Review Paper

The Relationship Between Early Maladaptive Schemas and Non-suicidal Self-injury: A Systematic Review

Mehdi Akbari[1], Shahram Mohammadkhani[1], Maryam Babaeifard[1*], Bahareh Shokrani[1]

1. Department of Clinical Psychology, Faculty of Psychology and Educational Sciences, Kharazmi University, Tehran, Iran.

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ABSTRACT

Background: Non-suicidal self-injury (NSSI) is a maladaptive strategy mainly regulating emotions in youth and adolescents. Early maladaptive schemas (EMSs) were identified to affect NSSI. This review aimed to provide a synthesis of the literature on the relationship between EMS and NSSI.

Methods: A systematic review was conducted via the electronic databases PsycINFO, PubMed, Science Direct, and Google Scholar. The inclusion criteria were (i) the study examined the relationship between EMSs and NSSI, (ii) full texts were available in the English language, and (iii) the study was a piece of published empirical quantitative research. The authors also evaluated the risk of bias assessment.

Results: Ten studies were investigated. The relationship between EMS and NSSI was identified from different points of view. The results confirmed a developmental model of NSSI and shame that focuses on the function of this behavior to regulate emotions (especially shame) in individuals with a predisposition for emerging EMS and schema modes. A major limitation of this review is the absence of longitudinal research.

Conclusion: It is important to address EMSs and modes that lead to NSSI engagement in both preventive and therapeutic interventions.

Keywords: Early maladaptive schemas, Non-suicidal self-injury, Systematic review

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*** Corresponding Author:**
Maryam Babaeifard, PhD Candidate.
Address: *Department of Clinical Psychology, Faculty of Psychology and Educational Sciences, Kharazmi University, Tehran, Iran.*
Phone: *+98 (912) 9478621*
E-mail: *m.babaeifard@yahoo.com*

1. Introduction

Non-suicidal self-injury (NSSI) has been defined as self-inflicted damage to bodily tissues without suicidal intent [1]. NSSI prevalence in non-clinical samples is reported to be 17.2% among adolescents, 13.4% among young adults, and 5.5% among adults [2]; however, prevalence rates are as high as 60% among clinical samples of adolescents [3]. There are different methods and forms of NSSI, such as cutting, scratching, burning, and self-hitting. Studies have indicated that the rates of self-harm and the number of methods used by self-injurers can reflect the severity of NSSI [4]. According to studies, early life events, such as childhood sexual abuse [5] and parental emotional neglect [6], are important factors contributing to NSSI engagement. When children with a predisposition for emotional lability are exposed to adverse experiences in their family environments, early maladaptive schemas (EMSs) emerge comprising cognitive, affective, somatic, and memory-based elements [7]. EMSs are "extremely stable and enduring themes that develop during childhood and are elaborated upon throughout anindividual's lifetime". EMSs are a cognitive-emotional representation of the knowledge individuals have about themselves and their environment [8]. The EMSs are categorized into five higher-order schema domains representing unmet emotional needs in childhood: (1) 'disconnectio' with EMS emotional deprivation, abandonment, mistrust/abuse, social isolation, and defectiveness/shame; (2) 'impaired autonom' with EMS social undesirability, dependence/incompetence, failure to achieve enmeshment, and vulnerability to harm and illness; (3) 'impaired limit' with EMS entitlement/grandiosity and insufficient self-control/self-discipline; (4) 'other-directednes' with EMS subjugation and self-sacrifice; and (5) 'inhibitio' with EMS emotional inhibition and unrelenting standards. Young assumed that EMSs expand when core emotional needs go unmet in childhood. EMS includes emotions, cognitions, memories, and bodily sensations in response to the development of maladaptive behaviors.

