ORIGINAL SCIENTIFIC ARTICLE

ROLE OF GENDER IN PHEMENON OF NON-SUICIDAL SELF-INJURIES AND SUICIDE ATTEMPT AMONG CLINICAL POPULATION OF ADOLESCENTS

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ABSTRACT

Non suicidal self-injury is defined as intentional self-inflicted injury without the intent to die. Suicide attempt is defined as a non-fatal, self-directed, potentially injurious behavior with the intent to die. Although distinct behaviors, they are frequently associated and possibly clinically related. The aims of this study are to explore demographic data, social-demographic differences between genders, co-occurrence of non-suicidal self-injuries with suicide attempt, their association with gender and clinical variables. Retrospective cohort study on 143 patient admitted in Clinic for mental disorders „Dr Laza Lazarevic", aged 14 to 18 years, between January 2015 and January 2016. Information were obtained from database and included two categories of variables: socio-demographic (age, gender, education level, current living situation) and clinical variables (abuse, neglect, peer violence, aggressive behavior, non-suicidal self-injuries, suicide attempt and others). The mean age of adolescents was 15.8 years, with female being more frequent in the sample (51.4%). The incidence of Mood disorders was significantly higher ($p<0.05$) in female compared to male ($\chi^2=3,96$, $df=1$, $rC=0.16$, $p=0.04$). A significantly higher incidence ($p<0.05$) of non-suicidal self-injury ($\chi^2=11.15$, $df=1$, $rC=0.27$, $p=0.001$) and suicide attempt was found in female compared to male ($\chi^2=5.38$, $df=1$, $rC=0.19$, $p=0.02$). No statistically significant difference was found in their simultaneous occurrence compared to total population of hospitalized adolescents. The findings of the present study demonstrated that non-suicidal self-injury and suicide attempt occur in clinical population of adolescent more often among female then in male adolescents.

Keywords: *Non-suicidal self-injury, suicide attempt, adolescents.*

INTRODUCTION

Self-injurious behavior (SIB) involves different forms of behavior in which an individual directly and intentionally causes harm to himself, regardless of motivation or the degree of intention to die (1, 2). One form of the SIB is the Non suicidal self-injury (NSSI) defined as intentional self-inflicted injury without the intent to die. Other form of the SIB is the Suicide attempt (SA), defined as non-fatal, self-directed, potentially injurious behavior with an intent to die (1-5). Although these forms of SIB are distinct behaviors differing in intent, form and function, they often co-occur in the same individual (6, 7). Research indicates that self-injury tends to first occur during adolescence (7). On the continuum of self-injurious behavior on which suicide is the ultimate and most severe end, the NSSI is seen as a potential predictor of future SA, which is consider to be one of the most powerful and clinically relevant predictors of eventual suicide (9-11).

NSSI has been listed as a proposed disorder in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) published by the American Psychiatric Association (APA) in 2013 under the category "Conditions for Further Study" (12). This proposal of diagnostic criteria for a future diagnosis is not an officially approved diagnosis and may not be used for clinical use but is meant for research purposes only. The disorder is defined as the intentional, self-inflicted damage to the surface of the body without suicidal intent, which is not socially sanctioned (e.g., body piercing, tattooing, part of a religious or cultural ritual and is not restricted to picking a scab or nail biting).

The most common methods of NSSI are cutting, scratching, hitting or banging, carving, and scraping. NSSI should be distinguished from some other similar forms of self-destructive behavior such as accidental self-harm in which we have an absence of intent or chronic self-destruction in cases of severe eating disorders (anorexia, bulimia) and substance abuse - which is indirect (13).

