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Research Article

Hopelessness, Impulsivity and Attachment as Possible Predictors of Nonsuicidal Self-Injury and Suicide Ideations in Croatian College Students

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Abstract

The main aim of this study was to investigate the role of attachment to parents and peers as a possible protective factor, as well as the role of impulsivity as a potential risk factor, for developing suicidal ideations and engaging in NSSI (non-suicidal self-injury) among college students feeling hopeless. Two separate groups of students were examined: those who changed their residence in order to attend college and those who remained living at home with their family.

A total of 353 students at the University of Rijeka (234 female) participated in the study. Their average age was 20.28 years. The following measures were used: Beck Hopelessness Scale (BHS), Inventory of Parent and Peer Attachment, (IPPA), Barratt Impulsiveness Scale (BIS 11), Self-harm CAT-PD and demographic data questionnaire.

The results show that students who have changed their residence are more likely to engage in NSSI and experience more suicidal ideations compared to those who remain living with their parents, even if there is no difference in the level of hopelessness and attachment to parents and peers between the two groups.

The significant but only partially mediating role of impulsivity in the relationship between hopelessness and NSSI has been confirmed in both groups of students, whilst the protective role of attachment to parents in the relationship between hopelessness and NSSI as well as partially mediating role of impulsivity in the relationship between hopelessness and suicidal ideation was confirmed only in the group of students who changed their residence. The results point to the need for preventive work with students who have moved from home when starting college.

Key words: *attachment, hopelessness, impulsivity, NSSI, suicidal ideation, students*

Introduction

Among the leading causes of death worldwide is death by suicide [1]. In the past few years, the rate of adolescent suicide in age 14-25 has increased. According to World Health Organization data, over 800 000 people die due to suicide every year, and many more attempt it [1]. In 2012, suicide was the second leading cause of death globally among 15-29 year olds and it is also a leading cause of death among college-aged students. Prevalence estimates of suicidal ideation on college campuses ranges from 6% to 12% [2-4]. Suicidal thoughts and behaviors are highly prevalent public health problems with devastating consequences and there is an urgent need to improve our understanding of the risk factors for suicide to identify effective intervention targets [5]. In this paper we have focused on student population, which is at an elevated risk of suicidal ideations and behavior [6].

Students are usually in age group that varies between 18 and 25 years, which is called emerging adulthood [7]. This developmental period is specific and exists only in those cultures that allow young people in their late teens and twenties to explore their role for a prolonged period of time [7]. It includes challenges such as exploration and identity development, transition from full dependence to semi dependence on their parents, forming new social relationships, managing finances and leaving their primary support system [7]. This is a period during which individuals have a possibility to make different choices and engage in a variety of behaviors that can influence rest of their lives [8], which can be very stressful for a young person.

Sometimes, individuals can expect negative outcomes for highly valued events and feel helpless to change them [9]. Hopelessness is considered to be the most important trait in suicidal adolescents [10,11] and it is significantly associated with suicidal ideation in general [12,13], but also in college population [15]. Many known risk factors for suicidal behavior actually predict suicide ideation, but not the transition from ideation to attempt [16]. It is important to understand how people move along the entire pathway to suicide: from the onset of the thought, to developing a plan and intention, to making preparations, to making a decision to act, and actually carrying out the attempt. This paper is focused just on the first part, trying to explore some of the predictors of suicidal thoughts.

According to recent meta-analysis [16] besides suicide attempt history, nonsuicidal self-injury was the strongest predictor of later suicide attempts. Nonsuicidal self-injury (NSSI) is defined as direct

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and deliberate self-harm enacted without the desire to die with the lifetime prevalence rates from 5.5 to 17% in community samples [17]. Approximately 15% to 20% of college students report lifetime NSSI, with 3% to 7% reporting 12-month NSSI [18]. The significance of NSSI was recently emphasized by the DSM-V with the inclusion of the NSSI disorder as a "condition requiring further study" [19] and research show that risk of suicide following NSSI is persistent in an long-term period, up to 15 years [20]. Some authors consider suicidal thoughts, attempts and NSSI as different stages on the continuum of deliberate self-harm, where suicide is the final stage with the most serious outcome [21-23], In our research we wanted to explore the mechanisms underlying the occurrence of NSSI and its connectedness with suicidal ideations among college students.

