Relationship Between Emotion Regulation and Non-suicidal Self-injury (NSSI): a Systematic Review and Meta-analysis Protocol

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Abstract

Background: Non-suicidal self-injury (NSSI) is recognized a serious mental disorder. Its prevalence has increased in recent years. Emotion regulation has been noted to have important role in mental health problems. There is evidence in the literature about the relationship between NSSI and emotion regulation. The studies, however, have reported mixed findings, and no comprehensive study has been conducted yet to address this topic. Therefore, the aim of this systematic review and meta-analysis is to investigate the relationship between NSSI and emotion regulation.

Methods: All studies published after 1990 that have assessed the relationship between NSSI and emotion regulation will be eligible. This entails observational-analytic (descriptive or cross-sectional) studies, case-control studies, cohort studies. There will be no language restriction. Additionally, no limitation will be imposed regarding age, gender, and nationality of the subjects studied

Discussion: Given the inconsistencies present in the findings of primary studies in terms of relationship between NSSI and emotion regulation strategies conducting such a study seems necessary. The results of this study could be used to improve our knowledge about NSSI, help revise health policies in the future, research and education to reduce NSSI burden, and to develop more effective interventions to manage NSSI.

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Background

According to the definition of the International Society for the Study of Self Injury, NSSI is a self-inflicted damage of body tissue made deliberately without suicidal intent that is culturally unacceptable (1). Common forms of NSSI include cutting, burning, scratching, peeling of the skin, and hitting (2). Diagnostic and Statistical Manual of Mental Disorders (DSM-5) has included NSSI in the section of disorders that requires further research studies and has provided research diagnostic criteria for NSSI (3).

NSSI is considered a serious mental health problem, especially among the youth, which has been reported in 13-24% of the general population and in about 35% of college students (4) (5). In a study conducted on 2,130 adolescents, the prevalence of NSSI, was reported as 6.7% (6). Also, the overall prevalence rate in the community varies between 7 and 47% (7) (8) (9). The Global Burden of Disease Study (2015) by measuring the disability-adjusted life year (DALY), reported the rate of self-injury as 471.1 per 100,000 persons (10). NSSI is associated with a wide range of negative outcomes including mental health problems, mood disorders, anxiety, substance abuse, psychotic and personality disorders as well as committing suicide (11) (12) (13) (14) (15) (16) (17) (18) (19) (20).

Longitudinal studies show that lack of proper emotion regulation leads to self-injury behaviors.

Emotion regulation has often been noted as the most important reason for NSSI in most studies (21) (22). Self-injury explanatory models suggest that this behavior is an abnormal external way of regulating and modulating unpleasant emotions. In a study, odds ratio (OR) of the relationship between NSSI and emotional disorders was reported as 1.75 (95% CI= 1.49, 2.06) (23) (24). In Gratz and Roemer study (25), the correlation between emotion dysregulation and self-injury was reported as 0.20 in women and 0.26 in men. Research has repeatedly shown that both in the general community and in clinical settings, self-injury behaviors occur more commonly in people who have difficulties in emotion regulation (26) (27) (28). However, most studies have not measured the relationship between emotion dysregulation and self-injury.

One of the most comprehensive definitions of emotion regulation considers this as a multidimensional structure that includes: A) awareness, recognition, and acceptance of emotions; B) ability to avoid impulsive behaviors and behave in line with desirable goals while experiencing negative emotions; C) modifiable use of strategies in different situations to manage the intensity or duration of emotional responses so that the individual can achieve individual goals and situational demands; D) desire to experience negative emotions as part of pursuing meaningful activities in life (25) (29) (30).