According to references adolescence is consider to be period with increased risk for the SIB (6-11). NSSI is the most common form of SIB which usually begins in puberty, between age 13 and 15. This phenomenon is reported at an earlier age among girls compared to boys. A girl is therefore at greater risk during adolescence (14-16). Among those who had the NSSI in their history, 70% attempted suicide at least once, and 55% several times. The risk of suicide is the highest in the first 6 months after the NSSI and decreases with time (10, 14, 17, 18). SA are more frequent among young girls than in boys, while the mortality rate of suicide between these groups is not that clear as in adults (17, 18). A strong correlation was found between a large number of NSSI methods, the high incidence of NSSI, and the risk of suicide attempts among adolescents. A history of past suicide attempts is one of the most powerful and clinically relevant predictors of eventual suicide (17, 18). According to references most people initially lack the ability to engage in suicide attempts. The repetition of NSSI might accordingly disrupt the pathways involved in the stress-induced analgesia that leads to the phenomenon of pain tolerance, in other words people become more „brave “to make suicide (8-10). Almost one third of all suicides occur among young people (19- 23). Suicide is the second leading cause of death among 15-29-year-olds and the second leading cause of death for females aged 15-19 (19).

A comprehensive SIB model is needed to better understand of this phenomenon and can help to identify factors that are important for their occurrence but also for its prevention. Previous research has been devoted to identifying risk factors for attempted suicide among adolescents and as well as to identify factors that increase the NSSI risk (24). There are numerous factors that can increase the risk for SIB including genotypic and neurobiological factors (25, 26), psychological and cognitive characteristics, psychiatric disorders of the adolescent (26), family factors (27, 28), peers and schools (29, 30). According to references, the factors that act protectively are good social skills, problem-solving abilities and an internal locus of control, enjoyment and involvement with school, playing sports, family cohesiveness (31).

International variation in data of incidence and prevalence of the NSSI exist. One of the reasons is that most of NSSI are frequently carried out in secret, wounds may be superficial and easily treated by the individual and are not reported to parents or medical professionals. Other reasons are different sociocultural norms, traditions, as well as substance use policies among countries, as well as different methodological factors use in research such as measurement errors and differences in assessment and sampling strategies (32). Provided data are based on three sources: psychiatric samples, hospital admissions and general population surveys.

In Serbia there are no data on NSSI, risk factors for this behavior or data on the relation between NSSI and SA (20). The aim of this study is to explore demographic data, social-demographic differences between genders, frequency of NSSI, co-occurrence of NSSI and SA, association of NSSI and SA with gender and clinical variables.

PATIENTS AND METHODS

A retrospective observational cohort study was conducted at the Clinical Department for Adolescents in the Clinic for Mental Disorders ‘’Dr Laza Lazarevic“. Information regarding these patients was obtained from comprehensive database forms that are completed routinely on all inpatients. These forms contains all data about the patient completed by a Psychiatrist, a Psychologist and an Associative (a Social workers, a Defectologist and a Special pedagogue), as well as all previous medical documentation considering his somatic and mental health. All data have been entered into an electronic database and contain information regarding demographics, patient and family history, psychopathology, somatic and psychiatric diagnoses following ICD-10 criteria, objective examination and treatment. The study was conducted in

accordance with the Helsinki declaration and was approved by the Ethical Committee of the Clinic for Mental Disorders "Dr Laza Lazarevic".

A data collection instrument was designed to include two categories of variables: socio-demographic variables and clinical variables. The main socio-demographic variables included: age, gender, education level, current living situation. The main clinical variables included: previous history, duration and severity of illness, diagnosis, treatment, data of abuse, neglect, peer violence, aggressive behavior, non-suicidal self-injuries, suicide attempt, attempt of homicide, delinquent behavior, the use of alcohol and psychoactive substances.

The database was created in Microsoft Excel 2007, and the data were analyzed using the Software package SPSS for Windows v. 17.0 (SPSS Inc. Chicago, IL). For the description of data, classical methods of descriptive statistics were used.

RESULTS

From January 1 to December 31 in the year 2015, 146 patients were admitted to the Clinical Department for Adolescents. The mean age was 15.8 years, with female being more frequent in the sample (51.4%). Majority of patients have finished 12 grades (69.3%), 7.5% have finished 8 grades while 23.2% have finished less than 8 grades. Most of the patients were living with family (78.8%), others were living in foster home (3.4%) or in the Social Welfare Institution (17, 8). Most of the patient were diagnosed with behavioral and emotional disorders with onset usually occurring in childhood and adolescence (32.2%), 26.7% were diagnosed with schizophrenia, schizotypal and delusional disorders, 15.1% mood disorders, 9.6% neurotic, stress-related and somatoform disorders. Distribution of diagnostic categories is shown in Table 1.

