



# Non-suicidal self-injury and life stress: A systematic meta-analysis and theoretical elaboration



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## HIGHLIGHTS

- We conducted a meta-analysis and narrative review of the link between stress and NSSI.
- A significant but modest relation was found between life stress and NSSI.
- Cross-sectional design limitations render the temporal nature of the relation unclear.
- A preliminary conceptual model of this association is presented to guide future study.

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## ABSTRACT

Recent years have seen a considerable growth of interest in the study of life stress and non-suicidal self-injury (NSSI). The current article presents a systematic review of the empirical literature on this association. In addition to providing a comprehensive meta-analysis, the current article includes a qualitative review of the findings for which there were too few cases (i.e., <3) for reliable approximations of effect sizes. Across the studies included in the meta-analysis, a significant but modest relation between life stress and NSSI was found (pooled OR = 1.81 [95% CI = 1.49–2.21]). After an adjustment was made for publication bias, the estimated effect size was smaller but still significant (pooled OR = 1.33 [95% CI = 1.08–1.63]). This relation was moderated by sample type, NSSI measure type, and length of period covered by the NSSI measure. The empirical literature is characterized by several methodological limitations, particularly the frequent use of cross-sectional analyses involving temporal overlap between assessments of life stress and NSSI, leaving unclear the precise nature of the relation between these two phenomena (e.g., whether life stress may be a cause, concomitant, or consequence of NSSI). Theoretically informed research utilizing multi-wave designs, assessing life stress and NSSI over relatively brief intervals, and featuring interview-based assessments of these constructs holds promise for advancing our understanding of their relation. The current review concludes with a theoretical elaboration of the association between NSSI and life stress, with the aim of providing a conceptual framework to guide future study in this area.

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## 1. Introduction

Life stress has been identified as a non-specific risk factor for psychiatric illness. It figures prominently in etiological models of a variety of mental disorders, including schizophrenia (Walker, Mittal, & Tessner, 2008), substance use (Sinha, 2001), depression (Monroe & Harkness, 2005), and, of course, post-traumatic stress disorder (Brewin & Holmes, 2003). Consistent with several of these theoretical perspectives, life stress has been found to be associated with increased risk for psychosis (Beards et al., 2013), substance use and dependence (Enoch, 2011; Hyman & Sinha, 2009), and depression (Hammen, 2005).

Stressful life events have also been theoretically and empirically linked with risk for self-harm, particularly in the form of suicidal ideation and behavior (Liu & Miller, 2014; Mann et al., 2005). Considerably less studied in this regard is non-suicidal self-injury (NSSI), defined as the direct and deliberate destruction of one's own bodily tissue in the absence of any suicidal intent (Nock, 2010). Although it has traditionally received less empirical consideration than suicidal behavior, NSSI has been increasingly recognized over the last decade as an important and phenomenologically distinct clinical phenomenon in its own right (Muehlenkamp, 2005). Indeed, NSSI as a distinct syndrome has been included in DSM-5 as a disorder warranting further study (American Psychiatric Association, 2013). The relative neglect of NSSI in earlier clinical research stemmed, in large measure, from the view that it exists along with suicidal behavior on a continuum of deliberate self-harm, and, moreover, that it falls on the milder end of this spectrum (Brent, 2011a). There is emerging evidence, however, suggesting that this is not the case. That is, although NSSI and suicidal behavior do share some common correlates, they differ significantly in their functions, neurobiology, response to treatment, and long-term trajectory (Brent, 2011a; Mars et al., 2014; Muehlenkamp, 2005; Muehlenkamp & Gutierrez, 2007; Wichstrøm, 2009). Not only is NSSI a meaningfully distinct form of self-harm, there is some emerging evidence to indicate that it may be an even stronger predictor of suicidal behavior than a prior history of suicide attempts (Asarnow et al., 2011; Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011), highlighting the clinical importance of this behavioral phenomenon.

Several researchers have emphasized the need for studies of suicide to move beyond the identification of general risk factors toward elucidating causal elements that lead individuals to engage in this specific form of self-harm, so as to inform intervention and treatment strategies (Brent, 2011b; Nock, 2009a). Given the current paucity of evidence-based treatments for NSSI (Whitlock, 2010), especially in adolescents (Nock, 2012), the need for research uncovering causal factors for this behavior also holds true. Arriving at a better understanding of the relation between life stress and NSSI may be particularly important in this regard. Specifically, insofar as stressful life events are a temporally

delimited rather than trait-like risk factor, and, moreover, insofar as these stressful life events potentially precipitate occurrences of NSSI, documenting this relation may aid in advancing our conceptualization of *who* is generally at risk to include *when* they are at imminent risk for engaging in this behavior. Such knowledge is of potential clinical utility in formulating and timing intervention strategies, particularly with chronically high-risk individuals.

The principal aim of the present article was to present a systematic meta-analysis of the empirical literature on the association between life stress and NSSI. As our interest was in conducting a comprehensive review of the literature, our meta-analysis was supplemented by a qualitative review of findings for which there were too few cases (i.e., <3) for reliable approximations of effect sizes. To provide an appropriate context in which to evaluate the existing literature, we first began with a brief overview of the conceptualization and measurement of life stress. We then proceeded with a consideration of the relevance of life stress to conceptual models of NSSI. Following a comprehensive review of the current literature on life stress and NSSI, we ended with a discussion of methodological considerations and a theoretical elaboration of the relation between these two constructs, with the aim of providing a framework to guide future study in this area.

### 1.1. Conceptualization and measurement of life stress

As a risk factor for negative mental health outcomes, stress has been defined and studied in a variety of notably different ways (for a detailed review, see Cohen, Kessler, & Gordon, 1995). These include physiologic stress, especially as operationalized in terms of hypothalamic-pituitary-adrenal (HPA) axis reactivity and allostatic load (McEwen, 1998; Selye, 1936). A second frequently adopted approach to conceptualizing stress centers on psychological or subjective stress (e.g., degree of distress experienced as a result of the individual's cognitive appraisal of the threat or challenge posed by an event; Lazarus & Folkman, 1984). In contrast, the focus of yet another commonly observed perspective is on exposure to exogenous stimuli or events within the individual's environment (e.g., loss of a job, end of a friendship), independent of the individual's subjective interpretation of the events (Grant, Compas, Thurm, McMahon, & Gipson, 2004; Hammen, 2005).

Although studies of physiologic and subjective stress have contributed considerably to our understanding of risk for different forms of psychopathology (Gunnar & Quevedo, 2007; Park, 2010), the current review focuses exclusively on stress as defined within the third tradition, often termed "objective" stress (Hammen, 2005). Several researchers have commented on the existence of certain significant advantages of this conceptualization of "objective" stress relative to subjective stress (Grant et al., 2003; Hammen, 2005). In particular, a potential concern with operationalizing stress based on subjective or

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