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Review article

## Nonsuicidal self-injury in community adolescents: A systematic review of prospective predictors, mediators and moderators



Fatima Valencia-Agudo<sup>a,b,\*</sup>, Georgina Corbet Burcher<sup>b</sup>, Lourdes Ezpeleta<sup>a</sup>, Tami Kramer<sup>b</sup>

<sup>a</sup> *Clinical and Health Psychology Department, Autonomous University of Barcelona, Facultat de Psicologia UAB, Departament de Psicologia Clínica i de la Salut, Edifici B1, Campus de la Universitat Autònoma de Barcelona, Carrer de Ca n'Altayó, s/n, 08193, Bellaterra, Barcelona, Spain*

<sup>b</sup> *Centre for Psychiatry, Imperial College London, 7th Floor Commonwealth Building, Du Cane Road, London, W12 0NN, UK*

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### ABSTRACT

Nonsuicidal self-injury (NSSI) usually starts during adolescence and is associated with an array of psychological and psychiatric symptoms and future suicide attempts. The aim of this study is to determine prospective predictors, mediators and moderators of NSSI in adolescent community samples in order to target prevention and treatment strategies. Two team members searched online databases independently. Thirty-nine studies were included in the review. Several variables were seen to prospectively predict NSSI: female gender, family-related variables, peer victimisation, depression, previous NSSI and self-concept. Few studies analysed mediators and moderators. Low self-concept was highlighted as a relevant moderator in the relationship between intra/interpersonal variables and NSSI. Implications of these findings are discussed. The considerable heterogeneity between studies posed a limitation to determine robust predictors of NSSI. Further prospective studies using standardised measures of predictors and outcomes are needed to ascertain the most at risk individuals and develop prevention strategies.

### 1. Background

Nonsuicidal self-injury (NSSI) has been defined as ‘the deliberate, direct, socially unacceptable destruction or alteration of body tissue that occurs in the absence of suicidal intent’ (Nock & Favazza, 2009). This behaviour is a focus of concern in the adolescent period, given that the onset frequently occurs between age 12 and 14 (Jacobson & Gould, 2007) and the rise in prevalence during middle adolescence (Barrocas, Giletta, Hankin, Prinstein, & Abela, 2015). A review showed a NSSI lifetime prevalence of 17.2%, 13.4% and 5.5% in adolescents, young adults and adults respectively (Swannell, Martin, Page, Hasking, & St John, 2014). Some studies have described a lifetime prevalence of up to 23.2% in adolescent community samples (Jacobson & Gould, 2007). NSSI declines substantially over time (Plener, Schumacher, Munz, & Groschwitz, 2015) but there is a group of young people in which it develops into a chronic practice, extending into late adolescence and adulthood (Barrocas et al., 2015). Consequently, adolescence is a key developmental stage for prevention and intervention.

There are several terms used to describe self-injury, and semantic differences exist between countries for similar terms (Hawton, Rodham, Evans, & Weatherall, 2002). Nonsuicidal self-injury has been proposed as a preferred expression to characterise self-injurious behaviours that are performed without a suicidal intent, given the term's clarity and absence of pejorative meaning (Jacobson

\* Corresponding author. Facultat de Psicologia UAB, Departament de Psicologia Clínica i de la Salut, Edifici B1, Campus de la Universitat Autònoma de Barcelona, Carrer de Ca n'Altayó, s/n, 08193 Bellaterra, Barcelona, Spain.

E-mail address: [fatima.valencia@salud.madrid.org](mailto:fatima.valencia@salud.madrid.org) (F. Valencia-Agudo).

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& Gould, 2007). NSSI behaviours include cutting/scratching wrists or arms, self-hitting, banging the head against the wall or burning skin. Acts such as overdosing on medication or jumping from height are excluded.

Although research suggests that suicide attempts are associated with more negative outcomes than NSSI, such as higher levels of psychological symptoms and psychosocial risk factors (Brauch & Gutierrez, 2010; Jacobson, Muehlenkamp, Miller, & Turner, 2008; Mars et al., 2014), NSSI is often repetitive and occurs more frequently than suicidal acts (Plener, Libal, Keller, Fegert, & Muehlenkamp, 2009). Moreover, it seems that history of previous NSSI is associated with more adverse psychological symptoms in individuals who have attempted suicide (Guertin, Lloyd-Richardson, Spirito, Donaldson, & Boergers, 2001). NSSI has also been shown to be a predictor of future suicide (Guan, Fox, & Prinstein, 2012; Hawton, Zahl, & Weatherall, 2003). Some previous studies have found no differences in suicidal ideation between self-injury with and without suicidal intent (Jacobson et al., 2008) and in the prediction of completed suicide (Cooper et al., 2005). NSSI behaviours often go unnoticed by the support networks surrounding young people, including their parents (Baetens et al., 2014) and the episodes rarely result in presentation to hospital (Hawton et al., 2002).

