Mediating Effects of Coping Style on Associations Between Mental Health Factors and Self-Harm Among Adolescents

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Abstract. *Background:* There is evidence for an association between suicidal behavior and coping style among adolescents. *Aims:* The aims of this study were to examine associations between coping style, mental health factors, and self-harm thoughts and acts among Irish adolescents, and to investigate whether coping style mediates associations between mental health factors (depression, anxiety, and self-esteem) and self-harm. *Method:* A cross-sectional school-based survey was carried out. Information was obtained on history of self-harm, life events, and demographic, psychological, and lifestyle factors. *Results:* Emotion-oriented coping was strongly associated with poorer mental health and self-harm thoughts and acts. Problem-Oriented Coping was associated with better mental health. Mediating effects of Emotion-Oriented Coping on associations between mental health factors and deliberate self-harm (DSH) was found for both genders and between Problem-Oriented Coping and mental health factors for girls. Similar mediating effects of coping style were found when risk of self-harm thoughts was examined. *Limitations:* Since the methodology used was cross-sectional, it is impossible to draw conclusions regarding causal relationships between coping style and associated factors. The coping measure used was brief. *Conclusions:* Promotion of positive coping skills and reduction of emotion-focused approaches may build resilience to self-harm thoughts and acts among adolescents experiencing mental health problems.

Keywords: mental health, adolescent, deliberate self-harm, coping, problem solving

Introduction

Self-harm is recognized worldwide as a major public health problem, with a wide-ranging impact on the individual, their family, and health services. Lifetime prevalence of self-harm among adolescent girls ranges from 5.7% (The Netherlands) to 17% (Australia) compared with 2.4% (The Netherlands) to 6.5% (Belgium) among boys (Madge et al., 2008). The school-based CASE study (Child and Adolescent Self-harm in Europe), on which this work is based, reported that 9.1% of Irish adolescents (13.9% of girls and 4.3% of boys) surveyed had harmed themselves at some point, of whom just under half reported repeated episodes. Self-cutting and overdose were the most common self-harm methods (Morey, Corcoran, Arensman, & Perry, 2008).

Coping can be defined as the cognitive and behavioral activities by which a person attempts to manage specific stressful situations as well as the emotions that they generate (Lazarus & Folkman, 1984). Problem solving can be considered one type of coping process. For any examination of coping among adolescents, it is important to note that coping methods and resources are specific to the individual's developmental level (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001) and that changes in coping style over time are a normal part of adolescent development (Oldershaw et al., 2009). However, the development of characteristic ways of coping in childhood and adolescence may be precursors to patterns of coping in adulthood (Compas et al., 2001).

Studies that have examined the relationship between self-harm and problem solving or coping among adolescents vary significantly in the coping/problem-solving measures and definitions of self-harm used (D'Zurilla & Maydeu-Olivares, 1995). Despite inconsistencies across studies, there is evidence for an association between suicidal behavior and problem-solving deficits in adolescents (Speckens & Hawton, 2005).

A study of Irish university students reported that those with suicidal thoughts had significantly poorer prob-

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lem-solving scores than those without (McAuliffe, Corcoran, Keeley, & Perry, 2003). The findings of the multicenter CASE study have been mixed in relation to coping, with self-harm found to be associated with Emotion-Oriented Coping (Portzky, De Wilde, & van Heeringen, 2007), coping by self-blame (De Leo & Heller, 2004), and "ineffective" coping strategies in adolescents (Voros, Fekete, Hewitt, & Osvath, 2005) in the various national samples.

It has been argued that research in this field has not adequately incorporated mediating and moderating variables into pathways linking psychosocial factors and suicidal behavior (Sandin, Chorot, Santed, Valiente, & Joiner, 1998). A variable may be called a mediator to the extent that it accounts for or explains the relationship between the predictor and the criterion. On the other hand, moderators are variables that influence the strength and/or direction of the relationship between the predictor and criterion (Baron & Kenny, 1986). Although depression (Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999) and self-esteem (McAuliffe et al., 2006) have been found to mediate or moderate associations between self-harm and coping style, no studies have specifically examined the mediating effect of coping styles on the established associations between psychological difficulties and self-harm thoughts or acts in adolescents. Adolescents at high risk of suicidal behavior have been found to hold attitudes that support the use of maladaptive coping strategies in response to depression, suicidal thoughts, and behaviors (Gould et al., 2004), but these associations need to be further investigated.