Several studies have found that EMSs are associated with developing personality disorders [9] and other psychopathological conditions [10-12]. Also, in this regard, Nicol et al. found evidence of the relationship between EMSs and psychopathology and argued that EMSs play an important role in developing and maintaining psychopathology [13]. Various studies in the field of schema theory supported evidence accruing the validity and stability of EMS themes and their links to psychopathology [14-17]. EMS and their domains have been associated with several conditions, including post-traumatic stress disorder [18], borderline personality disorder (BPD) [8, 19], anorexia nervosa [20], obsessive-compulsive disorder [21], and depression [22]. Several studies have shown strong associations between EMSs and personality disorders [8, 19, 23]. Pauwels et al. found significant associations between cluster C personality disorders and the EMS, including social undesirability, dependence/incompetence, and subjugation, and cluster B personality disorders and the EMS, including insufficient self-control and mistrust [24]. Also, it has been shown that early maladaptive schemas make the person psychologically vulnerable to disturbances such as substance misuse [25] and suicidal behaviors [26]. There are also many studies that have indicated EMS plays a role in NSSI [27, 28].

Several theoretical models confirm that NNSI is a way of coping with or avoiding distressing internal experiences [1, 29]. Recently, a novel model has investigated this issue from a developmental point of view, focusing on the relationship between NSSI and shame [30]. Based on this model, current shame-proneness, which can be caused by some of the schemas and modes, is linked to NSSI via internalizing shame-coping, current loneliness, and current psychological distress [30]. Therefore, it seems that EMS and NSSI are related to adverse childhood experiences. Generally, the link between EMS and NSSI has been suggested by different studies [27, 31]. This association has been investigated from different points of view. For example, Castille et al. studied different schemas in self-mutilators [28]. In another study, the link between EMS and NSSI was investigated in terms of severity [31]. Finally, some studies have examined the relationship between schema modes, defined as some EMS, and coping responses, which tend to group together [7], and NSSI engagement [32].

Previous review studies have investigated the relationship between NSSI and some salient constructs. For example, self-esteem [33] and emotion dysregulation [34] are among the major variables that were studied with NSSI. Recently, a meta-analytic review [35] has investigated the relationship between early maladaptive schemas, suicidal ideation, and self-harm. However, Pilkington et al., in their review, focused more on suicidal predispositions and using non-suicidal self-harm outcomes to increase the power of their analyses [35]. However, It is possible that different schemas are related to NSSI because people who self-injure differ in some aspects from those who suicide. Especially the intention, function, and type of behavior can be completely different [36], and different schemas and modes may be linked with non-suicidal self-injury whose main

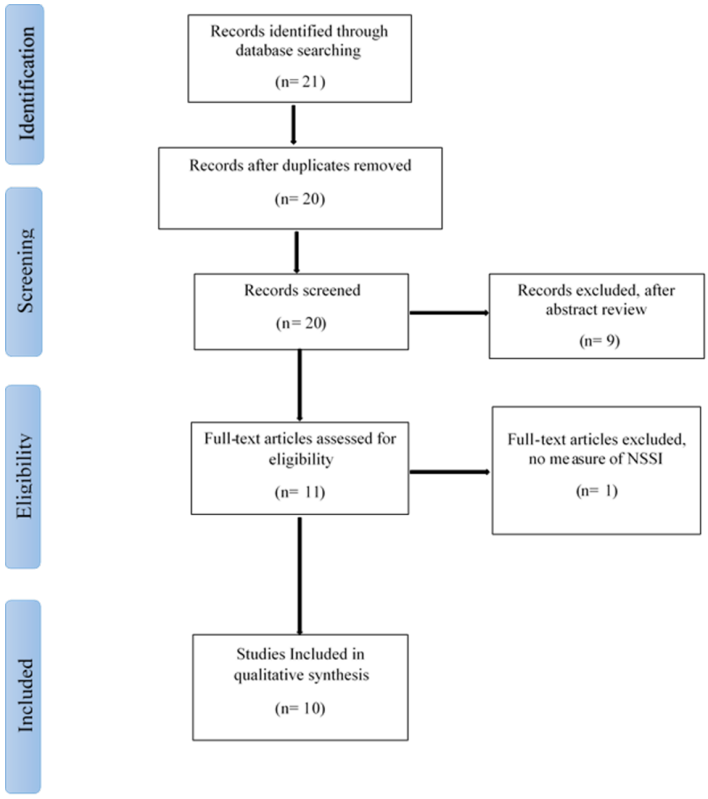

Figure 1. Flow diagram of the selection process of the studies

function is to regulate emotions [37]. In addition, focusing on a developmental model of NSSI and shame, we intended to consider the relationship between NSSI and EMS from a developmental point of view, emphasizing the role of shame. Therefore, the present study systematically reviews the literature on the relationship between EMS, modes, and NSSI. The study also seeks to suggest some clinical implications in this field.

