



The personal experience of severe suicidal behaviour leads to negative attitudes towards self- and other's suicidal thoughts and behaviours: A study of temperaments, coping strategies, and attitudes towards suicide among medical students

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ABSTRACT

The attitudes individuals have towards suicidal behaviour, be it their own or others', and their capacity for developing specific coping strategies are influenced by affective temperaments that play a significant role in emotional regulation. However, few studies have investigated these specific patterns with a view to stratify them according to the severity of suicidal behaviours in medical students. The Pearson χ^2 test for the comparison of categorical variables, the *t*-test for independent samples of continuous variables and logistic regression analysis were used to compare the association among temperaments, coping strategies, and attitudes towards suicide in a sample of medical students who attend the School of Medicine, Genoa. Severe suicidal thoughts and behaviours relative to those who were not at risk for suicide were also revealed. The severe suicidal thought and behaviour group had significantly more anxious and cyclothymic temperaments together with a higher use of dis-adaptive, lower emotional focus coping strategies, and higher self-reproaching, criticizing, and judgemental attitudes towards suicidality compared to the no severe suicidal thought and behaviour group. The identified pattern suggests the need for clinicians to carefully consider the complex interplay of clinical features which characterize severely at risk for suicide young adults in order to develop effective and comprehensive prevention strategies.

1. Introduction

Contemporary psychiatry recognized the growing relevance of pervasive characteristics underlying severe suicidal behaviour and has shown the importance of affective temperaments and coping strategies in the development of psychiatric disorders and at-risk behaviour patterns (Akiskal et al., 2005; Tondo et al., 2018). Based on assessments using the Temperament Evaluation of Memphis, Pisa, Paris and San Diego in autoquestionnaire version (TEMPS-A), a large body of literature reported the association of cyclothymic, depressive, anxious, and irritable temperaments with high risk suicidal behaviour (Pompili et al., 2012; Baldessarini et al., 2016) while hyperthymic temperament seems to exert a protective effect against suicidal behaviour (Tondo et al., 2018; Vázquez et al., 2018). Interestingly, affective temperaments remain stable over time and are commonly identifiable earlier both in clinical and non-clinical populations (Mitsui et al., 2017; Vázquez et al.,

2018).

Moreover, coping strategies have been recognized as important factors in promoting and protecting against suicidal behaviour in different age groups of both clinical and non-clinical samples of subjects with a positive history of prior suicide attempts (Knafo et al., 2015; Mirkovic et al., 2015; Imran et al., 2016). For instance, Heffer and Willoughby (2017) analyzed the role of coping strategies in developing depressive symptoms and suicidal ideation among university students through a two level analysis in which they investigated either the number of coping strategies employed by each student and the frequency of their use. Negative coping strategies were associated with higher risk of developing depressive symptoms and suicidal ideation both in respect to their number and frequency of use (Heffer and Willoughby, 2017). It is worth noting that the subject's coping flexibility and capacity for using different types of positive coping strategies, e.g., both problem-focused and emotional-focused coping

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strategies, were associated with better psychosocial adjustment, whereas the extensive use of the same positive coping strategies was not associated with this result (Heffer and Willoughby, 2017). Furthermore, there are studies suggesting that different attitudes towards suicidality play a significant role in suicidal behaviour, though contrasting evidence has been reported to this regard (Domino, 2005; Anderson et al., 2008; Li et al., 2010; Kodaka et al., 2011; Galynker et al., 2015; Li et al., 2015; Patel et al., 2016). In addition, depressive symptoms and suicidal ideation among medical students have been estimated to be 50% and 10–11.1% respectively (Dyrbye et al., 2008; Rotenstein et al., 2016).

Interestingly, U.S. medical student suicide rates were lower than those of the contemporaneous general population although a significant gap exists in the knowledge of medical student suicide rates, risk factors, and targets for intervention (Blacker et al., 2018). Mortier et al. (2018a) investigated the prevalence of suicidal thoughts and behaviour in first-year college students in eight different countries and reported that 32.7% of the sample had lifetime prevalence of suicidal ideation, 17.5% suicide plans, and 4.3% had attempted suicide. Furthermore, the 12-month prevalence of suicidal ideation was 17.2%, suicide plans 8.8%, and suicide attempts 1.0%. Becker et al. (2018) reported that approximately one quarter (24%) of participants were classified with suicide risk, though rates differed between females (26.1%) and males (20.4%). Overall, sluggish cognitive tempo was indicated as a significant predictor of increased suicide risk. However, it is noteworthy that the WHO Mental Health Survey showed that college students had a significantly lower 12-month prevalence of suicide thoughts and behaviours compared with peers not in college, 1.9% and 3.4% respectively (O.R. 0.5; $p < 0.01$) (Mortier et al., 2018b).