To optimize the teaching of positive coping skills to adolescents in the school setting, it is important first to identify the possible associations between coping style and self-harm and related mental health difficulties in this group.

Our school-based study aimed to examine the associations between coping style, mental health factors, and self-harm, using a standardized methodology. The objectives were:

1. To examine coping styles in a sample of Irish adolescents, and to compare male and female adolescents' coping styles;
2. To examine associations between coping style and mental health factors, self-harm thoughts, and self-harm acts; and
3. To examine whether coping style mediates the association between mental health difficulties including depression, anxiety and self-esteem, and self-harm thoughts and self-harm.

Method

Design and Participants

The study design was cross-sectional, with data gathered in 39 schools in counties Cork and Kerry in Ireland. The questionnaire was administered and completed by students in a class setting with a member of the research team present. The study design, procedure, and sample have been fully described elsewhere (McMahon et al., 2010; Morey et al., 2008).

Sample

Thirty-nine schools took part in the study. Of the 4,583 students invited to complete the questionnaire, 3,881 participated in the survey (85% response rate). For the purposes of the current study, 197 questionnaires were disregarded because age criteria were not met, gender was missing, the survey was not completed seriously, or questions regarding coping style were not answered in full, giving a total of 3,684 valid surveys. Fifty-two percent of the participants were girls and the majority (53.1%) of students were 16 years old.

Measures

The survey in Ireland was part of the multicenter CASE study (Madge et al., 2008). A standardized, internationally validated, anonymous questionnaire was designed by the CASE collaborators and used for data collection by each of the seven centers involved in the study (six centers in Europe and one in Australia). The questionnaire comprised a wide range of variables, including demographic variables, lifestyle factors, and questions about self-harm and self-harm thoughts.

Coping scale: Participants were asked how frequently – *never* (1), *sometimes* (2), *often* (3) – they did the following when they were worried or upset: (1) talked to someone, (2) blamed themselves for getting into the mess, (3) got angry, (4) stayed in their room, (5) thought about how they had dealt with similar situations, (6) had an alcohol drink, (7) tried not to think about what was worrying them, (8) tried to sort things out.

The questionnaire also included three validated psychological scales. Depressive symptoms and anxiety were measured using the Hospital Anxiety and Depression Scale (HADS), which has been validated for use with an adolescent population (White, Leach, Sims, Atkinson, & Cottrell, 1999). Impulsivity was measured using six items from the Plutchik impulsivity scale (Plutchik, van Praag, Picard, Conte, & Korn, 1989). Self-esteem was measured using an 8-item version of the Self-Concept Scale (Robson, 1989). Strong convergent and discriminant validation of the scale has been reported (Addeo, Greene, & Geisser, 1994). All three scales were found to have high internal consistency in our sample (McMahon et al., 2010).

An important aspect of the study methodology was that participants who reported self-harm were asked to describe, in their own words, the method(s) they had used to harm themselves as a validation. This description was later coded according to a standardized definition of self-harm:

> An act with non-fatal outcome in which an individual deliberately did one or more of the following: initiated behaviour (for example, self cutting, jumping from a height), which was intended to cause self-harm; ingested a substance in excess of the prescribed or generally recognisable therapeutic dose;

> ingested a recreational or illicit drug that was an act that the person regarded as self-harm; or ingested a non-ingestible substance or object. (Madge et al., 2008, p. 669)

Episodes of self-harm were classified by three independent raters using the standardized definition above (Cohen's $\kappa = 0.77$). When participants reported self-harm without providing a description they were not included as a self-harm case. The definition we used allowed for a wide range of motives and varying levels of suicidal intent. Self-harm thoughts were defined as one having thoughts of harming oneself without acting on them on that occasion.

Statistical Analyses

Principal component analysis using varimax rotation was used to investigate the number of factors represented by the 8 items of the coping scale (Table 1). To investigate associations between gender and coping style, boys and girls were compared using *t* tests (Table 2). Effect size was measured using partial η^2 and, following established guidelines (Cohen, 1988), the effect size was considered very small if partial $\eta^2 < 0.01$, small if < 0.06, medium if < 0.14, and large if 0.14 +. Pearson's correlation coefficient, *r*, was used to assess the strength of the linear association between the psychological measures (depressive symptoms, anxiety, and self-esteem) and coping style measures (Table 3). Subgroups of adolescents were compared in terms of coping style using one-way ANOVA and post-hoc tests (Tukey's Honestly Significant Difference Test) (Table 4).

