

Factors Associated with Non-Suicidal Self-Injury (NSSI) in Iran: A Narrative Systematic Review

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Abstract

Background: Non-suicidal self-injury (NSSI) refers to the intentional damage of one's own body without a suicidal intent, which involves common behaviors such as cutting, burning, scratching, and hitting the body. Identifying factors associated with the development and continuity of NSSI is a research priority, as prevention is crucial. The aim of the current study was to determine factors associated with NSSI in Iran.

Materials and Methods: In this systematic review, Persian databases including Barakat Knowledge Network System, Magiran, SID, and international databases including Scopus, Medline, and Web of Science were searched for relevant publications in English and Persian by using the following Medical Subject Headings search terms: "behavior self-injurious" OR "deliberate self-harm" OR "deliberate self-harm" OR "self-destructive behavior" OR "non-suicidal self-injury" AND "Iran": from 1983 until September 2019. Two independent reviewers studied the full text of the articles and extracted the main results. The results of studies were classified and presented descriptively with a narrative approach.

Results: A total of 334 articles were found of which 18 articles (n= 17343) met the inclusion criteria and were reviewed. More than half of the reviewed articles were cross-sectional (n=16). Three main themes were identified: factors associated with baseline characteristics (such as age and gender); mental disorders (such as depression); and psycho-social factors associated with mental disorders (such as self-concept disturbance).

Conclusion: The meaning of identified main themes shows that the most important factor in occurrence of NSSI in Iranian patients is mental health status. Since the majority of studies were cross-sectional, the data do not yet justify risk factors. Therefore, longitudinal studies with adequate methodological qualities are recommended in future studies.

Key Words: Iran, Non-suicidal self-injury, Risk factors, Systematic review.

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1- INTRODUCTION

Non-suicidal self-injury (NSSI) is defined as the intentional, self-induced harm to the surface of the body without a suicidal intent (1, 2), which involves common behaviors such as cutting, burning, scratching, and hitting the body (3). This definition excludes suicidal behaviors, and socially accepted behaviors like piercing, tattooing, or religious rituals (1). In the fourth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), NSSI and borderline personality disorder were not categorized separately from each other (4), and self-injury was considered as one of the symptoms of borderline personality disorder (5). Also, several studies showed that borderline personality disorder may have a unique and robust relationship with NSSI (6, 7, 8). In DSM-V, self-injury has been considered as one of the diagnoses that require further studies (9).

In some cases, NSSI is carried out secretly, and after that, the person does not refer to the healthcare centers. Therefore, the actual prevalence of NSSI is underestimated (7). Also, prevalence rates were usually based on self-harm behaviors, rather than NSSI. Self-harm is a broader term inclusive of suicidal and non-suicidal self-harm behaviors, including self-poisoning (5). Also, the prevalence of NSSI varies from one region to another. In Western nations such as the United States and Canada, lifetime prevalence of NSSI ranges from 1.5% to 54.8% (10). A systematic review on NSSI prevalence in adolescent and university youth in non-Western nations was found to range from about 9% in Japan to about 33% in Hong Kong; while among university students, NSSI prevalence ranged between 10% in Japan to 38% in India (11). Also, the prevalence of NSSI in patients with mental disorders is higher than patients without mental disorders (5). Adolescents are more at risk of NSSI than other age groups (12).

Moreover, evidence suggests that women are more likely to self-injury than men (13). Self-injury was the third cause of adolescent mortality in 2015 in the world and the second cause of adolescent death in Europe and South-East Asia (14). This disorder has been identified as the eighth cause of mortality in the United States (15). However, there are few studies about the prevalence of NSSI in different populations in Iran. For example, a study by Gholamzadeh et al. showed that 8.7% of those referring to forensic medicine in Shiraz suffered from self-injury (16). Another study showed that 4.3% of the second-grade high school students in Tabriz reported self-injury experience (17). This disorder has several negative consequences, including the increased risk of suicidal attempt (18, 19). Therefore, mental health providers need to be aware of these consequences and design appropriate interventions to prevent them. In this direction, a more fundamental step can be taken, including the identification of factors associated with the occurrence of NSSI in related context (20).