Perez, Lorca, and Marco study (26) showed that NSSI has relationship with lack of emotional clarity (r= 0.7), rejection of emotion (r= 0.41, P< 0.01), and interference with goal-directed behavior (r= 0.4, P< 0.01). Also it should be noted that regarding the relationship between self-injury and emotion dysregulation is that self-assessment studies have supported this relation (31) and have shown high levels of negative emotion in such individuals (20). For instance, Glenn, Blumenthal, Klonsky et al. (32) reported that patients with a history of NSSI reported higher emotional sensitivity using the Emotional Reactivity Scale (mean= 16.48) compared to those without such history (mean of 10.090, P= 0.004). Also, Bresin (33) showed that in a 14-day period, subjects with NSSI showed more negative emotion and fewer positive emotions than the group without NSSI. In Tuna and Gençöz study (34), subjects with history of NSSI had less self-compassion using the self-compassion scale (mean= 62.62, p<.001) and more difficulties in emotion regulation using the difficulties in emotion regulation scale (mean=95.88, p<.001).

But diary, experimental, neuropsychological, and longitudinal studies (35) (36) (37) (38) (32) (39) (36) often failed to demonstrate this pattern (28) (40). For example, Longitudinal study of Franklin, Puzia, Lee et al. (41) found that early self-assessment of emotional reaction significantly distinguishes NSSI from non-NSSI, but does not predict NSSI occurrence over the next six months. Fox (40) states that although emotional dysregulation is not a strong predictor of NSSI in the future, it is a significant risk factor in short time (e.g., during the following month). Also, there is controversy regarding the relationship between different types of emotion regulation strategies (42), such as cognitive reappraisal (43) (44), problem solving, avoidance, suppression (43) (45) and NSSI.

In two review articles (46) (47) and in several systematic reviews the relationship between NSSI and emotion regulation has been examined. Some studies have demonstrated approximately related to the relationship between NSSI and emotion regulation (48) (49) (50) (51) (52) (23) (53) (54) (55) (56) (39)

(57) (58) (59). As far as we know, Others are completely related to the relationship between NSSI and emotion regulation (60) (61) (62) (63) (64) (65) (66) (67).

Dixon-Gordon, Harrison, and Roesch (50) stated that although environmental control is the most prominent function of NSSI in relational studies, emotion regulation seems to be the primary motivation for performing this high-risk behavior. However, controversy exists regarding different strategies of emotion regulation. In this regard, Brereton and McGlinchey (61) reported a significant relationship between NSSI with emotion dysregulation, experiential avoidance/suppression. However, another study (68) noted that accepting emotions can lead to self-injury behaviors. Also, Jutengren, Kerr, and Stattin (69), reported a partial relationship between experiential avoidance and self-injury. These mixed findings highlight the importance of further studies to explore the relationship between experiential avoidance and self-injury, especially in adolescence. Wolff, Thompson, Thomas et al. (64) reported a significant association between emotion dysregulation and NSSI (pooled OR of 3.03, 95%CI= 2.56, 3.59). In this study, the subscales of emotion dysregulation including impulse control problems, non-acceptance of emotional responses, limited access to emotion regulation strategies, and problems with goal-related behavior were more strongly associated with NSSI. On the other hand, lack of knowledge/emotional clarity and cognitive aspects of emotion dysregulation had less significant, but still positive with NSSI. In another systematic review, Cleare, Gumley, and O'Connor (62) concluded that self-compassion and self-forgiveness were associated with lower levels of NSSI. Several studies also suggested that self-compassion and self-forgiveness weaken the relationship between negative life events and self-injury. However, Suh and Jeong (60) reported a small effect size between self-compassion and NSSI. In addition, McHugh, Chun Lee, Hermens et al. (63) examined the relationship between impulsivity and self-injury in young patients (with an average age less than 30 year) and concluded that some aspects of impulsivity are related to suicidal behavior in young adults. Therefore, it is suggested that subsequent studies should examine the relationship between different subtypes of impulsivity and self-injury. All in all, by reviewing of the findings of these studies, considering the diversity of emotion regulation strategies and emotion dysregulation and mixed results, it seems necessary to conduct a comprehensive study on this topic.