This study aims at investigating the association between severe suicidal thoughts and behaviours, coping strategies, temperament, and attitude towards suicidality in medical students, whether it be their own or others'. We aimed to investigate the role of affective temperaments in predicting coping strategies and attitudes toward suicide in a sample of medical students who displayed severe suicidal thoughts and behaviours compared to those with non-severe suicidal thoughts or behaviours. The interplay of affective temperaments and coping strategies in determining attitudes towards one's own and other's suicidal thoughts and behaviours has also been explored.

The following hypotheses were investigated:

- Depressive and cyclothymic temperaments and maladaptive coping strategies are more likely to be associated with greater empathy towards one's own and others' suicidal behaviour and are more common in the severe suicidal thought and behaviour group compared to the no severe suicidal thought and behaviour group.
- the no severe suicidal thought and behaviour group shows higher judgemental attitudes towards one's own and others' suicidal behaviour, better adaptive coping strategies, and higher hyperthymic temperament compared with the severe suicidal thought and behaviour group.

2. Methods

This is a naturalistic cross-sectional study in which participants were recruited using a sample of medical students attending the first four years of the School of Medicine, University of Genoa. Students attending the fifth and sixth year were not included in the survey having already attended a psychiatry course according to the assumption that their attitudes and general perception towards suicidal behaviour may have been influenced. Permission to proceed was obtained from the Dean of the School of Medicine and the survey was carried out anonymously in order to preserve the confidentiality of the participants. Prior to completing the survey, each student signed an informed consent form that explained the nature and purpose of our research in detail and agreed to the analysis and use of their responses for research aims. Students had to be within the age range of 18–26 while surveys of

students outside this age range were not included. Any surveys in which the students missed more than one question concerning the direct/indirect involvement in suicidal behaviour were not included in the sample. Thus, a final sample of 522 surveys out of a total of 531 was deemed valid and consequently analysed. Precisely, 6 surveys were not included in the final sample because more than one item concerning the subject's direct/indirect involvement in suicidal behaviour was missing and 3 surveys were not included because the subjects were older than 26. All individuals voluntarily accepted to participate in the study and signed their written informed consent form.

2.1. Assessment

Each survey consisted of a socio-demographic form, the Suicide Opinion Questionnaire (SOQ) (Domino et al., 1980), the Coping Orientation to Problem Experienced (COPE) (Carver et al., 1989) and TEMPS-A (Akiskal et al., 2005; Pompili et al., 2008).

The socio-demographic form inquired about age, gender, siblings, type of high school, home location (e.g., rural, urban or suburban), level of academic achievement (measured as being behind on coursework), presence of projects for their future (measured as the students' plans for residency after their graduation and future regarding their medical profession) and presence of parents working in the medical or mental health environment. Parents working in medical or mental health fields may, in our opinion, influence the subjects' understanding and perception of suicide-related phenomena by providing specific knowledge about mental illness and different attitudes towards it.

The TEMPS-A is a questionnaire designed to evaluate the fundamental affective temperaments: depressive, cyclothymic, hyperthymic, irritable, and anxious temperaments (Akiskal et al., 2005; Pompili et al., 2008). Recent evidence indicated that most studies support a five-factor solution while different versions of the TEMPS-A have adequate internal consistency and reliability (Elias et al., 2017).

Participants were also asked to complete the Coping Orientation to Problem Experienced Questionnaire (COPE) (Carver et al., 1989). It is a self-report questionnaire measuring 15 coping strategies divided into five scales that measure problem-focused coping, six scales that measure emotion-focused coping, and four scales that measure potentially dis-adaptive strategies/less useful coping responses such as denial, behavioural, mental and alcohol/drug disengagement. Behavioural disengagement is intended by reducing one's effort to deal with the stressor or even giving up trying to attain goals the stressor is interfering with. It is reflected by phenomena that are also identified with terms such as helplessness and generally occurs when people generally expect poor coping outcomes, whereas mental disengagement is a variation which occurs via a wide variety of activities such as day-dreaming and escaping through sleep, TV, or video-games when conditions prevent behavioural disengagement. Furthermore, the COPE may be used as a measure of dispositional coping or a situational measure of coping with a specific stressful event.