Although NSSI research in different contexts is still in its nascent stages, it is evident that knowledge of factors associated with NSSI with reference to local contexts self-injure is necessary to a context-based understanding of NSSI, which in turn would provide the basis for locally appropriate interventions (11). Evidence suggests that some factors are more common in some contexts (21). For instance, a study on African-American students showed that the rate of self-injury was significantly higher among participants who attended church irregularly than others who attended regularly. Also, participants with self-injury (vs. without) reported significantly lower levels of social support (22); while a systematic review on low-income and middle-income countries showed that major risk factors of self-injury were low-

level education of father, poor perceived family economic status, self-injury by best friend and peer group, low school performance, higher truancy and frequent absenteeism from school (11). Since there has been no review study of the factors associated with self-injury in Iran, the current systematic review sought to identify factors associated with non-suicidal self-injury in Iranian patients, using narrative approach. It is expected that the results of the present study can provide evidence for health care providers about patients with NSSI and a basis for the provision of evidence-based care, and improve patient's safety in Iranian context (23).

2- MATERIALS AND METHODS

The present study was a systematic review, using narrative approach. The methodology and presentation of results followed the Preferred Reporting Items for Systematic Reviews (PRISMA) statement (24).

2-1. Search strategy

Online Persian and English databases (Medline, Web of Science, Scopus, SID, Barakat Knowledge Network System, and Magiran) were systematically searched from 1983 to 3 September 2019. The search string was created by combining Medical Subject Headings (Mesh terms), including "behavior self-injurious" OR "behaviors self-injurious" OR "self-injurious behavior" OR "self-injurious behaviors" OR "deliberate self-harm" OR "self-harm, deliberate" OR "self-destructive behavior" OR "behavior, self-destructive" OR "behaviors, self-destructive" OR "self-destructive behavior" OR "self-destructive behaviors" OR "nonsuicidal self-injury" OR "nonsuicidal self-injuries", "self-injuries OR nonsuicidal" OR "self-injury, nonsuicidal" OR "non-suicidal self-injury" OR "non-suicidal self-injury" OR "non-

suicidal self-injuries" OR "self-injuries, non-suicidal" OR "self-injury, non-suicidal" AND "Iran". The search query in Medline (via PubMed) is shown in **Table.1**. The search string was reviewed by an expert librarian and adapted for each database.

Table-1: Search strategy for Medline (via PubMed).

("Behavior, Self-Injurious" OR "Behaviors, Self-Injurious" OR "Self Injurious Behavior" OR "Self-Injurious Behaviors" OR "Deliberate Self-Harm" OR "Self-Harm, Deliberate" OR "Self-Destructive Behavior" OR "Behavior, Self-Destructive" OR "Behaviors, Self-Destructive" OR "Self Destructive Behavior" OR "Self-Destructive Behaviors" OR "Nonsuicidal Self Injury" OR "Nonsuicidal Self Injuries" OR "Self Injuries, Nonsuicidal" OR "Self Injury, Nonsuicidal" OR "Non-Suicidal Self Injury" OR "Non Suicidal Self Injury" OR "Non-Suicidal Self Injuries" OR "Self Injuries, Non-Suicidal" OR "Self Injury, Non-Suicidal" AND Iran).

2-2. Inclusion criteria

Observational studies (cross-sectional and longitudinal) carried out in Iran (English and Persian) were included in this systematic review.

2-3. Exclusion criteria

Editorials, letters to editors, commentaries, expert opinions, and case studies were excluded.

2-4. Data extraction

Two of the authors independently extracted the study data. In case of controversy concerning the data, it was resolved through the consultation of the third author or through discussion until consensus was reached. The variables which were extracted including name of the first author, year of publication, study purpose, study design, population/sample size, sampling method, the place where the study was conducted, factors measured/instrument, and main results.

The researchers recorded these variables in a researcher-made checklist.

2-5. Quality assessment

Study quality was evaluated independently by two investigators (F.G.H. and J.M.), and disagreements were resolved by consensus. The strengthening the reporting of observational studies in epidemiology (STROBE) criteria for quality assessment were applied to evaluate each article. Key constructs of STROBE included assessment of study design, setting, participants, confounding variables, bias, study size, statistical analysis, outcome measures, results, limitations and study

generalizability (25). The STROBE statement was used for assessing observational studies and consists of 22 items. Score of 2 was assigned to each item. According to the number of items in each section of the statement, maximum score for each section of a study was determined, including score of 2 for Title and Abstract; score of 4 for Introduction; score of 18 for Methods; score of 10 for Results; score of 8 for Discussion; score of 2 for Funding. Therefore, maximum score of the statement was 44. In this study, articles with scores of 20 and more were selected. Quality assessment of included studies is shown in **Table.2**.

