

Comparison of Emotion Regulation Skills and Suicide Probability in Adolescents with Self-Harm

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ABSTRACT

Objective: Self-harm was classified to show forms like non-suicidal self injury and indirect risky behaviors and drug abuse. The aims of this study were to compare suicidal tendencies indexes and difficulty in emotion regulation skills in mixed groups of adolescents with direct and indirect forms of self-harm.

Methods: In a casual-comparative design from population of delinquent adolescents detained in Tehran correctional center and adolescents with histories of childhood maltreatment who lived in Iranian social welfare centers. 238 adolescents were selected. Then Groups based on direct and indirect self-harm were formed (control group, direct self-harm, indirect self-harm and mixed group). We used self-harm checklists, difficulties in emotion regulation checklist and suicide probability scale as instruments.

Results: Suicide probability of adolescents in mixed group was significantly higher than that of all groups but there weren't significant differences between direct and indirect self-harm. There weren't significant differences between groups in emotion regulation skills ($P < 0.001$). Scores of impulse control difficulty subscale in adolescents with direct self-harm were significantly higher than those of indirect self-harm group ($P < 0.001$); but the scores of mixed group and direct self-harm in impulse control were equal. Suicide ideation of indirect self-harm group was as much as mixed group.

Conclusion: Adolescents with direct and indirect self-harm were equally prone to suicide. These findings suggest that inability to impulse control and suicide ideation could be targets for decreasing suicide probability in adolescents with direct and indirect self-harm.

1. Introduction

Self-harm was one of the most challenging and controversial issues in clinical psychology. For example various terms such as non-suicidal self-injury (NSSI), deliberate self-harm (DSH), para suicide, self-mutilation has been used for referring to these phenomena. Direct forms of self-harm consist of behaviors such as self-cutting and self-burning that the effects of damage are immediate and intent of damage was unambiguous, but indirect self-harm includes behaviors such as substance abuse, eating disorders and risk-taking

behaviors that the effects of damage was accumulative and the harm intended in this behaviors was ambiguous (Walsh, 2005). Self-harm especially self-injury is classified as the main symptom of borderline personality disorder, but new studies suggested that self-harm could exist in other psychiatric disorders (Nock, Joiner, Gordon, Liroyd-Richardson, Prinstein, 2007), and there have been proposed new diagnostic entity for direct self-harm behaviors like nonsuicidal self-injury syndrome (Shaffer & Jacobson, 2009). Epidemiological studies in the USA showed that rates of deliberate self-harm in adolescents were 14% in general population (Ross & Heath, 2002). Lifetime prevalence of adolescents

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self-injury in a cross-national study from Italy, the Netherlands and USA found that 24% of the whole sample had a history of one episode of self-injury (Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012). Prevalence of different forms of direct forms of self-harm in American correctional system has been reported between 6% to 44% (Penn, Esposito, Schaeffer, Fritz, & Sprito, 2003). Furthermore, history of childhood abuse was associated with self-harm in adolescents (Gratz, 2003). There have been many questions about different kinds of self-harm and relationship between self-harm and suicide attempts. One way to reach a unified conceptualization of different kinds of self-harm is to examine their similarities and differences based on some risk factors such as emotion regulation skills and suicide proneness. If we know more about relationship between direct and indirect self-harm, thereafter we can better explain whether considering new diagnostic category such as non suicidal self-injury is true or it is better to regard self-harm as a mere symptom of borderline personality disorder.

Self-harm could be conceptualized as a maladaptive emotion regulation strategy (Gratz, 2003). There have been some identified kinds of emotion regulatory function for direct self-harm like non-suicidal self-Injury (NSSI) such as decreasing or enhancing negative or positive emotional states (Nock & Prinstein, 2004). Emotion regulation strategies could moderate or exacerbate negative effects of stressful life events on suicide attempts.

In a clinical study on 57 adolescents with childhood sexual abuse, ability to understand and manage emotions and ability to perceive emotions and integrate emotions into thoughts and acts like protective factor that buffer negative effects of childhood sexual abuse on suicide attempts (Cha & Nock, 2009). Difficulties in emotion regulation have been associated with direct self-harm in undergraduate students (Gratz & Roemer, 2008). Adolescents with low frequency of self-harm who keep doing self-harm have difficulty in emotion regulation strategies such as difficulty in cognitive reappraisal and more suppressive negative emotions (Andrews, Martin, Hasking, & Page, 2013).