As a key factor in adolescents' suicidal behavior, as well as in adult psychiatric patients, impulsivity stands out [10,24,25]. As a personality trait, it is associated with many behaviors that include low self-regulation, such as poor planning, too early response before considering consequences and decreased sensitivity to negative consequences of behavior, sensation seeking, risk taking etc. [25-29].

One possible moderator of the relation between depression, hopelessness and suicidal ideations is also social support, which has been recognized as an important protective factor for suicide [10,30]. For students who are able to form new relationships, healthy connectedness with parents may buffer them from feelings of sadness or loneliness. The nature of relationships with significant persons in one's life can be explained through one of the most famous attachment theories, Bowlby's attachment theory [31]. The relationship with parents teaches an adolescent to regulate their emotions, take a perspective, negotiate, control impulses and express feelings, which are all protective factors from suicide and depression [32,33]. On the other side, peer relations are more and more important as a child enters adolescence and moves towards adulthood. Instead of seeking intimacy, support and connection in parents, adolescents are more prone to seek those in their peers [32]. Good communication and a trustworthy relationship with their mother was found to be negatively associated with NSSI, while maternal and peer alienation is positively associated with such behaviors [34].

Going to college is an exciting and positive experience, but the college environment represents a novel situation that may activate the attachment system, especially for those who live away from their parents [35-37]. For students who change their residence in order to attend college, the academic surroundings can be an additional stress that enhances their feeling of isolation from the rest of the family [38,39]. Secure attachment relationships offer support in times of stress, allowing students to better adjust during the process of leaving home and acclimatizing to a new academic environment [36,40,41], while poor relationships with parents, rigid family functioning and unrealistically high parents' expectations are some of the factors influencing young person to think about suicide [42].

The main aim of this study is to investigate the role of attachment to parents and peers as a possible protective factor and the role of impulsivity as a potential risk factor for developing suicidal ideation and NSSI among college students. The mediating role of attachment to parents and peers as well as impulsivity in the relationship between hopelessness and suicidal ideations/NSSI in students will also be tested. Additionally, we wanted to check the differences between students who changed their residence and those who remained living with their family. We expect that the students who left home in order to attend college will be more prone to engage in NSSI and have suicidal ideations comparing to those who have stayed at home with their family. We also expect that students who are poorly attached to their parents and peers and on top of that have moved away from their familiar surroundings, could be at an elevated risk of developing suicide ideations and NSSI. Change of residence will be tested as a possible "trigger' factor for developing suicidal ideations and engaging in NSSI in this research.

It is important to investigate mechanisms of development of suicidal ideations and NSSI as a major public health concern, and to develop more effective prevention strategies in order to decrease the rate of young people harming themselves. This research has included college students' hopelessness, impulsivity, suicidal ideations, NSSI, attachment to parents and peers into one research, taking into account their residential status, as we did not find any other research that has combined all these factors. Some previous results and theories also suggest that change of residence can be distressing [43] and students with weaker social ties, suffering from a sense of non-belonging, are more prone to suicide attempt [44].

Method

Participants

Data were collected from 353 students (234 females) from different faculties at University of Rijeka, Croatia, with the age range from 18 to 31 years (M=20.28).

Measures

The *Beck Hopelessness Scale* (*BHS)* [45] is a 20-item self-report measure of hopelessness or negative attitudes about future events. Each dichotomous (true/false) item reflects how the respondent currently feels. The total score was obtained by summing all the individual items, with a higher score being indicative of stronger negative attitudes about the future. Studies with the BHS have reported satisfactory estimates of internal consistency and concurrent validity for the total BHS score [46]. Convergent validity has been demonstrated by high correlations between the BHS and similar constructs in university students [47]. In the current study the internal consistency reliability (Cronbach Alpha) was .80.