2. Methods

Search strategy

A systematic review of published articles in the electronic databases was conducted. We did not have any limitations regarding the publishing date. The electronic databases included PsycINFO, PubMed, Science Direct, and Google Scholar. The following search terms were used: "schem" or "early maladaptive schem" or "maladaptive schem" or "EM" and "self-harm" or "self-injury" or "self-mutilate" or "parasuicide" or "non- suicidal self-injur" or "NSSI" Search results are illustrated in Figure 1.

Inclusion and exclusion criteria

In this systematic review, we defined a range of inclusion criteria, including (1) the study examined the relationship between EMS and NSSI; (2) full-text papers were available in the English language; and (3) the study was a piece of published quantitative empirical research.

We defined five exclusion criteria, including (1) qualitative method in studies where it was unclear if self-injury demonstrated underlying suicidal intent; (2) studies measuring beliefs or other constructs that are not explicitly related to Young's early maladaptive schemas; (3) insufficient information to extract the methodology of the study and the results; (4) review papers, case studies, qualitative studies, or discussion articles; and (5) papers not available in English.

Data extraction

To ensure that all selected articles were eligible, abstracts and titles that met the inclusion criteria were reviewed. All articles that met the criteria were reviewed again for data extraction. Finally, data extraction was done using a data extraction form.

The standard quality assessment criteria for evaluating primary research papers from various fields [38] was used, and all the studies were assessed methodologically in terms of the risk of bias and then coded as'high,' 'moderate' or'wea' by the authors. Items were scored depending on the degree to which the criteria were met "ye" = 2, "partia" = 1, "n" = 0). The total score is 28 representing the minimum risk of bias. Since three criteria (5, 6, 7) were not related to our studies, the total high score for each paper was 22. Based on the agreement between authors, studies were classified as low risk of bias (i.e., the score equal to or more than 18) and moderate risk of bias (i.e., a score between 16 and 17).

Also, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines [39] were followed by the authors. The results of data extraction and quality assessment are represented in Table 1.

Outcome measures

The long form ofYoung's schema questionnaire was used to assess the EMS [40]. The questionnaire consists of 205 items divided into 16 subscales corresponding with the 16 EMS scales. The other instrument to assess EMS was the shortened version of the schema mode inventory, including 118 items developed by Lobbestael, van Vreeswijk, Spinhoven, Schouten, and Arntz [41]. NSSI was assessed using the Self-Injury Questionnaire-Treatment-Related (SIQ-TR) [42]. This questionnaire asks respondents to indicate if they have deliberately injured themselves by five common methods (scratching, bruising, cutting, biting, and burning) and how long ago they have engaged in each of these behaviors (a week ago, a month ago, etc.). The deliberate self-harm inventory [43] is a 17-item self-report questionnaire based on measuring intentional self-injurious behaviors without suicidal intent. The inventory was used in a study to measure motivations for self-injury among participants who had endorsed any lifetime self-injury. This measurement has 66 items scale designed to assess a wide range of injuries. Functional assessment of self-mutilation [44] and the inventory of statements about self-injury [45] was reviewed to derive the content of this scale.

3. Results

Study characteristics

An overview of study characteristics and relevant extracted data can be found in Table 1. All studies were cross-sectional in design, not longitudinal. All studies used clinical and non-clinical population samples. The studies were published from 2007, with over two-thirds of the studies taking place in the last ten years, indicative of a growing interest in this field. Most studies had more female than male participants (n=2888; male = 673; female = 2215) ranging from 16 to 42 years with Mean±SD age of 27.79±12.72. All studies included participants with and without NSSI.

Risk of bias assessments

Most of the included studies were assessed low in terms of risk of bias. However, there were just a few studies meeting approximately all the criteria for risk of bias assessments [46]. Most study designs led to masking or blinding assessors to participant status because they were online surveys. It can minimize biases because NSSI is known as a socially taboo behavior, and it is usually difficult for individuals to admit that they injure themselves for some reasons that are not acceptable to others.