The Suicide Opinion Questionnaire (SOQ) (Domino et al., 1980) consists of 107 items: 100 of an attitudinal nature, and 7 demographic items. For the attitudinal items, the respondent is asked to use a five-point Likert response scale with options ranging from strongly agree, agree, undecided, disagree, to strongly disagree and are scored on a scale from 5 for strongly agree to 1 for strongly disagree. The SOQ items cover a wide variety of opinions related to suicide and para-suicide, most of which are attitudinal in nature. The five-factor SOQ scale (SOQ-F) has been used to identify five domains, namely (a) acceptability, (b) perceived factual knowledge, (c) social disintegration, (d) personal defect, and (e) emotional perturbation. Psychometric studies provided support for this five-factor structure with Cronbach alpha reliabilities ranging from 0.60 to 0.89 (Rogers and DeShon, 1992). The SOQ has been used in a large number of research studies in the past, and it remains the most widely used questionnaire assessing opinions about suicide (Anderson et al., 2008). The SOQ cross-cultural applicability has

Table 1
Socio-demographic features of total sample and comparison between the two subgroups.

	Total sample (N = 522)	Severe suicidal thought and behaviour group (N = 88)	No severe suicidal thought and behaviour group (N = 434)	χ^2/t	df	p
Gender, N(%)				12.58	1	<0.001
Male	214 (41.0%)	51 (58.0%)	163 (37.6%)			
Female	308 (59.0%)	37 (42.0%)	271 (62.4%)			
Age, mean \pm SD	23.6 \pm 1.1	23.6 \pm 1.1	23.6 \pm 1.1	0.15	520	0.878
Siblings, N(%)	378 (72.4%)	52 (59.1%)	326 (75.1%)	9.41	1	0.002
High School, N(%)				0.59	2	0.746
Classical gymnasium	164 (31.4%)	25 (28.5%)	139 (32.0%)			
Science school	349 (66.9%)	61 (69.3%)	288 (66.4%)			
Linguistic	9 (1.7%)	2 (2.3%)	7 (1.6%)			
Good Academic Achievements, N(%)	249 (47.7%)	23 (26.1%)	226 (52.1%)	19.73	1	<0.001
Projects for the future, N(%)	156 (29.9%)	19 (21.6%)	137 (31.6%)	3.48	1	0.062
Urban Place, N(%)	276 (52.9%)	43 (48.9%)	233 (53.7%)	0.68	1	0.409
Parents working in medical or mental health fields, N(%)	150 (28.7%)	28 (31.8%)	122 (28.1%)	1.98	1	1.568

been shown by different studies (Domino, 1981; Domino et al., 2000; Domino et al., 2001–2002; Domino, 2005) including Italian samples (Domino and Perrone, 1993).

2.2. Procedure

Participants accepted voluntarily to take part in the survey and the study design was approved by the local Ethical Review Board of the School of Medicine, University of Genoa. The expected time of administration and completion of the survey was approximately 30 min. Moreover, students were asked to use only black or blue pens to fill in the forms in order to make their own survey less recognizable. The surveys were administered during class time over the course of two months and completed surveys were collected in boxes that were opened and analysed at the end of the administration study phase to assure confidentiality.

According to the subjects' responses to the SOQ items 104 "Have you ever seriously considered suicide?" and 105 "Have you ever attempted suicide?", two groups were identified within the sample: subjects with severe suicide thoughts and behaviours, namely the severe suicidal thought and behaviour group and subjects with non-severe suicide thoughts and behaviours, namely the no severe suicidal thought and behaviour group. Subjects who responded positively to one or both items were put into the severe suicidal thought and behaviour group while the remaining individuals in the no severe suicidal thought and behaviour group.

2.3. Statistical analysis

The socio-demographic and clinical characteristics of the subjects were represented as mean and standard deviation (SD) for continuous variables or in terms of frequency and percentages regarding categorical variables.

