Towards an effective and feasible treatment intervention for adolescents who present to hospital with nonsuicidal self-injury

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Thesis Abstract

The base rate of adolescent nonsuicidal self-injury (NSSI) is estimated to be between 40-61% in clinical samples. The high rate of psychiatric comorbidity and the increasing complexity of hospital presentations amongst these adolescents creates excess demands on limited hospital resources with associated implications for safety, clinical care and service costs. This makes NSSI a significant public health issue as well as a clinical service priority.

Despite its acknowledged clinical and economic relevance, there are no empirically supported treatments for NSSI in adolescents and limited attention has been given to clinical feasibility for tertiary healthcare settings who shoulder most of the service provision. Providing effective and viable interventions that are clinically and developmentally relevant is therefore a legitimate and important focus of clinical research to reduce general hospital and psychiatric service demands and improve the functioning and mental health of young people with NSSI and their families. These considerations provided the justification for this research and shaped the focus of the studies that make up this thesis.

Study one aimed to provide a critical review of the current treatment literature and found that there are currently no evidence-based interventions that target adolescents with NSSI that have been shown to be more effective than treatment as usual. Study two compared a clinical group of adolescents with NSSI to an age and gender matched non-clinical control group to gain a better understanding of leading theoretical models and their potential relevance to adolescent populations. The findings suggest that adult theories that prioritise the emotion-regulatory function of NSSI have application to adolescents and are therefore a useful basis from which to draw for adolescent models. The actual dimension of emotion regulation that is potentially important to adolescent-specific theory and treatment is highlighted. Based on these findings, study three details the development of a brief and feasible group treatment for adolescents who present to hospital with NSSI, the effectiveness of which is tested in a randomised controlled trial (RCT) in study four. The results of study

four showed a significant improvement in the treatment versus control group on NSSI frequency and type, as well as on a number of core constructs of emotion regulatory theory, including, emotion regulation, emotional avoidance, depression and stress. No significant difference was found in terms of anxiety or family functioning. Importantly, the treatment group maintained their gains at 3-months post treatment and needed significantly fewer acute care contacts in this period.

The effectiveness, feasibility and potential reach of a treatment utilising a time-limited group format that directly targets the function of adolescent NSSI is promising. This approach has the potential to offer a clinically and economically sound frontline intervention for adolescents who present to tertiary care services with NSSI. Further research and development is warranted and now urgently needed.

Declaration

I certify that this thesis contains no material which has been accepted for the award of any other degree in any university or other tertiary institution other than Macquarie University and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I certify that this thesis is an original piece of research and that it has been written by me. For each primary study, I was responsible for the formulation of the research questions, ethics application, study and project management, data preparation, statistical analysis and preparation of the papers. Dr Carolyn Schniering and Professor Ron Rapee supervised the preparation and writing of each paper.

All of the research was conducted while I was employed as a Clinical Psychologist at Redbank House, Westmead Hospital, where I was responsible for the development and implementation of clinical treatment programs for adolescent clients. My thesis builds significantly on previous work by my predecessors by utilising additional data sources, completing detailed statistical analyses, and through the use of specific theoretical models to guide the development of the treatment manual and the research study.

I give consent to this copy of my thesis, when deposited in the Macquarie University Library, being made available for loan subject to the provisions of the Copyright Act 1968.

The conduct of this research was approved by the Western Sydney Local Health District Human Research Ethics Committee under approval number *HREC2011/7/4.8 (3350) AU RED HREC/11/WMEAD/126.* External approval was noted by the Ethics Secretariat of the Human Research Ethics Committee of Macquarie University (*REF 5201200003*).

Signed: ………..   Date: …………………………

Holly J. Donnelly

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Thank you also to my supervisor, Dr Carolyn Schniering, for your thoughtful review and ongoing encouragement through the ups and downs of the last few years, and to my associate supervisor, Professor Ron Rapee, for keeping me on track and focused with invaluable feedback and encouragement.

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Acronyms

ANOVA	Analysis of Variance
BPD	Borderline Personality Disorder
CBT	Cognitive Behaviour Therapy
DBT	Dialectical Behaviour Therapy
EAM	Experiential Avoidance Model
ERg-A	Emotion Regulation group for Adolescents
MBCT	Mindfulness-Based Cognitive Therapy
MDD	Major Depressive Disorder
NSSI	Nonsuicidal Self-Injury
RCT	Randomised Controlled Trial
SSI	Suicidal Self-Injury
SSRI	Selective Serotonin Reuptake Inhibitor

Definitions

Nonsuicidal self-injury: the intentional and repeated destruction or alteration of body tissue, for purposes that are not socially sanctioned, and without conscious suicidal intent (Gratz, 2001; Klonsky & Muehlenkamp, 2007).

Tertiary care: specialised consultative health care, usually for and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment, such as a tertiary referral hospital (Johns Hopkins Medicine, 2011).

References

Gratz, K. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate

self-harm Inventory. *Journal of Psychopathology and Behavioral Assessment, 23,*

253-263.

Johns Hopkins Medicine. Tertiary Care Definition [Website]. Retrieved from

http://www.hopkinsmedicine.org/patient_care/pay_bill/insurance_footnotes.html.

Accessed 27 June 2014.

Klonsky, D., & Muehlenkamp, J. (2007). Self-injury: A Research review for the

practitioner. *Journal of Clinical Psychology*, *63(11),* 1045-1056.

doi:10.1002/jclp.20412

Foreword

In this thesis, I consider the phenomenon of nonsuidical self-injury (NSSI) in clinical populations of adolescents who require treatment by the tertiary public healthcare sector. The thesis is comprised of three sections. The first section is an introduction to the area of research, and includes our understanding of the behaviour to date and an outline of theoretical and research efforts so far. It provides the context and justification for the four research manuscripts that make up the second section. The third section then consolidates the key conclusions from these four studies, articulates implications for clinical practice, and makes recommendations for future research based on the findings.

INTRODUCTION

Self-harm has been recorded in history for thousands of years, with one of the earliest references dating back to a biblical story that describes how Jesus cured a man who was "crying out and cutting himself with stones" (Nock, 2010). The fields of history, science, art and literature have since been witness to this behaviour (Favazza 1989, 1998). In 500 B.C. Sophocles, the Greek dramatist, described the distress of Oedipus Rex who gouged out his eyes, in the 1800's Vincent van Gough severed the lower part of his ear with a razor, and in the 1900's Sylvia Plath's became known for her referencing of the phenomenon in her poetry, most notably in 'The Other'(Plath, 1962, p. 202). In more modern times celebrities such as Angelina Jolie, Johnny Depp, Amy Winehouse and Princess Diana have spoken out about their self-harm experiences (http://www.imdb.com/list/ls004286602/) and the behaviour has been a common topic of interest in magazines, films, and novels. The Internet and social media have played a significant role in transporting self-harm into public, and particularly adolescent, consciousness in recent years (Lewis & Seko, 2016; Skegg, 2005). Whilst this has been beneficial in terms of public awareness and education, the behaviour is frequently trivialised (wrist-slashing) and its sufferers are marginalised (as 'cutters'). The legitimacy of self-harm was first highlighted in 1996 by Favazza when he published his seminal work, *Bodies Under Siege: Self-mutilation in Culture and Society,* and drew attention to self-harm as an important clinical phenomenon that warranted psychiatric scrutiny and research effort. The consequent attention it received from the clinical community resulted in predictions that a large number of self-harmers would seek treatment at the turn of the century, and this would exert pressure on the clinical field to develop innovative and effective therapies. As the first decade of the new century has passed, these predictions have become a concerning reality.

As we sit in 2015, two important factors about self-harm have become clear. Firstly, consistent reports have confirmed that prevalence rates amongst adolescents are particularly high (Klonsky, 2007; Moran et al., 2012; Nock & Prinstein, 2004). In 2008, the Child &

Adolescent Self-harm in Europe (CASE) Study developed a rigorous methodology to identify deliberate self-harm among young people (Madge et al., 2008). The study coordinated over 30,000 adolescents from seven different countries and concluded that "deliberate self-harm in adolescents is an international problem of considerable scale" (Madge et al, 2008, p. 676). Whilst precise prevalence and incidence rates are still unknown, studies suggest that 13-46% of adolescents in the community and as many as 40-80% of adolescent psychiatric patients engage in self-harm (Darche, 1990; DiClemente, Ponton, & Hartley, 1991; Nock et al., 2004). Furthermore, anecdotal reports from clinicians suggest these numbers are still on the rise and hospital presentations suggest a steady increase over the past 10 to 20 years (Nock, 2010). The wide variation in reported numbers is due to measures not being included in any large scale epidemiological studies, variations and disagreements over the definition of the act, the assessment method used, the frequency required to meet criteria, and the characteristics of the sample and recruitment methods (Nock, 2010), as well as the private nature of the act itself (Messer & Fremouw, 2008). Notwithstanding these limitations, and even at lower bound estimates, this behaviour is occurring at a disproportionately high rate in adolescent populations, is more frequent than a wide range of mental disorders (Nock, 2010) and is noticeably higher among adolescents than among both children and adults (Klonsky, 2007; Washburn et al., 2012). There is no doubt that healthcare providers will encounter large numbers of these presentations in their practice today and when they do they will need effective treatment options.

