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## Evaluating suicide attitudes and suicide literacy in adolescents

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### ABSTRACT

**Background:** Two of the most common modifiable barriers to help-seeking for mental health problems during adolescence are stigma and poor mental health literacy. However, relatively little is known about stigma as it relates to suicide, and knowledge about suicidality in this age group.

**Aims:** To assess levels of suicide literacy and suicide attitudes in an adolescent sample, and to identify correlates of these constructs.

**Methods:** Data were drawn from the pre-intervention survey of the Sources of Strength Australia Project. A total of 1019 adolescents aged between 11 and 17 years participated. Suicide literacy and attitudes were measured alongside potential correlates including psychological distress, suicidal ideation, mastery, previous exposure to suicidal thinking and behaviour, and demographics.

**Results:** Participants more strongly endorsed attitudes attributing suicide to isolation/depression, compared to attitudes glorifying or stigmatising suicide. Gaps in knowledge about suicide included the risk factors, signs and symptoms. Key correlates of suicide attitudes and literacy included age, gender and cultural background.

**Conclusion:** Findings highlight the need for further education activities in schools and public awareness campaigns that address the gaps in suicide knowledge and attitudes. Such activities would assist in the identification of suicide risk among young people and improve help-seeking in this population.

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### Introduction

Suicide presents a growing health crisis among adolescents and is one of the leading causes of death in this age group globally (Glenn et al., 2020). In Australia, death by suicide represents 31% of all deaths in adolescents aged 15–17 years and 39% of all deaths in young adults aged 18–24 years (Australian Institute of Health and Welfare, 2021). Early identification and intervention for “at risk” adolescents are essential for effective suicide prevention (Torok et al., 2019). However, adolescents generally do not seek help, with less than one-third of “at risk” youth actively seeking help for suicidal behaviours (LeCloux et al., 2017).

Numerous psychosocial and systemic barriers to help-seeking have been reported by adolescents. These include insufficient knowledge of available services, family beliefs and support, long wait lists to access services, financial restrictions, confidentiality concerns, autonomy, and negative previous experiences (Aguirre Velasco et al., 2020; Radez et al., 2021). However, two of the most common barriers identified among young people, which are also modifiable, are mental health stigma and poor mental health

literacy or knowledge (Radez et al., 2021). Stigma refers to negative attitudes or beliefs towards an individual or group based on particular characteristics (Corrigan et al., 2012), while literacy encapsulates knowledge of a mental disorder or suicidality, such as signs and symptoms, risk factors and prevention and treatment approaches, that may facilitate identification and appropriate help-seeking (Calear et al., 2022; Jorm, 2000).

Research on mental health stigma and literacy in young people has tended to focus on depression, anxiety and psychosis (Mansfield et al., 2020), with higher mental health stigma associated with male gender, younger age, speaking a language other than English, having no personal or family history of mental illness (exposure), and lower levels of mastery and literacy (Arbanas, 2008; Calear et al., 2011, 2017; Dey et al., 2020; Jorm & Wright, 2008; Yap et al., 2014). Much less research has been conducted on the correlates of mental health literacy in adolescents, with male gender the only factor consistently reported as being associated with lower levels of literacy (Coles et al., 2016; Cotton et al., 2006; Mason et al., 2015).

Much of the quantitative research to date on suicide stigma and literacy has been conducted with adults, primarily utilising two validated scales: the Stigma of Suicide Scale (SOSS; Batterham et al., 2013b) and Literacy of Suicide Scale (LOSS; Calear et al., 2022). The SOSS assesses attitudes towards suicide and consists of three sub-scales assessing stigmatising attitudes, attribution of suicide to isolation/depression, and normalisation/glorification of suicide. The LOSS is a measure of suicide knowledge and assesses the full spectrum of characteristics involved in the mental health literacy framework (Jorm, 2000), including signs of suicide risk, cause or nature of suicide, risks factors, and treatment and prevention approaches.