To the best of our knowledge, there are 8 systematic review and meta-analysis studies focused completely on the relationship between the emotion dysregulation and emotion regulation strategies and NSSI (61) (62) (66) (67) (63) (65) (64) (60). Only two of them used the priori principle. All of these studies imposed language restrictions. Most of them did not include grey literature as a source for searching the primary studies or used limited grey literature. In limited numbers of these reviews, all these three steps including selection, quality assessment, and data extraction were duplicated (i.e., repeated twice which is recommended by guidelines for conducting a robust systematic review). In addition, a limited range of search key terms were used.

Therefore, given the importance of this research topic in psychology and the conflicting results regarding the effect that study design and its approach can have on the relationship between emotion regulation and NSSI and moreover the conflicting results on some types of emotion regulation strategies with NSSI mentioned earlier, we intend to comprehensively examine the relationship between emotion regulation

strategies and NSSI. In this systematic review and meta-analysis, we will try to include grey literature and wider range of search key terms and duplicating selection, quality assessment, and data extraction with the objective to overcome some of the limitations of previous reviews. Additionally, if possible, we will be trying to explore the relationship between emotion regulation and NSSI based on study type and design, emotion regulation strategies, and other variables by performing subgroup analysis. In addition, the evaluation of possible heterogeneity among the primary studies and finding its potential causes will be performed.

Objectives

The primary objective of this review study is to investigate the relationship between emotion regulation strategies and non-suicidal self-injury (NSSI).

Secondary objectives are:

1. To investigate the relationship between emotion regulation strategies and NSSI based on study approach (cross-sectional, retrospective, and longitudinal).
2. To investigate the relationship between emotion regulation strategies and NSSI based on gender.
3. To investigate the relationship between emotion regulation strategies and NSSI based on age groups.
4. To assess heterogeneity in the results of the primary studies and to examine the potential causes.
5. To investigate the relationship between emotion regulation strategies and NSSI based on different types of emotion regulation strategies.
6. To investigate the relationship between emotion regulation strategies and NSSI based on various tools used in the primary studies to measure emotion regulation strategies.

Methods

This systematic review and meta-analysis study will be conducted based on the PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) checklist (70). The study protocol is registered in the PRASPERO (Registration No. CRD42021226454).

Inclusion and exclusion criteria (eligibility criteria)

Study type/design

All studies published after 1990 that have examined the relationship between NSSI and emotion regulation will be eligible to be included. This entails observational-analytic studies (descriptive or cross-sectional studies), case-control studies (retrospective or prospective ones), and cohort studies. These studies should have details regarding measurements of NSSI and emotion regulation and have measured

the relationship between NSSI and emotion regulation. There will be no language restrictions and translation of non-English records will be done if necessary. Qualitative studies, case report/series, letters and editorials will be excluded.

Subjects

There will be no limitation regarding age, gender, and nationality of the participants.

Exposure (emotion regulation)

Studies that have evaluated one or more types of emotion regulation strategies will be eligible. The definition of emotion regulation strategies consists of a multidimensional structure that includes the following: A) awareness, recognition, and acceptance of emotions; B) ability to avoid impulsive behaviors and behave in line with desirable goals while experiencing negative emotions; C) modifiable use of strategies in different situations to manage the intensity or duration of emotional responses so that the individual can achieve individual goals and situational demands; and D) desire to experience negative emotions as part of pursuing meaningful activities in life (4) (29) (30). In this study, all dimensions of emotion regulation (any definition) will be considered.

Outcome (NSSI)

Studies that have evaluated NSSI (any type) will be eligible. The definition of NSSI is self-inflicted damage of body tissue made deliberately without suicidal intent that is culturally unacceptable. There will be no limit to any type of NSSI and all forms (any definition) will be eligible.

Search strategy

Four search strategies will be used to identify as much relevant literature as possible. Firstly, the electronic searching of databases will be performed. The electronic databases that will be used to conduct the search include PsycINFO, Scopus, PubMed, ProQuest, MEDLINE, Embase, Web of Science and Google scholar.

The keywords determined using controlled vocabularies of MeSH (Medical Subject Headings), Emtree, and PsycINFO thesaurus system as well as the three-phase method. Also, keywords determined using free text method including previous systematic reviews and expert opinions.