The second important issue that needs to be considered in any discussion of NSSI is the longstanding call to consider self-harm as a distinct behaviour or syndrome (Favazza & Rosenthal, 1993; Kahan & Pattison, 1984) or indeed to reclassify it as its own diagnostic entity (Glenn & Klonsky, 2010; Muehlenkamp, 2005). In the third publication of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association, 1980) self-harm was exclusively classified as a criterion of Borderline

Personality Disorder (BPD). Research over the past decade has led to an important shift in perspective demonstrated by the inclusion of the behaviour in the recent fifth edition as a "condition requiring further study" and the suggestion that a self-harm disorder be included in the next edition (DSM-5, American Psychiatric Association, 2013). This shift was prompted by three important findings: 1) that self-harm frequently occurs independently of BPD, 2) that whilst there is an overlap between self-harm and BPD this overlap is no greater than between BPD and other Axis I disorders, and 3) that self-harm has unique associations with clinical impairments, such as anxiety and loneliness, over and above a diagnosis of BPD. One contentious distinction with regards to this last finding is that made between self-harm and suicidal behaviours which were combined in the DSM-IV (American Psychiatric Association, 1994) under "recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior". Self-harm is a well-established risk factor for suicidal behaviour (Lengel & Mullins-Sweatt, 2013) and it is difficult to distinguish between these acts given that self-report of intent to die can be ambiguous. Nonetheless, it is important to do so whenever possible given the apparent difference in their function (i.e. to regulate emotions and to end life) and the subsequent implications for treatment development. There is ample research that demonstrates key differences between self-harm and suicide attempts in terms of prevalence, frequency, motivation, medical severity and psychosocial correlates (Lengel et al., 2013). There are also many cases of individuals who self-harm and do not report a history of suicide attempts (e.g. 41% of a sample of self-harming female adolescents; Schwartz, Cohen, Hoffman, & Meeks, 1989) as well as research that has found that self-harming individuals who attempt suicide tend to do so when they are not actively self-harming and by engaging in behaviors that are not classified as self-harm (e.g. overdosing; Walsh & Rosen, 1988). Therefore, whilst acknowledging that people who self-harm have an increased risk of later suicide than those who do not, the common practice of conflating or confusing these two acts in the literature (Messer, et al., 2008; Nock, 2010), has important research and clinical consequences. It may

result in reports of inflated prevalence of attempted suicide, inaccurate case conceptualisations, development of treatment interventions that are not effective, and inappropriate treatment recommendations including iatrogenic hospitalisations. The literature is currently littered with the interchangeable use of terms to describe this phenomenon (Skegg, 2005) including non-suicidal self-injury (NSSI; Muehlenkamp, 2006), deliberate self-injury (DSI; Klonsky, 2007), deliberate self-harm (DSH; Gratz, 2003; Pattison & Kahan, 1983), self-mutilation (SM; Nock et al., 2004), moderate self-mutilation (Favazza & Rosenthal, 1993), self-wounding (Tantum &Whittaker, 1992), and parasuicide (Ogundipe, 1999; Linehan, 1993). Some of these terms are used to describe the same behaviour, for example, descriptions by Pattison and Kahan (1983) and Favazza and Rosenthal (1993) of 'deliberate self-harm' and 'moderate self-mutilation' appear to describe the same phenomenon. On the other hand, many authors use the same terms to describe inherently different behaviours, for example, some use the term 'deliberate self-harm' to distinguish between self-harm and suicide related behaviors (e.g., Gratz, 2003), whilst others use this term without making this distinction (e.g., Burns, Dudley, Hazell, & Patton, 2005). Other authors use terms that refer to both of these types of behaviour, for example the use of the term 'parasuicide' to refer to both self-harm and suicidal behaviours (Linehan, 1993), and still others use the term as purely behavioural and don't reference intent at all (Lundh, Karim, Quilisch, 2007). Whilst these differences arise to some degree due to international variations, there is a global acknowledgement of the need for a standardised term (Lundh et al., 2007) that, amongst other things, would facilitate comparative research studies, contribute to accurate assessment protocols and clarify treatment goals and outcomes. To date, efforts to move towards this distinction and the integration of the key components of self-harm have identified four characteristics that consistently stand out: deliberateness, social unacceptability, repetitiveness and tissue damage without the intent to die (Messer et al., 2007). It is therefore important to define and make explicit the intentional selection and use of

the term 'nonsuicidal self-injury' in this thesis which is defined as the 'intentional and repeated destruction or alteration of body tissue, for purposes that are not socially sanctioned, and without conscious suicidal intent' (Gratz, 2001; Klonsky & Muehlenkamp, 2007). Nonsuicidal self-injury (NSSI) incorporates characteristics of the behaviour agreed upon and makes clear the distinction from suicidal behaviour and the intent to die. It is also less stigmatising than other options such as self-mutilation (Suyemoto, 1998) and self-cutting (Suyemoto & MacDonald, 1995), which is important given the stigma attached to these behaviours and the tendency of NSSI to arouse negative feelings, strong reactions, and prejudice in clinicians (Skegg, 2005) and the general public (Gratz, 2003).

What is NSSI?

NSSI is a clinically important behaviour that is associated with recurrent psychosocial problems (Nock, 2010) and poor long-term outcomes (Moran et al., 2012) and it may mark an emerging personality disorder (Green et al., 2011). The most common age of onset of NSSI is consistently reported to be between 12 and 14 years (Nock, 2010) or early adolescence (Favazza & Conterio, 1989). Whilst common lore is that NSSI is a behaviour used more frequently by women, recent large-scale studies have found similar overall rates in men and women, who were more likely to differ in the form or method of NSSI used, with women more likely to cut themselves and more men likely to hit or burn themselves (Klonsky et al., 2007). The only apparent pattern regarding ethnicity is that Caucasians have uniformly been found to perform NSSI more than non-Caucasians, although the amount of difference found varies significantly between studies (Klonsky et al., 2007). NSSI has a consistent presentation cross-nationally (Green et al., 2011) with a recent report of 6.2% in 2,757 Australian adolescents in the community (De Leo & Heller, 2004). Around two-thirds of children and adolescents presenting with NSSI score positively for depressive disorders (Green et al., 2011), and the persistence of a major depressive disorder predicts substantially increased risk

of further NSSI when other factors are controlled (Green et al., 2011). NSSI has also been found to be comorbid with anxiety, anger, low self-esteem, grief reactions, peer and family relational problems, and poor school performance (Skegg, 2005).

Due to the lack of a consistent set of symptoms and reliable assessment measures (Gratz, 2001) the presence of NSSI is the only consistently measured characteristic of the behaviour (Nock, 2010). Ascertaining the severity of the behaviour, however, is becoming increasingly important due in a large part to its link to suicide (Hawton, 2014). Given the likelihood that there are clinically significant differences between individuals who chronically engage in NSSI compared to those who engage in the act only once or twice in their lives (Gratz, 2001), both frequency of self-harm and the number or types of methods used are important areas of assessment. In samples that are non-psychotic and have no cognitive impairment, the most commonly used methods of NSSI described across virtually all studies are self-cutting (Nock, 2010) and scratching (Klonsky et al, 2007). Other common methods include banging, burning or inserting objects into the skin (Nock 2010). Less frequently reported methods include hitting oneself, biting oneself, picking at wounds and pulling one's hair out (Skegg, 2005). The frequency of NSSI varies depending on the population being studied, with studies using inpatient psychiatric samples reporting that the majority of self-harmers have engaged on average >50 episodes in the past year (Nock et al., 2004).

Studies consistently report that when a person is engaging in NSSI they are alone and experiencing chronic emptiness, alienation, and isolation in combination with intense, overwhelming negative emotions (Klonsky et al., 2007; Nock & Favazza, 2009; Ross & Heath, 2002; Skegg, 2005). Whilst some of the consequences of NSSI are negatively reinforcing, others inadvertently increase emotional pain and isolation. For example, NSSI has the potential to disrupt interpersonal relationships as it often arouses intense negative reactions in others (Skegg, 2005) further exacerbating isolation, loneliness and resultant distress. Moreover, secondary shame, guilt, and regret can follow an act of NSSI and lead to

further isolation (Klonsky, 2009). The negative physical consequence (e.g. scars) may also result in shame and further isolation (Favazza, 1989). Whilst physical harm as a result of NSSI seems an obvious negative consequence, most report feeling little to no pain during episodes of NSSI (Favazza, 1996; Nock et al., 2004) and behavioural studies have confirmed decreased pain sensitivity and high thresholds to various types of pain (Russ, Campbell, Kakuma, Harrison, & Zanine, 1999). Despite all the possible negative consequences, numerous studies report the behaviour as reinforcing in several different ways, and when these rewards outweigh the consequences the behaviour is maintained.

Whilst a standardised definition and formalised classification system for NSSI is still in progress, there is general agreement amongst researchers and clinicians that the behaviour typically varies on a scale from mild (i.e. low frequency and intensity), to moderate (i.e. more frequent and severe, perhaps requiring medical attention), to severe (i.e. high frequency, severe injury and requires immediate medical attention; Favazza, 1996). Consensus is also found in the distinction between NSSI as it is performed among typically developing people and that (a) performed stereotypically (such as head banging and self-biting) among people with developmental disorders (e.g. autism), cognitive disabilities (e.g. mental impairment) and genetic or medical syndromes (e.g. Lesch-Nylan syndrome, de Lange syndrome, Rett's syndrome), or (b) resulting in major injury as a result of a psychotic disorder or intoxication such as eye enucleation and amputation of the limbs or genitals (Favazza, 1996). There are also different forms of NSSI in the absence of cognitive deficits or psychosis amongst individuals with, for example, BPD, PTSD, dissociative disorders and/or depressive disorders. Socially sanctioned forms (such as tattooing and body piercing) are also seen in cognitively normal sub-cultures and adolescents (Klonsky, 2007). Despite the clinical relevance of NSSI, however, not all forms of this behaviour have received research attention commensurate with their importance. In comparison to the number of studies that have measured NSSI amongst individuals with cognitive disabilities and psychosis, few studies have empirically evaluated

treatments for NSSI behaviour in non-psychotic, typically developing adults, and even fewer

have focused on typically developing adolescents (Washburn et al., 2012), and these are

desperately needed.

Current Context in Tertiary Care

NSSI is a clinically important behaviour that occurs at an alarmingly high rate in

adolescent populations, is associated with a broad range of psychopathology and dysfunction

and is a major contributor to tertiary service utilisation and cost among young people (Green

et al., 2011). Given the prevalence of this complex group of young people, it is not surprising

that NSSI in adolescents is a major public health concern across most countries (Green et al.,

2011) with a steep rise in hospital admissions during the teenage years, from 0.2 per 1000

population per year aged 10 years to 2.2 per 1000 aged 19 years (James, Clacey, Seagroatt, &

Goldacre, 2010). Management of these presentations is equally concerning with suggestions

that less than half of patients receive appropriate psychosocial care in emergency departments

(Hurry & Storey, 1998), less than 10% of management decisions concerning NSSI are cost

effective in terms of clinical and health service outcomes, and around 50% of adolescents are

admitted to inappropriate wards (James et al., 2010; "SCIE Research Briefing", 2005).