The hypothesis that the associations between psychological factors and self-harm thoughts and self-harm would be mediated by coping style was tested in accordance with the approach advocated by Baron and Kenny (Baron & Kenny, 1986), involving four stages. First, the independent variable (in this case, level of depressive symptoms, anxiety, or self-esteem) should predict change in the outcome (e.g., self-harm). This analysis was carried out previously on this sample and significant associations were reported (McMahon et al., 2010). Secondly, the independent variable (mental health factor) should predict change in the proposed mediator (coping style; see Table 3). Thirdly, change in the mediator should be significantly associated with change in the outcome (e.g., self-harm; see section "Associations Between Coping Style and Self-Harm Thoughts and Acts" below). Finally, the effect of the independent variable on change in the outcome should be attenuated when change in the mediator is statistically controlled (Table 5). Regression analyses were used to perform this final step (investigation of potential mediation effects). Odds ratios and 95% confidence intervals were calculated for lifetime history of self-harm. Initially, each psychological variable was entered separately as the independent variable and lifetime history of self-harm was entered as the dependent variable (method = enter). The regression analyses were replicated with the problem-oriented coping score as a covariate and again with emotion-oriented coping as a covariate. Full mediation is said to occur when this latter effect drops to zero; partial mediation is said to occur when the effect diminishes, but remains significant. In the case of partial mediation, a further test was required to establish whether the indirect effect of the independent variable on the dependent variable via the mediator was significant. Because of the dichotomous dependent variable, the stages described above included a mixture of linear and logistic regression analyses that give rise to coefficients on different scales thereby making standard mediation analysis (e.g., Sobel tests) inappropriate. We used Hayes' mediation analysis that allows for dichotomous dependent variables (Preacher & Hayes, 2008). This provides an estimate of the indirect effect of the independent variable on the dependent variable via the mediator and its standard error based on resampling. We referred the quotient of these (i.e., indirect effect coefficient divided by standard error) to the standard Normal distribution to estimate its statistical significance, which we report. This analysis was repeated with self-harm thoughts as the dependent variable for a subgroup of the sample with no history of self-harm (Table 6). Problems with multicollinearity were not anticipated because the coping style variables which were correlated with the outcome measure did not show high mutual correlations.

Results

Principal Component Analysis

We undertook exploratory data analysis of the 8-item coping scale on the entire sample using principal component analysis. Varimax rotation was used with a cut-off of 0.4, revealing two components (Table 1). One item in the scale did not load on either component and so it was excluded from the analyses. The two components can be referred to as Emotion-Oriented Coping and Problem-Oriented Coping. The first factor, Emotion-Oriented Coping, accounted for 20.6% of the variance explained and the second factor, Problem-Oriented Coping, accounted for 17.8% (38.4% in total). This distinction between problem-focused and emotion-focused coping dimensions was supported by the literature on coping in general (Folkman & Lazarus, 1980) and adolescent coping specifically (Compas, Worsham, Ey, & Howell, 1996), and has been employed by other CASE study researchers (Portzky et al., 2007).

Internal consistency of the two subscales was examined. Cronbach's α values for the subscales were 0.47 for the emotion-oriented subscale and 0.45 for the problem-oriented subscale. Low Cronbach's α values such as these are common in scales with few items (Pallant, 2007), and therefore we also report interitem correlations, which were 0.18 for the emotion-oriented subscale and 0.22 for the problem-oriented subscale. These correlations fall just below and within the recommended optimal range of 0.2–0.4 for scales of this type (Briggs & Cheek, 1986). Subsequent analyses were carried out using the emotion-oriented subscale (scored between a minimum of 4 and maximum of 12) and the problem-oriented subscale (scored between a minimum of 3 and a maximum of 9).