Table 1. Socio-demographic characteristics

Characteristic	Participants (n=146)
Gender (n)	
Female	75
Male	71
Age, years	
Range	14-18
Mean	15,78
Standard deviation	1,14
*Educational level (*n)	
Less than 8 grades	34
8 grades	11
12 grades	101
Current living situation (n)	
Living with family	115
Living in foster home	5
Living in social welfare institution	26
Diagnosis (n)	
Mental and behavioral disorders due to psychoactive substance use	7
Schizophrenia, schizotypal and delusional disorders	39
Mood [affective] disorders	22
Neurotic, stress-related and somatoform disorders	14
Eating disorders	3
Mental retardation	11
Pervasive and specific developmental disorders	3
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	47

No statistical significant difference was found in socio-demographic data in relation to gender. We found a statistically significant difference ($p<0.05$) in the incidence of mood disorders in females compared to males ($\chi^2=3.96$, df=1, rC=0.16, p=0.04).

Table 2. Social-demographic and clinical variable differences between genders

Variable	Male	Female	Test value	p
Diagnosis (N/%)				
Mental and behavioral disorders due to psychoactive substance use	3 (2,05)	4 (2,74)	0,21	0,64
Schizophrenia, schizotypal and delusional disorders	24 (16,44)	15 (10,27)	2,20	0,13
Mood [affective] disorders	7 (4,79)	15 (10,27)	3,96	0,04
Neurotic, stress-related and somatoform disorders	5 (3,42)	9 (6,16)	1,51	0,21
Eating disorders	0 (-)	3 (2,05)	3,23	0,07
Mental retardation	7 (4,79)	4 (2,74)	0,71	0,39
Pervasive and specific developmental disorders	3 (2,05)	0 (-)	2,90	0,08
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	26 (17,80)	21 (14,38)	0,43	0,51
Abuse (N/%)	10 (6,85)	12 (8,22)	0,36	0,54
Neglect (N/%)	9 (6,16)	11 (7,53)	0,37	0,54
Bulling (N/%)	3 (2,05)	2 (1,36)	0,15	0,69
NSSI (N/%)	12 (8,22)	29 (19,86)	11,14	0,00
SA (N/%)	12 (8,22)	23 (15,75)	5,37	0,02
Family history of mental disorders (N/%)	28 (19,18)	22 (15,07)	0,65	0,41
Suicide in family (N/%)	3 (2,05)	2 (1,36)	0,15	0,69
Homicide in family (N/%)	1 (0,68)	1 (0,68)	0,00	0,96
Misuse of PAS (N/%)	30 (20,55)	25 (17,12)	0,35	0,55
Misuse of alcohol (N/%)	35 (23,97)	29 (19,86)	0,50	0,47

NSSI was reported in 28,1% of adolescents, more frequent among girls (70,7%) then in boys (29,3%). There is a statistically significant difference ($p<0,05$) in the occurrence of NSSI in females compared to males ($\chi^2=11$, 15, df=1, rC=0.27, p=0,001). Among adolescents who had history of NSSI 34.1% met criteria for the behavioral and emotional disorders with onset usually occurring in childhood and adolescence, 24.4% nood disorders, 12.2% schizophrenia, schizotypal and delusional disorders, 9.7% neurotic, stress-related and somatoform disorders.

In this clinical population of adolescents 15.1% reported abuse in their past and 6.2% of them reported NSSI. Further, 37.7% reported misuse of PAS and 13.7% of them reported NSSI; 43.8% misuse of alcohol and among them 14.9% had the NSSI in their past. There is no statistically significant difference in the association of these clinical variables and NSSI compared to total clinical population.

Data on family history showed that 34.1% of adolescents have family member who suffers from mental illness, and 10.3% of them were engaged in the NSSI. Suicide in family was found in 3.4% of adolescents and 2.1% of them reported NSSI. This data didn't show a statistically significant difference in the association of these clinical variables and NSSI compared to total clinical population.