Table- 2: Quality assessment of included studies (with STROBE checklist).

| First author (Year), Reference | Title and Abstract (2) | Introduction (4) | Methods (18) | Results (10) | Discussion (8) | Funding (2) | Total score (44) |
|--------------------------------|------------------------|------------------|--------------|--------------|----------------|-------------|------------------|
| Azami (2007), (37) | 1 | 3 | 10 | 4 | 3 | 0 | 21 |
| Hoseini (2008), (35) | 1 | 3 | 9 | 6 | 2 | 0 | 21 |
| Taghaddosinejad (2009), (27) | 2 | 3 | 11 | 6 | 2 | 0 | 24 |
| Pourasl (2010), (40) | 2 | 4 | 12 | 6 | 7 | 2 | 33 |
| Farsi (2010), (33) | 2 | 4 | 15 | 7 | 6 | 0 | 34 |
| Ekramzadeh (2012), (32) | 2 | 4 | 11 | 10 | 6 | 0 | 33 |
| Khanipour (2014), (31) | 2 | 4 | 6 | 6 | 5 | 0 | 23 |
| Avakh (2014), (34) | 2 | 3 | 9 | 5 | 3 | 0 | 22 |
| Babakhanian (2014), (42) | 2 | 4 | 13 | 6 | 6 | 2 | 33 |
| Taghva (2015), (45) | 1 | 4 | 9 | 5 | 3 | 0 | 22 |
| Hasanvand (2016), (28) | 1 | 2 | 11 | 6 | 3 | 0 | 23 |
| Azimi (2016), (44) | 2 | 3 | 8 | 5 | 3 | 0 | 21 |
| Gholamzadeh (2017), (16) | 2 | 4 | 11 | 8 | 5 | 1 | 31 |
| Rammazi (2017), (43) | 1 | 3 | 9 | 7 | 4 | 0 | 24 |
| Nobakht (2017), (29) | 1 | 4 | 14 | 7 | 8 | 0 | 34 |
| Gholamrezaei (2017), (41) | 1 | 4 | 14 | 8 | 7 | 2 | 36 |
| Imani (2018), (39) | 2 | 4 | 14 | 6 | 7 | 2 | 35 |
| Shahbaz (2019), (30) | 1 | 4 | 13 | 8 | 4 | 0 | 30 |

2-6. Synthesis of results

This systematic review summarized systematically relevant quantitative literature on factors associated to self-injury in Iran. Data analysis was guided by narrative synthesis which identified the prominent themes emerging from the evidence. From these main themes sub-themes emerged (26). The study details

and results are summarized in **Table.3** (*Please see the table at the end of paper*).

3- RESULTS

The initial systematic literature search yielded 334 articles reporting the factors associated with self-injury. From these, 101 repetitive articles were excluded, bringing the number to 233 articles. These

articles were reviewed by title, and abstract and 128 non-related articles were removed. The full text of the remaining 105 articles was evaluated and only 18 met the inclusion criteria and were included in

this study. The process of selecting articles is shown in **Figure.1**. Eighty-seven articles were excluded, with reasons (articles required score of STROBE lower than 20 or did not meet the inclusion criteria).