Table 1. Principal component analysis: 8-item coping scale

	Component	
	1	2
	Emotion-Oriented Coping	Problem-Oriented Coping
How often do you blame yourself for getting into the mess?	0.684	
How often do you get angry?	0.682	
How often do you stay in your room?	0.639	
How often do you have an alcoholic drink?	0.437	
How often do you try to sort things out?		0.720
How often do you talk to someone?		0.650
How often do you think about how you have dealt with similar situations?		0.640
How often do you try not to think about what is worrying you?	–	–

Coping Style and Gender

Table 2 reports scores on both coping subscales for girls and boys, with higher scores indicating more frequent use of each type of coping. Girls reported significantly more use of both coping styles than boys did.

Associations Between Coping Style and Mental Health Difficulties

Problem-Oriented Coping was associated with significantly lower levels of depressive symptoms, lower levels of anxiety, and higher self-esteem in the total sample (Table 3). Emotion-Oriented Coping was associated with significantly higher levels of depressive symptoms and anxiety and poorer self-esteem. For the total sample, there was a strong positive correlation between Emotion-Oriented Coping and anxiety ($r = 0.493$), a moderately strong positive association between Emotion-Oriented Coping and depressive symptoms ($r = 0.360$), and a strong negative correlation between Emotion-Oriented Coping and self-esteem ($r = -0.468$). For the total sample, correlations between Problem-Oriented Coping and depression and self-esteem were significant but weak ($r = -0.185$ and $r = 0.201$, respectively). The correlation between Problem-Oriented Coping and anxiety was significant among girls but nonsignificant among boys and among the total sample.

Associations Between Coping Style and Self-Harm Thoughts and Acts

Those adolescents who reported a lifetime history of self-harm differed significantly from those without a history of self-harm in terms of both Emotion-Oriented Coping and Problem-Oriented Coping ($p < .0005$ for both genders on both coping subscales). Those with a history of self-harm reported more frequent use of Emotion-Oriented Coping and less frequent use of Problem-Oriented Coping.

In order to further examine potential associations between coping style and self-harm thoughts and acts, three subgroups of young people were identified within the sample: those who reported no self-harm (lifetime history) and no self-harm thoughts; those who reported self-harm thoughts but no self-harm; and those who reported at least one episode of self-harm. There were differences between the three subgroups in terms of scores on both coping subscales (one-way ANOVA, $p < .0005$ for both subscales

Table 2. Scores on coping subscales by gender

	Total sample (N = 3,684)		Girls (n = 1,857)		Boys (n = 1,827)			
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Partial η^2	p
Emotion-Oriented Coping	7.6	7.50–7.61	7.9	7.81–7.96	7.2	7.14–7.29	0.041*	$p < .001$
Problem-Oriented Coping	6.1	6.07–6.15	6.3	6.21–6.33	5.9	5.89–6.01	0.016*	$p < .001$

Note: CI = confidence interval.
* Effect size was considered very small if partial $\eta^2 < 0.01$, small if < 0.06, medium if < 0.14, and large if 0.14 + (Cohen, 1988).

Table 3. Correlations (Pearson's r) between scores on coping subscales and levels of depressive symptoms, anxiety, and self-esteem[a]

	Problem-Oriented Coping			Emotion-Oriented Coping		
	Girls	Boys	Total sample	Girls	Boys	Total sample
Depressive symptoms	– 0.239*	– 0.144*	– 0.185*	0.419*	0.290*	0.360*
Anxiety	– 0.134*	– 0.034†	– 0.052††	0.485*	0.449*	0.493*
Self-esteem	0.286*	0.176*	0.201*	– 0.511*	– 0.371*	– 0.468*

Note: [a]Correlation is considered small if $r = 0.1–0.23$, medium if $r = 0.24–0.36$, and large if $r = 0.37$ or larger. *$p < .001$. †$p = .114$. ††$p = .002$.

Table 4. Comparison of adolescents with and without self-harm thoughts and acts in terms of scores on coping scales

	Boys					**Girls**				
	1. No self-harm thoughts or acts (n = 1,471)		2. Self-harm thoughts only (n = 168)		3. History of self-harm (n = 75)	1. No self-harm thoughts or acts (n = 1,180)		2. Self-harm thoughts only (n = 334)		3. History of self-harm (n = 242)
	Mean (*SD*)	p (group 1/ group 2)	Mean (*SD*)	p (group 2/ group 3)	Mean (*SD*)	Mean (*SD*)	p (group 1/ group 2)	Mean (*SD*)	p (group 2/ group 3)	Mean (*SD*)
Emotion-Oriented Coping	7.00 (1.50)	$p < .001$	8.25 (1.81)	$p = .07$	8.72 (1.64)	7.36 (1.44)	$p < .001$	8.66 (1.47)	$p = .001$	9.12 (1.47)
Problem-Oriented Coping	6.02 (1.24)	$p = .002$	5.68 (1.22)	$p = .855$	5.59 (1.37)	6.46 (1.21)	$p < .001$	6.06 (1.27)	$p = .014$	5.77 (1.26)