Relationship between NSSI and EMS

Differentiating role of EMS

Three studies compared EMS to differentiate self-mutilators from non-mutilators. They all suggested that higher scores on some of the schemas lead to higher scores on NSSI. Especially some of the schemas including unrelenting standards [31], social isolation [27, 28], emotional inhibition, entitlement/grandiosity [27], emotional deprivation [28], alienation, insufficient self-control/self-discipline, and mistrust/abuse, [28] were reported to be able to differentiate self-injurers.

NSSI and its frequency prediction by EMS

Several studies have shown that some schemas also affect the frequency of NSSI. For example, dependence/incompetence [27], social isolation/alienation, insufficient self-control/self-discipline [28, 47], defectiveness/shame, and emotional deprivation [28] could differentiate those with a higher NSSI frequency. It is important to state that Castille et al. [28] found that the social isolation/alienation schema was strongly related to the number of self-mutilative episodes. However, they did not find any differences between individuals who had mutilated on one occasion compared to non-mutilators or even those who had mutilated multiple times.

Relationship between EMS and NSSI in disorders

Studies showed that EMS and NSSI are related in two disorders. One study investigated EMS in eating disorder (ED) patients with and without NSSI. Pauwels et al. indicated that ED patients with NSSI reported significantly higher EMS levels (except for entitlement) than patients without NSSI [24]. Leppänen et al. showed that BPD patients with parasuicidal behavior had significantly higher mean scores in four EMSs, including emotional deprivation, abandonment/instability, mistrust/abuse, and social isolation/alienation [48]. On the other hand, some studies indicated that after controlling for gender and general psychopathology [46] and depressive symptoms [27], the relationship between some of the schemas, including social isolation and emotional inhibition, entitlement/grandiosity, emotional deprivation, vulnerability to harm, subjugation, and self-sacrifice and NSSI was still maintained.

Modes and NSSI

In some studies, the relationship between NSSI and maladaptive schema modes was identified. Many modes were related to NSSI, but vulnerable child, impulsive child, and punitive parent modes were common at an earlier age of onset, longer duration, and a higher number of NSSI methods [32]. Leppänen et al. showed that the BPD patients with parasuicidal behavior had significantly higher scores in two innate child modes, vulnerable child, and angry child [48].

4. Discussion

This study aimed to examine the relationship between early maladaptive schemas and NSSI to identify the main schemas related to this behavior. Twelve studies were investigated in this review. All of them examined the relationship between EMS and NSSI, confirming the relationship between these two constructs. However, it was also discovered that some schemas are more important because of the higher association and their role in differentiating mutilators from non-mutilators. Generally, the results indicate that the association between EMS and NSSI can be addressed in different ways.

Association between EMS and NSSI

The relationship between EMS and NSSI can be addressed from different points of view. For example, some studies showed schemas, including social isolation/alienation, emotional deprivation, and unrelenting standards, could differentiate those who self-mutilate from those who do not engage in this behavior [27, 28, 31]. These findings suggest that EMS can identify those who self-mutilate as soon as possible, and it can be important for preventive interventions, especially among the younger population like adolescents [49].

On the other hand, it has been reported that some schemas are highly associated with NSSI, as indicated in terms of frequency of NSSI engagement in some studies [46, 50, 51]. Some schemas, including social isolation/alienation, insufficient self-control/self-discipline, emotional deprivation, and vulnerability to harm or illness, were influential in the frequency of NSSI. These findings can explain how EMS can be effective in repetitive engagement in NSSI because if individuals have mutilated on only one occasion, their schemas are similar to those of non-mutilators and repetitive self-mutilators [28]. In other words, schemas of those who self-mutilate on only one occasion cannot differentiate mutilators from non-mutilators. This finding also suggests that repetitive self-harm for those with some schemas, including social isolation/alienation, and emotional deprivation, has the function of regulating emotions.