Management of NSSI in adolescents is further challenged by poor adherence to follow-up

treatment in the community which is reported at below 50% (Burns et al., 2005), and

notoriously high relapse rates that see many young people re-presenting to emergency

departments within months of discharge (Green et al., 2001). The burden on healthcare

professionals to provide high-quality treatment for this high-risk, multi-problem population

has become especially laden in the context of major economic crises, with the lifetime cost of

fatal and attempted self-harm in the state of NSW, Australia, alone estimated at $588 million -

$25 million in direct costs and $563 million in mortality and morbidity costs (Potter-Forbes &

Aisbett, 2003). Again, no formal diagnostic recognition means that data for NSSI alone does

not currently exist. Nonetheless, the US, UK and Australia, have all observed cuts to mental

health services due to national trends of reducing these services in order to deal with fiscal

shortages (Aaron, Hornberg, & Duckworth, 2009). As numbers of young people presenting to

hospitals with NSSI continue to steadily increase there is a parallel increase in pressure to

reduce psychiatric inpatient length of stays, or avoid inpatient hospital admissions altogether,

in exchange for less costly and restrictive settings (Salinsky & Loftis, 2007). This pattern is

both unsustainable and clinically contraindicated. The provision of effective and efficient

interventions that can accommodate this growing need and reduce the burden of NSSI on

general hospital and psychiatric services is now imperative.

Treatment Status

Theoretical Underpinnings

Functional analytic approaches to psychopathology suggest that effective interventions

need to classify and treat maladaptive behaviours according to the functional processes that

produce and maintain them (i.e. antecedent and consequent contextual factors). This contrasts

to syndromal approaches which focus on the classification and treatment of behaviours

according to their topographical characteristics (such as the expression, intensity and/or

reactivity). Despite advances in the treatment of a range of clinically relevant behaviour

problems, functional approaches are somewhat absent from the NSSI literature (Gratz, 2001),

although recent attention to NSSI has seen the emergence of theoretical explanations with

some encouragingly common ground (Suyemoto, 1998). A review by Klonsky (2007)

identified eighteen studies examining the functions of NSSI. Whilst the study found only

modest support for most of those put forward (including anti-disassociation, interpersonal

influence, sensation seeking, anti-suicide, and interpersonal boundaries functions), it found

some support for a self-punishment function (which positions NSSI as an expression of anger

or self-derogation towards oneself), and converging evidence that was overwhelmingly in

favour of an affect (or emotion) regulation function of NSSI and the idea that NSSI in some way functions to regulate unwanted or uncomfortable emotions. Importantly, these findings remained consistent regardless of the type of sample (e.g. non-clinical vs. clinical, adult vs. adolescent, outpatient vs. inpatient, men vs. women). A second review by Messer and Fremouw (2008) considered the functions of NSSI in adolescents which was particularly helpful given the dearth of reviews focused on this population. Their critical review found seven historically significant explanatory models relevant to adolescents, namely, the sexual/ sadomasochistic model, the depersonalisation model, the interpersonal/systemic model, the suicide model, the physiological /biological model, the affect regulation model, and the behavioural/ environmental model. Whilst there was overlap within these models, the strongest empirical support was shown for the behavioural /environmental model, which includes components of the affect regulation model, interpersonal systemic model, and depersonalisation model. Given the complexity of NSSI behaviours, the reality is likely to lie in an integrated model that incorporates a range of these factors and researchers are starting to consolidate this work. Some of these integrative explanatory models still lack evidence (Yates, 2004; Yip, 2005), but two are receiving increasing empirical support and both are consistent with current reviews that prioritise emotion regulation as the primary function of NSSI (Chapman, Gratz, & Brown, 2006; Nock et al., 2004). Both show promise and have a number of key components in common, however, one holds particular relevance for the conceptualisation of this behaviour in adolescent populations.

An Integrated Theoretical Model of NSSI

In contrast to much of the literature which examines NSSI as a symptom of or in the context of BPD in adults, the integrated model proposed by Chapman and colleagues (Chapman et al., 2006) was developed to apply to NSSI at a general level across various populations and hence holds important utility for non-psychotic, cognitively normal populations of adolescents. The model is also grounded in functional analytic theory, placing

an emphasis on the way an individual responds to their emotional experience (e.g., Mennin, Heimberg, Turk, & Fresco, 2005) rather than defining the expression or intensity of the emotional experience itself (e.g., Livesley, Jang, & Vernon, 1998). Importantly, it moves away from literature on emotion regulation in adulthood which emphasises the control and reduction of negative emotions and focuses on the functionality of emotions which is more consistent with child and adolescent theory. Because emotion regulation is not conceptualised as synonymous with control of the emotion, and as such does not necessarily aim to immediately diminish negative affect, it suggests that deficiencies in the capacity to experience the full range of emotions and respond simultaneously may be just as maladaptive as deficiencies in the ability to attenuate and modulate strong negative emotions. Adaptive regulation therefore involves modulating the experience of emotions rather than eliminating certain emotions. In order to capture this important distinction and the complexity of this process, the model views emotion dysregulation as a multidimensional construct involving: (a) a lack of awareness, understanding, and acceptance of emotions; (b) a lack of access to adaptive strategies to modulate the intensity and/or duration of emotional responses; (c) an unwillingness to experience emotional distress as part of pursuing desired goals and; (d) the inability to engage in goal-directed behaviours when experiencing distress (Gratz & Roemer, 2004). Empirical evidence for all four constructs has been provided (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006) but highlights the potentially detrimental consequences of emotional non-acceptance in particular relative to the other aspects of emotion dysregulation (Gratz et al., 2006). Put simply, if an individual is unwilling to experience emotional distress, the use of maladaptive coping strategies such as NSSI allows them to escape from or avoid that distress. Despite its obvious negative consequences, NSSI can function as an exceedingly effective means of terminating unwanted emotional states. In a vicious cycle, repeated negative reinforcement trials strengthen the association between unpleasant emotional arousal and NSSI, such that NSSI becomes an automatic escape response. Although the model

suggests that NSSI is primarily a behaviour of *emotional* avoidance, it may also function to avoid thoughts, memories, physical sensations, or other aversive internal experiences. In order to capture all these potential forms of avoidance or escape, Chapman and colleagues (2006) refer to the theory as the 'Experiential Avoidance Model' or EAM. The authors therefore situate their model of NSSI within the broader category of *experiential avoidance* behaviours which are bound together by the primary function of reducing, avoiding or escaping from unwanted internal experiences. In the context of this thesis, experiential avoidance is the phenomenon that occurs when a person is unwilling to remain in contact with private experiences (such as emotions, thoughts, memories and physical sensations) and uses NSSI to alter the form or frequency of these events and the contexts that occasion them, even when doing so can cause themselves harm or further distress (Hayes, Strosahl, & Wilson, 1999). When avoidance behaviours occur pervasively and are ineffective within the current context, they may eventually result in or exacerbate clinical disorders.

A growing number of studies provide support for the EAM model and the conceptualisation of NSSI as an experiential avoidance behavior, with frequent findings of stronger experiential avoidance tendencies among individuals who engage in NSSI (Chapman et al., 2006; Hayes et al., 1999). A few studies using EAM have begun to report findings that suggest consistency in adolescent populations who report the most frequently endorsed reasons for NSSI are to get relief from a "terrible" state of mind, depression, feeling "horrible" about oneself, the build-up of pressure until it was no longer tolerable, and escape from having to think about one's problems (Bancroft, Skrimshire, Simkin, 1976; Skegg, 2005). Overall, results of these studies suggest that NSSI is often used to avoid or eliminate unwanted internal experiences, including intolerable emotions and distressing thoughts or memories. Even the self-reported function of self-punishment may be conceptualised as an attempt to avoid shame or unwanted negative beliefs about the self, as punishing the self may alleviate feelings of guilt or shame. Researchers are also beginning to delineate the potential

mechanisms by which NSSI may provide escape from emotional arousal, suggesting that

NSSI may result in the release of endogenous opioids, distract the individual from unwanted

emotional arousal, or serve a self-punishment function that reduces arousal (Nock et al., 2004;

Walsh & Rosen, 1988). Given the growing evidence base to support EAM theory, the fact

that it is grounded in the literature on emotion regulation in childhood, along with its

application across a range of clinical presentations and populations, it was considered to be a

useful conceptual guide for research and treatment development concerning NSSI in

adolescents.

Treatment Approaches

Over the last few years a third wave of behaviour therapies has emerged from within both

the cognitive and behavioural traditions that are consistent with EAM theory in that they seek

to diminish behavioural impact by altering the context and function of unwanted internal

experiences rather than attempting to alter their content, frequency, and/or form as in

traditional Cognitive Behavior Therapy (CBT) models. Dialectical Behavior Therapy (DBT;

Linehan, 1993) is the current flagship for these approaches and combines the focus on

problem solving and change, with the inclusion of a dialectical world-view of acceptance of

issues that cannot be changed. Linehan's biopsychosocial theory postulates a defining feature

of BPD as emotion dysregulation, a multidimensional construct that includes an

unwillingness to tolerate emotional distress and results in the use of avoidance or escape

strategies such as NSSI. DBT aims to enhance an individual's ability to safely regulate and

tolerate emotions in order to focus on goal directed behaviour and hence create a life worth

living. Acceptance and Commitment Therapy (ACT; Hayes et al., 1999) is similar in that it

suggests that human suffering is exacerbated by psychological inflexibility, which is

produced by two interrelated processes, namely cognitive fusion and experiential avoidance.

Central goals of ACT are to enhance psychological flexibility and consequently a value-based

life despite the thoughts or feelings an individual is experiencing in any particular moment,

not instead of them. Finally, Mindfulness-based Cognitive Therapy (MBCT; Segal, Williams,

& Teasdale, 2001) is also on the radar and focuses on increasing the child and family's

capacity to understand action in terms of thoughts and feelings, which in turn is hypothesised

to augment self-control and regulate affect. All these new generation approaches build on the

best of the past by revitalising important features of the behaviour and cognitive therapies,

such as functional analysis, direct shaping and skills acquisition, whilst venturing into areas

traditionally reserved for the less empirical branches of clinical work, such as acceptance,

mindfulness, dialectics, values, relationships and spirituality (Hayes, 2004). This has in part

contributed to the limited number of empirical efficacy studies available for ACT and MBCT.