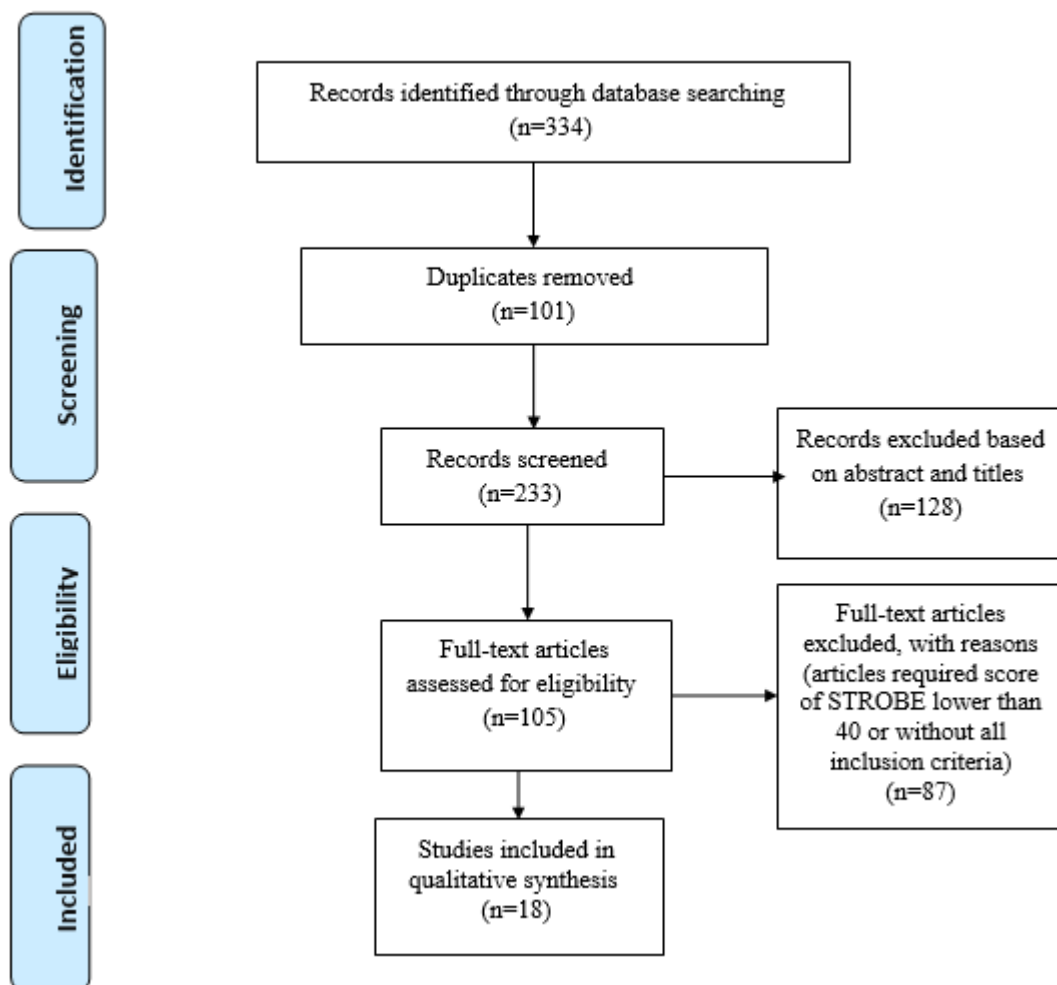


Fig.1: PRISMA flowchart of present study.

3-1. Study characteristics

This systematic review included a total of 17,343 samples. All of the studies were published over the last 12 years. Majority ($n = 16$) of the studies were cross-sectional (88.88%), and the rest were longitudinal (prospective type) (5.56%, $n=2$). The number of samples in the studies varied widely ranging from 54 to 9874. Most of the studies ($n = 6$) were performed on military personnel (33.33%). The majority of studies ($n = 9$) were performed in Tehran (50%).

3-2. Main themes

This narrative systematic review identified three main themes: factors associated with baseline characteristics, mental disorders, and psycho-social factors associated with mental disorders.

3-2-1. Factors associated with baseline characteristics

The first theme which emerged in the data was factors associated with demographic characteristics. Eight studies (16, 27-33)

included in this review examined baseline characteristics of patients who self-injury. Within this theme, two sub-themes emerged: uncontrollable demographic characteristics and controllable demographic characteristics.

Uncontrollable baseline characteristics

This sub-theme included factors which were out of the control of a person including age and gender. Six studies (16, 27-31) examined the role of uncontrollable baseline characteristics in NSSI. Four studies showed that the younger age was associated with NSSI (27-30). Contradictory results have been reported regarding the relationship between gender and NSSI. Four studies on people referred to forensic medicine showed that being male is related to an increased risk of NSSI (16, 27, 29, 30). Another study on adolescents with pseudo-family living in well-being centers showed that NSSI was more common in girls than boys (31).

Controllable baseline characteristics

This sub-theme included marital status, education level, and employment status. Four studies (16, 27, 32, 33) examined the role of controllable demographic characteristics in NSSI. The results of three studies showed that married people had a better status regarding NSSI and are less likely to suffer from it (27, 32, 33). Three studies showed that the higher the level of education, the lower the risk of NSSI (16, 32, 33). Based on the results of two studies, unemployment was associated with NSSI (16, 27).

3-2-2. Mental disorders

The second theme which emerged in the data was mental disorders. Eleven studies (28, 30, 32-40) included in this review examined this theme. Within the theme, three sub-themes emerged: issues related to personality disorders, depression and

substance abuse (in person, close relatives, and close friends).

Issues related to personality disorders

Five studies (34-38) included in the analysis described the role of personality disorders in NSSI. Two studies were conducted on military personnel, which found that cluster-B personality traits were significantly more common in patients with NSSI (34, 35). This cluster includes borderline, histrionic, antisocial, and narcissistic personality disorders (36). Also, a study on people who referred to a legal medical center showed that individuals who self-injure had cluster-A personality traits and hypochondriasis more than individuals without NSSI (37). Cluster-A includes schizotypal, schizoid, and paranoid personality disorders (38).