Research in adults has tended to report a greater endorsement of the isolation/depression items of the SOSS compared with the stigma and normalisation/glorification items. The items of the LOSS related to risk factors and signs of suicide tend to be more difficult than items related to treatment and prevention (Batterham et al., 2013a, 2013b; Calear et al., 2022; Ludwig et al., 2021). A recent review of studies using the LOSS (Calear et al., 2022) found that the median proportion of LOSS items answered correctly across studies was 63% (range = 36.9–84.2%) and lower levels of education, English as a second language, higher suicide stigma and lower attribution of suicide to isolation/depression were consistently identified as correlates of lower suicide literacy. Unlike the broader mental health literacy literature, the effects of age and gender on suicide literacy were found to be mixed (Calear et al., 2022). Previous research using the SOSS has also identified several correlates of the different attitudes toward suicide. Higher levels of suicide stigma have been associated with younger age, male gender, cultural minority background, lower literacy, and the absence of previous mental illness, suicidal ideation, suicide attempt, and exposure to suicide attempt (Batterham et al., 2013a, 2013b, 2019; Fong et al., 2022; Williams et al., 2018). Correlates of the glorification of suicide have included male gender, history of mental illness and higher levels of psychological distress, suicidal ideation and suicide attempts (Batterham et al., 2019; Fong et al., 2022; Williams et al., 2018). Greater attribution of suicide to isolation/depression has been associated with female gender, older age, and higher levels of literacy, psychological distress, suicidal ideation and suicide attempts (Batterham et al., 2013a; Fong et al., 2022; Williams et al., 2018).

While no research on suicide stigma and literacy in adolescents has been conducted, understanding these constructs in adolescents is important as it may assist in the development of targeted public awareness campaigns to improve literacy, reduce stigma, and thus increase help-seeking for suicide in adolescents. The aim of the current study, therefore, is to assess levels of suicide literacy and suicide attitudes in an adolescent sample and to identify correlates of these constructs. Understanding these associations may assist in better targeting future help-seeking interventions and better characterising the roles of stigma reduction and literacy promotion in promoting appropriate help seeking. The correlates of suicide stigma and literacy assessed in the current study were selected based on their previously reported

association with mental health literacy and stigma in adult and youth populations.

## Methods

### Participants

A total of 1019 adolescents (58.7% female, 40.4% male, 0.9% other) aged between 11 and 17 years ( $M = 13.37$ ,  $SD = 1.27$ ) participated in the current study as part of the Sources of Strength Australia Project (Calear et al., 2016). The Sources of Strength Australia Project was a randomised controlled trial (ACTRN12616000048482) designed to evaluate the effectiveness of the Sources of Strength suicide prevention program in increasing help-seeking intentions in adolescents. Thirteen schools located in rural and metropolitan areas of Australia participated in the trial, with a universal sample of students recruited from years 7 to 11. Responses from the pre-intervention survey were used in the current study. The majority of participants (89.7%) reported speaking only English at home. Just under a third of participants (31.8%) reported experiencing suicidal thoughts in the past month, while 34.1% reported having a friend that had shared thoughts of suicide with them and 21.5% knew of a friend who had made a suicide attempt.

### Measures

#### Suicide attitudes

The 16-item Stigma of Suicide Scale-Short Form (SOSS-SF; Batterham et al., 2013b) was used to assess attitudes toward people who die by suicide. Each item on the SOSS-SF consists of a one- or two-word descriptor that may be applied to a person who dies by suicide. Participants rate how much they agree with each item on a five-point Likert scale ranging from “Strongly Disagree” (1) to “Strongly Agree” (5). The SOSS-SF has a three-factor structure that form individual sub-scales assessing stigma (eight items, e.g. irresponsible, cowardly), attribution of suicide to isolation/depression (four items, e.g. lonely, isolated), and normalisation/glorification of suicide (four items, e.g. strong, brave). The total sub-scale scores are calculated as the mean of the subscale items, with total scores on each sub-scale ranging from 1 to 5. Higher scores are indicative of higher levels of stigma, attribution of suicide to isolation/depression and glorification/normalisation of suicide. The internal consistency of the sub-scales was very good in the current study (stigma:  $\alpha = 0.87$ ; isolation/depression:  $\alpha = 0.90$ ; glorification/normalisation:  $\alpha = 0.81$ ).