The simultaneous occurrence of the NSSI and SA was found in 4.8% of adolescents, which does not indicate a statistically significant difference ($\chi^2=1.49$, df=1, rC=0.10, p=2.22) compared to the total population of hospitalized adolescents.

SA was reported in 24% of total of hospitalized adolescents, among which 32.4% in girls and 16% in boys. There is a statistically significant difference ($p<0.05$) in the occurrence of SA in the females compared to males ($\chi^2=5.38$, df=1, rC=0.19, p=0.02).

Table 3. Social-demographic and clinical variable differences related to the NSSI

Variable	NSSI		Test value	P
Diagnosis (N/%)	Yes	No		
Mental and behavioral disorders due to psychoactive substance use	4 (2,74)	3 (2,05)	3,07	0,08
Schizophrenia, schizotypal and delusional disorders	5 (3,42)	34 (23,29)	6,13	0,01
Mood [affective] disorders	10 (6,85)	12 (8,22)	3,87	0,04
Neurotic, stress-related and somatoform disorders	4 (2,74)	10 (6,85)	0,00	0,96
Eating disorders	2 (1,36)	1 (0,68)	2,25	1,33
Mental retardation	2 (1,36)	9 (6,16)	0,57	0,44
Pervasive and specific developmental disorders	3 (2,05)	0 (-)	1,19	0,27
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	14 (9,59)	33 (22,60)	0,10	0,75
Abuse (N/%)	9 (6,16)	13 (8,90)	2,11	0,14
Neglect (N/%)	7 (4,79)	13 (8,90)	0,54	0,45
Bulling (N/%)	0 (-)	5 (3,42)	2,02	0,15
SA (N/%)	7 (4,79)	28 (19,18)	1,48	0,22
Family history of mental disorders (N/%)	15 (10,27)	35 (23,97)	0,13	0,71
Suicide in family (N/%)	3 (2,05)	2 (1,36)	2,61	0,10
Homicide in family (N/%)	0 (-)	2 (1,36)	0,79	037
Misuse of PAS (N/%)	20 (13,70)	35 (23,97)	2,99	0,83
Misuse of alcohol (N/%)	21 (14,38)	43 (29,45)	1,26	0,26

DISCUSSION

Epidemiological studies have shown that rates of the NSSI vary remarkably between countries. NSSI is present among adolescents both in community as well as in clinical settings (32-34).

The prevalence of NSSI in our study, among one year clinical population of adolescent, was 28.1%. Prevalence rates of the NSSI among adolescent samples range from 14% to 40% in the community (33) and from 40% to 61% in inpatient samples (32). In the United States, in the clinical population of hospitalized adolescents the mean prevalence of NSSI is around 35%, while its prevalence in the general population of adolescents is thought to be around 10% (35). In England data from a hospital admission monitoring study indicate that 0.3% males aged between 15 and 24 years, and 0.7% females of the same age are engaged in NSSI each year, while general population study carried out in the same country found that almost 5% of males and 8% of females aged between 13 and 15 years reported the NSSI and SA (32-34). Data from the Child and Adolescent Self-harm in Europe (CASE) Study involving seven European countries (Australia, Belgium, England, Hungary, Ireland, the Netherlands and Norway) has showed that 8.9% of females and 2.6% of males reported an episode of self-harm in the past year, and 13.5% and 4.3% respectively reported an episode sometime in their lifetime (33).

The present study confirms earlier findings that the NSSI and SA are considerably more common among female than males (14-16). According to The Centers for Disease Control and Prevention (CDC) of United States who maintains data on the estimated rate of nonfatal self-injury based on a national surveillance system of injuries treated in US Hospital Emergency Departments (the National Electronic Injury Surveillance System), in contrast to suicide mortality, rates of the NSSI and SA are consistently higher among females (35).