Table 5. Associations between lifetime history of self-harm and scores on psychological scales, including adjusting for emotion-oriented and problem-oriented coping

	OR* (95% CI) for self-harm	OR* (95% CI) for self-harm		OR* (95% CI) for self-harm	
		Adjusting for Emotion-Oriented Coping	Significance of mediation	Adjusting for Problem-Oriented Coping	Significance of mediation
			Boys		
Depressive symptoms†	1.27 (1.20-1.35)	1.20 (1.12–1.28)	$p < .001$	1.26 (1.19–1.34)	$p = 0.073$
Anxiety†	1.32 (1.24–1.39)	1.24 (1.16–1.39)	$p < .001$	1.31 (1.24–1.39)	$p = 0.169$
Self-esteem†	0.79 (0.74–0.83)	0.84 (0.79–0.89)	$p < .001$	0.79 (0.74–0.84)	$p = 0.148$
			Girls		
Depressive symptoms†	1.27 (1.22–1.32)	1.18 (1.13–1.23)	$p < .001$	1.25 (1.20–1.30)	$p < .001$
Anxiety†	1.22 (1.18–1.27)	1.13 (1.09–1.18)	$p < .001$	1.21 (1.17–1.26)	$p < .001$
Self-esteem†	0.81 (0.78–0.84)	0.87 (0.84–0.91)	$p < .001$	0.82 (0.79–0.86)	$p < .001$

Note. OR = odds ratio; CI = confidence interval.
*Odds ratio for lifetime history of self-harm associated with one unit increase in score on psychological scales.
†$p < .001$ in all cases for association between scores on psychological scales and self-harm.

Table 6. Subgroup with no history of self-harm (n = 1,632 boys, n = 1,510 girls): Associations between self-harm thoughts and scores on psychological scales, including adjusting for emotion-oriented and problem-oriented coping

	OR* (95% CI)	OR* (95% CI)		OR* (95% CI)	
		Adjusting for Emotion-Oriented Coping	Significance of mediation	Adjusting for Problem-Oriented Coping	Significance of mediation
			Boys		
Depressive symptoms†	1.24 (1.18-1.31)	1.19 (1.12–1.25)	$p < .001$	1.23 (1.17–1.30)	$p = .017$
Anxiety†	1.27 (1.21–1.32)	1.20 (1.14–1.26)	$p < .001$	1.26 (1.21–1.32)	$p = .184$
Self-esteem†	0.80 (0.76–0.84)	0.84 (0.80–0.88)	$p < .001$	0.80 (0.76–0.84)	$p = .032$
			Girls		
Depressive symptoms†	1.31 (1.25–1.38)	1.22 (1.16–1.28)	$p < .001$	1.30 (1.24–1.36)	$p = .001$
Anxiety†	1.27 (1.22–1.32)	1.19 (1.14–1.24)	$p < .001$	1.27 (1.22–1.31)	$p = .001$
Self-esteem†	0.78 (0.75–0.81)	0.83 (0.80–0.86)	$p < .001$	0.78 (0.76–0.81)	$p = .031$

Note. OR = odds ratio; CI = confidence interval.
* Odds ratio for self-harm thoughts in past year associated with one unit increase in score on psychological scales.
†$p < .001$ in all cases for association between scores on psychological scales and self-harm thoughts.

for both genders). Post-hoc tests (Tukey's HSD) were performed to compare the subgroups in terms of both subscales (Table 4). There was a trend among both girls and boys for higher scores on Emotion-Oriented Coping and lower scores on Problem-Oriented Coping across the three subgroups in order of increasing severity from no self-harm thoughts or acts to history of self-harm. The largest differences in terms of coping were between those with no thoughts or acts of self-harm and those with self-harm thoughts only ($p < .0005$ for both coping subscales for both genders). The difference between those with self-harm thoughts only and those with acts of self-harm reached statistical significance for girls on both coping subscales but was not significant for boys on either subscale.