Depression

Five studies (28, 30, 32, 33, 39) examined the role of depression in NSSI. Contradictory results were obtained based on these studies. Three studies on adult and elderly patients showed that depression was associated with NSSI (28, 32, 39); while two studies on medical students and soldiers did not confirm this result (30, 33).

Substance abuse (in person, close relatives, and close friends)

Three studies (32, 33, 40) examined the role of substance abuse in NSSI. In the studies included in the current review, substance abuse was assessed in three states: in person, close relatives, and close friends. A study by Ekramzadeh et al. on the elderly patients showed that the history of drug abuse was correlated to NSSI (32). Another study by Pourasl et al. also found that smoking and alcohol consumption were associated with NSSI in high school adolescents. Also, having close friends with a smoking habit was associated with the incidence of NSSI (40). Another study

also showed that the history of addiction in close relatives had a significant correlation with NSSI among soldiers (33).

3-2-3. Psycho-social factors associated with mental disorders

The final theme which emerged in the data was psycho-social factors associated with mental disorders. Within the theme, two sub-theme emerged: intrapersonal factors and interpersonal factors. Intrapersonal factors included three sub-sub-themes: self-concept disturbance, maladaptive emotion regulation, and obsessive psychiatric motivation. Interpersonal factors included three sub-sub-theme: history of exposure to traumatic events in life, family functioning disturbance, inadequate support in social interactions, and occupational issues. Eleven articles reported on the role of psycho-social factors associated with mental disorders on NSSI.

Intrapersonal factors: self-concept disturbance

Two studies (28, 31) examined the role of self-concept disturbance in NSSI. One study showed that adolescents with NSSI had more self-criticism than others (31). Also, the results of two studies showed that the negative body image and self-inadequacy had mediating roles in the incidence of NSSI (28, 31).

Intrapersonal factors: maladaptive emotion regulation

Four studies (28, 30, 31, 41) examined the role of maladaptive emotion regulation in NSSI. The results of these studies showed that the emotion dysregulation had a significant correlation with NSSI (28, 30, 31, 41). It was also found that the lack of control over impulses increased NSSI in adolescents (31).

Intrapersonal factors: obsessive psychiatric motivation

Only one study examined the role of obsessive psychiatric motivation in NSSI. The results of this study showed that the most common motivation associated with NSSI is self-punishment (42).

Interpersonal factors: history of exposure to traumatic events in life

Three studies examined the role of history of exposure to traumatic events in life in NSSI. These studies conducted on elderly patients and college students found that traumatic experiences in life were associated with NSSI (29, 30, 32).

Interpersonal factors: family functioning disturbance

Only one study examined the role of family functioning disturbance in NSSI. Imani quotes McMaster that these functions included problem-solving, communication, roles, affective responsiveness, affective involvement, and behavior control. The results of this study on military staff showed that this factor had a significant and direct effect on NSSI (39).

Interpersonal factors: inadequate support in social interactions

Two studies (32, 43) examined the role of inadequate support in social interactions in NSSI. A study showed that older people who reported less perceived social support suffered from more NSSI than other older people (32). Another study also found that the lack of social support increased NSSI among students with learning disabilities (43).

Interpersonal factors: occupational issues

Three studies (39, 44, 45) examined the role of occupational issues in NSSI. These studies were conducted on army personnel. One of the occupational stresses in military places is an improper relationship with superordinate in the form of perceived

conflicts in the behavior and words of the superordinate, which, according to the results of one study, had the most significant effect on incidence of NSSI (44). The other two studies also found that job burnout increased the risk of NSSI (39, 45).

4- DISCUSSION

This review aimed at determining factors associated with NSSI with narrative approach. Our study identified three main themes: factors associated with baseline characteristics, mental disorders, and psycho-social factors associated with mental disorders. A narrative study by Aggarwal et al. (2017) on youth self-injury in low-income and middle-income countries identified three categories including family-related factors, peer-related factors, and school-related factors. Also, risk factors for self-injury were family conflict, peer groups with members indulging in self-harm, truancy, and school absenteeism. Protective factors were having an understanding family, having friends and higher school competence (46). Another narrative study by Buckmaster et al. (2018) on family factors associated with self-injury in adults identified three themes including parent-adult-child relationship factors, romantic relationship factors, and family unit factors (47). None of the studies included in the two review studies were done in Iran. Also, in this study, there were limited studies that explored factors for NSSI in different populations in Iran, making the comparisons with the evidence from other countries harder, while in the two studies, only one target population was assessed. However, this review provided us with a few helpful insights into the factors associated with NSSI in Iranian context.