Previous studies have reported high rates of mental illness in adolescents engaging in both fatal and non-fatal suicidal behavior and the presence of multiple disorders is associated with especially elevated risk (24, 25) In our study among adolescents who reported the NSSI one third of them met criteria for behavioral and emotional disorders with onset usually occurring in childhood and adolescence, quarter met criteria for the mood disorders, and around 10% psychotic, neurotic and substance abuse disorders. Studies suggest that depression with hopelessness is the most prevalent mental health disorder reported in adolescent population with non-fatal suicidal behaviors. Anxiety, especially when comorbid with depression, has been identified as increasing risk for the SIB (24, 25). Panic attacks have been recognized as the high risk of suicidal ideation and the NSSI. Among adolescents with substance abuse there is also the high risk of SIB. Up to one-third of the young hospitalized after NSSI have consumed alcohol around the time of the act. Alcohol abuse is also associated with increased rates of repetition (24, 25). In our study around 14% of adolescents who had the PAS and alcohol misuse had reported the NSSI.

Abuse, sexual and physical abuse, as well as peer violence is associated with the increased risk of suicidal ideation, SIB and SA among adolescents (27-30). Exposure to

these adverse experiences increase the risk for the SIB through internalizing emotions such as shame, feelings of depression and social isolation, which affect the ability to cope with life stressors. We found out that around 6% who reported abuse in their past also have reported the NSSI. Previous studies have explained that childhood abuse and negative affect together with low emotional expressivity increase the risk of NSSI. Others have showed that there is a direct association between childhood abuse and NSSI through the low self-esteem and dissociation.

Another risk factor for the SIB is parental mental health disorders (24). Results from references show that poor parental mental health is association with the increased risk of both suicide ideation and nonfatal suicide behavior, particularly parental depression and substance abuse. Data on family history in our study showed that 10,3% of adolescents who had family member suffering from mental disorder reported the NSSI. There are also data confirming that a family history of suicide behavior is associated with the increased risk for suicide deaths and NSSI among adolescents. One of the given explanations is that adolescents copy model seen in parents when they fail in their attempt to cope with the unbearable negative feelings that overwhelm them.

In our study, we didn't find a higher incidence of the SA among adolescents with the NSSI, although research has demonstrated a strong correlation between a large number of NSSI methods, the high incidence of NSSI, and the risk of suicide attempts among adolescents (2-4). It is suggested that the NSSI can be understood as a strategy of emotional adaptation and regulation that involves reducing negative emotions, such as anger, tension, anxiety, guilt, loneliness, alienation or hatred towards oneself; to provide a sense of security or control; as punishment, as wish to die, way of communication with surrounding (36, 37). If the adolescent receives relief from the undesirable feeling or thoughts after the first NSSI or if the NSSI brings some changes as a result of the reaction of the environment which are desirable, it is very likely that the NSSI will reoccur. According to references most people initially lack the ability to engage in suicide attempts. The repetition of NSSI might accordingly disrupt the pathways involved in the stress-induced analgesia that leads to the phenomenon of pain tolerance, in other words people become braver to make suicide attempt and suicide (36, 37).

Although these data provide valuable information indicating that the NSSI exists among clinical population of adolescents in Serbia, since there were no data until now, there are several limitations of the study: Data were collected through comprehensive database completed by medical stuff, no self-report measures were used and are retrospective in nature; detailed data about methods and repetition, function of the NSSI are missing; protective factors were not taken into account; one year clinical sample.

CONCLUSION

The findings of the present study demonstrated that the NSSI and SA occur in clinical population of adolescent more often among female then in male adolescents. Getting a better understanding of this phenomenon, its function and relationship with the SA, investigation of risk factors and psychosocial variables associated with these behaviors is a necessary step in helping Clinicians in better assessment of the risk of suicide within this group. SIB as well as suicide among adolescents is a global public health problem. Prevention of self-injury and suicide among adolescents is a challenge in which national suicide prevention strategies are essential for elevating suicide prevention on the political agenda taking into account the dangers and mortality of such behavior.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was conducted in accordance with the Helsinki declaration and was approved by the Ethical Committee of the Clinic for Mental Disorders "Dr Laza Lazarevic".Voluntary written and informed consent was obtained from each participant prior to enrollment in the study.

CONFLICT OF INTEREST

There are no conflicts of interest.

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