In order to analyse differences between the severe suicidal thought and behaviour and no severe suicidal thought and behaviour groups, we used the Pearson χ^2 test with Yates correction or Fisher's exact test for the comparison of categorical variables, and the *t*-test for independent samples for continuous variables. We also divided our samples into three subgroups (suicide ideation vs suicide attempt vs no suicide behaviour) and we used the Pearson χ^2 test with Yates correction or Fisher's exact test for categorical variables and ANOVA for continuous variables. Logistic regression analysis was used to explore the relationship between subjects with severe suicidal dimensions (the severe suicidal thought and behaviour group) and each of the previously found independent variables associated in the statistical analyses. The probability of entering the equation was set at $p < 0.05$. All statistical analyses were performed using SPSS version 20.0 (SPSS Inc., Chicago)

and statistical significance was set at $p < 0.05$.

3. Results

Six hundred and thirty-four ($N = 634$) questionnaires were prepared according to the official number of students attending the first to fourth years of Medicine and Surgery at the University of Genoa. Five hundred and fifty-six ($N = 556$) questionnaires were distributed during the study time frame. Seventy-eight ($N = 78$) questionnaires were not distributed due to students being abroad for a study period or having abandoned their studies without informing the University central offices or other unspecified reasons. No students were on maternity leave or sick for periods longer than two weeks during the study time frame according to the University official registers. Eight ($N = 8$) questionnaires were not returned to the research group, one ($N = 1$) appeared seriously damaged as to impair the its interpretation, twenty three ($N = 23$) were not completed properly (two answers given for the same item; at least one of the suicide-related questions not answered; comments written on the questionnaires that may have impaired the individual's confidentiality), and two ($N = 2$) were returned with the students' name on it hence they could not be used to preserve the students' confidentiality. Five hundred and fifty-two ($N = 522$) questionnaires were included in the study, i.e. 82.3% of all officially registered students in the surveyed years of the Medicine and Surgery course at the University of Genoa. The mean (\pm SD) age of the sample was 23.6 (\pm 1.1) while 41.0% students were males. In addition, 47.7% of the sample had good academic achievements and 29.9% had active projects for the future (Table 1). 72.4% of the subjects had siblings and formed 75.1% of the no severe suicidal thought and behaviour group and 59.1% of the severe suicidal thought and behaviour group, respectively. 52.9% of the sample lived in urban environments and represented 48.9% of the severe suicidal thought and behaviour group, and 53.7% of the no severe suicidal thought and behaviour group (Table 1). 20.3% of the whole sample of students belonged to the severe suicidal thought and behaviour group; males corresponded to 58.0% and 37.6% of the severe suicidal thought and behaviour and no severe suicidal thought and behaviour groups, respectively. One hundred and fifty (28.7%) of the subjects' parents worked in medical or mental health fields and 28 (31.8%) belonged to the severe suicidal thought and behaviour group (Table 1).

The chi-square test showed that subjects belonging to the severe suicidal thought and behaviour group were more likely to be males ($p < 0.001$), only children ($p = 0.002$), with poor academic achievement ($p < 0.001$), and less likely to have a parent working in medical or mental health fields ($p < 0.001$). No significant association was reported between severe suicidality and "the presence of projects for their future" (measured as the students' plans for their studies after

Table 2a

Chi-square/Fisher's exact test evaluating the relationship between temperaments (TEMPS-A) and the severe suicidal thought and behaviour and no severe suicidal thought and behaviour groups.

	Severe suicidal thought and behaviour group (N = 88)	No severe suicidal thought and behaviour group (N = 434)	χ^2	p
Depressive, N(%)	13 (14.8%)	106 (24.4%)	3.87	0.049
Cyclothymic, N(%)	17 (19.3%)	48 (11.1%)	4.58	0.032
Hyperthymic, N(%)	15 (17.0%)	202 (46.5%)	26.2	<0.001
Irritable*, N(%)	1 (1.1%)	3 (0.7%)	0.19	0.523
Anxious, N(%)	48 (54.5%)	151 (34.8%)	12.1	0.001

* Fisher's exact test.

Table 2b

Chi-square/Fisher's exact test evaluating the relationship between temperaments (TEMPS-A) and the three subgroups (suicide ideation vs suicide attempt vs no suicide).

	Suicide Ideation group (N = 46)	Suicide Attempt group (N = 42)	No severe suicidal thought and behaviour group (N = 434)	χ^2	p
Depressive, N(%)	6 (13.0%)	7 (16.7%)	106 (24.4%)	4.04	0.133
Cyclothymic, N(%)	13 (28.3%)	3 (7.1%)	48 (11.1%)	12.6	0.002
Hyperthymic, N(%)	7 (15.2%)	8 (19.0%)	202 (46.5%)	26.3	<0.001
Irritable*, N(%)	0 (0.0%)	1 (2.4%)	3 (0.7%)	1.83	0.401
Anxious, N(%)	24 (52.2%)	24 (57.1%)	151 (34.8%)	12.3	0.002

* Fisher's exact test.

graduation and future residency regarding their medical profession) ($p = 0.062$) and home location ($p = 0.409$) (Table 1).