#### Suicide literacy

The 12-item Literacy of Suicide Scale-Short Form (LOSS-SF; Calear et al., 2022) was used in the current study to assess suicide literacy. Each of the items on the LOSS-SF is responded to on a three-point scale (“True”, “False”, or “I don’t know”), with correct responses assigned a score of 1 and incorrect or “I don’t know” responses allocated a score of 0. Total scale

scores can range from 0 to 12 and are calculated by summing the number of correct responses. Higher LOSS-SF scores are indicative of higher suicide literacy.

### Correlates

Current psychological distress and suicidal ideation were assessed with the Distress Questionnaire-5 (DQ5; Batterham et al., 2016) and Suicidal Ideation Attributes Scale (SIDAS; van Spijker et al., 2014) respectively. The Pearlin Mastery Scale (Pearlin & Schooler, 1978) was used to measure mastery (confidence to exert control over one's behaviour and social environment to achieve a goal), while previous exposure to suicidal thinking and behaviour was assessed by two single yes/no items asking if a friend had shared thoughts of taking their own life (exposure suicide thinking) or if a friend had tried to take their own life (exposure suicide attempt; Callear et al., 2016).

### Demographics

Participant age, gender (male, female, other gender) and language spoken at home (English language only vs. other) as an indicator of cultural minority background were also measured.

### Procedure

Informed consent was obtained from all participating students and their parent/guardian prior to the commencement of the trial. All participants in the trial self-completed a pre-intervention survey that took approximately 30 minutes to complete. Any student identified from survey responses as being at-risk (i.e. reporting suicidal ideation or high levels of distress) was followed-up by their school psychologist. The study received ethical approval from the Human Research Ethics Committee at the Australian National University (protocol number 2015/199), as well as from the education departments responsible for the schools involved in the study.

### Statistical analysis

Participant responses to the SOSS and LOSS were tabulated. Participant characteristics were also tabulated and differences in suicide attitudes and suicide literacy across various subgroups (e.g. age, gender) were assessed using one-way ANOVA. Finally, four separate multivariate linear regression models were used to identify potential correlates of suicide attitudes and suicide literacy. All assumptions of linear regression were assessed prior to analysis, with no violations identified. All statistical analyses were conducted using SPSS version 26 (IBM Corp., Chicago, IL, USA).

## Results

### Suicide attitudes and suicide literacy

Table 1 presents participant responses to the SOSS items. Participants tended to endorse the isolation/depression items

**Table 1.** Responses from the Stigma of Suicide Scale ( $n = 1019$ ).

Item	Agree/strongly agree (%)	Mean (SD) rating
Stigma sub-scale items		
Stupid	24.1	2.63 (1.25)
Irresponsible	22.7	2.74 (1.10)
Cowardly	20.4	2.60 (1.12)
Shallow	14.0	2.43 (1.09)
Pathetic	13.4	2.33 (1.13)
An embarrassment	13.1	2.24 (1.08)
Immoral	11.9	2.58 (0.99)
Vengeful	8.1	2.45 (0.99)
Isolation/depression sub-scale items		
Lost	72.7	3.83 (1.10)
Lonely	69.8	3.78 (1.12)
Isolated	63.8	3.61 (1.16)
Disconnected	56.6	3.45 (1.14)
Glorification/normalisation sub-scale items		
Strong	18.5	2.55 (1.13)
Brave	18.4	2.44 (1.13)
Dedicated	16.8	2.52 (1.08)
Noble	9.4	2.39 (1.00)