The *Inventory of Parent and Peer Attachment* (*IPPA*) [48] measures positive and negative affective and cognitive dimensions of parent and peer attachment based on current perceptions of relationship quality. Two questionnaire forms try to measure the extent to which parent and peer figures serve as a source of psychological safety. Each inventory form consists of 25 items in each section (mother, father and peer) and yields three attachment scores. Items are scored on a Likert type scale ranging between 1 (almost never or never true) and 5 (almost always or always true). The total score is calculated as a simple linear combination of all the statements. A lower score means a lower quality of attachment. In this sample, all three forms of inventory have shown a satisfying internal consistency. The Cronbach Alpha coefficient for mother inventory is .70, for father inventory .73, and .79 for the peers inventory form.

The *Barratt Impulsiveness Scale* (*BIS 11)* [49] measures impulsivity and consists of 30 items scored on a Likert type scale from 1 (rarely/never true) to 4 (almost always/always true). It is one of the most frequently used instruments that assess impulsivity as a trait. It measures common impulsive and non-impulsive behaviors and preferences. The questionnaire was translated into the Croatian language. Factor analysis has been conducted (PAF, Oblimin rotation) which resulted with two factors, but due to low saturation on one factor (below .30) and moderate reliability (Cronbach Alpha=.66), only one factor named *Impulsivity* has been used. It consists of 12 items with internal consistency (Cronbach Alpha) in this study of .78.

The *Self-harm CAT-PD* [50] questionnaire consists of 7 items where participants respond on a Likert type scale ranging between 0 (never) to 4 (almost always/always). It measures a range of self-harm thoughts, feelings and behaviors which are connected to both lethal

and non-lethal intentions. The total score is obtained by calculating the arithmetical mean and standard deviation of the sample on which it was used, and using those parameters as norms. This means that individual scores are being compared with the scores gathered on the rest of the sample they belong to. The author has suggested this type of scoring to avoid dividing people into categories, and to observe scores as part of the same continuum rather than specific categories [50]. The authors also suggest that all scores above half standard deviation from the arithmetical mean are considered high and all scores below half standard deviation from the arithmetical mean are considered low [50]. In this study, we are interested in scores above that line, which indicate high self-harm behaviors and high suicidal risk. Factor analysis has been conducted (PAF, Oblimin rotation) and one factor has been extracted, explaining 50.71% of the total variance, with high internal consistency (α=.84).

Suicide ideation was measured by one single statement from the *Self-harm CAT-PD* [50] questionnaire "Frequently have thoughts about killing myself". It was used as a continuous variable and higher score on that variable means more frequent occurrence of suicidal ideations.

The demographic data questionnaire included data on age, gender, faculty, year of college and residential status (living with or away from parents when attending college).

Procedure

The study was carried out by group poll during classes in the winter semester of academic year 2014/2015. Students were informed about the purpose of the study and its potential benefit for the community. Before the poll started, it was explained that data collecting is anonymous and that it would not be possible to connect the collected data with the identity of the persons taking part in this research. If a student decided to participate in the study, they were given two copies of an informed consent form where they signed that they agreed that the data collected could be used for scientific-research purposes. One copy was kept by the participant and one was handed to the author who filed it. After taking the poll, a short *'debriefing'* was carried out, during which it was again explained to the participants that their results were anonymous and cannot be in any way connected to their identity. For all persons, the subject of this research is very intimate and those participants who were thinking about suicide or NSSI could feel extreme discomfort when taking the poll. For this reason, students were provided with contact information for the University Counseling Center and a personal phone number, as well as the electronic mail address of the author, so they could talk to someone regarding their problems. This procedure is extremely important for the wellbeing of the participants, due to the specificity of the research topic, and the possible discomfort it could cause, although the risk in this research does not overcome the usual risk that the participants experience in their everyday life when thinking about this topic. We requested and obtained permission from the Ethics Committee to conduct this research.

Results and Discussion

The main aim of this study was to check the role of attachment to parents and peers as a possible protective factor and the role of impulsivity as a potential risk factor for developing suicidal ideation and NSSI among college students, considering change of residence as a possible 'trigger' for developing those thoughts and behaviors.