In this review, the majority of studies examined psycho-social factors associated with mental disorders including self-concept disturbances, maladaptive emotion

regulation, obsessive psychiatric motivation, history of exposure to traumatic events in life, inadequate support in social interactions, and working in a stressful workplace. This study highlights the psycho-social skill deficits which can predispose individuals to mental disorders including NSSI (48, 49). Also, these findings suggest that interventions aimed at reducing NSSI must consider a variety of targets, such as reinforcement of aspects of self-concept, adaptive emotions regulation, and increasing effectiveness of interpersonal communication. This research may help health professional providers design intervention strategies by underscoring these psycho-social deficits that are associated with NSSI.

According to included studies in this review, some variables were associated with NSSI including age, marital status, level of education, unemployment, issues related to personality disorders, substance abuse, self-concept disturbance, maladaptive emotion regulation, obsessive psychiatric motivation, history of exposure to traumatic events in life, family functioning disturbance, inadequate support in social interactions, and occupational issues, but some variables had a challenging role for NSSI including gender and depression. This study has some limitations that must be taken into consideration when interpreting the data. First, in this review, the definition of self-injury varied across the studies. Although we put the focus on the studies of self-injury without suicidal intent. This could mean that the demarcation between self-harm and NSSI may be blurred in this study. Second, most of the reviewed studies were cross-sectional. Therefore, this review cannot identify causal relationship between the factors and occurrence of NSSI. Also, the findings do not yet justify risk factors, because this design carries an inherent risk of producing false-positive associations

among variables. Furthermore, cross-sectional studies have a relatively low level of evidence (50) that can have an adverse effect on the quality of the results. Third, the included studies were heterogeneous in terms of the instruments used to measure factors, and methods used to detect NSSI. Also, the methodological heterogeneity of the studies precluded meta-analysis. Fourth, the current review was limited to studies of clinical presentations of NSSI.

Therefore, the factors identified in the review may not be applicable to the prediction of future NSSI in non-clinical populations. Fifth, the vast majority of studies were conducted in large cities of Iran. Therefore, the findings may not be generalizable to small cities of Iran. Sixth, some databases such as EMBASE and Cochrane Library were not searched in the current review. Seventh, included studies were in English and Persian. These problems would decrease comprehensiveness of findings. Eighth, the included studies were heterogeneous in terms of age. Further research is needed to resolve these limitations by using longitudinal designs with larger samples from various populations. Also, it is recommended that future studies include psychometric assessments of self-injury and intent to distinguish nonsuicidal self-injury as precisely as possible.

5- CONCLUSIONS

For the first time, the present meta-Results of this study with a total sample of 17,343 showed three main themes for factors associated with NSSI in Iran, including factors associated with baseline characteristics; mental disorders; and psycho-social factors associated with mental disorders. In this review, the largest number of studies was conducted on the theme of psycho-social factors associated with mental disorders. These factors include self-concept disturbances,

maladaptive emotion regulation, obsessive psychiatric motivation, history of exposure to traumatic events in life, inadequate support in social interactions, and working in a stressful workplace. This theme considers psycho-social skills deficits which predispose individuals to NSSI; while NSSI is prevalent in adolescents, there has been criticism of the paucity of research undertaken with adolescents in Iran. Therefore, it is recommended more studies about the correlated factors for NSSI in this population be done. Taken together, the findings may provide insight about NSSI to be better predicted, understood, and cared for.

Also, these findings suggest that interventions aimed at reducing NSSI must consider a variety of targets, such as strategies for monitoring of NSSI in psychiatric patients and improving psycho-social skills deficits. Although more evidence for identifying the role of psycho-social factors is needed for the prevention and management of NSSI. Despite the importance of factors associated with NSSI, there is little evidence in this regard in Iran, and it was found that this issue has not been taken into consideration much, and few studies with methodological concerns addressed this subject. Therefore, more longitudinal studies are suggested without these limitations.

6- CONFLICT OF INTEREST

All the authors declare that they have no conflict of interest.

7- AUTHORS' CONTRIBUTIONS

All authors conceived the idea, contributed to the search strategy employed. FGH and JM conducted the literature search, quality assessment, data extraction and analysis. FGH wrote the draft manuscript. MB and GH-KH edited the manuscript. All authors read and approved the final manuscript.

