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Locus of control as an indicator of risk for suicidal behaviour among adolescents

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Using a sample of high school students, this pilot study investigated the relationship between locus of control and a range of suicidal behaviours, the proportion of high school students in an Australian sample who report having engaged in such behaviours and the proportion of suicide attempters who received medical attention following an attempt. Two hundred male and 205 female students aged between 13 and 19 years (mean = 15, SD = 1), attending one randomly chosen metropolitan state high school, completed a questionnaire that included demographic details, the Nowicki-Strickland Locus of Control Scale for Children and questions concerning suicide. The findings indicated that a substantial proportion of individuals in the sample have suicidal ideation. A smaller proportion have engaged in a range of more serious and overt self-destructive and suicidal behaviours. Further, a majority of attempters in the sample had not received medical attention following their attempt. There was also a clear association between locus of control and suicidal behaviour, with the individuals who had engaged in suicidal behaviours characterized by a more external locus of control orientation. This study adds further weight of evidence to the suggestion that the locus of control construct is useful in identifying adolescents at risk of engaging in suicidal behaviour.

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Suicidal behaviour among young people is of increasing concern to society. Although completed suicide amongst adolescents is still relatively uncommon, with estimates of between 9 and 12 completed suicides per 100,000 people (1, 2), the suicide rate amongst young people aged 15 to 19 years has more than tripled in the last 30 years (2). More disturbing is the fact that suicide thoughts, attempts and other self-destructive behaviour occur far more frequently, with estimates of the ratio of adolescent attempts to each death varying between 50:1 and 120:1 (3, 4). Such estimates are often derived from special samples (typically, the adolescents who are hospitalized as a result of a suicide attempt); yet the majority of adolescent attempters may not seek medical attention following an attempt (2). Hence, epidemiological studies may, in fact, be underestimating the true incidence of suicidal behaviour among adolescents. Further, the literature on school population surveys, although sparse, suggests that attempters make up approximately 11% of high school students (5), whereas suicidal ideation is much more common (2, 6, 7).

The locus of control (LOC) construct refers to the extent to which individuals perceive reinforcement to be contingent upon their own actions (8). Those typifying an external locus of control orientation perceive reinforcement (or an effect) following an action of their own as not being entirely contingent upon that action. Rather, they attribute the reinforcement (or effect) to some factor outside of their own control, such as luck, chance, fate or powerful others; and they often feel relatively unable to influence their environment. Conversely, individuals typifying an internal locus of control orientation perceive that reinforcement (or an effect) is contingent on their own actions or attributes, and hence, is to some degree under their control.

Goldney (9) suggests that this construct is valuable in the assessment of suicidal individuals, as clinical reports have identified analogous characteristics. He suggests the oft-quoted "cry for help" is a clear reference to the need for external intervention from significant others, and hence, an external LOC orientation. Indeed, in his study of young women who had attempted suicide (9), Goldney found they

scored more externally than a non-suicidal control group on the Adult Nowicki-Strickland Internal-External Locus of Control scale. He also found that LOC scores varied according to lethality, with high lethality attempters scoring more internally than low-lethality attempters.

A number of other studies have identified a relationship between locus of control and suicidal behaviour among adolescents and young adults (10-14). For example, Goldney et al. (11, 12), in their 8-year longitudinal study of suicidal ideation among high school students as they moved into young adulthood, found that locus of control scores were associated with suicidal ideation over time and suggest that suicidal ideation is not simply a transient phenomenon but is associated with more pervasive psychological attributes (12). Further, Topol & Reznikoff (10) found that hospitalized suicidal adolescents scored more externally than hospitalized non-suicidal teenagers and non-hospitalized controls. They also suggest that the locus of control construct may be useful in identifying potentially suicidal adolescents.

Nevertheless, these studies used special samples (for example, hospitalized suicidal adolescents and young adults). Furthermore, the range of suicidal behaviour was commonly restricted to suicide ideation and attempts. Therefore, this pilot study was undertaken to investigate the relationship between locus of control and the full range of suicidal behaviour in a normal population of adolescents. Further, given the relative lack of published data on suicidal behaviour among Australian high school students, this study aimed to gain an estimate of the incidence of various suicidal behaviours in such a population, and determine how great a proportion of the suicide attempters received medical attention.

