included at step 2. All continuous measures were standardised before the regression, such that the Odds Ratios (ORs) and associated 95% Confidence Intervals (CIs) relate to a one-standard deviation increment in each measure.

Due to the likely strong relationship between current and future SI [30], two sub-analyses were also undertaken. Variables were computed to assess: 1) individuals who did not have SI at baseline and had developed it by follow-up, and 2) individuals who did have SI at baseline and did not at follow-up. Significant predictors from the original regression were re-analysed in two additional regressions in order to distinguish between factors which may be related to the development and resolution, rather than persistence, of SI.

In light of the likely strong association between psychological factors and SI, a post-hoc receiver operating characteristic (ROC) analysis was undertaken. Significant variables in

the final step of the regression model were divided into two categories: “psychological variables” and “socio-demographic variables”. Psychological variables were first plotted alone, and were subsequently plotted together with socio-demographic variables, in order to assess the additional predictive value obtained by including supplementary predictors in the model for 12-month SI.

Results

Cross-sectional analysis

Of the 2135 participants who completed the PHQ at baseline, 264 (12%) did not complete the full set of associated demographic, mental health and social measures. Therefore, analysable data was initially collected for 1871 participants. A further 515 participants did not complete 12-month follow-up and were excluded from analysis, leaving complete data for 1356 individuals; therefore the relevant retention rate from baseline to follow-up was 72%. Participants who were not retained at follow-up indicated higher baseline levels of both psychological distress (15.2 vs 14.4, $F_{(1, 1869)} = 9.39, p < .01$) and infrastructure and services distress (15.8 vs 15.0, $F_{(1, 1869)} = 6.44, p = .01$). These individuals were younger (53.9 vs 56.5, $F_{(1, 1869)} = 13.07, p < .01$), more likely to be unemployed (16.5% vs 11.5%, $\chi^2_{(2)} = 8.38, p = .02$), and just getting along/poor (39.2% vs 29.9%, $\chi^2_{(3)} = 24.29, p < .01$) than participants who completed follow-up assessment. Individuals with missing data were also significantly more likely to express suicidal ideation at baseline (7.8% vs 4.5%, $\chi^2_{(1)} = 7.81, p < .01$).

Of the final sample, 534 (39%) were male, and the mean age was 56.5 years. Sixty-one participants (4.5%) experienced SI in the 2 weeks prior to the baseline survey. Relationships between baseline characteristics and baseline SI status are reported in Table 1. Individuals who were unemployed and those with a lower financial status were more likely to

report baseline SI. Those with recent SI also reported significantly higher levels of psychological distress, neuroticism and alcohol use, and also indicated higher distress about perceived changes in rural areas. Perceived availability of social support, social network and sense of community scores were all significantly lower in individuals experiencing SI. No effect of age, gender, marital status or level of remoteness was found.

Insert Table 1 near here

Longitudinal determinants of suicidal ideation

At 12-month follow up, 57 participants (4.2%) endorsed the SI item. Of these individuals, 31 (54%) had previously experienced SI at baseline, and 26 (46%) had SI at follow-up only. Thirty participants with SI at baseline did not report SI at 12-month follow-up.

Table 2 reports univariate associations between the baseline predictors and SI at 12-months. Individuals who were unemployed at baseline were more likely to report SI at 12-months. Higher baseline psychological distress, alcohol intake, infrastructure and services distress, and neuroticism were also characteristic of those who reported SI at 12-months. They were more likely to have “low” or “medium” social networks, and indicated a lower sense of community and availability of support at baseline. They were also significantly more likely to have had SI at baseline.

The same set of predictors was included in the multivariate analysis (i.e., hierarchical logistic regression), which is reported in Table 3. Participants who experienced SI at baseline were 19 times more likely to indicate SI at follow-up than those with no history of SI. Each one-standard deviation increment in baseline psychological distress was associated with a 40% increase in the likelihood of experiencing SI at 12-months. Higher perceived availability of support at baseline was associated with lower levels of SI, with each one-standard deviation increment in support significantly decreasing the odds of SI at 12 months by 24%.

Individuals who were unemployed at baseline were more than twice as likely as employed participants to experience SI at follow-up. To further explore the contribution of social support to SI, an interaction for baseline availability of support and psychological distress was calculated to predict SI at 12 months. This interaction was non-significant ($p = .28$).