However, data are increasingly emerging as a result of manualised treatments and assessment

tools and multiple randomised controlled trials have demonstrated DBT as the most effective

and evidence-based of these practices to date (Groves, Backer, van den Bosch, & Miller,

2012). Originally developed for suicidal adult women with BPD, the treatment has been

shown to improve adherence rates, decrease inpatient psychiatric days and reduce frequency

and severity of suicide attempts, NSSI and suicidal ideation. DBT was first adapted for use

with adolescents by Miller and colleagues (Miller, Rathus & Linehan, 2006) who retained the

core tenets and modes of treatment but made several changes to the original treatment manual

to make it appropriate for this younger population. The flexibility to synthesise this DBT

worldview with CBT skills acquisition has made the treatment very useful in addressing the

multitude of stressors seen in multi-problem adolescents. DBT is also very well-tolerated by

adolescents and their families who have frequently been shown to complete DBT programs,

which is compelling given that adolescents are notorious for poor engagement and retention

in treatment (Groves et al., 2012). Whilst these findings highlight the important practical and

acceptable components of DBT, the most recent review of clinical populations of adolescents

treated with DBT leaves it currently wanting in terms of empirical support for adolescents,

and those with NSSI in particular (Groves et al., 2012). The review found some empirical

support for the conclusion that DBT is a promising treatment for adolescents with BPD symptomology, suicidal ideation and comorbid depression, bipolar disorder, disordered eating behaviours and aggressive and impulsive behaviours. Adolescents in these studies were also hospitalised less frequently and the studies suggested that DBT could be adapted for use in outpatient, inpatient, community and residential treatment settings. However, of the 12 studies reviewed, only 6 included adolescents who self-harm, only 4 of those separated out the effects of treatment for NSSI from suicide attempts and none looked at NSSI to the exclusion of suicidal behaviours. None of those that included adolescents were randomised controlled trials (RCTs). RCT's that have been carried out suggest DBT-A is no more effective than treatment as usual (Fleischhaker, et al., 2011; Kate, Cox, Gunasekara, & Miller, 2004).

In addition to their empirical limitations, and whilst efficacy studies are urgently needed, research evaluating complex treatment interventions must be flexible and endeavor to ask whether the intervention works in everyday practice (Medical Research Council, 2008) and in the traditional clinical settings that so desperately need them. The treatment offerings to date involve intensive programs for durations that are not usually available within tertiary healthcare systems (i.e. the DBT package for adolescents requires 16 weeks and multiple modes of treatments to implement; empirical support for MBCT includes 18-months of partial hospitalisation) and certainly not within the current climate that expects reductions in expensive inpatient stays (James et al., 2010). Thus, whilst the theoretical literature for NSSI continues to make exciting and increasingly integrated headway, and there are several reasons to think that DBT and related treatment approaches represent a meaningful development in behaviour therapy, the extent to which any positive outcomes would be found in shorter term or less intensive versions that target high-risk adolescent populations remains to be determined.

In summary, despite the increasing clinical and economic problem posed by this at-risk population, there is a marked shortage of relevant treatment literature and hence no treatments

are currently available to guide clinicians dealing with NSSI. Vague, ambiguous and confusing terminology continues to be rife in the NSSI literature and continue to impede advances in this field. The development and evaluation of effective and viable treatments for tertiary healthcare providers represents a high-priority for future research into NSSI in adolescent populations.

What Does The Field Need?

According to the National Institute for Health and Care Excellence (NICE) guidelines, all adolescents with NSSI should be admitted to a pediatric unit overnight and be assessed by a specialist in child and adolescent mental health (Ougri n, Tranah, Leigh, Taylor, & Asarnow, 2012). Standard treatment therefore commonly includes general hospital followed by referral to a psychiatric hospital or unit despite no rigorous RCTs showing that acute psychiatric inpatient admissions reduce risk or promote the well-being of the young person. With no appropriate and effective treatment available, psychiatric hospitalisation may in fact be unhelpful, in that they can reinforce repetition of NSSI and repeat admissions if all that the contact with services provides is removal from a stressful situation and receipt of support and assistance from caring staff (Green et al., 2011). A further risk factor for repeated NSSI is that the crisis services staff may become habituated to this behaviour and only respond with hospitalisation when the lethality of the behavior increases (Skegg, 2005). Given that referral rates for psychiatric hospitalisation in Australia average around 21% (between 5% and 10% in the UK), NSSI is a very expensive condition to treat at a time when mental health care agencies are under consistent pressure to decrease lengths of stay on adolescent psychiatric units and more stringently manage treatment while utilising fewer resources (Aaron et al., 2009; Salinsky et al., 2007). Nonetheless, common sense and clinical judgment dictate the necessity of an admission in some cases, or least restrictive care that is compatible with the safety of the youth. The dilemma currently faced by tertiary healthcare providers is that high,

and probably increasing, numbers of adolescents are presenting for the treatment of NSSI and no viable or efficacious treatments are available to offer them. The repeated admissions and swing-door effect observed as a result (James, Taylor, Winmill, & Alfoadari, 2008) comes at a huge expense to the young person, the healthcare system and the clinicians that service them. Despite these growing numbers, the repeated reports of high-level concern, and increased theoretical understanding of NSSI, there are no empirically supported treatments for this population and few research efforts that have focused on the development of treatments that can be made available for efficacy trials. The need for highly targeted treatments for adolescents with NSSI that present to tertiary healthcare facilities is now critical. Under the current economic climate, and the increasing scarcity of inpatient beds, treatment developers and researchers need to be equally cognisant of the need for interventions that are both clinically and economically viable, and that provide a helpful segway into and adjunct to standard care provided by clinicians in the community.

Study Aims

The central aim of this thesis was to investigate the treatment of clinically unwell adolescents with NSSI in the context of the time and resource challenged public healthcare services that shoulder most of their care. To this end, four separate studies were conducted:

(a) Study one consisted of a critical review of the current literature in regards to NSSI in adolescents, with a specific interest in empirically supported treatments and feasibility for tertiary healthcare service providers.

(b) Study two aimed to investigate the emotion regulation theory of NSSI in a clinical group of adolescents with NSSI compared to an age matched non-clinical control group.

(c) Study three described the development of a manualised, time-limited group treatment for this population that is theoretically robust, highly targeted and viable for NSSI adolescents in tertiary care.

(d) Study four aimed to examine the efficacy of this brief group treatment in a randomised

controlled trial.

References

Aaron, L., Hornberg, R., & Duckworth, K. (2009). Grading the states 2009: Reporting on the health of America's mentally ill. *A report on America's health care system for adults with serious mental illness*. Retrieved from http://www.nami.org/gtsTemplate09.cfm?Section=Grading_the_States_2009

American Psychiatric Association, 1980. Diagnostic and Statistical Manual of Mental Disorders, third ed. American Psychiatric Publishing, Washington, DC.

American Psychiatric Association, 1994. Diagnostic and Statistical Manual of Mental Disorders, fourth ed. American Psychiatric Publishing, Washington, DC.

American Psychiatric Association, 2013. *Diagnostic and Statistical Manual of Mental Disorders, fifth ed.* American Psychiatric Publishing, Washington, DC.

Bancroft, J., Skrimshire, A., Simkin, S. (1976). The reasons people give for taking overdoses. *British Journal of Psychiatry, 128,* 538–548.

Burns, J., Dudley, M., Hazell, P., & Patton, G. (2005). Clinical management of deliberate self-harm in young people: the need for evidence-based approaches to reduce repetition. *Australia and New Zealand Journal of Psychiatry, 39 (3),* 121-128.

Chapman, A., Gratz, K., & Brown, M. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour Research and Therapy, 44,* 371-394.

Darche, M. (1990). Psychological factors differentiating self-mutilating and non-self-mutilating adolescent inpatient females. *The Psychiatric Hospital, 21,* 31–35.

De Leo, D., & Heller, T. (2004). Who are kids who self-harm? An Australian self-report school survey. *Medical Journal of Australia, 181 (3),* 140-144.

DiClemente, R., Ponton, L., & Hartley, D. (1991). Prevalence and correlates of cutting behavior: Risk for HIV transmission. *Journal of the American Academy of Child and Adolescent Psychiatry, 30,* 735–739.

Favazza, A. (1989). Why patients mutilate themselves. *Hospital and Community   Psychiatry, 40,* 137-145.

Favazza, A. (1996). *Bodies under siege. Self mutilation and body modification in culture and psychiatry (2nd edition).* Baltimore: Johns Hopkins University Press.

Favazza, A. (1998). The coming of age of self-mutilation. *Journal of Nervous and Mental Disease, 186*, 259-268.

Favazza, A., & Conterio, K. (1989). Female habitual self-mutilators. *Acta Psychiatrica Scandinavica,* 79, 283–289.

Favazza, A., & Rosenthal, R. (1993). Diagnosis issues in self-mutilation. *Hospital and Community Psychiatry, 44,* 134-40.

Fleischhaker, C, Bohme, R., Sixt, B., Bruck, C., Schneider, C., & Schulz, E. (2011). Dialectical behaviour therapy for adolescents (DBT-A): a clinical trial for patients with suicidal and self-injurious behavior and borderline symptoms with a one-year follow-up. *Child and Adolescent Psychiatry and Mental Health, 5(3),* 1-10.

Glenn, C., & Klonsky, E. (2010). A multimethod analysis of impulsivity in non- suicidal self-injury. *Personality Disorders: Theory, Research, and Treatment 1,* 67–75.

Gratz, K. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate self-harm Inventory. *Journal of Psychopathology and Behavioral   Assessment, 23,* 253-263.

Gratz., K. (2003). Risk factors for and functions of deliberate self-harm: An empirical and conceptual review. *Clinical Psychology: Science and Practice, 10(2)*, 192-205.

Gratz, K., Lacroce, D., & Gunderson, J. (2006). Measuring Change in Symptoms Relevant to Borderline Personality Disorder Following Short–term Treatment across Partial Hospital and Intensive Outpatient Levels of Care. *Journal of Psychiatric Practice, 12(3),* 153-159.