Material and methods

Subjects

The sample consisted of 200 male and 205 female students aged between 13 and 19 years (mean = 15, SD = 1) attending one randomly chosen government-owned state high school located in the southern half of the state of South Australia (total population approximately 1.5 million). It serves a defined area population in southern metropolitan Adelaide with predominantly lower middle-class residents. After permission was received from the school to conduct a study of issues concerning psychological health and well-being in adolescents, the sample was recruited from among students enrolled in years 9 (n = 134, mean age = 14 years), 10 (n = 164, mean age = 15 years) and 11 (n = 110, mean age = 16 years) who were at school on the day of data collection.

Instruments

The Locus of Control construct was measured using the Nowicki-Strickland Locus of Control Scale for Children (15). This paper-and-pencil instrument consists of 40 items, each requiring a yes or no response, and increasing scores signify an increasingly external locus of control orientation. This measure of the LOC construct has been extensively used; and its authors report satisfactory internal consistency, test-retest reliability, and construct validity across samples of children and adolescents, as well as a lack of relationship with social desirability (15).

Suicidal behaviours were measured using an abbreviated form of the questionnaire used by Smith & Crawford (2). Subjects were asked to respond yes or no to questions regarding suicidal ideation ("I think about killing myself"), suicide planning ("I have made specific plans to suicide without carrying them out"), deliberate self-harm ("I deliberately try to hurt myself"), and suicide attempts ("In the past I have made one or several suicide attempt(s)"). Subjects were also asked whether they had been taken to hospital or needed medical help following a suicide attempt.

Finally, a range of demographic details were collected, including age, gender and year level. Questions regarding this information, along with the measures of suicidal behaviours and locus of control, were arranged in a single questionnaire booklet.

Procedure

Two weeks prior to data collection, a letter was sent home to parents in a weekly school newsletter explaining the study and seeking written permission for their children to be surveyed. To assist parents in making this decision, copies of the questionnaire were made available for inspection at the school office.

All students present on the day of data collection were given both written and verbal explanations of the study, and the questionnaires were distributed for completion during one normal class period. Subjects were assured of the confidentiality of their responses, and asked not to write their names on any part of the booklet. Furthermore, given the sensitive nature of some sections of the questionnaire, included on the inside cover of the booklet was an invitation to contact one of several community service organizations should they feel the need (for instance, if the questionnaire had caused some distress). The names and telephone numbers of these organizations were listed, and subjects were asked to tear off this page for their own reference. Moreover, subjects were asked to complete all questions as best they could and were assured that there were

no right or wrong answers. Upon completion of the questionnaire, subjects were thanked for their participation and placed their questionnaire into a sealed collection box to ensure confidentiality of their responses.

Analysis of the obtained data involved the use of chi-square, *t*-test, and analysis of variance. An alpha-level of 0.01 was chosen for statistical significance in view of the multiple inferential statistical analyses and the elevated probability of a Type I error.

Results

For the total sample, 24% ($n = 96$) reported suicidal ideation; 11% ($n = 45$) reported having planned a suicide attempt without carrying it out; 9% ($n = 34$) reported deliberate self-harm; 6% ($n = 23$) reported having made one suicide attempt; 2% ($n = 9$) reported having made several suicide attempts; and only 30% ($n = 7$) of the attempters reported having been taken to hospital or needing medical help following a suicide attempt. Chi-square analyses indicated no statistically significant gender effects in reported incidences of suicidal behaviours in the sample.

There were no appreciable deviations from normality in LOC scores in either the sample or the gender and year-level sub-populations. Year level was used in preference to age as a categorizing variable on the assumption that it may be a "cleaner" indicator of a subject's level of cognitive development and adjustment to their world; constructs held to be important in the manifestation of locus of control (15). Regardless of such theorizing, a one-way analysis of variance demonstrated statistically significant variation in age between subjects in year 9, 10 and 11 ($F_{(2,398)} = 495$, $P = 0.0001$).