Research findings demonstrate strong and consistent associations between NSSI and depression and anxiety symptoms (Jacobson & Gould, 2007), substance use (Hilt, Cha, & Nolen-Hoeksema, 2008), adverse psychological symptoms and behaviours (Barrocas et al., 2015; Tatnell, Kelada, Hasking, & Martin, 2014; You, Lin, & Leung, 2015) and borderline personality disorder (Ferrara, Terrinoni, & Williams, 2012). NSSI has been conceptualised as a maladaptive coping strategy to regulate aversive affect and social situations (Klonsky, 2009; Nock, 2009) in the context of diminished capacity to achieve these objectives through alternative and adaptive means. However, NSSI can also exist independently from other mental health problems (Muehlenkamp, 2005).

The development of prevention strategies for adolescent NSSI is essential given the increasing numbers of young people engaging in the practice (Swannell et al., 2014) and the associated risk. Rates of NSSI are as high as 50% in inpatient adolescents (Glenn & Klonsky, 2013) and this behaviour is often associated with history of suicide attempts and personality disorder (Nock, Joiner Jr., Gordon, Lloyd-Richardson, & Prinstein, 2006). Identification of NSSI at an earlier stage is fundamental in terms of prevention, but this task is difficult in the community (Baetens et al., 2014), since the majority of cases do not present to services (Hawton, Saunders, & O'Connor, 2012). In recent years there has been an increasing interest in school-based prevention and health promotion programmes (Weare & Nind, 2011), considering schools as preferred settings to identify potential problems and to provide support.

Determining prospective predictors will improve the chances of identifying the most at-risk individuals and will inform prevention strategies for NSSI. Establishing moderators and mediators may also improve the understanding of aetiological factors. Moderators can help ascertain under which circumstances a risk factor may make adolescents more likely to self-harm, whereas mediators will highlight possible internal psychological factors accounting for and explaining relationships between two variables (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001).

Previous studies looking at predictors of adolescent self-harm have determined the importance of depression (Barrocas et al., 2015; Claes, Luyckx, Baetens, Van de Ven, & Wittman, 2015), previous self-injury (Sourander et al., 2006; Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011), low self-esteem (O'Connor, Rasmussen, & Hawton, 2009; Tatnell et al., 2014), history of sexual abuse (O'Connor et al., 2009; Weierich & Nock, 2008), posttraumatic stress symptoms (Weierich & Nock, 2008) and peer NSSI (Prinstein et al., 2010), amongst other factors. However, studies commonly show contradictory findings and present a number of limitations: heterogeneous conceptualisation of self-harm behaviours lacking consideration of the intent of self-harm (O'Connor et al., 2009; Sourander et al., 2006), use of non-community samples (Wilkinson et al., 2011) and use of cross-sectional designs (Webb, 2002; Weierich & Nock, 2008). Longitudinal methodology is preferred in identifying predictors, since stronger conclusions about causal relationships are possible as well as allowing for more rigorous control of confounders (Kraemer et al., 1997). These limitations pose a barrier to the comparison of studies and formation of consistent conclusions for prevention programmes.

The few existing reviews present similar problems to individual studies: the use of mixed adolescent and adult samples (Fliege, Lee, Grimm, & Klapp, 2009; Fox et al., 2015; Plener et al., 2015), the inclusion of cross-sectional studies (Fliege et al., 2009; Webb, 2002) and the lack of assessment of suicidal intent (Evans, Hawton, & Rodham, 2005; Webb, 2002). Moreover, a considerable number of longitudinal studies on this topic have been published in recent years subsequent to the publication of available reviews (Evans, Hawton, & Rodham, 2004; Fliege et al., 2009; Webb, 2002).

This is the first systematic review with the aim of answering the following question: What are the prospective factors that predict, moderate and mediate NSSI-related outcomes in community adolescents?

## 2. Method

The review protocol is not registered but it is available upon request to the authors.

### 2.1. Search strategy

A literature search was conducted using four databases: Medline, PsycInfo, Embase and Web of Science. The following mesh and free terms were searched for in title and abstract: ["adolescen\*" OR "teen\*" OR "young pe\*"] AND ["nonsuicidal self-injury" OR "non-suicidal self-injury" OR "NSSI" OR "nonsuicidal self-harm" OR "non-suicidal self-harm" OR "self-injur\*" OR "self-cut\*" OR "self-mutilat\*"] AND ["risk factor\*" OR "protective factor\*" OR "mediat\*" OR "predict\*" OR "moderat\*"] AND ["longitudinal\*" OR "prospective\*" OR "cohort" OR "wave\*"]. Databases were searched and screened independently by two reviewers. Reference lists were also hand-searched to identify other potential relevant citations.

The last updated search was conducted in January 2017. Once the search was completed, titles and abstracts were screened and

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