**Table 2.** Correct responses to the Literacy of Suicide Scale items ( $n = 1019$ ).

Item	Percentage correct (%)	Domain
People who have thoughts about suicide should not tell others about it (F)	79.7	Treatment/prevention
Seeing a psychiatrist or psychologist can help prevent someone from suicide (T)	74.5	Treatment/prevention
Not all people who attempt suicide plan their attempt in advance (T)	54.9	Sign/symptom
Most people who suicide are psychotic (F)	57.1	Risk factor
A suicidal person will always be suicidal and entertain thoughts of suicide (F)	49.3	Cause/nature
Very few people have thoughts about suicide (F)	46.6	Cause/nature
Talking about suicide always increases the risk of suicide (F)	45.7	Cause/nature
If assessed by a psychiatrist, everyone who kills themselves would be diagnosed as depressed (F)	35.6	Cause/nature
People who want to attempt suicide can change their mind quickly (T)	35.1	Sign/symptom
People who talk about suicide rarely kill themselves (F)	27.2	Sign/symptom
There is a strong relationship between alcoholism and suicide (T)	26.4	Risk factor
Men are more likely to die by suicide than women (T)	16.0	Risk factor

more strongly than the stigma and glorification/normalisation items. The most strongly endorsed items were that people who die by suicide are lost (72.7%) and lonely (69.8%) and the least endorsed items were that people who die by suicide are vengeful (8.1%) and noble (9.4%). While endorsement of the stigmatising and glorification/normalisation items was generally low, close to one-fifth of participants agreed that people who died by suicide were stupid (24.1%), irresponsible (22.7%), cowardly (20.4%), strong (18.5%), or brave (18.4%).

The mean total LOSS score for the current sample was 5.48 items correct out of 12 (46%;  $SD = 2.49$ ; range = 0–12). Table 2 presents the percentage of participants that responded correctly to each of the LOSS items. Participants tended to

**Table 3.** Descriptive statistics for the survey sample and one-way ANOVAs assessing relationships with LOSS and SOSS scores ( $n = 1019$ ).

	<i>n</i>	(%)	LOSS-literacy		SOSS-stigma		SOSS-isolation		SOSS-glorification	
			Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Complete sample	1019	100.0%	5.48	(2.49)	2.50	(0.80)	3.67	(0.99)	2.47	(0.87)
Age (years)										
11	10	0.9	5.40	(2.22)***	2.49	(0.78)***	3.30	(1.39)	2.87	(0.77)*
12	289	28.4	5.05	(2.36)	2.66	(0.82)	3.60	(1.02)	2.48	(0.86)
13	309	30.3	5.02	(2.53)	2.48	(0.77)	3.64	(1.06)	2.49	(0.93)
14	228	22.4	5.81	(2.40)	2.48	(0.76)	3.72	(0.86)	2.51	(0.77)
15	107	10.5	6.29	(2.39)	2.36	(0.86)	3.71	(1.01)	2.50	(0.93)
16	58	5.7	6.89	(2.31)	2.29	(0.67)	3.89	(0.83)	2.24	(0.73)
17	18	1.8	6.83	(2.71)	1.70	(0.69)	3.94	(0.76)	1.93	(0.78)
Gender										
Male	412	40.4	5.24	(2.57)*	2.70	(0.80)***	3.55	(1.09)**	2.46	(0.90)
Female	598	58.7	5.64	(2.41)	2.36	(0.77)	3.75	(0.91)	2.47	(0.84)
Other	9	0.9	6.00	(3.61)	2.56	(1.06)	3.78	(0.65)	3.14	(0.52)
Language										
Only English at home	914	89.7	5.59	(2.48)***	2.47	(0.79)**	3.69	(0.99)*	2.47	(0.86)
Non-English lang. at home	105	10.3	4.55	(2.43)	2.72	(0.82)	3.49	(0.99)	2.49	(0.93)
Exposure suicide thinking										
Yes	347	34.1	5.90	(2.43)***	2.40	(0.81)**	3.72	(0.93)	2.58	(0.88)**
No	672	65.9	5.27	(2.56)	2.55	(0.79)	3.64	(1.02)	2.42	(0.85)
Exposure suicide attempt										
Yes	219	21.5	6.02	(2.46)***	2.33	(0.81)***	3.65	(0.93)	2.54	(0.87)
No	800	78.5	5.33	(2.48)	2.54	(0.79)	3.67	(1.01)	2.45	(0.86)
Suicidal ideation, past month										
Yes	324	31.8	5.88	(2.47)**	2.43	(0.80)	3.83	(0.81)***	2.57	(0.85)*
No	695	68.2	5.30	(2.49)	2.53	(0.80)	3.59	(1.06)	2.43	(0.87)