This review also showed the relationship between EMS and NSSI in two disorders: ED and BPD. This relationship is not surprising due to the high comorbidity between ED and BPD [52] and the self-destruction nature of ED and BPD. Therefore, it seems that EMS and NSSI are highly associated with these disorders, especially in some schemas, including emotional deprivation and social isolation/alienation. Generally, it can show common psychopathology (EMS) in ED and BPD; therefore, schema therapy can be an appropriate suggestion for individuals with ED and BPD.

The relationship between maladaptive schema modes and EMS was investigated in some of the studies. Modes are as important as schemas because they can help recognize oversensitivity in response to some particular circumstances that can lead to NSSI engagement [32]. Certain modes play a role in NSSI, including the vulnerable child (feelings of being lost and isolated), impulsive child (acting on the impulse to achieve short-term goals), and punitive parent (blaming and punishing self and others). Self-blaming and isolation lead to emotions like shame and anxiety [53]. Consequently, individuals act immediately to eliminate these feelings following the impulsive child. These findings agree with the developmental model of shame and NSSI [30]. This model can explain how problems in shame-related functioning may be related to NSSI among the youth.

Table 1. Characteristics of the final included studies in the systematic review (n=10)

Author/Year	Final Sample	Age, Mean±SD	Gender (Females%)	NSSI Measure	EMS Measure	Main Findings (Effect Sizes)	Risk of Bias
Arthurs & Tan (2017) [31]	156	25.23±8.14	82.69	Deliberate self-harm inventory (DSHI)	Early maladaptive schema question-naire- short form (EMSQ-SF)	Significantly higher on all early maladaptive schemas Both high and low NSSI groups except for self-sacrifice beliefs. Significantly Higher on Beliefs Related to Unrelenting Standards Compared to low NSSI group.	Low
Lewis et al. (2015) [27]	434	18.59±1.205	73	Deliberate self-harm inventory (DSHI)	Young schema questionnaire – short form (EMSQ-SF)	Higher scores on social isolation and emotional inhibition and possibly lower scores on entitlement/ grandiosity schemas differentiated those who self-injure. Higher levels of dependence/incompetence schema differentiated those Who reported a higher NSSI frequency	Low
Castille et al. (2007) [28]	105	19±3.29	67.61	Deliberate self-harm inventory (DSHI)	Young schema question-naire–long form, second edition (YSQ–L2)	Mistrust/Abuse, emotional deprivation, social isolation/ alienation and insufficient self-control/self-discipline differentiated Self-mutilators from non-mutilators. The social isolation/alienation schema was endorsed more strongly as the number of self-mutilative episodes increased	Low
Pauwels et al. (2016) [24]	491	21.44±5.85	100	Self-Injury question-naire-treatment-related (SIQ-TR)	Young schema questionnaire-long form (YSQL2)	Significantly higher EMS levels in patients with an eating disorder with NSSI than those without NSSI.	Low

Author/Year	Final Sample	Age, Mean±SD	Gender (Females%)	NSSI Measure	EMS Measure	Main Findings (Effect Sizes)	Risk of Bias
Walker (2014) (Thesis) [46]	252	16.42±1.6	77	Deliberate self-harm inventory (DSHI)	Young schema questionnaire-short form (YSQ-S)	Higher scores on emotional deprivation, vulnerability to harm, subjugation, and self-sacrifice EMSs Accounted for a unique proportion of the variance in NSSI.	Low
Trincas et al. (2014) [51]	456	Female: 38.8.1±1.5 Male: 42.7±9.7	71.92		Young schema questionnaire-short form (YSQ-S3)	Self-harm was predicted by EMSs (emotional deprivation and vulnerability to harm or illness)	Low
Quirk et al. (2015) [50]	296	19.41±2.01	75	Motivations for self-injury scale	Young schema questionnaire-short form (YSQ-SF3)	Higher levels of both intrapersonal and interpersonal maladaptive schemas which, in turn, influenced corresponding intrapersonal and interpersonal motivations for self-injury	Low
Shashoua (2015) [47]	516	34.26±10.85	61.9	Inventory of statements about self-injury (ISAS)	The Young schema questionnaire – short form (YSQ-SF)	Those with an NSSI history reported significantly higher levels of emotional deprivation, mistrust/abuse, social isolation/alienation, and insufficient self-control EMS than those without an NSSI history.	Low
Leppänen (2016) [48]	46	32.4±8.6	85	The parasuicidal behavior subscale of the BPDSI-IV	the Young schema questionnaire (YSQ-L3a) the Young Atkinson Mode Inventory (YAMI)	Significant correlations were observed between the schema modes of detached protector, vulnerable child, punitive parent, and angry child and almost every EMS in BPD patients with parasuicidality	Low
Saldias et al. (2013) [32]	70	35.03±10.17	81.42	Deliberate self-harm inventory (DSHI)	The schema mode inventory (SMI)	Maladaptive schema modes were significantly associated with a higher number of methods of NSSI and also significantly mediated the relationship between parental care and age of onset of NSSI and between parental care and duration of NSSI.	Low