Our data showed that 16.4% of the students who participated in this study are involved in some kind of NSSI (11.6% of students who have changed their residence and 4.8% of students who remained at home) while 17.3% of them have suicidal ideations (12.9% of student who changed the residence and 4.4% of students who stayed at home). These results are in line with data from American universities where 11% of students endorsed current (in the past 4 weeks) suicidal ideation and 16.5% had a lifetime suicide attempt or self-injurious episode [51]. Not all of those who are involved in NSSI attempt suicide, but after the first episode of NSSI the risk of attempting suicide increases in comparison to individuals with no history of NSSI [52,53]. NSSI is a phenomenon occurring most often during the period of late adolescence when it is related to suicide, and some research show that approximately 13-45% of the adolescent nonclinical population is engaged in NSSI [17], which is accordant to our findings. In clinical samples, the numbers are much higher and raise up to 40-60% [17]. Our data are compatible with the studies including the nonclinical population, even if some students could satisfy criteria for a psychiatric diagnosis.

Differences between students who changed their residence after enrolling at college and those who remained living in their family home, regarding levels of hopelessness, experience of suicidal ideations and NSSI

In order to examine the differences between those students who have changed their residence after enrolling college compared to those who remained at their family home, the t-test was conducted. The results are presented in Table 1.

Even if there is no difference in the feelings of hopelessness and attachment to parents and peers between the two groups, students who changed their residence have higher risk of suicidal ideations and a greater tendency for engaging in NSSI compared to those who stayed at home, although with very small effect-size, which supports the findings that change in residence due to starting university may be a possible trigger for developing depression and suicidality [43]. Some research show that suicidality in students is higher when they often change residence and that the risk of suicide increases with each new change of residence. This is not surprising since for those students who no longer live in familiar surroundings and have lost their everyday support of persons close to them, the academic surroundings can be an additional stress and enhance their feeling of isolation and loneliness [38,39].

In order to determine the correlation between all the variables included in the study, Pearson coefficients have been computed and presented in Table 2.

Results show moderate negative correlation between attachment to mother, father and peers on one side and hopelessness, suicidal ideations and NSSI on other side. This suggests that students who are less attached to their parents or peers, are more likely to feel hopeless and engage in NSSI or have suicidal ideations. As expected, hopelessness is positively correlated to NSSI, impulsivity and suicidal ideations which suggests that students who feel hopeless, are more

Table 1: Differences between those students who changed their residence and those who remained in their family home, regarding the occurrence of suicidal ideations, hopelessness and NSSI.

	Students who changed residence		Students who remained in their family home		df	t	Cohen d
	M	SD	M	SD			
Hopelessness	4.06	3.25	4.24	3.86	336	-0.43	-0.05
NSSI	1.55	3.41	1.12	2.30	343	1.19*	0.13
Suicidal ideations	0.28	0.67	0.18	0.48	345	1.34**	0.14
Attachment to mother	81.03	11.59	80.51	13.12	325	0.35	0.04
Attachment to father	75.48	15.20	74.31	15.80	302	0.60	0.07
Attachment to peers	98.84	13.71	99.57	11.79	318	-0.45	-0.05

*p<.05; **p<.01

Table 2: Correlations between variables included in the study.

Changed their residence Remained living at home	Hopelessness	NSSI	Attachment to mother	Attachment to father	Attachment to peers	Impulsivity	Suicidal ideations
Hopelessness	-	.56**	-.34**	-.28**	-.34**	.32**	.39**
NSSI	0.48**	-	-.32**	-.30**	-.22**	.36**	.66**
Attachment to mother	-0.26*	-0.18	-	.58**	.35**	-.29**	-.20**
Attachment to father	-0.39**	-0.21*	0.85**	-	.27**	-.36**	-.20**
Attachment to peers	-0.26*	0.39**	0.29*	0.39**	-	-.14**	-.19**
Impulsivity	0.38*	0.35**	-0.38**	-0.50**	-0.22*	-	.26**
Suicidal ideations	0.33**	0.57**	-0.24**	-0.31**	-0.30**	0.26**	-

**p <.01 *p<.05

likely to engage in NSSI and have suicidal ideations, and are also more often impulsive by nature. Impulsivity and attachment to parents and peers are negatively correlated which is expected, having in mind that attachment is a protective factor and impulsivity is a risk factor.