Gratz, K. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and

   dysregulation: Development, factor structure, and initial validation of the Difficulties

   in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral*

   Assessment, 26, 41-54.

Gratz, K., Rosenthal, M., Tull, M., Lejuez, C., & Gunderson, J. (2006). An experiential

   Investigation of emotion dysregulation in borderline personality disorder. *Journal of*

   Abnormal Psychology, 4, 850-855.

Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood and

   adolescence: Development and evaluation of the Avoidance and Fusion Questionnaire

   for Youth. *Psychological Assessment, 20(2)*, 93-102.

Green, J., Kroll, L., Imrie, D., Begum, K., Frances, F., & Anson, R. (2001). Health gain and

   predictors of outcome in inpatient and related day patient child and adolescent

   psychiatry treatment. *Journal of the American Academy of Child and Adolescent*

   Psychiatry, 40, 325–33.

Green, J., Wood, A., Kerfoot, M., Trainor, G., Roberts, C., Rothwell, J., … & Harrington,

   R. (2011). Group therapy for adolescenst with repeated self-harm: randomised

   controlled trial with economic evaluation. British Medical Journal, 342, d682.

Groves, S., Backer, H., van den Bosch, W., Miller, A. (2012). Review: Dialectical behaviour

   therapy with adolescent. *Child and Adolescent Mental Health, 17(2),* 65-75.

Hawton, K. (2014). Psychiatric disorders in patients presenting to hospital following

   self-harm: A systematic review. *Journal of Affective Disorders. 151(3),* 821-830.

Hayes, S., Strosahl, K., & Wilson, K. (1999). *Acceptance and commitment therapy: An*

   experiential approach to behavior change. New York: Guilford Press.

Hayes, S., Strosahl, K., Wilson, K., Bissett, R., Pistorello, J., Toarmino, D., … & McCurry,

   S. (2004). Measuring experiential avoidance: A preliminary test of a working model.

   The Psychological Record, 54, 553-578.

Hurry J., & Storey P. (1998). Deliberate Self Harm among Young People. *Institute of Education.* Retrieved from http://www.ioe.ac.uk/tcru/pub-ib-7.htm

James, A., Taylor, A., Winmill, L., & Alfoadari, K. (2008). A preliminary community study of Dialectical BNehavior Therapy (DBT) with adolescent females demonstrating persistent, deliberate self-harm. *Child & Adolescent Mental Health, 13(3),* 148-152. doi: 10.1111/j.1475-3588.2007.00470.x

James, A., Clacey, J., Seagrott, V., & Goldacre, M. (2010). Adolescent inpatient psychiatric admission rates and subsequent one-year mortality in England: 1998-2004. *The Journal of Child Psychology and Psychiatry, 51(12), 1*395-1404. doi: 1111/j.1469-7610.2010.02293.x

Kahan, J., & Pattison, E. (1984). Proposal for a distinctive diagnosis: the deliberate self-harm syndrome. *Suicide and Life-threatening Behavior, 14,* 17-35.

Katz, L., Cox, B., Gunasekara, S., & Miller, A. (2004). Feasibility of dialectical behavior therapy for suicidal adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 43(3),* 276-282.

Klonsky, D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review, 27*, 226-239.

Klonsky, D. (2009). The functions of self-injury in young adults who cut themselves: Clarifying the evidence for affect regulation. *Psychiatry Research, 166,* 260-268.

Klonsky, D., & Muehlenkamp, J. (2007). Self-injury: A Research review for the practitioner. *Journal of Clinical Psychology*, *63 (11),* 1045-1056.

Lewis, S., & Seko, Y. (in press). A double-edged sword: A review of the potential benefits and risks of online non-suicidal self-injury activities. *Journal of Clinical Psychology*

Linehan, M. (1993). *Skills Training Manual for Treating Borderline Personality Disorder*. New York: Guilford Press.

Livesley, W., Jang, K., & Vernon, P. (1998). Phenotypic and genetic structure of traits delineating personality disorder. *Archives of General Psychiatry, 55,* 941-948.

Lengel, G., & Mullins- Sweatt, S. (2013). Nonsuicidal self-injury: Clinician and expert ratings. *Psychology Research, 210,* 940-944.

Lundh, L., Karim, J., Quilisch, E. (2007). Deliberate self-harm in 15-year-old adolescents: A pilot study with a modified version of the deliberate Self-harm Inventory. *Scandinavian Journal of Psychology, 48,* 33-41.

Madge, N., Hewitt, A., Hawton, K., Jan de Wilde, E., Corcoran, P., Fehete, S., & Ystgaard, M. (2008). Deliberate self-harm within an international community sample of young people: Comparative findings from the Child & Adolescent Self-Harm in Europe (CASE) Study. *Journal of Child Psychology and Psychiatry, 49(6),* 667–677.

Medical Research Council. (2008). *Developing and evaluating complex interventions: New guidance.* Retrived from http://www.mrc.ac.uk/complexinterventionsguidance

Mennin, D., Heimberg, R., Turk, C., & Fresco, D. (2005). Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder. *Behaviour Research and Therapy, 43,* 1281–1310.

Messer, J., & Fremouw, W. (2008). A critical review of explanatory models for self-mutilating behaviours in adolescents. *Clinical Psychology Review, 28*, 162-178.

Miller, M., Rathus, J., & Linehan, M. (2006). *Dialectical Behaviour Therapy with Suicidal Adolescents.* New York: Guilford.

Moran, P., Coffey, C., Romaniuk, H., Olsson, C., Borschmann, R., Carlin, J., & Patton, G. (2012). The natural history of self-harm from adolescence to young adulthood: a population-based cohort study. *The Lancet, 379*, 236-243.

Muehlenkamp, J. (2005). Self-injurious behavior as a separate clinical syndrome. *American Journal of Orthopsychiatry,75,* 324–33.

Muehlenkamp, J. (2006). Empirically supported treatments and general therapy guidelines

for nonsuicidal self-injury. *Journal of Mental Health Counselling, 28*, 166-185.

Nock, M. (2010). Self-Injury. *Annual Review of Clinical Psychology, 6,* 339-363.

Nock, M., & Favazza, A. (2009). Non-suicidal self-injury: definition and classification. In

M.K. Nock (Ed). *Understanding Nonsuicidal Self-Injury: Origins, Assessment, and

Treatment.* Washington, DC.

Nock, M. K., & Prinstein, M. J. (2004). A functional approach to the assessment of self-

mutilative behavior. Journal of Consulting and Clinical Psychology, 72, 885–890.

Ogundipe, L.O., 1999. Suicide attempts vs. deliberate self-harm. *British Journal of

Psychiatry 175,* 90. Presented at Societal and Behavioral Medicine., New Orleans, LA.

Ougrin, D., Tranah, T., Leigh, E., Taylor, L. & Asarnow, J. (2012). Practitioner review: Self-

harm in adolescents. *Journal of Child Psychology and Psychiatry, 53,* 337–350.

Plath, S. (1962). The Other. In T. Hughes (Ed), *The collected poems: Sylvia Plath* (pp. 201-

202). New York: Harper Collins.

Pattison, E., & Kahan, J. (1983). The deliberate self-harm syndrome. *American Journal of

Psychiatry*, *140,* 867–872.

Ross, S., & Heath, N. (2002). A study of the frequency of self-mutilation in a community

sample of adolescents. *Journal of Youth and Adolescence, 31*, 67-77.

Russ, M., Campbell, S., Kakuma, T., Harrison, K., & Zanine, E. (1999). EEG theta activity

and pain insensitivity in self-injurious borderline patients. *Psychiatry Research, 89*,

201–14.

Schwartz, R., Cohen, P., Hoffmann, N., & Meeks, J. (1989). Self-harm behaviors (carving) in

female adolescent drug abusers. *Clinical Pediatrics, 28,* 340–346.

Salinsky, E., & Loftis, C. (2007). Shrinking inpatient psychiatric capacity: Cause for

celebration or concern? *George Washington University, National Health Policy

Forum, Issue brief, 823,* 1-21.

SCIE research briefing 16: Deliberate self-harm (DSH) among children and adolescents: who

is at risk and how is it recognized? (2005, August). *Social Care Institute of Excellence*.

Retrieved from http://scie.org.uk/publications/briefings/briefing16/

Segal, Z., Williams, J., & Teasdale, J. (2001). *Mindfulness-based cognitive therapy for

depression: A new approach to preventing relapse.* New York: Guilford Press.

Skegg, K. (2005). Self-harm. *The Lancet, 366*, 1471-1483.

Suyemoto, K. (1998) The functions of self-mutilation. *Clinical Psychology Review, 18,* 531-

554.

Suyemoto, K., & MacDonald, M. (1995). Self-cutting in female adolescents. *Psychotherapy,

32,* 162-171.

Tantam, D., & Whittaker, J. (1992). Personality disorder and self-wounding.

British Journal of Psychiatry 161, 451–464.

Walsh, B., & Rosen, P. (1988). *Self-Mutilation: Theory, Research, and Treatment.* New York:

Guilford

Washburn, J., Richardt, S., Styer, D., Gebhardt, M., Juzwin, K., Yourek, A., Aldridge, D.

(2012). Psychotherapeutic approaches to nonsuicidal self-injury in adolescents. *Child

and Adolescent Psychiatry and Mental Health, 6(14),* 1-8.

Yates, T. (2004). The developmental Psychopathology of self-injurious behaviour:

Compensatory regulation in posttraumatic adaptation. *Clinical Psychology Review, 24,*

35-74.

Yip, K. (2005). A multi-dimensional Perspective of Adolescents' Self-Cutting. *Child and

Adolescent Mental Health, 10(2),* 80-86.