Mediating Effect of Coping Style on Associations Between Mental Health Difficulties and Self-Harm

The potential mediating roles of emotion-oriented and problem-oriented coping on the associations between depression, anxiety, and self-esteem and self-harm were investigated. To assess whether the associations between psychological variables and self-harm were attenuated when the potential mediators were statistically controlled, we used separate regression analyses to generate odds ratios and 95% confidence intervals for lifetime history of self-harm (Table 5). Adjusting for Emotion-Oriented Coping resulted in large changes in odds ratios for self-harm associated with a one unit increase in scores on depression, anxiety, and self-esteem scales among both boys and girls. Adjusting for Problem-Oriented Coping resulted in smaller changes on all three scales. As the effect of the independent variable on the dependent variable was reduced upon addition of the mediator, there was informal evidence for partial mediation. To test whether these mediation effects reached statistical significance, mediation analysis was carried out (Preacher & Hayes, 2008). Significant mediation effects in the case of Emotion-Oriented Coping were observed among both boys and girls for the associations between all psychological variables and self-harm. Significant mediation effects of Problem-Oriented Coping were observed among girls for the associations between all psychological variables and self-harm, but among boys the mediation effect was nonsignificant in all three cases.

Mediating Effect of Coping Style on Associations Between Mental Health Difficulties and Self-Harm Thoughts Among Adolescents With No History of Self-Harm

Mediation analyses were replicated to investigate the possible mediating effects of coping style on risk of self-harm thoughts among those adolescents with no history of self-harm (Table 6). Adjusting for Emotion-Oriented Coping resulted in large changes in odds ratios for self-harm thoughts on all scales among both boys and girls, and mediation effects were significant in all cases. Adjusting for Problem-Oriented Coping resulted in smaller changes on all three scales, and weaker but nonetheless significant mediation effects of Problem-Oriented Coping were observed among girls for the associations between all psychological variables and self-harm thoughts. Among boys, only the mediating effect of Problem-Oriented Coping on associations between depression and self-harm thoughts was significant at the 0.05 level.

Discussion

In this study we have investigated associations between coping style, mental health factors, and self-harm among Irish adolescents. Emotion-Oriented Coping, which includes self-blame, anger, withdrawal, and use of alcohol, was strongly associated with poorer mental health. Use of Problem-Oriented Coping (attempting to solve problems, seeking social support, and reflecting on previous experience) was associated with better mental health, but associations between Problem-Oriented Coping and levels of anxiety were not significant among boys. Investigating associations between coping style and self-harm thoughts and acts, we found that higher scores on Emotion-Oriented Coping and lower scores on Problem-Oriented Coping were associated with greater severity of self-harm history. However, boys with self-harm thoughts did not differ significantly from those with a history of self-harm in terms of coping. We found evidence for a mediating effect of Emotion-Oriented Coping on associations between mental health factors (depressive symptoms, anxiety, and self-esteem) and self-harm among both genders and between Problem-Oriented Coping and all three mental health factors among girls. Similar mediating effects of coping style were found when risk of self-harm thoughts was examined for those young people with no history of self-harm.

We found that girls reported using both types of coping more frequently than boys. This is at odds with previous research that has found that boys report using negative coping strategies more often than girls (Sawyer, Pfeiffer, & Spence, 2009). However, the fact that girls report more use of Emotion-Oriented Coping reflects the view that girls in particular may use coping strategies that add to malaise and poor mental health (Compas et al., 2001). However, this finding relating to girls' coping may also reflect methodological differences in the coping measures used across studies and the labeling of "positive" and "negative" methods of coping.

The use of Emotion-Oriented Coping was associated with poorer mental health on the three scales examined (depressive symptoms, anxiety, and self-esteem), while Problem-Oriented Coping was associated with scores reflecting more positive mental health. Our findings are in line with previous research that has established a link between coping style and depressive symptoms (Rohde, Lewinsohn, Tilson, & Seeley, 1990) and self-esteem (Lewinsohn, Rohde, & Seeley, 1994).