The mediating role of attachment and impulsivity in the relationship between hopelessness and suicidal ideations and hopelessness and NSSI in students who remained living in their family home

In order to examine the role of attachment and impulsivity in explaining the occurrence of suicidal ideations and NSSI in students who remained living in their family home, eight hierarchical regression analyses with mediating effects were conducted. The only mediator found to be statistically significant in this group of students is impulsivity, which partially mediates the relationship between hopelessness and NSSI (Sobel z=1.99, p<.05) in this group. That means that after introducing impulsivity into the model, the effect of hopelessness on NSSI was reduced but did not disappear, which means that this effect is only partially mediated by impulsivity. This mediation is presented in Figure 1.

Mediation analysis shows that students engaged in NSSI are more impulsive by their nature (Figure 1), which is consistent to previous findings of this topic [54,55] and could mean that impulsivity as a trait facilitates engaging in NSSI behavior in students feeling hopeless.

On the other hand, attachments to mother, father and peers do not have an important role in this relationship. The procedures of testing the mediating role of attachment to mother (Sobel z=0.60, p=0.55), father (Sobel z=-0.27, p=0.79) and peers (Sobel z=-0.47, p=0.64) in the relationship between hopelessness and NSSI, as well as procedures of testing the mediating role of impulsivity (Sobel z=1.46, p=0.15), attachment to mother (Sobel z=-0.95, p=0.34), father (Sobel z=-0.97, p=0.33) and peers (Sobel z=-1.49, p=0.14) in the relationship between hopelessness and suicidal ideations, have resulted in a non-significant Sobel z test which indicates no mediating effect.

This finding is in line with those findings that suggest impulsivity as a trait often connected with suicide attempts [56] in such a way that it increases the vulnerability for suicidal behavior [25]. That means it affects behaviors more than thoughts, which would explain why impulsivity in this group of people facilitates engaging in NSSI, but not having suicidal ideations. Even though attachment to parents and peers does not mediate the relationship between hopelessness and suicidal ideations and hopelessness and NSSI, it is possible that just being in a familiar surrounding reduces the risk of suicidal ideations. If we look at it as a continuum of self-harm behaviors as some authors suggest [21-23], suicidal ideations would mean progression in severity of symptoms, moving towards suicide. If change of residence, as we hypothesized, is a trigger factor in these relationships, then we could assume that in students who did not have to move from their family home, hopelessness won't progress from NSSI to suicidal ideations.

The mediating role of attachment and impulsivity in the relationship between hopelessness and suicidal ideations, and hopelessness and NSSI in students who changed their residence after enrolling at college

In order to examine the role of attachment and impulsivity in explaining the occurrence of suicidal ideations and NSSI in students who changed their residence, eight hierarchical regression analyses with mediating effects were conducted. The analyses have shown the existence of partial mediating effect of impulsivity (Sobel z=3.25, p<.01), attachment to mother (Sobel z=-2.53, p<.05), and attachment to father (Sobel z=-2.26, p<.05) in the relationship between hopelessness and NSSI, as well as partial mediating effect of impulsivity (Sobel z=2.07, p<.05) in the relationship between hopelessness and suicidal ideations. After introducing the mediator into the model, the effect of hopelessness on NSSI is reduced but did not disappear, which means that this effect is only partially mediated by impulsivity, attachment to mother and attachment to father. The same effect has been found in the relationship between hopelessness and suicidal ideations with impulsivity as a mediator. The results are presented in Figure 2-4

Based on previous studies that emphasize the protective role of attachment to parents in suicidal ideations and NSSI [10,32,33,57], we have hypothesized that attachment to parents and peers will mediate

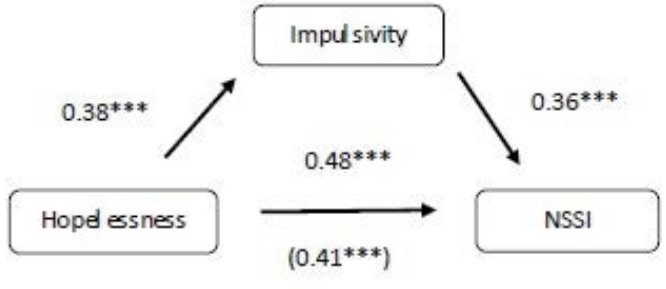


Figure 1: The mediating role of impulsivity in the relationship between hopelessness and NSSI for students who remained living at home.