LOSS: Literacy of Suicide Scale; SOSS: Stigma of Suicide Scale; lang.: language.  
\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

have the most difficulty getting the risk factor and sign/symptom items correct and the least difficulty getting the items related to treatment and prevention correct.

### Correlates of suicide attitudes and suicide literacy

Table 3 presents univariate associations between the LOSS, SOSS subscales and participant characteristics. Younger age was associated with lower levels of suicide literacy, higher levels of suicide stigma and higher glorification/normalisation of suicide. Males and people who spoke languages other than English at home had lower suicide literacy, higher suicide stigma and were less likely to attribute suicide to isolation/depression. Exposure to suicidal thinking or suicide attempts was associated with higher levels of literacy and lower levels of stigma. Exposure to suicidal thinking was also related to greater glorification/normalisation of suicide. Similarly, higher suicidal ideation in the past month was associated with higher suicide literacy, higher glorification/normalisation of suicide and higher attribution of suicide to isolation/depression.

The correlates of suicide attitudes and suicide literacy were then explored through four separate multivariate linear regression models, which are presented in Table 4. The model for suicide literacy was significant,  $F(12, 1006) = 14.61$ ,  $p < .001$ , and explained 13.8% of the variance in suicide literacy. Higher suicide literacy was associated with older age, speaking only English at home, higher levels of psychological distress, higher levels of mastery, lower levels of suicide stigma, and higher attribution of suicide to isolation/depression. In contrast to the univariate associations, gender, exposure to suicide and suicidal ideation were not significantly associated with suicide literacy after accounting for other characteristics including attitudes.

The model for suicide stigma was also significant,  $F(12, 1006) = 29.69$ ,  $p < .001$ , and explained 25.3% of the variance in suicide stigma. Higher suicide stigma was associated with younger age, male gender, speaking a language other than English at home, lower levels of suicide literacy, higher attribution of suicide to isolation/depression and higher glorification/normalisation of suicide.

The model assessing the correlates associated with the attribution of suicide to isolation/depression was significant,  $F(12, 1006) = 24.57$ ,  $p < .001$ . This model explained 21.7% of the variance and found higher attributions of suicide to isolation/depression to be associated with female gender, speaking only English at home, no previous exposure to a suicide attempt in friends, higher levels of psychological distress, higher levels of suicidal ideation in the past month, higher levels of suicide literacy, higher levels of suicide stigma, and lower levels of suicide glorification/normalisation.

The final model for suicide glorification/normalisation was significant,  $F(12, 1006) = 11.08$ ,  $p < .001$ , and explained 10.6% of the variance. Higher suicide glorification/normalisation was associated with identifying with a gender other than male or female, higher levels of suicidal ideation in the past month, lower levels of mastery, higher levels of stigma, and lower attribution of suicide to isolation/depression. As with the literacy model, suicide exposure was only significant in the univariate comparisons, although exposure to suicide attempt was significantly associated with SOSS-isolation.