Insert Tables 2 and 3 near here

ROC analysis. The performance of the parsimonious regression model was evaluated by calculating the area under the curve (AUC) of the ROC. As shown in Figure 1, this analysis was initially conducted without the availability of support variable (i.e. baseline SI and psychological distress only); AUC = 0.85, 95% CI 0.79-0.91. Availability of support was then added to the model to determine the additional effect of this variable, AUC = 0.86, 95% CI 0.79-0.92; the difference between AUCs was not significant, $p = .56$.

Insert Figure 1 near here

Development of suicidal ideation. To explore factors associated with the development of SI in the 12-month period, significant longitudinal predictors were re-analysed with individuals with baseline SI excluded from the analysis. Sixty-one participants were therefore excluded, leaving 26 follow-up ideators and 1269 non-ideators. Due to their significance in the original model, psychological distress, availability of support and employment status were explored. Each one-standard deviation increment in psychological distress (K10) was associated with an increased odds of developing suicidal ideation by 12-month follow-up (OR = 1.8, 95% CI 1.3-2.4, $p < .001$). There was also a marginally significant effect of availability of support, with each one-standard deviation increment decreasing the odds of suicidal ideation developing (OR = 0.74, 95% CI 0.55-1.0, $p = .06$). The odds of developing SI did not differ for either unemployed ($p = .07$) or retired ($p = .42$) participants compared to employed individuals.

Resolution of suicidal ideation. The above regression analysis was repeated only on those individuals who expressed SI at baseline, to investigate factors associated with the resolution of suicidal thoughts. Sixty-one participants were therefore included in this regression, thirty of whom had resolved their SI by follow-up. Neither psychological distress ($p = .13$), availability of support ($p = .55$) or employment status ($p = .52$) contributed significantly to the resolution of SI.

Discussion

This study aimed to investigate the relationship between social support variables and patterns of SI over time in a rural sample in a longitudinal population-based study. Those with SI at baseline and 12-month follow-up differed from those without thoughts of suicide in each of the social integration and support variables explored, as hypothesised. Lower perceived availability of social support, less active engagement in the community, and a lower sense of belonging were all associated with thoughts of suicide, whereas higher distress about rural infrastructure and access to services was also related to SI. These findings support the hypothesis regarding the independent effect of social factors on the persistence of SI in this sample. Interestingly, the occurrence of SI did not vary by remoteness category, indicating that geographical factors alone may not be as relevant to suicidality; rather the associated social circumstances may contribute more significantly. Investigation of factors associated with the development of SI over this period (as compared with persistence of pre-existing SI) was undertaken. No significant effect of these social factors on SI at 12 months was detected once baseline levels of psychological distress were accounted for.

The cross-sectional findings of the present research also reveal a range of differential characteristics between individuals with and without recent SI. As supported by previous studies, those with SI were chiefly younger, unemployed, and indicated a lower financial

status [4,31]. SI was also associated with a higher level of psychological distress, alcohol use, and neuroticism, all of which have been reliably associated with suicidality in previous research [6,32,33]. The replication of previous findings, which have largely focused on urban samples, indicates that the contribution of demographic and psychological factors to SI translates across geographical regions.

Although the cross-sectional results are of interest, the greater value of this research lies in the longitudinal findings. Previous research indicates that the risk of a suicide plan or attempt is greatest in the 12 months following the onset of SI [17]. This indicates a limited timeframe in which to engage people in preventive services, and therefore the ability to predict future SI is considered particularly useful.

The hierarchical regression model revealed three significant baseline predictors of 12-month SI, suggesting that these factors may be ideal targets for early intervention strategies. The highly predictive value of previous SI supports existing evidence regarding the persistence of SI in some populations, rather than it being a transient experience [30,34]. This was also replicated in the univariate results, with approximately half of participants reporting SI at baseline continuing to do so at follow-up. Considering the increased risk for suicide attempts following the onset of SI [17], this finding emphasises the importance of effective clinical monitoring for persistent SI and early intervention in these individuals.

The majority of individuals who experience SI do so in conjunction with a psychological disorder [35], therefore effective detection of and responses to symptoms of mental disorder is a necessary component of any suicide prevention program [3]. Psychological distress was identified as being associated with the emergence of SI, emphasising the benefit of addressing psychological distress as a cornerstone of suicide prevention. Overcoming issues such as limited access to services and increased levels of

stigma may be pertinent to the success of such an approach in rural areas, as identified in other research [36,37].