Our analyses showed significant associations between belonging to the severe suicidal thought and behaviour group and anxious ($p = 0.001$), cyclothymic ($p = 0.032$) temperaments. Conversely, hyperthymic and depressive temperaments were significantly associated with the no severe suicidal thought and behaviour group ($p < 0.001$ and $p = 0.049$ respectively) (Table 2a). The relationship between temperaments (TEMPS-A) and the three subgroups (suicide ideation vs suicide attempt vs no suicide) is presented on Table 2b.

Perceiving suicide as the result of a personal defect was significantly associated with the severe suicidal thought and behaviour group ($p < 0.001$), while the no severe suicidal thought and behaviour group was considerably associated with higher rates of acceptance of their own and others' suicidal thoughts and behaviours ($p < 0.001$) and was more likely to link suicidal behaviour with emotional perturbation

($p = 0.003$) (Table 3a).

The severe suicidal thought and behaviour group showed significant association with lower problem-focused and emotional-focused coping strategies, i.e. active coping strategies ($p < 0.001$), lower planning ($p < 0.001$), suppression of competing activities ($p = 0.005$), venting of emotions ($p = 0.025$), use of social support ($p = 0.008$), positive re-interpretation and growth ($p = 0.002$), and lower acceptance ($p = 0.003$). Conversely, the severe suicidal thought and behaviour group, as compared to the no severe suicidal thought and behaviour group, showed strong significant associations with all the subscales of the potentially dis-adaptive coping strategy scale, i.e. denial ($p < 0.001$), mental and behavioural disengagement ($p < 0.001$), and alcohol and drug disengagement ($p < 0.001$) (Table 3a). On Table 3b, the relationship between attitudes towards suicide (SOQ) and COPE among the three subgroups (suicide ideation vs suicide attempt vs no suicide) is presented.

Table 3a

Relationship between Attitudes towards Suicide (SOQ), COPE and the severe suicidal thought and behaviour and no severe suicidal thought and behaviour groups.

mean \pm SD	Severe suicidal thoughts and behaviours group (N = 88)	No severe suicidal thoughts and behaviours group (N = 434)	t-test	p
Acceptability	32.2 \pm 6.5	38.3 \pm 5.3	9.37	<0.001
Social Disintegration	36.5 \pm 3.8	36.6 \pm 3.8	0.21	0.836
Emotional Perturbation	19.7 \pm 3.6	20.7 \pm 2.8	3.02	0.003
Perceived Factual Knowledge	33.7 \pm 3.5	33.6 \pm 3.4	-0.25	0.800
Personal Defect	40.3 \pm 6.6	37.7 \pm 4.6	-4.41	<0.001
<i>Problem-focused coping</i>				
Active coping	10.8 \pm 2.3	12.2 \pm 1.6	6.86	<0.001
Planning	11.5 \pm 3.2	12.8 \pm 2.4	4.28	<0.001
Suppression of competing activities	9.6 \pm 1.5	10.2 \pm 2.0	2.85	0.005
Restraint coping	9.8 \pm 2.2	10.0 \pm 2.0	0.74	0.462
Use of instrumental social support	11.4 \pm 2.1	11.8 \pm 2.4	1.09	0.275
<i>Emotion-focused coping</i>				
Use of social-emotional support	10.3 \pm 3.0	11.3 \pm 3.1	2.66	0.008
Positive reinterpretation and growth	11.6 \pm 2.1	12.3 \pm 2.0	3.04	0.002
Acceptance	10.4 \pm 2.9	11.2 \pm 2.3	2.97	0.003
Humor	7.8 \pm 2.6	7.4 \pm 2.5	2.92	0.168
Venting of emotions	10.7 \pm 2.6	9.9 \pm 2.8	-2.25	0.025
Turning to religion	6.5 \pm 2.8	6.4 \pm 3.3	-0.16	0.876
<i>Potentially disadaptive strategies</i>				
Denial	6.3 \pm 2.5	5.4 \pm 1.8	-4.27	<0.001
Behavioral disengagement	8.3 \pm 2.7	6.3 \pm 1.8	-8.51	<0.001
Alcohol and drug disengagement	6.3 \pm 3.0	4.7 \pm 1.5	-7.26	<0.001
Mental disengagement	10.3 \pm 2.3	8.6 \pm 2.2	-6.47	<0.001

df = 520 for all mentioned items.