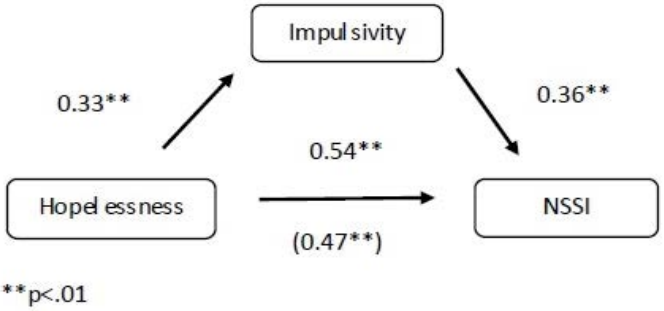
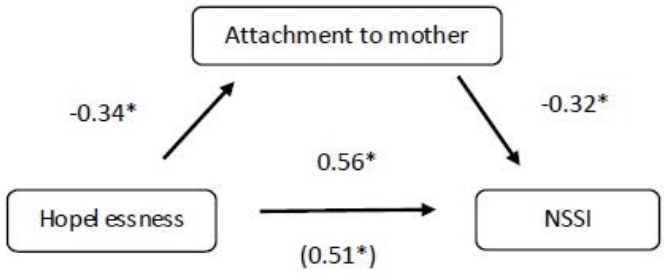
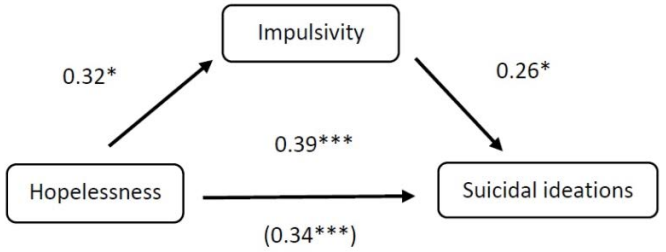


Figure 2: The mediating role of impulsivity in the relationship between hopelessness and NSSI for students who changed their residence after enrolling college.



*p<.05

Figure 3: The mediating role of attachment to mother in the relationship between hopelessness and NSSI for students who changed their residence after enrolling college.



*p<.05; ***p<.001

Figure 5: The mediating role of impulsivity in the relationship between hopelessness and suicidal ideations for students who changed their residence after enrolling college.

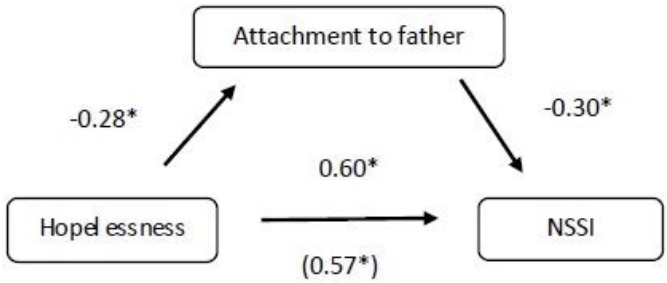
the relationship between hopelessness and NSSI and hopelessness and suicidal ideations. The results show no mediation role of attachment to parents and peers between hopelessness and suicidal ideations, but attachment to parents does partially mediates the relationship between hopelessness and NNSI in the group of students who changed their residence after enrolling at college (Figures 3-5).

Impulsivity seems to play more important role in the group of students who changed their residence, enhancing both their engagement in NSSI and suicidal ideations (Figures 2 and 5). As a risk factor, it has its role in both students who live with their family as well as those who changed residence. In those living with their family it facilitates engaging in NSSI behaviors, while in those who changed their residence impulsivity is stronger, and it 'pushes' a student not only to engage in NSSI but also to think of suicide.