Of the various types of social integration and support which were explored, only availability of social support was identified as a significant independent predictor of SI at follow-up. Higher availability of support at baseline decreased the odds of experiencing SI at 12 months, indicating that the presence of this facet of social support is an important protective factor. This concurs with existing research in rural settings that suggests associations between the quality of social support and mental health outcomes [38]. The non-significant interaction between availability of support and psychological distress suggests that social support is an important protective factor regardless of psychological wellbeing, and may therefore be a useful target for preventive strategies for all members of rural communities.

While rural areas are frequently conceptualised as having strong community ties and social networks, our findings suggest that social participation alone is insufficient to protect against thoughts of suicide. There was a tendency for the effects of high versus low social networks to reverse after adjusting for other social and psychological factors, although this did not reach significance (cf. Tables 2 and 3). Further exploration of the data revealed that participants with recent SI at 12 months were more likely to utilise particular supportive social networks (e.g., charities and related services, and “other” groups); thereby, reflecting a greater overall need for support networks (rather than an apparent negative impact of social networks on SI).

The importance of availability of interpersonal support was of particular relevance to the present study, persisting even when the largest risk factors for SI, such as psychological distress, alcohol use, and previous ideation, were accounted for. The perceived availability of social support was found to be a protective factor against the development of thoughts of

suicide, suggesting the potential benefit of introducing social components to rural suicide prevention programs.

Despite these findings, the ROC analysis revealed no increase in sensitivity or specificity when availability of support was included as a predictor variable alongside psychological distress and current SI. This indicates that the addition of measures of social support in clinical screening procedures may not necessarily improve the identification of individuals at risk of future SI, above accurate identification of distress. Therefore while social support factors may be useful in creating a population profile of rural suicidality, there are limitations to these findings and their direct clinical translation at this stage from this relatively small sample.

Several limitations of the present research should be taken into account. Firstly, the outcome measure used is a compound question, inquiring about thoughts of suicide but also of self-harm. Secondly, a large number of participants were excluded from analysis due to incomplete information, which biased the study population. Excluded participants rated significantly higher on both psychological distress and distress concerning infrastructure and services, and also rated lower on perceived financial status. International findings suggest an important contribution of socio-economic factors to suicide [39], therefore the under-representation of these individuals in our final sample may limit the generalisability of results. Interestingly, age and gender were not found to be significant predictors of SI in our sample, contrasting with existing research which places the highest suicide risk among young rural males [40]. Unfortunately, younger age groups were under-represented in our sample (see Kelly et al. [22] for a discussion), which restricted our ability to explore determinants within this high-risk group. These differences imply that our results may be biased towards the null, and if the population were represented more adequately, the effects described here may be somewhat greater. These limitations however are balanced by the advantages of a

longitudinal approach, which allows stronger inferences about causation to be made than the current cross-sectional studies.

Our results suggest that screening for current SI, psychological distress and availability of social support in clinical settings may be an effective means of identifying individuals at risk of future SI. In particular, the findings support the existing consensus that attention to screening for psychological distress and provision of effective clinical responses is a robust approach to suicide prevention [6]. Our results did not identify any factors contributing to the resolution of SI once thoughts of suicide have developed; therefore our findings are likely to apply to a preventive approach rather than treatment of individuals already at high risk. The limited sample used in this study may have restricted our ability to detect factors contributing to SI resolution; this may be more clearly assessed using methods such as path analysis in a larger sample of individuals with SI.

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Table 1 Participant characteristics, by suicidal ideation status at baseline