STUDY ONE

The current status of evidence-based treatments available to adolescents who present to

hospital with nonsuicidal self-injury: A critical review

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Abstract

Despite increased theoretical understanding of nonsuicidal self-injury (NSSI) in recent years, the availability of evidence-based treatments in clinical adolescent populations, where prevalence is at its highest, is severely limited. The present review was undertaken to clarify the status of this body of literature and highlight areas for research attention. PubMed, PsycINFO, Medline and EMBASE databases were searched to identify treatment interventions that target NSSI in clinical populations aged 12 to 18 as at February 2016. The limited number of studies retrieved led to a second search that extended the age range to include adults. Results of the adolescent search were limited to four relevant treatment studies and of these only Dialectical Behavior Therapy for Adolescents (DBT-A) reported any significant reduction in NSSI in a small-scale open trial that has yet to be replicated or subjected to a RCT. Its feasibility for many healthcare settings is also problematic given the program's length and complexity. The adult literature, whilst also limited, points to a brief group therapy informed by DBT and Acceptance and Commitment Therapy (ACT) as a potentially effective and feasible treatment for NSSI. In summary, NSSI in general, and NSSI in adolescents in particular, is particularly poorly served by empirical research to date and front line clinicians continue to be guided by a severely depleted literature. There is an urgent need for research to guide the clinical care of the increasing number of high-risk young people that present to tertiary healthcare services for the treatment of this complex behaviour. Replication of efficacious adult approaches may be useful and timeous avenues to pursue as long as adequate consideration is given to developmental differences. It is imperative that future research pays close attention to behavioural definitions and treatment targets so that outcomes can be clearly interpreted and appropriately implemented.

Keywords: practitioner review, nonsuicidal self-injury, adolescent, empirical treatment

Over the last decade researchers and clinicians have acknowledged that nonsuicidal self-injury (NSSI) is a behaviour that warrants individual focus and attention (Selby, Bender, Gordon, Nock, & Joiner, 2012). This attention has up until recently been focused predominantly on the stereotypic self-injury that results from developmental and intellectual delays (Washburn et al., 2012) and the understandable attention given to suicidal self-injury where the intent is to end life. Nonetheless, prevalence rates of NSSI are highest in populations of adolescents who are cognitively normal, with recent reports as high as 61-80% (Nock & Prinstein, 2004; Klonsky & Muehlenkamp, 2007) and steadily increasing (Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005; Nock, Wedig, Janis, & Deliberto, 2008). These rates are consistently higher than in children (Washburn et al., 2012) and adults (Klonsky, 2007) and higher than those reported for suicide attempts (Asarnow, et al., 2011), suggesting attention to this population is long overdue. The lack of clinical guidance available is not only challenging for these young patients, but for their families and the tertiary healthcare services and clinicians that treat them. For the patients and their families, NSSI may involve hospitalisation against the adolescents' will, it may cause psychological distress if there is physical damage that requires medical treatment, and it is often associated with fear that the adolescent will attempt suicide. Clinicians, on the other hand, have to effectively manage these high-risk and highly distressed adolescents and their families, while facing increasingly long waitlists and relentless pressure to discharge patients to less costly and restrictive treatment options (Aaron, Hornberg, & Duckworth, 2009; Salinsky & Loftis, 2007). The pattern of care that has emerged as a result is a high turnover of beds in inpatient settings, outpatient community management of high-risk adolescents who are renowned for poor engagement and treatment drop-out (Burns, Dudley, Hazell, & Patton, 2005), and the somewhat inevitable re-admission of many patients back to hospital as concerns for safety escalate (James, Taylor, Winmill, & Alfoadari, 2008). Healthcare providers are in desperate need of treatments that are brief and flexible enough to be implemented in highly pressured

and often poorly resourced healthcare facilities, but that are effective enough to achieve 'adequate' outcomes following hospital or inpatient stays. Whilst an 'adequate' outcome varies from facility to facility depending on positioning within the continuum of care, outcomes for tertiary level services can broadly be described as adolescents with a sufficient degree of behavioural control over their NSSI, and enough emotional relief and psychological recompensation, to permit safe and lasting reintegration back into the community with community mental health care follow-up. The emphasis here is not only on safety and brevity, but also on maintenance, as the number of repeat admissions currently being observed (James et al., 2008) is clinically counterproductive, comes at large cost to the facility, and negatively impacts treating clinicians who are forced to adopt a band-aid approach to care that can have a poor prognosis.

Although theoretical conceptualisations of NSSI have expanded greatly in the past decade, only a handful of studies have focused on the development and evaluation of effective and viable treatments for high-risk and cognitively normal adolescent populations who need specialist clinical care. The serious nature and increasing rates of these presentations referred to pressured healthcare services now necessitate the development and dissemination of effective, efficient and feasible treatment options. This critical review of the current status of treatment for this population is a necessary starting point.

Method

This literature review was primarily concerned with identifying evidence-based treatments for adolescents who present to tertiary healthcare facilities for the treatment of NSSI behaviours. Given the additional importance attributed to applicability and acceptability for tertiary care settings, secondary criteria regarding treatment feasibility and adherence were also collected.

Review Criteria

1. **Primary inclusion criteria**

   1.1.*Target behaviour.* One of the major challenges within the NSSI literature is the
   inconsistent use of terminology such as the interchangeable use of terms to describe
   the same phenomenon, the same term being used to describe inherently different
   behaviours, cross-country variability and in some cases failure to provide any
   definition of terms whatsoever (Gratz, 2001). Some of the most commonly used
   terms to refer to self-harming behaviour include 'nonsuicidal self-injury' (NSSI;
   Muehlenkamp, 2006), 'deliberate self-injury' (Klonsky, 2007), 'deliberate self-harm'
   (DSH; Gratz, 2003, Pattison & Kahan, 1983), 'self-mutilation' (SM; Nock &
   Prinstein, 2004), 'moderate self-mutilation' (Favazza & Rosenthal, 1993), 'self-
   wounding' (Tantum &Whittaker, 1992), and 'parasuicide' (Ogundipe, 1999; Linehan,
   1993). This review utilised the term NSSI and included in its definition some
   important distinctions. It conceptualises NSSI as a broader phenomenon than just a
   symptom of BPD as has been historical practice (Selby et al., 2012). It also made the
   notable distinction between self-harm phenomena that are nonsuicidal in nature, in
   which there is no intent to die from the act, and those that are suicidal, in which there
   is an intent to die. Whilst acknowledging that there is a complex association between
   these two behaviours, and that intent to die in many cases can be ambiguous, key
   differences found in terms of their prevalence, frequency, function and severity
   (Nock, 2010) are convincing enough for it to be defined as a distinctive type of self-
   destructive behaviour (Pattison et al., 1983). This is especially important for clinical
   interventions as the apparent difference in the function of these behaviours, namely to
   regulate emotions and to end life (O'Carroll et al., 1996), has significant implications
   for treatment development. For the same reason, NSSI reviewed in this paper was
   also distinguished from self-harm performed stereotypically among people with

developmental disabilities (e.g. high-frequency head banging), self-harm resulting in major injury as a result of psychotic disorders (e.g. genital castration and eye-enucleation), behaviours that indirectly cause physical or psychological harm (e.g. alcohol and drug abuse, smoking and purging), self-harm observed as part of a cluster of a medical syndromes (e.g. Lesch-Nylan syndrome and de Lange syndrome) and self-harm for reasons that are socially sanctioned (e.g. tattooing and jewelry piercings). In summary, NSSI referred to in this review was defined as the 'deliberate and repeated destruction or alteration of body tissue, for purposes that are not socially sanctioned, and without conscious suicidal intent' (Gratz, 2001; Klonsky et al., 2007).

1.2. *Population demographic.* NSSI appears to have a consistent presentation cross nationally (Nock, 2010) and does not appear to be influenced by socioeconomic status (Lloyd, Kelley, & Hope, 1997). Whilst conventional lore suggests NSSI is predominantly a female behaviour, recent large-scale studies have found similar overall rates in men and women with differences more likely in the methods used (Klonsky, Oltmanns, & Turkheimer, 2003; Whitlock, Eckenrode, & Silverman, 2006). Age was therefore the only demographic specified in this review. Studies were included if they were concerned with young people aged 12 to 19 years (18 years and 11 months) in accordance with the World Health Organisation (WHO) definition (WHO, 1986), and the majority of studies in this body of literature. Studies with no or large age ranges were included if their results isolated this age range.

2. **Secondary inclusion criteria**

2.1. *Treatment setting.* This review was predominantly concerned with the population of adolescents who present or are referred to tertiary healthcare services and hence are at the more severe end of the continuum of care. Whilst a fairly wide range of psychologically based prevention programs have been developed for forensic, education and community settings, evidence for their effectiveness is lacking

(Lieberman et al., 2009; Whitlock & Knox, 2009). The needs and underlying functions of NSSI behaviours in these settings are also likely to be different and so studies targeting these populations were excluded in order to specify a greater homogeneity of sample. For the purposes of this review, tertiary healthcare services were defined as specialised consultative health care, usually for inpatients and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment, such as a tertiary referral hospital (Johns Hopkins medicine, 2011).

2.2. *Treatment feasibility and acceptability.* Given that tertiary facilities aim to limit length of stay, have limited access to resources, and have staff numbers that are notoriously low or highly changeable, treatment feasibility was of interest in this review. Data were collected regarding the interventions: (i) length and frequency; (ii) format (e.g., assessment, individual therapy, group work, family therapy and/or on-call availability); and (iii) cost to implement (i.e., set-up and running costs). Data concerning treatment acceptability and attrition were also important in this regard given adolescents are prone to treatment drop-out.

3. Exclusion criteria

Exclusion criteria eliminated: (i) studies that combined behaviours with and without intent to die or did not specify behavioural intent; (ii) studies with NSSI occurring exclusively in the context of developmental disorders, intellectual delays, psychotic disorders, medical syndromes or socially sanctioned behaviours; (iii) studies using forensic, education or community populations; (iv) studies published in languages other than English; and (v) qualitative reports, expert opinions and case studies.

Procedure

A standard search strategy developed by the Cochrane Collaboration was used to identify relevant articles. First, PubMed, PsycINFO, Medline and EMBASE databases were searched

for articles that included NSSI and any of the above definitional variations (i.e. 'nonsuicidal self-injury', 'deliberate self-injury', 'deliberate self-harm', 'self-mutilation', 'moderate self-mutilation', 'self-wounding' and 'parasuicide') in any combination with the terms 'randomized controlled trial', 'intervention, 'therapy', 'treatment' or 'review'. The results were deduplicated and refined using the modifier 'adolescent' to narrow the search but ensure relevant results were retained. Titles, abstracts and, if necessary, methods of the resulting citations were scanned for primary inclusion criteria to ensure treatment interventions specifically targeted or separated out clinical adolescent populations and excluded in their definition of NSSI behaviours with the intent to die. Where no definition of the behaviour was provided, assessment measures were studied to identify specifics, and if these did not clarify the specific target behaviour/s the study was excluded. Reference lists of the articles shortlisted were then examined in order to identify additional relevant citations and these were subjected to the same scrutiny. Secondary inclusion criteria were gathered from the final list, however absence of these details did not exclude the study to avoid unnecessarily losing useful data. There were no time limits placed on searches so that dates ranged from first publications through to February 2016. The entire search was replicated without the 'adolescent' specifier to see if any additional relevant studies could be found in the adult literature.