The search syntax developed to be used for PUbMed database is presented in additional file 2. And will be modified for other electronic databases.

The second source will consist of searching the reference lists of any studies selected for inclusion in the final review to identify relevant articles that may have been missed by the electronic database searches and reference list of previous reviews.

The third source will be to conduct a search of the grey literature (other sources such as conferences, dissertations).

The forth source will consist of searching the key journals.

Screening and Selection

Selection process

Studies identified in the search step will be transferred to Mendeley for screening. Duplicate records will be excluded. The records will then be screened independently by two reviewer to ensure meeting inclusion and exclusion criteria. This will be done using a two-step approach based on titles/abstracts and full texts. Any disagreement will be resolved through consensus. There will be no language restrictions and translation of non-English records will be done if necessary.

Methodological quality (risk of bias) assessment of primary studies

Quality assessment will be done by two reviewers independently. In order to perform this step, the JBI critical appraisal tool (71) will be used. Any disagreement will be resolved through consensus.

Data extraction

The required data will be collected by two reviewers independently and will be transferred to a data collection form. The required data that will be extracted are:

1. Study identification information (first author, year of publication, journal title, study design, methodology, geographical location, funding source, conflict of interest reported by the authors)
2. Demographic data (age, gender, number of participants, specific groups, inclusion and exclusion criteria, study period, educational level)
3. Effect size indices: primary goal is relationship between emotion regulation and NSSI and secondary goals are exploring this relationship based on several variables mentioned earlier in the “objectives” section.

If the required data related to the primary goal of the review are not reported in the article, we will contact the authors for further data. In case of presentation of data in the diagrams or figures (graphs), WebPlotDigitizer tool will be used to extract the data. This online tool permits conversion of graphical information to numerical data.

If the required data is not reported in the original articles, correspondence with the authors will be done to ask for the data. This contact will be made for 3 times (every 7 to 10 days) and if no response is received that particular study will be excluded.

Data Synthesis

Considering methodological similarities, fixed-effect or random-effects model will be used. The pooled data will be presented by forest lots.

The heterogeneity of the results of primary studies will be assessed using Q Cochran test and I^2 (inconsistency) index. The categorization suggested by Higgins et al. considers I^2 values as follows: 0 to 25% (mild heterogeneity), 25 to 50% (moderate heterogeneity), 50 to 75% (severe heterogeneity), and 75 to 100% (very severe heterogeneity).

Two methods will be considered for this step including subgroup analysis or meta-regression. The variables that are considered for this step include age, gender, study design, study overall quality (risk of bias), different types of emotion regulation strategies, different types of emotion regulation measurement tools, and study periods.

The following methods will be used in order to evaluate possible publication bias:

1. Visual examination of funnel plot: If the total number of included studies is less than 10 studies, this method will not be used. If evidence of heterogeneity is observed (i.e., asymmetry of the plot), the next two steps will be employed.2. In the second stage, Begg and Egger tests will be used. In case of p values less than 0.1 in any of these tests, trim and fill method will be used to correct the bias.

Discussion

The purpose of this systematic review is to assess the relationship between NSSI and emotion regulation. Despite the growing attention NSSI in recent years, due to the inconsistencies of the results of studies regarding the relationship between different strategies of emotion regulation and NSSI, a systematic review seems necessary. The results of this study will help improve our knowledge about NSSI. Also, the results will help in policy making for research and education on this topic. The role that different emotion regulation strategies play will be clearer for decision makers to develop more effective interventions to manage NSSI.

Abbreviations

NSSI: Non-suicidal self-injury

DSM: Diagnostic and Statistical Manual of Mental Disorders

DALY: Disability-adjusted Life Year

OR: Odds ratio

PROSPRO: Prospective Register of Systematic Reviews

Declarations

Availability of data and materials

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Authors` contributions

ZT and NM led the design of the protocol. All authors drafted the first protocol. ZT, NM and SA reviewed the protocol. All authors have developed the search strategy. AK have reviewed the manuscript and incorporated intellectual inputs. All authors have read, edited and approved the final manuscript for submission.

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