Finally, based on the results, it seems that some schemas, social isolation/alienation, and emotional deprivation, both of them belonging to disconnection and rejection domains are of high importance. On the other hand, some of the modes (the vulnerable child, impulsive child, and punitive parent) possibly leading to emotions like shame and anxiety seem to be specially related to NSSI. Generally, these findings confirm the developmental model of NSSI and shame [30], which suggests that problems related to coping with shame can lead to NSSI. The link between experiences of rejection (and feeling shame) and NSSI has been investigated in previous studies [54].

Study limitations

This study had some limitations: (1) it only considered correlation designs, but experimental designs may tell a different narrative, (2) it was based on theparticipants' self-report, and therefore, method variance could influence the results, and (3) the absence of longitudinal research is a major limitation of this literature. All reviewed studies were cross-sectional in design. Longitudinal work is necessary here to explore the temporal dynamics and direction of these relationships. As Norman et al. noted, reviews can be subject to publication bias because non-significant findings are less likely to be published [55]. The findings of this review may therefore over-represent the relationship between EMS and NSSI. Most samples in the present study were women, which can be problematic for generalizing the results to men.

Clinical implications

The present study has some important clinical implications that can help clinicians to extend their field of practice. Some schemas are highly related to engagement in NSSI, and some (especially social isolation/alienation) are related to repetitive engagement in NSSI. Therefore, schema therapy seems to be an effective treatment for both the prevention and treatment of NSSI. On the other hand, since it has been indicated that adolescents are at a high risk of doing self-harming behaviors, addressing schemas is of high importance because it can help clinicians to identify adolescents that may engage in NSSI [49].

Schema therapy can help individuals with NSSI to feel safe [7], and this feeling of safety can prevent their engagement in maladaptive strategies like NSSI. For example, based on the results, one of the most critical schemas that need to be addressed is social isolation/alienation, and emotional deprivation, and the main modes are a vulnerable child, an impulsive child, and a punitive parent. Focusing on social isolation/alienation, the therapy can help individuals to feel less alone and different from others which can prevent engagement in NSSI. Emotional deprivation is another schema that must be considered in the treatment because working on emotions makes these individuals learn to accept their emotional needs and find an adaptive way to regulate them, rather than engaging in NSSI, which mainly regulates emotions [37]. Working with modes can also help regulate emotions, especially shame and anxiety [53], that are dysregulated through the vulnerable child, impulsive child, and punitive parent modes and can lead to engagement in NSSI. Finally, addressing EMS and schema modes in clinical practice is important because schemas can be considered common psychopathology in developing some comorbid disorders like ED and BPD, two comorbid disorders that can increase the possibility of engagement in NSSI.

5. Conclusion

The results showed the importance of addressing EMSs and modes that lead to NSSI engagement in both preventive and therapeutic interventions and provided evidence for a developmental model of NSSI and shame, suggesting that early interventions in schema therapy, especially in adolescents, can prevent NSSI engagement.

Ethical Considerations

Compliance with ethical guidelines

The instructions of the National Ethics Committee and the COPE (The Committee on Publication Ethics) regulations have been considered in the writing of the article.

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Authors' contributions

Data collection and Writing–original draft: Maryam Babaeifard and Bahareh Shokrani; Writing–review & editing: Mehdi Akbari and Shahram Mohammadkhani.

Conflict of interest

The authors declared no competing interest.

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