### Discussion

Similarly to previous research in adults (Batterham et al., 2013a, 2013b; Calear et al., 2022; Ludwig et al., 2021), adolescents in the current study tended to more strongly endorse attitudes that attributed suicide to isolation/depression, than



**Table 4.** Multivariate linear regression models of LOSS and SOSS scores ( $n = 1019$ ).

	LOSS-literacy		SOSS-stigma		SOSS-isolation		SOSS-glorification	
	Estimate	$p$	Estimate	$p$	Estimate	$p$	Estimate	$p$
(Constant)	-0.948	0.390	21.275	<.001	4.733	.005	12.486	<.001
Age	0.297	<b>&lt;.001</b>	-0.400	<b>.005</b>	0.136	.136	-0.114	.183
Gender								
Male (reference)								
Female	-0.270	.091	-2.406	<b>&lt;.001</b>	0.998	<b>&lt;.001</b>	0.373	.100
Other	0.350	.657	-1.784	.344	1.330	.266	2.486	<b>.026</b>
English language only	0.716	<b>.003</b>	-1.677	<b>.004</b>	0.971	<b>.008</b>	0.378	.271
Exposure suicide thinking	0.313	.107	-0.439	.345	0.321	.276	0.479	.082
Exposure suicide attempt	0.233	.288	-0.145	.782	-0.743	<b>.025</b>	-0.311	.317
DQ5 psychological distress	0.056	<b>.007</b>	-0.079	.110	0.117	<b>&lt;.001</b>	0.033	.257
Suicidal ideation, past month	-0.003	.758	-0.039	.119	0.034	<b>.032</b>	0.034	<b>.022</b>
Mastery	0.071	<b>.005</b>	-0.085	.158	0.059	.120	-0.076	<b>.033</b>
LOSS-literacy			-0.534	<b>&lt;.001</b>	0.260	<b>&lt;.001</b>	-0.011	.802
SOSS-stigma	-0.094	<b>&lt;.001</b>			0.254	<b>&lt;.001</b>	0.129	<b>&lt;.001</b>
SOSS-isolation	0.113	<b>&lt;.001</b>	0.632	<b>&lt;.001</b>			-0.222	<b>&lt;.001</b>
SOSS-glorification	-0.006	.802	0.367	<b>&lt;.001</b>	-0.254	<b>&lt;.001</b>		

LOSS: Literacy of Suicide Scale; SOSS: Stigma of Suicide Scale.

Bold values indicate  $p < .05$ .

attitudes stigmatising or glorifying suicide, and exhibited most difficulty with the literacy items related to risk factors and the signs/symptoms of suicide. While the endorsement of the stigmatising and glorification/normalisation items was generally low, it is concerning that up to one-fifth of participants agreed or strongly agreed that people who die by suicide are stupid, irresponsible, cowardly, strong, or brave, as such attitudes may reduce help-seeking behaviour (Calear et al., 2014). Although research is yet to examine how suicide stigma and literacy influences peer support among adolescents, previous research on mental health literacy interventions suggests that people with low literacy and high stigma may be less confident in providing support to a peer who is struggling (Morgan et al., 2018). In general, the endorsement of the stigmatising items in the current sample was higher, and the endorsement of the isolation/depression items was lower, than in previous adult samples (Batterham et al., 2013a). This may reflect an effect of age, lower literacy levels, or more limited exposure to suicide resulting in more negative attitudes and a reduced awareness that suicide may be driven by isolation and disconnection. Taken together, these findings suggest that more needs to be done to shift these perceptions in young people and that there is a need for careful messaging, particularly around the association between loneliness and suicide, to ensure awareness of the risk of suicide in self and others.