Table 3b
Relationship between Attitudes towards Suicide (SOQ) and COPE among the three subgroups (suicide ideation vs suicide attempt vs no suicide).

mean ± SD	Suicide Ideation group (N = 46)	Suicide Attempt group (N = 42)	No severe suicidal thoughts and behaviours group (N = 434)	F	p
Acceptability	34.7 ± 7.0	29.5 ± 4.6	38.3 ± 5.3	55.6	<0.001
Social Disintegration	36.3 ± 3.9	36.6 ± 3.7	36.6 ± 3.8	0.08	0.926
Emotional Perturbation	19.2 ± 3.2	20.3 ± 3.9	20.7 ± 2.8	6.13	0.002
Perceived Factual Knowledge	33.7 ± 2.5	33.7 ± 4.4	33.6 ± 3.4	0.03	0.969
Personal Defect	40.6 ± 4.6	39.9 ± 8.2	37.7 ± 4.6	9.90	<0.001
<i>Problem-focused coping</i>					
Active coping	10.2 ± 2.2	11.4 ± 2.4	12.2 ± 1.6	29.1	<0.001
Planning	10.7 ± 2.6	12.4 ± 3.6	12.8 ± 2.4	14.2	<0.001
Suppression of competing activities	9.1 ± 1.8	10.1 ± 0.8	10.2 ± 2.0	7.15	0.001
Restraint coping	9.2 ± 1.4	10.5 ± 2.6	10.0 ± 2.0	5.04	0.007
Use of instrumental social support	11.0 ± 2.0	11.9 ± 2.2	11.8 ± 2.4	1.95	0.143
<i>Emotion-focused coping</i>					
Use of social-emotional support	11.2 ± 2.8	9.3 ± 3.0	11.3 ± 3.1	7.95	<0.001
Positive reinterpretation and growth	11.8 ± 1.7	11.4 ± 2.5	12.3 ± 2.0	5.24	0.006
Acceptance	10.6 ± 2.3	10.1 ± 3.4	11.2 ± 2.3	4.77	0.009
Humor	6.5 ± 2.1	9.3 ± 2.2	7.4 ± 2.5	15.4	<0.001
Venting of emotions	11.1 ± 2.9	10.2 ± 2.1	9.9 ± 2.8	3.78	0.023
Turning to religion	6.5 ± 3.0	6.5 ± 2.5	6.4 ± 3.3	0.01	0.987
<i>Potentially disadaptive strategies</i>					
Denial	6.8 ± 2.5	5.9 ± 2.4	5.4 ± 1.8	11.6	<0.001
Behavioral disengagement	7.8 ± 2.1	8.8 ± 3.1	6.3 ± 1.8	38.8	<0.001
Alcohol and drug disengagement	6.8 ± 3.2	5.7 ± 2.6	4.7 ± 1.5	30.5	<0.001
Mental disengagement	10.0 ± 2.6	10.5 ± 1.8	8.6 ± 2.2	21.4	<0.001

Table 4
Logistic regression analysis (R^2 Cox-Snell: 0.424; R^2 Nagelkerke: 0.711) of socio-demographic variables, coping strategies (COPE), temperaments (TEMPS-A), attitudes towards suicide (SOQ) in the severe suicidal thoughts and behaviours and no severe suicidal thoughts and behaviours group.

Variables	E.S.	Wald	p	Odd Ratio	95%CI
Emotional Perturbation	0.103	31.058	<0.001	0.752	0.614–0.920
Anxious temperament	0.715	0.312	<0.001	0.671	0.165–0.723
Acceptance	0.110	14.028	<0.001	0.874	0.534–0.822
Suppression of competing activities	0.135	10.322	0.001	1.014	1.277–2.744
Good Academic Achievements	0.550	8.127	0.004	4.802	1.633–14.123
Planning	0.203	0.011	0.004	0.560	0.376–0.833
Mental disengagement	0.143	7.705	0.006	1.489	1.124–1.972
Gender	0.561	7.568	0.006	4.689	1.565–14.098
Acceptability	0.061	30.328	0.006	0.714	0.633–0.805
Siblings	0.576	6.912	0.009	4.543	1.470–14.043
Use of social-emotional support	0.116	5.642	0.018	0.872	0.604–0.953
Behavioral disengagement	0.145	4.679	0.031	1.369	1.030–1.819
Venting of emotions	0.117	4.370	0.037	1.602	1.015–1.609

df = 1 for all mentioned items.