Results

Adolescent Studies

The original searches resulted in the retrieval of 3,813 articles which were reduced to 1,816 after deduplication and 593 using the modifier 'adolescent'. After checking definitions of terms used to describe the sample and target behaviours only nine studies remained, highlighting the significant issue with nosology in this field of research. Four of these nine studies were reviews themselves (Glenn, Franklin & Nock, 2015; Labelle, Pouliot, & Janelle,

2015; Ougrin, Tranah, Stahl, Moran, & Asarnow, 2015; Washburn et al., 2012) and two had not yet published results (Fischer, Brunner, Parzer, Resch, & Kaess, 2013; Wright-Hughes et al., 2015). This left only three publications that met the primary inclusion criteria. Selected characteristics of these three studies are presented in Table 1. Of these studies, two were small ($N = 12$) open trials (Fleischhaker et al., 2011; Mufson, Weissman, Moreau, & Garfinkel, 1999) and only one used a randomised control design (Brent et al., 2008).

Given the large number of articles identified that were excluded due to their conflated definition of NSSI, Appendix A details some of these key studies for reference and to begin to separate out and define the NSSI-specific literature in both adolescents (Table A1) and adults (Table A2).

Primary findings. Mufson and colleagues (1999) carried out a small open trial of Interpersonal Therapy for Depressed Adolescents, an efficacious treatment for depressed adolescents that has been adapted for adolescent NSSI. According to the clinical trials register, only 5 out of 12 participants completed this trial negating any statistical analysis or conclusive outcomes (ClinicalTrials.gov Identifier: NCT00401102). A second open trial by Fleischhaker and colleagues (2011) recruited adolescent outpatients aged 13-19 years of age who presented with either NSSI or suicidal self-injury. Importantly, they considered and reported on these two presentations as distinct behaviours. The treatment utilised an adaptation of Dialectical Behavior Therapy (DBT; Linehan, 1993), which is an efficacious treatment originally developed for adults with Borderline Personality Disorder (BPD) that has shown positive outcomes for the NSSI prevalent in these populations (MacPherson, Cheavens, & Fristad, 2013). The adolescent adaptation (DBT-A; Rathus & Miller, 2002) includes 16 to 24 weeks of individual therapy, weekly family skills groups and regular support consultations by telephone. The study used only a small sample ($N = 12$) and a pre-post design but it did find a significant reduction in NSSI behaviours that were maintained at a 1-year follow-up. The adherence to treatment was also promising with a retention rate 75%.

Table 1

Selected characteristics of studies evaluating treatments for adolescents with clearly defined NSSI behaviour

Study	Design	Participants and setting	Intervention	Structure and cost of intervention	Outcome
Brent et al., 2008	RCT; 6-month follow-up	334 outpatients (12-18 years) in treatment for MDD (not responding to SSRI) with comorbid NSSI	Anti-depressant medication with and without CBT. Individual CBT: cognitive restructuring and behavior activation, emotion regulation, social skills, problem solving. Family CBT: decrease parent criticism, improve support, family communication, and problem solving	Max 12 sessions (incl. 3-6 family sessions) held weekly (mean 8.3 weeks) for 60-90 minutes; medication reviews at 0, 6 and 12 weeks; 1 x CBT trained mental health therapist and 1 x psychiatrist	No significant difference in rate of NSSI across treatment conditions (despite reduction in depression with CBT plus medication versus medication switch); 69.2% completed the treatment
Fleischhaker et al., 2011	Open pre-post trial; 12-month follow-up	12 outpatients (13-19 years) with NSSI, SSI and BPD at a medical clinic	DBT for Adolescents (DBT-A): strategies and principles derived from behaviour therapy, dialectical philosophy and Zen practice	16 to 24 weeks including weekly 60 minute individual session and weekly 60 minute family skills group plus phone consult as needed	Significant reduction in NSSI (and BPD symptoms and suicide attempts); 75% completed the treatment; gains maintained at 1-year
Fischer et al., 2013	RCT; 6-month follow-up	80 outpatients (12-17 years) with NSSI at a medical clinic	The Cutting Down Program: includes CBT & DBT elements: promoting motivation and compliance, identifying triggers, testing alternative behavioural responses, stabilising alternative behaviours	Eight to 12 individual therapy sessions with 1 x psychotherapist + on-call team for crises + monthly therapist supervision	Trial was scheduled for completion end 2014 – no published outcome data to date
Mufson et al., 1999	Open trial	12 outpatients (12-18 years) diagnosed with a depressive disorder and NSSI	Interpersonal Therapy for Depressed Adolescents adapted for NSSI	12 individual sessions over 12 weeks	Five participants completed treatment - no statistical analysis or outcome data due to low numbers

Note. RCT, randomised controlled trial; MDD, Major Depressive Disorder; SSRI, selective serotonin reuptake inhibitor; NSSI, nonsuicidal self-injury; SSI, suicidal self-injury; BPD, Borderline Personality Disorder; CBT, Cognitive Behaviour Therapy; DBT, Dialectical Behaviour Therapy.

The third study found in the search was the only treatment trial that used a randomised control design (Brent et al., 2008). The Treatment of SSRI-Resistant Adolescent Depression (TORDIA) targeted adolescents aged 12 –18 years with a diagnosis of major depressive disorder that had not responded to a selective serotonin reuptake inhibitor (SSRI), and specified NSSI acts performed by its participants. The study used 12 weeks of medication (venlafaxine or a different SSRI) with or without Cognitive Behaviour Therapy (CBT) implemented via both family and individual sessions. Whilst a combination of CBT plus medication was more effective in reducing depressive symptoms than just switching to another medication, there were no significant differences in the rate of NSSI acts across the various treatment arms.

Secondary findings. Little can be deduced about the secondary criteria from the information reported in the three adolescent studies found. None of them recruited their participants from a tertiary care setting or included any kind of cost analysis. Treatment lengths varied from 12 to 24 weeks and from individual therapy only to multi-model programs. The only study that appears to show some efficacy, namely DBT-A, is lengthy and more complex with up 24 weeks of treatment involving weekly individual sessions, weekly family skills groups, and an on call clinician. Whilst exact cost and feasibility can only be inferred from this data, the length of the current treatment alone makes DBT-A unrealistic for many tertiary care facilities where admissions fall well short of the 12-week minimum.

Additional findings. One of the original nine studies identified in the adolescent literature search is worthy of brief comment. The Cutting-Down Programme (CDP; Fischer et al., 2013) did not meet the review's primary inclusion criteria as its results are still pending. It is, however, one of the only treatments found that specifically targets adolescent NSSI, takes into consideration the treatments acceptability and feasibility, and is supported by some promising trials in related areas. The original Manual-Assisted Cognitive Behaviour Therapy (MACT; Evans et al., 1999) is an efficacious cognitive-orientated and problem-focused short-

term (6-session) therapy for adults with deliberate self-harm (including NSSI and suicidal

behaviours). The original adolescent adaptation targeted suicidal behaviours and found

preliminary support for its efficacy and acceptability in a small ($N = 16$) pilot trial (Taylor et

al., 2011). The outcomes of the RCT by Fischer and colleagues (2013), which aims to apply

CDP to adolescent NSSI specifically, are therefore eagerly awaited.

It is worth briefly mentioning that at present there are no published RCTs of

pharmacological agents specifically targeting self-injury of any kind in adolescents (Ougrin,

Tranah, Leigh, Taylor, & Asarnow, 2012).

Summary of adolescent findings. The finding of most concern from this review was the

dearth of literature in general, and treatment efficacy studies in particular, for this vulnerable

population. Only three studies resulted from the search that met primary inclusion criteria,

and the outcomes of only one of these show promise in terms of impacts on NSSI behaviour.

Only two studies aimed to specifically target NSSI (Fischer et al., 2013; Mufson et al., 1999)

and none of the treatments were developed primarily for NSSI, but rather included the

behaviour as a byproduct of depression, BPD and/or suicidal behaviours. Some conclusions

can nonetheless be drawn. Firstly, they suggests that treatments that are effective for a

condition closely related to NSSI, such as depression (Brent et al., 2008; Mufson et al., 1990),

may not adequately address NSSI itself and hence may need modification to specifically

target the unique attributes of this behaviour. Second, DBT-A appears to hold the most

promise to date, but more than a decade on from its description, its empirical support remains

limited and most studies continue to embed NSSI within BPD and suicide presentations

(James et al., 2008; Katz, Cox, Gunasekara, & Miller, 2004; Rathus et al., 2002; Sunseri,

2004; Woodberry & Popenoe, 2008). Furthermore, the current length and resource

requirement of DBT-A prevent it from being a viable treatment option for many public

healthcare settings. The outcomes of the CDP trial (Fischer et al., 2013), and indeed any

treatment that targets NSSI using a feasible treatment option, will be important. Finally, the

historical practice of incorporating NSSI into BPD and suicidal behaviours is common and continues to confound the NSSI literature and slow the development of potentially beneficial treatment options for this population (Groves, Backer, van den Bosch & Miller, 2012). In general, the literature would benefit from more detailed treatment descriptions, specified behavioural targets, and feasibility measures as treatment facilities look to treatments that have a good fit with their program structures, resource allowances and clinical goals.