	Suicidal ideation n = 61	No suicidal ideation n = 1295	<i>p</i>
<i>Demographic characteristics</i>			
Age, mean (SD)	53.8 (11.8)	56.6 (13.5)	.11
Gender			
Female	30 (3.6%)	792 (96.4%)	.06
Male	31 (5.8%)	503 (94.2%)	
Marital status			
Currently married/de facto	42 (4.1%)	987 (95.9%)	.42
Previously married/de facto	14 (5.9%)	224 (94.1%)	
Never married	5 (5.6%)	84 (94.4%)	
Employment status			
Working	32 (3.8%)	817 (96.2%)	<.001
Unemployed/not working	22 (14.1%)	134 (85.9%)	
Retired	7 (2.0%)	344 (98.0%)	
Financial status			
Prosperous	1 (4.0%)	24 (96.0%)	<.001
Comfortable	25 (2.7%)	901 (97.3%)	
Just getting along	28 (7.5%)	347 (92.5%)	
Poor/very poor	7 (23.3%)	23 (76.7%)	
ASCG category			
Inner regional	24 (4.8%)	479 (95.2%)	.17
Outer regional	28 (5.4%)	492 (94.6%)	
Remote/very remote	9 (2.7%)	324 (97.3%)	
<i>Mental health and wellbeing</i>			
Psychological distress, mean (SD)	23.2 (7.9)	14.0 (4.3)	<.001
Alcohol use, mean (SD)	5.1 (6.4)	3.9 (4.0)	.03
Infrastructure & services distress, mean (SD)	19.5 (5.8)	14.8 (5.9)	<.001
<i>Social integration and support</i>			
Social networks			
High	5 (1.5%)	337 (98.5%)	<.001
Medium high	13 (3.1%)	409 (96.9%)	
Medium	31 (6.8%)	424 (93.2%)	
Low	12 (8.8%)	125 (91.2%)	
Availability of support, mean (SD)	4.1 (1.9)	5.4 (1.3)	<.001
Sense of community, mean (SD)	8.1 (2.8)	9.2 (2.3)	<.001
Neuroticism, mean (SD)	6.7 (2.9)	3.2 (2.8)	<.001

Table 2 Participant characteristics, by suicidal ideation status at 12-month follow-up

	Suicidal ideation n = 57	No suicidal ideation n = 1299	OR†	95% CI
<i>Demographic characteristics</i>				
Age, mean (SD)	54.4 (14.6)	56.6 (13.4)	0.86	0.66-1.1
Gender				
Female	33 (4.0%)	789 (96.0%)	.	
Male	24 (4.5%)	510 (95.5%)	1.1	0.66-1.9
Marital status				
Currently married/de facto	37 (3.6%)	992 (96.4%)	.	.
Previously married/de facto	13 (5.5%)	225 (94.5%)	1.6	0.81-3.0
Never married	7 (7.9%)	82 (92.1%)	2.3	0.99-5.3
Employment status				
Working	30 (3.5%)	819 (96.5%)	.	.
Unemployed/not working	19 (12.2%)	137 (87.8%)	3.8	2.1-6.9**
Retired	8 (2.3%)	343 (97.7%)	0.64	0.29-1.4
Financial status				
Prosperous	1 (4.0%)	24 (96%)	.	.
Comfortable	21 (2.3%)	905 (97.7%)	0.56	0.07-4.3
Just getting along	29 (7.7%)	346 (92.3%)	2.0	0.26-15
Poor/very poor	6 (20%)	24 (80%)	6.0	0.67-53
ASCG category				
Inner regional	19 (3.8%)	484 (96.2%)	.	.
Outer regional	29 (5.6%)	491 (94.4%)	1.5	0.83-2.7
Remote/very remote	9 (2.7%)	324 (97.3%)	0.71	0.32-1.6
<i>Mental health and wellbeing</i>				
Psychological distress, mean (SD)	22.1 (8.4)	14.1 (4.4)	2.5	2.0-3.0**
Alcohol use, mean (SD)	5.4 (6.2)	3.9 (4.0)	1.3	1.1-1.6**
Infrastructure & services distress, mean (SD)	18.1 (5.8)	14.9 (6.0)	1.6	1.3-2.1**
Baseline suicidal ideation				
No	26 (2.0%)	1269 (98.0%)	.	.
Yes	31 (50.8%)	30 (49.2%)	50.4	26.7-95.1***
<i>Social integration and support</i>				
Social networks				
High	9 (2.6%)	333 (97.4%)	.	.
Medium high	11 (2.6%)	411 (97.4%)	0.99	0.41-2.4
Medium	26 (5.7%)	429 (94.3%)	2.2	1.0-4.9*
Low	11 (8.0%)	126 (92.0%)	3.2	1.3-8.0*
Availability of support, mean (SD)	4.1 (1.8)	5.4 (1.3)	0.57	0.47-0.68**
Sense of community, mean (SD)	8.0 (2.9)	9.2 (2.3)	0.64	0.51-0.81**
Neuroticism, mean (SD)	6.4 (3.3)	3.2 (2.8)	2.6	2.0-3.3**

*** $p < .001$, ** $p < .01$, * $p < .05$

†For categorical variables, a blank cell indicates a reference category. For continuous variables, ORs and 95% CIs related to a 1-SD increase in each measure.