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Table-3: General Characteristics of included studies.

| First author (Year), Reference | Study purpose | Study design | Sample size | Sampling method | Setting | Instrument | Main results |
|--------------------------------|---|----------------------------|--|-----------------|---|--|--|
| Azami, (2007), (37) | Personality characteristics of people with self-injury | Cross-sectional | 150 Patients | Random | Shahrekord Legal Medicine General Office | Minnesota Multi-phasic Personality Inventory (MMPI) | Hypochondriasis, hysteria, and paranoia were higher among patients who self-injury. |
| Hoseini, (2008), (35) | Risk factor and etiology of self-mutilation | Cross-sectional | 150 Military personnel with self-mutilation | Census | Army hospital, Tehran | Observation and interview | Most patients with self-injury suffered borderline personality disorder and antisocial personality disorder. |
| Taghaddosinejad, (2009), (27) | Frequency and morphologic characteristics of self-inflicted injuries | Longitudinal (prospective) | 9,874 Outpatient forensic referrals over a 3 year period | Indeterminate | Ghouchan city | Researcher-made questionnaire | Self-injury was significantly higher in men, people with lesser age, single and unemployed. |
| Pourasl, (2010), (40) | Incidence of self-injury and some related factors | Longitudinal (prospective) | 1,772 male high school students (second year) | Random | High schools, Tabriz | Researcher-made questionnaire | Having close friends with cigarette and alcohol consumption was associated with self-injury in students. |
| Farsi, (2010), (33) | Relationship between depression and self-injury and some demographic characteristics | Cross-sectional | 301 outpatient soldiers referrals | Convenient | Military clinic, Tehran | Beck Depression Scale, and interview | There was no significant correlation between depression and self-injury. There was a significant relationship between self-injury with education level, marital status and history of addiction in first-degree relatives. |
| Ekramzadeh, (2012), (32) | Prevalence and risk factors of suicidal ideation and direct and indirect self-destruction behaviors | Cross-sectional | 650 elderly patients | Convenient | Medical centers affiliated with Shiraz University of Medical Sciences, Shiraz | Beck Scale for Suicidal Ideation (BSSI) and Harmful Behavior Scale (HBS) and Geriatric Depression Scale (GDS), Cumulative Illness Rating Scale-Geriatric (CIRS-G), Paykel Life Event Scale, and Perceived Social Support Scale | Having self-injury behaviors was associated with depression, marital status, substance abuse history, history of traumatic events, lack of perceived social support, and education level. |
| Khanipour, (2014), (31) | Relationship between impaired impulse control without suicide and mediating effect of self-incompetency | Cross-sectional | 169 teenagers with a history of child abuse | Cluster | Family-like and welfare centers, Tehran and Karaj city | Non-suicidal self-injurious behaviors inventory, Difficulties in Emotion Regulation Scale (DERS), Self-Criticizing/attacking & Self-Reassuring Scale (SCSRS) | The history of self-injury in girls was more than that of boys. Self-incompetency had a mediating role in frequency of self-injury. |

Factors Associated with Non-suicidal Self-injury

| | | | | | | | |
|---------------------------|---|-----------------|--|---------------|---|---|---|
| Avakh, (2014), (34) | Relationship between self-injury and personality disorders | Cross-sectional | 60 soldiers | Random | One of the army psychiatric centers, Tehran | Clinical interview and psychiatric examination of personality disorders and self-injury | Individuals with cluster-B personality traits were more prone to self-harm. |
| Babakhanian, (2014), (42) | Prevalence and reasons associated with the incidence of self-injury | Cross-sectional | 54 patients | Convenient | Emergency department of Rezaei-brothers hospital, Damqan city | Addiction Severity Index, and a research-made questionnaire | The most common factor related to self-injury was self-punishment. |
| Taghva, (2015), (45) | Role of job burnout and depression in self-injury | Cross-sectional | 215 military personnel | Convenient | Tehran | Suicide Behavior Questionnaire-Revised, Self-harm Inventory, Beck Depression Inventory-Second Edition, Maslach Burnout Inventory (MBI) | Burnout and depression had a direct impact on increasing tendency to self-injury. |
| Hasanvand, (2016), (28) | Mediating role of body image and emotion regulation in the relationship between negative emotions and depression with self-injury | Cross-sectional | 302 soldiers | Convenient | Clinic of one of the military hospitals, Tehran | Beck Depression Inventory, Beck Hopelessness Scale, Body Investment Scale, Gratz Deliberate Self-harm Inventory, Emotion Regulation Scale | The negative body image and the use of the negative strategies for emotion regulation had a mediating role in the incidence of self-injury. Self-injury had negative correlation with education level and age and positive correlation with addiction. |
| Azimi, (2016), (44) | Effective factors in the incidence of self-injury | Cross-sectional | 214 NAJA experts on the issue of self-injury in military staff | Random | Tehran | Researcher-made questionnaire | Interpersonal relationships issues in relationship between commanders and military staff such as duality in their behaviors and speech had the greatest effect on occurrence of self-injury. |
| Gholamzadeh, (2017), (16) | Different aspects of non-suicidal self-injury | Cross-sectional | 2166 referral patients | Convenient | Legal medicine organization, Fars province | Researcher-made questionnaire | Self-injury was more common in men, unemployed people, and with lower education. |
| Rammazi, (2017), (43) | Comparison of the social support, aggression and self-injury in students with and without learning disabilities | Cross-sectional | 60 students with and without learning disabilities | Cluster | Secondary schools, Ardabil | Raven's IQ Test, Social Support Scale, Aggression Questionnaire and Deliberate Self-harm Inventory | Low social support and high aggression were two important factors, which affected self-injury. |
| Nobakht, (2017), (29) | Prevalence of self-injury and its relationships to trauma and dissociation | Cross-sectional | 200 college students | Indeterminate | Islamic Azad University, Babol city | Dissociative Experiences Scale-II (DES-II), Deliberate Self-Harm Inventory (DSHI), and Childhood Trauma Questionnaire (CTQ) | Patients with self-injury were significantly younger than patients with infrequent self-injury. Self-injury was significantly more prevalent among men than women. Participants with self-injury reported more traumatic experiences than participants without self-injury. |