On average, participants in the current study only responded to 46% of the suicide literacy items correctly, which is substantially lower than the median rate of 63% correct reported in a recent review of studies that had used the LOSS to assess suicide literacy in adult samples (Calear et al., 2022). While not surprising, this finding highlights the limited suicide knowledge of young people and likely reflects their constrained education on the topic through school and personal experiences. Schools and society have tended to evade open discussion of suicide with young people (Fitzpatrick & Kerridge, 2013). While conversations and messaging around suicide can be challenging and complex, they can occur safely. Avoidance of suicide prevention programs in schools may alienate young people experiencing

suicidal thoughts, as they may be less likely to understand what they are experiencing, or how to access support for themselves or their peers (Lindow et al., 2020; Pisani et al., 2012). This is reflected in the findings of the current study in which less than 50% of participants knew that talking about suicide does not increase the risk of suicide, only 27% of participants knew that people who talk about suicide are still at-risk of death by suicide and fewer than 20% of participants knew that men are more likely to die by suicide than women. Misconceptions about suicide may be driven by popular culture depictions of greater self-harm and suicidal behaviour in females than males and suicide being taboo, which could affect young people's perceived risk or seriousness of suicide in themselves and their peers (particularly among males), along with reluctance to speak with others about suicide concerns. Given the low rates of suicide literacy in young people, there is likely to be value in investing in evidence-based school-based education programs and public health messaging that target key gaps in knowledge to increase awareness and help-seeking (Aguirre Velasco et al., 2020; Calear et al., 2021).

In accordance with previous research, male gender was associated with higher levels of suicide stigma and a lower attribution of suicide to isolation or depression (Batterham et al., 2013a, 2013b, 2019; Calear et al., 2011, 2017; Dey et al., 2020; Fong et al., 2022; Jorm & Wright, 2008; Williams et al., 2018; Yap et al., 2014). This finding likely reflects the lower levels of literacy exhibited by males in the univariate analyses, leading to more negative attitudes and a reduced awareness of the drivers of suicide. Participants reporting a gender other than male or female also reported higher levels of suicide glorification or normalisation. This association is concerning in that it may reflect a level of acceptance of suicide among gender diverse young people, possibly in response to the difficulties and discrimination they observe or experience. More research, such as qualitative interviews with gender diverse young people, is needed to better understand this finding, particularly as gender diverse young people are considered an at-risk population for suicide (Surace et al., 2021).

Suicide literacy was higher among older adolescents in the current study. Previous research in adult populations has found mixed effects for age, with some studies finding no association and others reporting higher suicide literacy in younger adults, compared to older adults (Calear et al., 2022). This suggests that literacy levels may increase through adolescence and early adulthood, reflecting developmental effects, and the influence of education and increasing exposure to suicide with age. While lower literacy levels in middle aged and older adults may reflect cohort effects, such as less frequent discussion of suicide in past decades.

Other concordant findings with previous research included higher levels of suicide stigma being associated with younger age (Batterham et al., 2013a; Calear et al., 2011; Jorm & Wright, 2008; Yap et al., 2014) and speaking a language other than English being associated with lower suicide literacy, higher suicide stigma and lower attribution of suicide to isolation/depression (Batterham et al., 2013a, 2013b; Calear et al., 2011, 2017, 2022). The former finding likely reflects an effect of education and increasing exposure to suicide with age, while the latter may also reflect an effect of education or differences in cultural attitudes or norms toward suicide (Money & Batterham, 2021). Given that suicidal ideation is not uncommon among younger adolescents, there is a need to reduce suicide stigma in this age group (Wasserman et al., 2021), as well as improve knowledge and attitudes in culturally and linguistically diverse communities that often have elevated rates of suicide (Bowden et al., 2020).

Participants reporting suicidal ideation in the past month were more likely to attribute suicide to isolation and depression, which may reflect personal experience and an acknowledgement of the factors underlying their own ideation. Concerningly, levels of suicide glorification and normalisation were also higher in these participants, as had been previously reported in adult populations (Batterham et al., 2013a, 2019; Fong et al., 2022). This suggests that there is a need to counter these beliefs, and that messages to promote hope and help-seeking may be important to reduce suicide risk in this population. There would also be value in identifying the drivers of these attitudes in this population to better understand their development and maintenance. Interestingly, current suicidal ideation was not associated with increased literacy, but psychological distress was. Similarly, psychological distress was independently associated with a higher attribution of suicide to isolation or depression (Fong et al., 2022).