Table 3 Hierarchical logistic regression model predicting suicidal ideation at 12-month follow-up

		OR†	95% CI
Step 1	<i>Demographic characteristics</i>		
	Age	0.94	0.66-1.3
	Gender		
	Female	.	.
	Male	1.2	0.66-2.0
	Marital status		
	Currently married/de facto	.	.
	Previously married/de facto	1.4	0.68-2.7
	Never married	1.5	0.60-3.8
	Employment status		
	Working	.	.
	Unemployed/not working	2.7	1.4-5.2**
	Retired	0.63	0.25-1.6
	Financial status		
	Prosperous	.	.
	Comfortable	0.48	0.06-3.8
	Just getting along	1.5	0.19-11.6
	Poor/very poor	3.3	0.34-31.4
	ASCG category		
	Inner regional	.	.
	Outer regional	1.3	0.72-2.4
	Remote/very remote	0.66	0.29-1.5
Step 2	<i>Mental health and wellbeing</i>		
	Psychological distress	1.4	1.0-1.9*
	Alcohol use	1.2	0.89-1.6
	Infrastructure & services distress	0.72	0.48-1.1
	Baseline suicidal ideation		
	No	.	.
	Yes	19.0	8.6-42.3***
	<i>Social integration and support</i>		
	Social networks		
	High	.	.
	Medium high	0.53	0.19-1.5
	Medium	0.55	0.20-1.5
	Low	0.35	0.08-1.5
	Availability of support	0.76	0.58-1.0*
	Sense of community	0.84	0.61-1.2
	Neuroticism	1.4	0.97-2.2

*** $p < .001$, ** $p < .01$, * $p < .05$

†For categorical variables, a blank cell indicates a reference category. For continuous variables, ORs and 95% CIs related to a 1-SD increase in each measure.

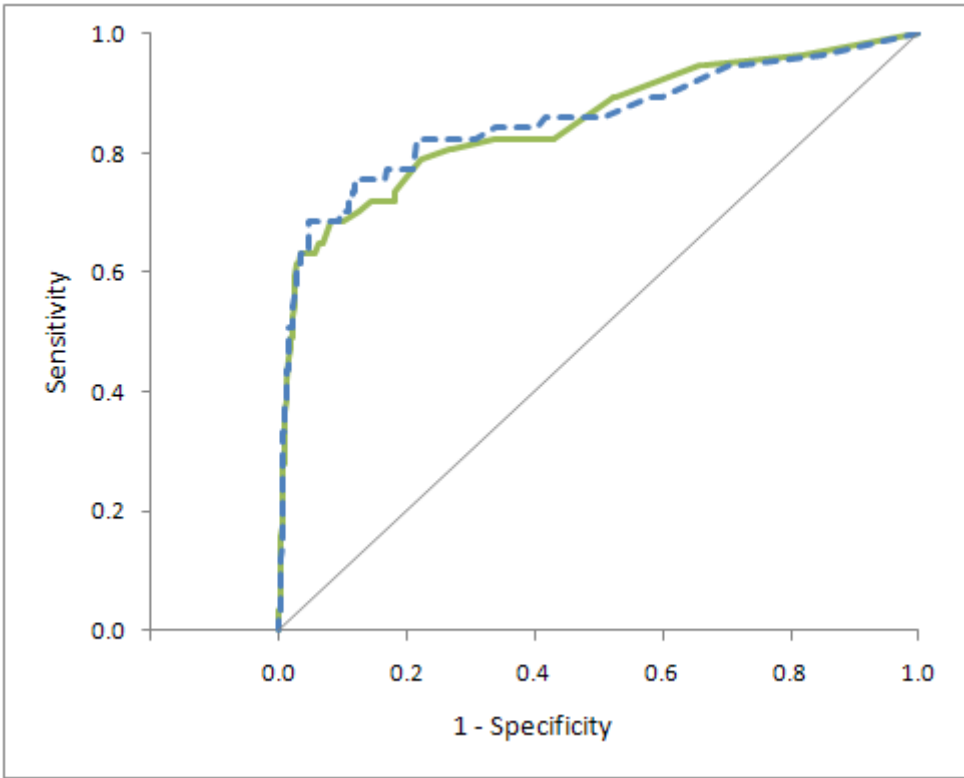


Fig 1 ROC curve showing baseline suicidal ideation and psychological distress, with (broken line) and without (solid line) availability of support, to predict suicidal ideation at 12-month follow-up