| | | | | | | | |
|----------------------------|--|-----------------|-------------------------|---------------|---|--|---|
| Gholamrezaei, (2017), (41) | Investigate the prevalence, characteristics and risk factors of NSSI | Cross-sectional | 556 university students | Convenience | University, Tehran | Difficulties in Emotion Regulation Scale (DERS), Non-Suicidal Self-Injury Scale-researcher made, Depression Anxiety Stress Scales (DASS-21), and Suicidal Behaviors Questionnaire-Revised (SBQ-R) | For male students, only suicide ideation remained a significant predictor of NSSI. Lack of emotional awareness significantly predicted NSSI after control for anxiety, depression and suicide ideation among female students. |
| Imani, (2018), (39) | Investigate the role of psychological disorders, personality disorders, occupational and family variables in self-injuring behaviors | Cross-sectional | 250 military staff | Convenience | Shiraz | Suicide Behavior Questionnaire-Revised (SBQ-R), Self-Harm Inventory (SHI), Beck Depression Inventory-II (BDI-II), Millon Clinical Multi Axis Inventory-III (MCMI-III), Family Assessment Device (FAD), Maslach Burnout Inventory (MBI), Berry Field and Roth Job Satisfaction Inventory and Job Stress Questionnaire | Depression, occupational problems, and problems in family functions had significant and direct effect on NSSI. By mediating depression and family functioning, occupational problems had an indirect effect on NSSI. |
| Shahbaz, (2019), (30) | Examine relationship between NSSI and psychological variables including trauma exposure, dissociation, emotion dysregulation, Alexithymia with the mediating roles of dissociation and emotion dysregulation | Cross-sectional | 200 medical students | Indeterminate | Medical faculty, Shahid Beheshti University of Medical Sciences, Tehran | Dissociative Experiences Scale-II (DES-II), Emotion Regulation Scale (DERS), Childhood Trauma Questionnaire (CTQ), Toronto Alexithymia Scale (TAS) | The males reported more NSSI than females. NSSI rate in the individuals with a young age was higher than that of the older individuals. Trauma exposure was related to NSSI. Emotion dysregulation and dissociation had direct effect on NSSI. Alexithymia did not affect NSSI significantly. |

MMPI: Minnesota Multi-phasic Personality Inventory; **BSSI:** Beck Scale for Suicidal Ideation; **HBS:** Harmful Behavior Scale; **GDS:** Geriatric Depression; **CIRS-G:** Cumulative Illness Rating Scale- Geriatric; **DERS:** Difficulties in Emotion Regulation Scale; **SCSRS:** Self-criticizing/attacking & Self-Reassuring Scale; **IQ:** Intelligence quotient; **DES-II:** Dissociative Experiences Scale-II; **DSHI:** Deliberate Self-Harm Inventory; **CTQ:** Childhood Trauma Questionnaire; **DASS:** Depression Anxiety Stress Scales; **SBQ-R:** Suicidal Behaviors Questionnaire-Revised; **SHI:** Self-Harm Inventory; **BDI-II:** Beck Depression Inventory-II; **MCMI-III:** Milon Clinical Multi Axis Inventory-III; **FAD:** Family Assessment Device; **MBI:** Maslach Burnout Inventory; **TAS:** Toronto Alexithymia Scale.