Previous studies showed that individuals with direct self-harm especially NSSI have problems in using emotion regulation strategies and accepting emotional states (Perez, Venta, Garanaat, & Sharp, 2012). Also, Among high school students in an undeserved community in United States of America, lack of clarity in discriminatory emotions and limited access to emotion regulation strategies predicted suicide attempts (Pisani et al., 2013); but there has been no study that investigated differences between emotion regulations disturbance in direct and indirect forms of self-harm in adolescents. Some theories (Zeman, Cassano, Perry-Parrish, &

Stegall, 2006) asserted that emotion regulation difficulties varied in different internalizing and externalizing disorders in children and adolescents. So, it could be suggested that there would be differences between self-harm groups based on emotion regulation difficulties.

Suicide probability can be examined based on four indexes that include hopelessness, negative self-evaluation, hostility-impulsivity and suicide ideation (Cull & Gill, 2002). Self-harm, especially direct forms of self-injury like NSSI were robust and significant predictors of suicide attempts (Hawton, Zahl, & Weatherall, 2003; Asarnow et al., 2011). Based on interpersonal theory of suicide (Joiner, 2005), adolescents with direct self-harm were more prone to suicide attempts because by experiencing pain and direct exposure to death cues their capacity to harm themselves will be increased. But, it is unknown whether adolescents with indirect self-harm are prone to suicide as much as individuals with direct self-harm or not.

However some believed that being risk taking and having maladaptive eating patterns would be indicative of suicide proneness (Rohd, Seeley, Langhinrichsen-Rohling, & Rohling, 2003), but there hasn't been any study that compares suicide probability of adolescents with this behavior based on some known risk factors of suicide attempts such as hostility-impulsiveness or suicide ideation. In summary, this study aimed to explore and compare suicide probability and emotion regulation skills in a mixed sample of adolescents with direct and indirect self-harm.

2. Methods

We used a casual-comparative design. The sample consisted of mixed group of adolescents with histories of childhood maltreatment from Iranian social welfare centers in Tehran (n=169) and adolescents with delinquent behavior living in Tehran correctional center (n=69). This strategy in comparison was not ideal in groups, but because we need to find different kinds of self-harm behaviors, we decide to study different high risk groups whose rates of self-harm were more prevalent than general population.

Also, in previous study on self-harm in adults had been used a mixed groups (Gilbert, Clarke, Hempel, Miles, & Irons, 2009). This sample, then divided based on whether having direct or indirect self-harm. One group with no self-harm was assigned as control group. We had four groups: control group, group with only direct self-harm, group with only indirect self-harm and group with both direct and indirect self-harm. Direct self-harm included cutting, burning, suicide attempt, self-hitting, head banging and scratching; while indirect self-harm behaviors included reckless driving,

alcohol use, illicit drug use, sexual risky behavior, maladaptive eating behaviors, losing job or dropping out of collage on purpose. Based on participant's responses in Self-harm checklist, groups were separated according to direct/indirect forms of self-harm.

These adolescents were 12-18 years old and they could read and write. They had psychotic symptoms or cognitive deficits. There were 142 females and 96 males with an overall mean age of 14.23 years. All participants who enrolled in this study completed the consent form. When the result of test showed high risk for suicide attempt, we had to inform the psychiatrists or other staffs of the center to plan for preventive intervention. Group comparison was examined using Multivariate analysis of variance (MANOVA). We used analysis of variance (ANOVA) for comparing groups in subscales. We used Tukey test as post-hoc test to assess differences between two groups separately.

Instruments

Suicide Probability Scale (SPS)

Participants should rate 36 questions based on 4-points likert scoring system (ranging from "none or a little of the time" to "most or all of the time") (Cull & Gill, 2002). Psychometric properties of this scale for adolescents have been approved (Eltz et al., 2007). This scale was administered on Iranian adolescents and findings showed that scores on this scale can discriminate suicidal adolescents from non-suicidal (Sharifian et al., 2011). In this study on adolescents with history of childhood maltreatment, alpha coefficient has been obtained 0.83 for total scale.