The procedures of testing the mediating role of attachment to peers in the relationship between hopelessness and NSSI (Sobel z=-0.47, p=0.64), as well as procedures of testing the mediating role of attachment to mother (Sobel z=-1.45, p=0.15), father (Sobel z=-1.46, p=0.14) and peers (Sobel z=-0.98, p=0.32) in the relationship between hopelessness and suicidal ideations have resulted with a non-significant Sobel z test which indicates no mediating effect.

Results of testing the mediating effect of attachment to parents are accordant with those by Lamis et al. [3] who have found that the association between depressive symptoms and hopelessness was stronger among poorly supported students compared to students perceiving higher levels of social support. A possibly depressed college student with a strong supportive social network may be protected against developing hopelessness about his or her situation and less likely to manifest NSSI. As students who left home are at a higher risk of being isolated and not well supported [43], it is important to provide them with mechanisms to build new social networks at college (e.g. study groups, sports teams, clubs) and to maintain social supports from afar.

This research indicates a high prevalence of suicidal ideations and NSSI in our sample of college students, especially in those who



*p<.05

Figure 4: The mediating role of attachment to father in the relationship between hopelessness and NSSI for students who changed their residence after enrolling college.

have moved away from home. Change of residence appears to be the 'trigger' factor for developing suicidal ideations and engaging in NSSI. When those students feel hopeless, moving away from family will probably enhance progression towards more serious behaviors on the path of symptom severity. In this relationship attachment to parents is a protective factor which buffers a student who changed residence from feeling isolated and hopeless and engaging in NSSI, but it does not prevent him from having suicidal ideations.

These results could mean that attachment is a protective factor only in case of NSSI engagement, but when it comes to suicidal ideations that indicate progressing towards the act of suicide as a more serious outcome, attachment as a variable is not strong enough to prevent it. These data are in opposition with the three-step theory [58], according to which the feeling of connectedness may protect individuals against a progression of severity into suicidal thinking.

These findings suggest that the factors examined in the relationship between hopelessness, NSSI and suicidal ideations are not so significant that they could reduce the strong effect of hopelessness, which is in accordance with the interpersonal theory of suicide that argues that the interaction between thwarted belongingness and perceived burdensomeness significantly predicted current suicidal risk only at high levels of hopelessness [59]. In our sample 54.7% of the participants have no signs of hopelessness, 34.9% have mild hopelessness, 8.7% have moderate level of hopelessness and only 1.7% of them have severe hopelessness. One optimistic implication derived from this research is that cognitive-behavioral interventions may be more efficient in treating feelings of hopelessness compared to more stable personality traits such as impulsiveness.

We should also mention some of the limitations of our study. First, it was conducted with a small, non-representative sample of students. Future research should use larger samples including more male participants and focus more on freshmen who are at highest risk of developing suicidal ideations and NSSI, considering the fact that enrolling college is the most challenging life event and the biggest change in life during emerging adulthood. This is especially the case for those who have to move away from their family home. Also, replication of this research on a clinical sample would provide more information on impulsivity as a trait and other possible factors that, above hopelessness, increase suicidal ideations and engaging in NSSI.

It would be also useful to consider students' relationship status. Having a stable romantic relationship could minimize the negative effects of moving from home and living a stressful college life with not enough support from the family. On the other hand, a long-distance relationship could strengthen the negative effects of moving from home.

Conclusions

The results of this study have important implications. The significant mediating role of attachment to parents indicates that the

relationship with parents does not lose its importance in emerging adulthood, but only changes in form through a persons' life span. Starting from adolescence, the relations with peers may overtake those with parents, but in stressful and difficult times, when strong support and closeness is needed, adolescents still turn to their parents as an important source of support. When in crisis, if a parent is not available, student can be in such a distress that he/she thinks of suicide. Positive attachment to parents provides a strong base for creating new quality relationships. University support services should recognize and help those students who are in need of help, as a number of those students is significant. Among other interventions, it is important to strengthen students' bonds with other people, providing them social support they are lacking.

Cognitive-behavioral interventions directed at non-suicidal self-injury behaviors with simultaneous skill acquisition of alternative coping behaviors and study skills training may be best suited to teach students how to manage overall stress and to reduce such kind of risky behaviors [60].

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Conflict of interests

There is no conflict of interests.

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