Our findings on the associations between coping style and self-harm extend previous research that has shown that adolescents with a history of self-harm report more maladaptive behaviors as ways of coping than their peers (Kirchner, Ferrer, Forns, & Zanini, 2011; Mikolajczak, Petrides, & Hurry, 2009; Wilson et al., 1995). The comparison of three subgroups of adolescents showed that the greatest difference in terms of coping style is between those with no self-harm thoughts or acts and those with self-harm thoughts but no acts. This highlights the significance of self-harm thoughts as a discrete step in the self-harm process among adolescents, and mirrors earlier findings of the international CASE study (Madge et al., 2011).

We have investigated whether coping methods act as mediators between psychological difficulties and self-harm thoughts and acts. We found evidence to support the hypothesis that Emotion-Oriented Coping accounts to a significant degree for the associations between psychological difficulties (depression, anxiety, and low self-esteem) and self-harm among both girls and boys. These findings point to the significance of Emotion-Oriented Coping as a maladaptive strategy that contributes to the self-harm process, with mental health difficulties as strong associated factors.

Our striking findings in terms of the mediating role of Emotion-Oriented Coping indicate that self-harm may be understood in many cases as an attempt to manage the negative feelings that are heightened by the use of ineffective emotional coping strategies, as others have previously suggested (Mikolajczak et al., 2009). The mediating effects of Problem-Oriented Coping were much smaller than those of Emotion-Oriented Coping, and they reached statistical significance for girls but not for boys.

Given that adolescents who report self-harm thoughts share a similar profile to those reporting acts of self-harm, we sought to examine the mediating effects of coping style on associations between psychological factors and self-harm thoughts among young people with no history of self-harm. The findings were very similar to those for self-harm, with Emotion-Oriented Coping playing a significant mediating role in this association, and Problem-Oriented Coping playing a smaller role, significant only among girls. Awareness of the importance of coping in mediating associations between mental health problems and self-harm thoughts is important owing to the significance of self-harm thoughts as part of the self-harm process.

A limitation of our study was that it examined lifetime history of self-harm, while coping style was assessed at one time point. Previous research has pointed toward changes in coping style as part of adolescent development, and has suggested a possible association between improved decision making and cessation of self-harm (Oldershaw et al., 2009). It is possible that changes to coping style over time have made associations with lifetime history of self-harm less valid. However, as 82% of those who had harmed themselves had done so within the past year (Morey et al., 2008), the associations we have reported may be valid.

Because the methodology used was cross-sectional, it is impossible to draw conclusions regarding causal relationships between coping style and associated factors. Although it is possible that maladaptive coping results from mental health difficulties and contributes to the development of self-harm, previous research has also found problem-solving deficits to be a concomitant, rather than a cause, of depression, hopelessness, and suicide intent (Schotte, Cools, & Payvar, 1990). The coping instrument used was brief, and it could be argued that it may not capture the multidimensional nature of coping (Compas et al., 2001).

Future research could further address the question of whether the nature and structure of coping, as well as associations with mental health, change with developmental stage and age and in response to life stresses. It has been reported that young people with suicidal behavior report recent histories of more severe life stress, inaccurate appraisal of the extent to which stressful events can be controlled, and poorer coping than their nonsuicidal peers (Wilson et al., 1995). To further expand an understanding of how coping, mental health problems, and self-harm develop, the life situations and stressors with which adolescents cope should be examined as well as their reported coping reactions.

Despite these limitations, this study has employed a rigorous methodology to examine coping style among adolescents. We have built on previous knowledge regarding associations between coping style and self-harm (Evans, Hawton, & Rodham, 2005), specifically through the identification of two valid coping subscales within the CASE coping measure and through the in-depth examination of associations between coping style, psychological factors, and self-harm. Our findings on the mediating effect of coping on risk of self-harm thoughts and acts are novel and highlight the important role that adaptive and maladaptive styles of coping play in the self-harm process, with the particular significance of self-harm thoughts as a discrete step in this process.

Our findings suggest that the promotion of positive coping skills and the reduction of emotion-focused approaches may build resilience to self-harm thoughts and acts among those young people who experience mental health problems. The importance of gender-specific approaches to the promotion of effective coping is clear, with a particular focus on the development of problem-oriented coping skills in building resilience among girls. As maladaptive coping is associated with poor mental health and self-harm, programs that aim to teach positive coping skills to adolescents and that reduce use of emotion-oriented coping – for example, by teaching emotion-regulation skills, reducing avoidance, and reducing use of alcohol or other substances – may be effective in tackling the problem of self-harm thoughts and self-harm in this group.

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