Difficulties in emotion regulation scale

Six dimensions of emotion regulation difficulties in this scale include non-acceptance of emotional responses, difficulties engaging in goal directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies and lack of emotional clarity. Participants asked how often does each item apply to them in a 5-points likert type scale ranging from 1 (almost never) to 5 (almost always). Previous studies in Iran and USA had confirmed the factor structure and internal consistency of this scale in both foreign samples and Iranian undergraduate students (Gratz & Roemer, 2004; Khanzadeh et al., 2012).

Self-harm Checklist

We select items of this checklist based on most common kind of direct and indirect self-harm from Self-Harm Inventory (Sanson et al., 1998). Direct self-harm includes

behaviors such as suicide attempts, self-cutting, burning, hitting, head banging, rubbing and picking wounds; whereas indirect self-harm behaviors include physical risk taking, sexual risk taking, using Alcohol and drugs, maladaptive eating behaviors and risky driving. Participants were asked to indicate one of those behaviors they have ever done. We removed some behaviors from indirect self-harm behaviors. For example abusive relationships often occur with force and could not be regarded as a self-harm.

3. Results

Among the whole sample there were 142 female and 96 male. According to classification 86 (36%) of adolescents were assigned in mixed group, 71 (30%) in indirect self-harm group; 42 (17%) were assigned in direct self-harm group and 39 (16%) were in control group. Among the whole sample in terms of age 46 (20%) were 12-14, and 94 (40%) were 15-17 and 98 were 17-18 (40%). Descriptive results about frequency of direct and indirect self-harm in girls and boys were represented in Table 1. There weren't significant differences between scores of boys and girls in suicide probability scale ($t=0.329$, $df=234$, $P=0.742$).

Results showed that boys had more Alcohol use and risky driving experiences than girls. Prevalence of direct self-harm was 17%; while prevalence of 30% had indicated for indirect self-harm. In this study in the whole sample 49% were at sever risk in regard to suicide probability, while 38% were in moderate risk and 11% in mild risk of suicide probability and relationship between suicide probability indexes and self-harm groups was significant ($\chi^2=31.32$, $P<0.001$). Comparison of groups via MANOVA (Table 2) showed that differences between four groups in a linear combination of four subscales of suicide probability were significant ($F=4.72$, $P<0.001$, Wilks Lambda=0.789).

Results of post hoc test (Turkey test) showed that the mean score of mixed group in hopelessness was higher than that of control group ($P=0.004$) but, there were not significant differences between mixed group, direct and indirect self-harm groups. Mean scores of mixed group in hostility/impulsivity were higher than those of other groups ($P<0.001$). Also, scores of mixed group in negative self-evaluation were higher than those of other three groups ($P<0.001$). However, Scores of suicide ideation in mixed group were significantly higher than those of control group ($P<0.001$) and those of direct self-harm group ($P=0.004$); post hoc comparison didn't show significant differences between mixed group and indirect self-harm group in regard to suicide ideation subscale ($P=0.820$).

Table 1. Direct and indirect self harm behaviors by gender.

	Female N (%)	Male N (%)	Contingency coefficient	P
Cutting	66 (55%)	56 (45%)	0.116	0.073
Burning	25 (55%)	20 (45%)	0.040	0.533
Hitting	53 (57%)	43 (43%)	0.089	0.38
Head banging	53 (57%)	44 (43%)	0.085	0.19
Rubbing	30 (58%)	21 (42%)	0.009	0.890
Picking wounds	49 (62%)	29 (38%)	0.106	0.609
Suicide attempt	58 (59%)	40 (41%)	0.008	0.889
Alcohol use	41 (45%)	50 (55%)	0.228	0.001
Risky driving	34 (41%)	47 (59%)	0.252	0.001
Sexual risk taking	37 (56%)	29 (44%)	0.045	0.483
Work/academic failure	51 (59%)	35 (41%)	0.006	0.932
Maladaptive eating habits	46 (56%)	36 (44%)	0.58	0.371
Drug use	29 (46%)	34 (54%)	0.17	0.28
Direct self-harm	22 (52%)	20 (48%)	0.223	0.45
Indirect self-harm	41 (57%)	30 (43%)	0.223	0.006