Logistic regression showed a positive correlation between the severe suicidal thought and behaviour group and the following variables: siblings ($p = 0.009$), lack of academic success ($p = 0.004$), personal defect ($p < 0.001$), suppression of competing activities ($p = 0.001$), venting of emotions ($p = 0.037$), mental and behavioural disengagement ($p = 0.006$ and $p = 0.031$, respectively), and male gender ($p = 0.006$) (Table 4).

4. Discussion

Overall, our results show that students who experienced suicidal thoughts and behaviours more often used not only maladaptive and rigid coping strategies leading to mental and behavioural disengagement, but were also more likely to be not empathetic towards their own or other's suicidal behaviour. For instance, students who experienced suicidal thoughts and behaviours showed more judgemental attitudes

towards individuals with suicidal thoughts and behaviours and tended to consider them as “weak” subjects.

These findings show that actually experiencing serious suicidal desires and behaviours does not elicit a deeper and more empathetic understanding of these characteristics in others on the basis of human sharing. Apparently these subjects cannot access to emotional contagion. In particular, the use of maladaptive coping strategies, such as poor venting of emotions together with mental and behavioural disengagement, may foster the subjects' isolation and retreat from social relationships along with detachment from their own and others' emotional experience, thereby provoking the development of judgemental attitudes in this population. Moreover, students who had suicidal thoughts and behaviours were more likely to have anxious and cyclothymic temperaments. Both temperaments play a significant role in the development of impulsive behaviours, related to attentional and motor impulsivity (Beşirli, 2018). Subjects with these temperaments may be more likely to adopt maladaptive coping strategies.

One fourth of our sample had severe lifetime suicidal thoughts and behaviours; these subjects were more likely to be experienced by males. These findings are consistent with previous evidence showing suicidal thoughts and behaviours in medical (Rotenstein et al., 2016; Campos et al., 2017; Blacker et al., 2018) and college students in general with higher rates among males with poor academic performance (Mortier et al., 2018a,b).

Interestingly, our results show that depressive and hyperthymic temperaments were more common in the no severe suicidal thought and behaviour group. The higher presence of a hyperthymic temperament in the no severe suicidal thought and behaviour group was consistent with the findings reported by Pompili et al. (2013) which revealed the long-term protecting role of the hyperthymic temperament with respect to health and social functioning as this temperament commonly provides greater energy, ambition, drive, confidence, cheerfulness, gregariousness, sociability, optimistic attitude together with increased creativity and social skills.

Our results do not confirm previous evidence reporting significant associations between depressive temperament and higher suicide risk (Pompili et al., 2012; Vasquez et al., 2018) which have also been confirmed by existing neurobiological and genetic findings (Serafini et al., 2010; Gonda et al., 2011). This may be related to the different study samples as the latter studies have been conducted among subjects

with specific psychiatric conditions such as mood disorders while our study mainly referred to a non-clinical sample (Karam et al., 2015). Moreover, our findings regarding the significant association between anxious/cyclothymic temperaments and higher suicidal behaviour are consistent with previous studies, sustaining that these affective temperaments are more frequent in subjects with a family history of completed suicide in first and second-degree relatives (Rihmer et al., 2013; Tanabe et al., 2016). These findings comprehensively addressed the different attitudes medical students have towards suicidal behaviour according to the personal experience of their own and others' suicidality. For instance, students who seriously considered attempting suicide or had already attempted it, showed less empathetic attitudes towards suicidal behaviour. Unlike the no severe suicidal thought and behaviour group, students in the severe suicidal thought and behaviour group tended to perceive suicidal behaviour as the result of an unacceptable personal defect rather than understanding it as an emotional perturbation. Similarly, Wallin and Runeson (2003) showed that students, who had previous suicidal thoughts, had greater difficulties in understanding the needs of suicidal individuals and poor empathetic contact with them.