An independent samples *t*-test failed to demonstrate statistically significant difference in LOC scores between males (mean = 15.8) and females (mean = 16.3). However, one-way analysis of variance demonstrated statistically significant variation in LOC scores between year 9 (mean = 17.2), 10 (mean = 15.8) and 11 (mean = 15.2); $F_{(2,378)} = 4.87$, $P < 0.009$. In view of this, it seemed prudent to take variation in locus of control scores across year levels into account wherever possible in further analyses.

To investigate the extent to which locus of control orientation was associated with suicidal behaviours, LOC scores were divided at the 50th percentile; the lower half being categorized internals (LOC scores 4 to 16, mean = 12.4), and the upper half externals (LOC scores 17 to 30, mean = 20.7). The sample was divided by median-split to maximize the statistical power of subsequent analyses, and hence, maximize the possibility of detecting statistically significant effects.

Table 1 portrays the results of a series of chi-square analyses of the association between suicidal behaviours and internal *vs* external locus of control orientation. The results are shown for the whole sample and the gender sub-populations only, as small numbers prohibited conducting meaningful analyses for year-level sub-populations. Analyses

Table 1. Chi-square analysis

Suicidal behaviours	Internals	Externals	Chi-square	*P* (2-tailed)
		Whole sample		
Ideation				
% (*n*)	15.9 (33)	32.7 (55)	14.8	<0.001
RR	1	2.06		
Plans				
% (*n*)	6.2 (13)	14.9 (25)	7.80	<0.01
RR	1	2.40		
DSH				
% (*n*)	3.8 (8)	13.7 (23)	10.8[c]	<0.001
RR	1	3.59		
1 attempt				
% (*n*)	1.9 (4)	9.5 (16)	9.35[c]	<0.01
RR	1	5.01		
>1 attempt				
% (*n*)	0.95 (2)	1.8 (3)	0.06[c]	NS
RR	1	1.88		
		Male sub-population		
Ideation				
% (*n*)	11.1 (12)	27.8 (20)	8.21[c]	<0.01
RR	1	2.50		
Plans				
% (*n*)	3.6 (4)	13.9 (10)	5.08[c]	<0.05
RR	1	3.82		
DSH				
% (*n*)	4.5 (5)	11.1 (8)	1.93[c]	NS
RR	1	2.44		
1 Attempt				
% (*n*)	2.7 (3)	12.5 (9)	5.26[c]	<0.05
RR	1	4.58		
>1 Attempt				
% (*n*)	1.8 (2)	1.4 (1)	0.14[c]	NS
RR	1	0.76		
		Female sub-population		
Ideation				
% (*n*)	21.0 (21)	35.8 (34)	5.26	<0.05
RR	1	1.70		
Plans				
% (*n*)	9.0 (9)	14.7 (14)	1.04[c]	NS
RR	1	1.64		
DSH				
% (*n*)	3.0 (3)	14.7 (14)	7.02[c]	<0.01
RR	1	4.91		
1 attempt				
% (*n*)	1.0 (1)	6.3 (6)	2.59[c]	NS
RR	1	6.32		
>1 attempt				
% (*n*)	0 (0)	1.05 (1)	0.001[c]	NS

[c] Chi-square with continuity correction. RR = relative risk.

were not performed using the data for "Hospitalization or medical attention following a suicide attempt" due to small numbers. Relative risk ratios are included, with internals arbitrarily assigned a relative risk of 1 for engaging in each suicidal behaviour. The figures for externals indicate how many times more likely they are to have engaged in each suicidal behaviour.