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Furthermore, comparison of groups in terms of emotion regulation difficulties revealed significant differences between four groups on a linear combination of the five difficulties in emotion regulation skills scale ($F=3.33$, $P<0.001$, Wilks Lambda=0.758). As indicated in Table 3, differences between non acceptance of emotional responses, difficulty in goal-directed behavior, impulse control difficulties and limited access to emotion regulation strategies were significant. Post hoc test showed that there weren't significant differences between direct self-harm group and indirect self-harm group in difficulties in emotion regulation subscales except for impulse control subscale ($P<0.001$). Scores of mixed group in nonacceptance of emotional responses, difficulty engaging in goal-directed behavior, impulse control difficulties and limited access to emotion regulation were significantly

higher than those of control group. Also, indirect self-harm group scores in impulse control difficulties were significantly lower than those of mixed group ($P<0.001$).

4. Discussion

The most common types of direct self-harm in both boys and girls were self-cutting and suicide attempts, while using alcohol in boys and academic/work failure on purpose in girls were more common types of indirect self-harm. Current suicide probability of adolescents in mixed group was higher than that of other three groups, but there hadn't been significant differences between suicide probability of direct and indirect groups. Previous findings showed that the more diverse the self-harm methods are, the more the likelihood of suicide attempts will be (Nock,

Table 2. Comparison of groups in suicide probability subscales.

	Group 1 M (Sd)	Group 2 M (Sd)	Group 3 M (Sd)	Group 4 M (Sd)	F	Sig.
Hopelessness	21.89 (4.93)	23.33 (4.48)	22.20 (4.69)	23.56 (5.12)	5.453	0.001
Hostility	14.61 (4.40)	18.33 (4.62)	18.75 (5.8)	21.69 (5.87)	15.62	0.001
Suicide idea	14.63 (5.56)	16.64 (5.37)	18.36 (7.73)	20.92 (6.64)	9.19	0.001
Negative self	17.11 (4.72)	19.40 (4.51)	20.86 (5.52)	22.93 (6.92)	9.76	0.001

Notes: Group 1: Control group; Group 2: Direct self-harm group; Group 3: Indirect self-harm group; Group 4: Mixed group.

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Table 3. Comparison of groups in emotion regulation difficulties subscales.

	Group 1 M (Sd)	Group 2 M (Sd)	Group 3 M (Sd)	Group 4 M (Sd)	F	Sig.
No acceptance	5.39 (4.55)	10.17 (5.47)	8.83 (5.40)	10.95 (5.67)	9.4877	0.001
Goal difficulty	7.11 (3.84)	9.95 (4.51)	9.72 (5.16)	11.30 (4)	7.866	0.001
Impulse control	7.50 (4.03)	12.29 (5.60)	11.01 (5.73)	14.30 (5.58)	14.69	0.001
Awareness	17.63 (4.11)	17.67 (4.33)	17.18 (3.87)	16.81 (3.79)	0.528	0.664
Strategy	10.55 (6.82)	15.50 (5.34)	13.30 (6.68)	16.43 (6.84)	8.185	0.001
Clarity	7.13 (3.97)	9.74 (3.80)	7.89 (3.57)	9.06 (3.27)	4.916	0.002

Notes: Group 1: Control group; Group 2: Direct self-harm group; Group 3: Indirect self-harm group; Group 4: Mixed group.

PRACTICE in
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Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2007). In other words, adolescents who frequently use different types of self-harm may turn to suicide when their self-harm behaviors stop working as an effective regulation technique (Walsh, 2008).

Suicide ideation of adolescents with mixed types of self-harm was more than the direct self-harm group, but had an equal amount with the indirect self-harm group. This result confirmed the anti suicide model of direct self-harm (Messe & Fremouw, 2008). According to this model, most of the behaviors belong to direct self-harm such as NSSI is a way to cope with suicide ideation and had soothing effects that postpone suicide ideation. So adolescents who use self-injury practically decrease their suicide ideation, but adolescents with indirect self-harm haven't apply any direct way to forgo suicide ideation. Our results supported direct self-harm that have different functions such as decreasing in amount of suicide ideation apart from suicide attempts.