Our results additionally investigated the basis of these attitudes by analysing the coping strategies used by students in the severe suicidal thought and behaviour group, who had greater cognitive rigidity related to poor problem-solving focus and integrative capacities. Severe suicidal thought and behaviour subjects were more likely to develop potentially dis-adaptive coping strategies such as denial, mental and behavioural disengagement, alcohol and drug disengagement together with suppression of competing activities and emotional venting. These results are consistent with previous evidence concerning the existence of cognitive distortions/deficits in suicidal subjects, that may markedly hamper the subjects' ability to cope with intense emotional perturbation and sufficiently develop adaptive and integrated adjustments patterns (Turecki and Brent, 2016; Fazakas-DeHoog et al., 2017; Flink et al., 2017). In particular, behavioural disengagement implies that subjects can even give up attempting to attain goals with which the stressor is interfering.

Panek et al. (2015) underlined the role of personal (also genetic) and environmental factors in determining strategies of coping with stress and temperamental traits according to the Regulatory Theory of Temperament. These understandings further support our results showing the role of actual experience in mediating complex temperamental and coping factors. Similarly, Gould et al. (2018) showed that high school students, exposed to negative life events, had vastly more maladaptive coping strategies with lower help-seeking behaviour and higher behavioural disengagement compared with students who never experienced negative stressful life events. Interestingly, a large body of literature confirmed the association between maladaptive coping patterns, stressful life-events, suicide attempts, and suicidal ideation both in clinical and non-clinical samples (Pompili et al., 2011; Woodhead et al., 2014; Kattimani et al., 2015; Al-Gamal et al., 2016; Ambrus et al., 2017; Gould et al., 2018; Horwitz et al., 2018; Lamis et al., 2018).

This survey needs to be interpreted in the light of several limitations and strengths. The major shortcomings of the present study involve the use self-reporting questionnaires as their reliability could be biased by under-reporting, under-estimating and misunderstanding the issues. In particular, students with life experience of suicidal thoughts and behaviours may have been more reluctant to take part in the study or only give partial answers to the suicide-related items, thus providing questionnaires that could be not included in the survey. However, the operative definition of "severe suicidal thoughts and behaviour" may overestimate the frequency and seriousness of suicidal thoughts due to self-rating biases. In particular, the severe suicidal thought and behaviour and no severe suicidal thought and behaviour groups were formed according to the students' answers to the items 104 and 105 of the SOQ. These items are quite broad and include different types of suicidal thoughts and behaviours entailing a variable severity of suicidal

behaviour especially because it regards the subjects' personal understandings of "seriously considering suicide" and "having attempted suicide". In this sense, our groups encompass a wide range of suicide-related features in a non-clinical sample with the aim of investigating how the subjective experience of suicide, which is understood as having seriously considered suicide and/or having attempted suicide, may be related to temperamental factors. We also aimed to find possible similarities in the subject's coping strategies and attitudes towards their own and others' suicidal thoughts and behaviours. Therefore, our results do not include the investigation of these patterns among suicide ideation vs. suicide attempters, being beyond the aims of the present paper. Future studies should investigate and compare these patterns in sub-populations of medical students. Moreover, the cross-sectional nature of this survey does not allow any inference concerning causality although it does provide preliminary evidence regarding the possible prediction of certain patterns involving affective temperaments, coping strategies, together with their role in shaping the subjects' attitudes towards suicidal behaviour. We are aware and we would like to remind readers of the complex interplay between multiple factors in causing suicidal behaviour. Thus, we do not claim to explain such a multifaceted dimension by simply reducing it to temperamental and coping factors. Rather, we believe that our understandings may help shed light on specific patterns associated with severe suicidal behaviour in young adulthood and may be helpful to implement effective prevention strategies aimed at improving emotional adjustment in the targeted population.

Further studies are needed to replicate our results in larger samples, with specific regard to the possible role of anxious and cyclothymic temperaments in the development of disruptive coping strategies leading to poor empathetic attitudes towards one's own and others' suicidal behaviour.

However, one of the most relevant strengths of the present study is the investigated sample, which is relatively large and representative of the student population attending the School of Medicine, University of Genoa, for the course years included in the survey. To the best of our knowledge, no previous studies investigated the complex interplay between affective temperaments, coping strategies, and attitudes towards suicide in medical students according to their personal experience of suicide thoughts and behaviours; therefore, our results could be of interest both when considering suicidal behaviour in medical students and when approaching and working with suicidal patients.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.psychres.2018.12.116](https://doi.org/10.1016/j.psychres.2018.12.116).

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