Most of the chi-square analyses portrayed in Table 1 approached or attained statistical significance, which demonstrated an association between locus of control and the range of suicidal behaviours. Externals in the sample were twice as likely as internals to report suicidal ideation; with external males 2.5 times more likely, and external females almost twice as likely to report suicidal ideation. Further, externals in the sample were more than twice as likely as internals to report having made a suicide plan without carrying it out; with external males approximately 4 times more likely than internal males to report having done so. Furthermore, externals in the sample were almost 4 times more likely than internals to report deliberate self-harm; with external males more than twice as likely, and external females more than 6 times as likely to report deliberate self-harm. Moreover, externals in the sample were 5 times more likely than internals to have made one suicide attempt; with the external males nearly 6 times more likely than the internal males to have done so. Finally, externals in the sample were nearly twice as likely as internals to have made several suicide attempts.

Discussion

In discussing the findings of the present study, it is noteworthy that a considerable proportion of the sample have engaged in some kind of suicidal behaviour. For example, nearly a quarter of our subjects reported having had suicidal ideation. This proportion is similar to that found in other studies (6, 16); and although it does not match the massive 63% reported by Smith & Crawford (2), it does constitute further evidence that a substantial proportion of a normal population of adolescents are having self-destructive thoughts. Further, 11% of the sample reported having planned a suicide attempt without carrying it out; a figure that is substantial but fails to replicate the massive 25% reported by Smith & Crawford (2) as having made such plans in their sample. Furthermore, 9% of the sample indicated that they had deliberately tried to hurt themselves. Although Smith & Crawford (2) report that 10% of their sample had made one or more suicide attempts, a figure that was adjusted to 8.4% when the overrepresentation of females in the sample was taken into account, the present study found smaller proportions; with 6% having made one suicide attempt, and 2% having made several suicide attempts. Moreover, although Smith & Crawford (2) report that only 12% of their attempters received medical treatment following their suicide attempt, the present study found this proportion to be much higher at 30%.

In attempting to explain why the figures across a range of suicidal behaviours in the present study do not replicate those of Smith & Crawford (2), one possible explanation concerns the limited scope of sampling in this pilot study (i.e., one randomly chosen state high school). That is, the data may underestimate true proportions that may have been evident if a broader representation of students from a variety of high schools and socioeconomic strata in the Adelaide metropolitan area had been examined. However, given that the proportion of students engaging in suicidal ideation is similar to that reported in other studies (6, 16), the lower rate of the more serious and overt suicidal behaviours may reflect the fact that, since 1986, there has been a push towards greater mental health and other support to high schools and their students in South Australia; although, again, such an explanation needs to be treated as tentative in view of the limited sampling.

Nevertheless, the findings suggest that a substantial proportion of adolescents in the present sample do engage in a range of suicidal behaviours. Further, although the proportion of subjects who have made a suicide attempt but did not receive medical treatment following it is not as startling as the 90% in Smith & Crawford's (2) study, the 70% in our sample represents a significant proportion of young attempters who do not present to the medical system. Although low lethality attempts that do not require medical attention may confound the issue to some degree, it remains to be said that suicide attempts of any degree of lethality are very worrisome. This study would appear to confirm that estimates of the rate of suicidal behaviours among adolescents that are based on those who receive medical attention do not account for a significant proportion of adolescent suicide attempters.

Analyses of the association between locus of control and suicidal behaviours demonstrated that adolescents with an external locus of control orientation were more likely to have engaged in a range of suicidal behaviours. This is shown well by the higher relative risk of engaging in such behaviours. For example, both male and female adolescents in the present sample with an external locus of control orientation were more likely to have had suicidal ideation. This trend was also evident for deliberate self-harm and for planning a suicide attempt (males only). Further, this pattern of results is evident among the adolescents in the sample who claimed to have made

one suicide attempt; with statistically significant associations for the sample population and the male sub-population, but not for the female sub-population. This finding for the females appears to result from a lack of numbers in the attempter cells. This was a surprise, and at odds with previous work (1), which has suggested that many more females attempt suicide than males. Of note, the relatively low number of females who report having made a suicide attempt may be in line with more recent work (17), which suggests that rates of suicide attempts among males and females are equivalent. Nevertheless, for the whole sample and gender sub-populations, externals were more likely to have made a suicide attempt than internals.