Exposure to suicidal thinking in a friend was not associated with any of the multivariate outcome analyses, however in the bivariate analyses, it was associated with higher suicide literacy, lower suicide stigma and higher glorification or normalisation of suicide. The association between exposure and suicide stigma is not unexpected given substantial previous research demonstrating the positive effects social contact with a person with mental illness can have on attitudes (Corrigan et al., 2012). Interestingly, exposure to suicide attempt in a friend was associated with lower attribution of suicide to isolation/depression, while exposure to suicide attempt was bivariate associated with lower suicide stigma.

These findings may reflect differential impacts of social contact on attitudes or could be an indication that other precipitants of suicide, such as a relationship break-up or school pressures, may be more salient drivers of suicide to young people than feelings of isolation or depression. Nevertheless, after accounting for other factors such as distress, stigma and literacy, the effects of exposure became non-significant, which in conjunction with previous research suggests that exposure to suicidality may be a less salient determinant of suicide attitudes in adolescents than adults (Batterham et al., 2013a, 2019).

Similarly to previous research, suicide literacy, suicide stigma, attribution of suicide to isolation/depression, and normalisation/glorification of suicide were differentially associated with each other, with the most consistent relationships between high suicide literacy and low suicide stigma, and high suicide literacy and high attribution of suicide to isolation/depression (Arbanas, 2008; Batterham et al., 2013a; Calear et al., 2017, 2022; Jorm & Wright, 2008; Williams et al., 2018). Higher levels of mastery were also associated with higher levels of suicide literacy and lower levels of suicide glorification/normalisation. The reason for these associations is less clear but may reflect a tendency to view things as changeable and within an individual's capacity to control. Further research in this area would be beneficial.

While there are many strengths associated with the current study, including being the first to comprehensively assess suicide literacy and suicide attitudes and their associated correlates in a large adolescent sample, there are also some limitations that need to be considered. All measures in the current study were self-report and thus participant responses may have been influenced by social desirability and other reporting biases. For instance, rates of suicidal ideation were high in the current study. This may reflect the overreporting of suicidal thoughts, with fleeting, occasional thoughts of suicide reported in addition to frequent or impairing suicidal ideation. There would also be value in further exploring the role of contextual factors, particularly cultural and linguistic diversity, in future research. The cross-sectional nature of the present study is also a potential limitation in that the temporal relationship between variables cannot be established. Future longitudinal research would help to further elucidate the observed associations and their development and maintenance from childhood into adolescence and beyond. Although not insignificant, the proportion of variance explained by each of the regression models was small, suggesting that other factors may also be associated with suicide literacy and suicide attitudes. As such, other variables should be explored in future studies, such as exposure to suicide in family members, exposure to suicide through popular culture and the media, cultural, parental and peer attitudes and norms toward suicide. Furthermore, an important next step is to test the impact of suicide prevention awareness programs on suicide literacy, attitudes, and help-seeking in adolescents.

It is clear from the findings of the current study that there is a real need for further education activities in schools and public awareness campaigns that address the gaps in

suicide knowledge and attitudes that may be hindering the identification of suicide risk among young people and delaying help-seeking in this population. Based on the identified correlates of suicide literacy and suicide stigma, there is a particular requirement for interventions targeted at younger adolescents, males, and those adolescents who are from culturally diverse backgrounds or who have had limited exposure to suicide through personal experience or contact. Suicide prevention awareness programs for secondary school students should carefully consider the need for culturally relevant materials and ensure that they are engaging for both male and female students. Furthermore, the findings highlight a need to better understand the development and maintenance of attitudes that normalise or glorify suicide. This is driven by the finding that such attitudes were higher among already at-risk populations, being gender diverse young people and those with elevated levels of suicide ideation.

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## Data availability statement

The data that support the findings of this study is available on request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions.

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