Adolescents with mixed types of self-harm had more difficulties in all of the emotion regulation skills compared to control groups. Previous studies indicated that adolescents with both suicide attempts and NSSI have more psychiatric symptoms like depression, hopelessness, anhedonia and emotion dysregulation compared to adolescents with only NSSI (Dougherty et al., 2009; Muhlenkamp, Ertelt, Miller, & Claes, 2010). Our findings indicated that increasing in forms of self-harm was a representation of difficulties in emotion regulation skills. Comparison between mixed group and indirect self-harm in impulse control difficulties showed that mixed group significantly had more severe difficulties in impulse control than indirect self-harm, but mixed groups' score in this scale was equal with that of direct self-harm group and direct self-harm group status in difficulties in impulse control was more worse than that of indirect self-harm.

These findings supported this idea that adolescents with direct self-harm such as NSSI had vulnerability to emotional impulsivity (Nock, 2007). This result was consistent with studies that indicated there have been significant associations between trait impulsivity and engaging in direct self-harm like NSSI (Glen & Klonsky, 2010). It has confirmed that impulsivity was one of the main features of adolescents with past suicide history (Langhinrichsen-Rohling, & Lamis, 2008). So it could be noted that adolescents with direct self-harm was prone to suicide because of severe difficulties in impulse control.

Although adolescents with direct self-harm evaluate their emotion regulations worse than ones with indirect self-harm, there haven't been any significant differences with indirect self-harm in emotion regulation skills except for the difficulty in impulse control. It could be related to low discriminate validity of scale that used for measuring emotion regulation skills. In another study that was used this scale, emotion regulation skills had similar association patterns of internalizing disorder such as depression and externalizing disorder such as alcohol in high school students (Weinberg & Klonsky, 2009). Our results at least showed that impulse control was distinguish demotion regulation difficulties that differentiate direct self-harm from indirect self-harm.

Direct and indirect self-harm groups had not significant differences in suicide probability scale. In only one study that compared emotional problems and suicide proneness of adults with direct and indirect self-harm showed that there were not significant differences between these two groups, but adults with direct self-harm were more prone to suicide (Germain & Hooley, 2012). Our study revealed that proneness to suicide in adolescents with indirect self-harm was as much as adolescents with direct self-harm. This results support theories that using indirect self-harm such as risk-taking, careless driving, doing unproductive thing, and maladaptive eating habits as indexes indica-

tive of suicide proneness (Rohd, Seeley, Langhinrichsen-Rohling, & Rohling, 2003).

According to finding of this study, it could be noted that both adolescents with direct and indirect self-harm was prone to suicide but with different reasons. Adolescents with direct self-harm was prone to suicide attempts because of elevated levels of difficulties in impulse control, but adolescents with indirect self-harm was prone to suicide because of experiencing more suicide ideation. So, preventing suicide attempts in these two groups needs different intervention. For example learning behavior strategies for managing impulsive behavior may be more useful for adolescents with direct self-harm; whereas cognitive restructuring would be more effective for adolescents with indirect self-harm.

In summary, we aimed to show that there were different kinds of self-harm. All of these behaviors in a common diagnosis such as borderline personality may not have functional value and we supported new diagnostic categories such as non-suicidal self-injury syndrome (Shaffer & Jacobson, 2009). Also, it could be suggested that direct and indirect self-harm existed in a spectrum which differed from other dimensions of impulse control difficulties, methods of self-harm and intention. Future studies could assess this assertion about relationship between direct and indirect self-harm by using another methodology and by examining other risk factors such as personality traits or physiological indices of emotion regulation.

Some of the limitations of this study were lack of homogeneity in sample, inequality of boys and girls and using only self-reported measures for assessing self-harm behaviors. In this study, we selected sample from two populations because many of adolescents in Iran rarely express this kind of problems to clinician, indeed we used high risk adolescents for case finding. So, any conclusion or interpretation about this article should be done by regarding this limitation. We suggest that the future research be investigated via predictive values of suicide probability subscales in direct and indirect self-harm groups and compare the diagnosis of adolescents with direct and indirect self-harm by structural clinical interview.

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