One important point to note in relation to the above findings is that, although LOC scores were shown to vary across year levels, a lack of numbers in some cells meant that this could not be taken into account in the chi-square analyses. Given that the year 9's as a group scored somewhat higher on the measure of locus of control than the other 2 year levels, it is possible that the sample median-split had the effect of placing greater proportions of non-suicidal year 9's in the externals category; resulting in a weakening of the association. Hence, it is quite possible that the strength of the association between locus of control and suicidal behaviour is somewhat underestimated.

Thus, the findings of this pilot study demonstrate a clear association between locus of control and a range of suicidal behaviours; with the adolescents who engage in such behaviours characterized by a more external locus of control orientation than those who do not. This finding supports those of a number of other studies (9-14) and adds further weight of evidence to the suggestion that locus of control could be useful in the identification or early detection of individuals at risk of suicidal behaviours (12). Clinically, it makes sense to think that a person who is experiencing a great deal of life stress, feels trapped in a terrible situation or confronted with seemingly insurmountable barriers to achieving their goals or fulfilling their needs and who feels powerless to alter their circumstances may be vulnerable to the one alternative left available to them to alter those circumstances: suicide. In view of this, and given that externals in this sample population were much more likely to report suicidal behaviours, we believe that these findings demonstrate that the locus of control construct has much to offer in the identification of individuals at risk of suicidal behaviour.

Furthermore, the findings of the present study support Goldney's (9) suggestion of the similarity between the "cry for help" (a concept often associated with suicidal behaviour, as it clearly refers to the need for intervention from significant others) and the suicidal person who is characterized by an external locus of control orientation. For it is possible that these individuals are sending a message to others that they need their help; in making a suicide attempt, they may be offering the decision as to their living or dying to fate or the intervention of others.

A limitation of the present study is the cross-sectional nature of its design. Such a design prohibits an analysis of the enduring nature of the relationship between locus of control and suicidal behaviours. It could be suggested that external locus of control orientation develops concurrently with life events that move an individual towards engaging in suicidal behaviours, and hence, would have limited utility in the prediction of risk. Although this may be the case, the longitudinal study of Goldney et al. (11, 12) suggests that individuals who engage in suicidal ideation at some point in their lives are characterized by a more external locus of control orientation than those who do not, and that this orientation is stable across a number of years. That is, those who claimed suicidal ideation at some point in the 8 years of the study reported are characterized by a more external locus of control orientation throughout the 8 years than those who have not. This study provides strong evidence for the utility of the locus of control construct in identifying (and possibly predicting) individuals at risk of suicidal ideation by suggesting that individuals who report suicidal ideation are characterized by enduring personal attributes (12). It follows that further research among younger adolescents using a longitudinal design is warranted for the full range of suicidal behaviours to see whether similar findings can be replicated.

The use of only one randomly chosen high school may be conceived of as a limitation in the present study, giving us a sample made up of individuals from a restricted socioeconomic stratum in Adelaide society, and thus limiting generalizability across all adolescents growing up in Adelaide. In view of this, we recommend that further research sample across socioeconomic strata to achieve true representation of adolescents, and hence, adolescent suicidal behaviour.

Nevertheless, the study does try to take into account the limitations of hospital-based samples and to establish a picture of the range of adolescent suicidal behaviour in the real world. Thus, although acknowledging some limitations, we believe that the present study achieved its aims in a relatively sound empirical manner.

Conclusion

This pilot study was able to demonstrate that a significant proportion of adolescents in one randomly chosen Adelaide metropolitan state high school

report that they have engaged in a range of suicidal behaviours. Further, a significant proportion of them are never seen by a medical practitioner following a suicide attempt, and hence, estimates of the rates of adolescent suicide attempts based on the number of individuals who present to the medical system are problematic. Finally, adolescents who engage in suicidal behaviours were characterized by a more external locus of control orientation. Although this suggests the utility of the locus of control construct in identifying at-risk adolescents, further research using a longitudinal research design replicating and extending that of Goldney et al. (11, 12) is warranted to further elucidate the relationship between locus of control and suicidal behaviours in adolescents.

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