Adult Studies

Given the limited studies populated by the search of the adolescent literature, the review was extended to incorporate adult studies as a potential supplement and resource to guide treatment developers. Despite adult NSSI attracting the vast majority of clinical and research focus, only two studies were found that met the review's primary criteria, the characteristics of which are detailed in Table 2. In contrast to the adolescent literature, however, these studies did give consideration to the importance of specificity, acceptability and feasibility of the interventions trialed. The first of these is the Treatment for Nonsuicidal Self-Injury in Young Adults (T-SIB), a brief psychotherapeutic treatment designed specifically to treat NSSI in young adults (Andover, Schatten, & Morris, 2010). Although this was only an open pilot study ($N = 60$), preliminary results utilising outpatients aged 18 to 29 years support the efficacy, feasibility and acceptability of this approach for young people with NSSI (ClinicalTrials.gov Identifier: NCT01018433). The treatment included 9 weeks of individual therapy only, the length of which may be problematic for some settings, but can potentially be implemented with relative ease and at limited expense. The second study identified by the search was a treatment developed as an adjunct to treatment as usual and so it too had target-specificity (NSSI), brevity and feasibility as important elements of its design (Gratz, Levy, & Tull, 2012). Whilst heralding from work in the BPD arena, these authors prioritise the uniqueness of NSSI and the importance of targeting it within a feasible and targeted treatment intervention. The 14-week Emotion Regulation Group Treatment (Erg-A) uses strategies

Table 2

Selected characteristics of studies evaluating treatments for adults with clearly defined NSSI behaviour

Study	Design	Participants and setting	Intervention	Structure and cost of intervention	Outcome
Gratz et al., 2012	RCT	45 outpatients (18-58 mean 33) with BPD and NSSI	Emotion Regulation Group Therapy (ERGT): elements of behaviour therapy, ACT and DBT targeting emotion dysregulation	Fourteen groups held weekly for 90 minutes; 1 x doctorate-level therapist; feasible design	Significant difference in frequency of NSSI, and positive effects for emotion dysregulation, emotional avoidance, BPD-symptoms, depression, anxiety and stress.
Gratz et al., 2014	9-month follow-up of above RCT	As above	As above	As above	Gains maintained at 9-month follow-up.
Andover et al., 2010	Open pilot trial; 3-month follow-up	60 (18-29) self-referrals with NSSI	Treatment for NSSI in Young Adults (T-SIB): motivational enhancement, functional analysis, and skills in problem solving, distress tolerance, cognitive distortions and interpersonal problems	Nine individual sessions held weekly for 1-hour; 1 x clinical psychologist; feasible design	Preliminary results support treatment feasibility, acceptability and effectiveness

Note. RCT, randomised controlled trial; NSSI, nonsuicidal self-injury; BPD; Borderline Personality Disorder; DBT, Dialectical Behaviour Therapy; ACT, Acceptance and Commitment Therapy

from behaviour therapy, CBT and DBT to directly target the mechanism underlying NSSI

which it purports to be emotion dysregulation (e.g., Gratz & Roemer, 2008; Gratz & Tull,

2010; Slee, Garnefski, van den Leeden, Arensman, & Spinhoven, 2008). The efficacy of

ERGT is supported in adult populations by a small ($N = 22$) RCT (Gratz & Gunderson, 2006)

and follow-up trial (Gratz & Tull, 2011) that found the addition of ERGT to participants'

ongoing outpatient therapy had positive effects on both NSSI and emotion dysregulation (as

well as various other clinically relevant outcomes, including BPD symptomatology,

depression, anxiety, stress, and social and vocational impairment). Whilst more than half of

the participants reported clinically significant improvements in emotion regulation, 70%

showed a reduction in NSSI of 50% or greater over the course of the group and 55% reported

abstinence from NSSI during the second half of the group. A drop-out rate of 17.4% was

reported. Furthermore, the durability of these gains was shown in a 9-month follow-up (Gratz,

Tull, & Levy, 2014) A more recent study by these authors found emotional avoidance in

particular to directly mediate the observed reductions in NSSI frequency (Gratz, Levy & Tull,

2012). Impressively, the vast majority of the group (83%) reached normative levels on

emotion dysregulation and emotional avoidance, the primary targets of the intervention.

Overall, these results provide strong support for treatments that specifically target emotion

dysregulation as the underlying function of NSSI. In addition, whilst its length may be

limiting to some facilities, the format suggests that time-limited group approaches can be

effective. These treatment attributes are likely to be attractive to treatment providers who have

limited timescales and resources.

Summary of adult findings. Similar to the adolescent literature, adult NSSI efficacy

studies are sparse but they do provide some useful guidance and treatment developers would

benefit from monitoring their progress in the coming years. Replication of both T-SIB and

ERGT in adolescent populations in the near future is indicated. ERGT may be particularly

worthwhile given that regulating emotions is a key developmental task of adolescence

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(Zeman, Cassano, Perry-Parish & Stegall, 2006) and given the potential ease and cost-effectiveness with which this intervention could be implemented in a variety of treatment settings. The durability of the gains made is also promising. Shorter or more condensed versions will need to be trialed, and as with all adult approaches, adaptations that account for the developmental demands of this unique age group would be an initial requirement.

Discussion

Despite increasing concern about the NSSI phenomenon and advances in our theoretical understanding of this complex behaviour, there are still surprisingly few treatment trials that target NSSI specifically and even fewer that consider treatment in the population in which it is of greatest concern, clinically impaired, cognitively normal adolescents. To date there are no treatments for adolescents engaging in clinically significant levels of NSSI that are supported by a RCT. Existing efficacious treatments that may be relevant tend to (1) draw from the adult literature or studies with samples that cover a broad range of age groups, (2) be focused primarily on depression or borderline personality disorder and hence are considered to be strongly associated or the exclusive domain of such disorders, or (3) combine NSSI and suicidal behaviours into one broad and non-specific construct, ignoring the specific functions of each of these behaviours. Whilst these studies provide the only available guidance for clinicians and researchers at present, their use needs to be carefully and judiciously applied to adolescent populations for a number of reasons if they are to be progressive and not problematic. Firstly, treatment approaches that are downward extensions of the adult literature will require considerable adaptation to suit the developmental needs of an adolescent population and/or will need replication studies to ensure they have the same outcomes for this age group (Christner, Stewart, Freeman, 2007). Second, there is currently a lack of support for treating NSSI by treating related disorders such as depression (Brent et al., 2008) and NSSI may need specific psychotherapeutic interventions that directly target its unique function

beyond the treatment of comorbid or related phenomena. Similarly, whilst evidence suggests treatments that target personality features such as BPD may help to reduce NSSI, a BPD-specific program may not necessarily be needed or suited to adolescents with NSSI who do not fulfill criteria for such psychiatric diagnoses, not least because they would not meet criteria for these programs, but because they may not need an extensive BPD-targeted program (Washburn et al.,). Finally, whilst NSSI and suicidal behaviours are undoubtedly related, the importance of separating them out in future research and practice has long been argued and is highlighted in this review. Given that we now know there are key differences between these two behaviours (Nock, 2010), and the increasing availability of clinical instruments that can effectively assess for each (Nock et al., 2008), there should be less of a need to conflate them in future research.

The results of this review (summarised in Table 3) suggest that the only approach that has shown some promise in the treatment of adolescent NSSI is DBT-A but it awaits further efficacy RCTs before any conclusions can be drawn. Furthermore, whilst significantly briefer and more palatable than its adult version, DBT-A is still too long and complex to adequately reach the high prevalence of adolescent NSSI presenting to tertiary care settings. One trial in the adult literature points to the possible value of ERGT which is also grounded in DBT and ACT theory, but specifically targets the mechanism underlying NSSI and underscores the need for treatment viability using a brief group format that can be easily and cost-effectively implemented.

Table 3

Summary of selected characteristics of all trials (adolescent and adult) found by the search that evaluate treatments for NSSI behaviours

Study	Participants targeted	Treatment target	Effective for NSSI			Feasibility and Acceptability				Tertiary setting
	Adolescent	NSSI	RCT	Significant outcome	Maintained at follow-up	Brief [a]	Low resource [b]	Cost effective	Strong Adherence [c] (%)	
Brent et al., 2008	√	X	√	X	n/a	√	X	NR	√ 69.2)	X
Fleischhaker et al., 2011	√	X	X	√	√	X	X	NR	√ (75.0)	X
Fischer et al., 2013	√	√	√	AP	AP	√	√	AP	AP	X
Mufson et al., 1999	√	√	X	X	n/a	√	√	NR	X	X
Gratz et al., 2012; 2014	X	√	√	√	√	X	√	NR	√ (82.6)	X
Andover et al., 2010	X	√	X	√ (p)	AP	√	√	AP	AP	X

Note. [a]Brief = operationalised in terms of treatment context as a maximum of 12 sessions. [b]Low resource = estimate only based on number of modes (< 2) and hence staffing, materials and time needed. [c]Strong adherence = > 50% (McHugh et al., 2013).
NR = not reported; (p) = preliminary data; AP = awaiting publication.

The major limitation to this review was the insufficient number of good-quality studies and dearth of RCT's that would allow for any confident conclusions or future directions. Searches were made particularly difficult due to studies with poor or confusing terminology as well as the comparative lack of literature reporting on NSSI specifically. Most relevant studies were also relatively low-power experimental studies, and many more powerful in-depth studies are required in order to work towards an efficacious treatment for clinical populations of adolescents with NSSI. Refinements to the literature search may have eliminated relevant studies, however, refinement methods used would have limited this loss. Addition of the adult literature outcomes was also presented so as to clearly differentiate it from the adolescent literature.

Future Research and Directions

The dearth of interventions available to adolescents with NSSI may be due to the relatively recent interest and recognition of the problem of NSSI amongst this age group, and may improve with the adoption of NSSI as a 'condition for further study' in the recently published fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5: American Psychiatric Association, 2013). The lack of evidence-based treatments nevertheless leaves clinicians who work with this challenging population in a dire situation because they can only draw from research studies of adults with NSSI or adolescents with related conditions or disorders. Put simply, more research that considers interventions that specifically target NSSI in this population are urgently needed. The strongest line of research at our disposal comes from the adult literature and a brief group treatment (ERGT) that specifically targets emotion regulation, a construct underlying NSSI. Replication of this treatment, with appropriate adaptations to incorporate the developmental differences in an adolescent population, would seem pertinent. Given that this treatment is promising both in terms of efficacy, viability and durability, the field would be well served by research that

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looks to adapt and/or replicate it with adolescent populations. Briefer or more condensed versions would be particularly helpful to investigate for tertiary care facilities. RCTs in DBT-A and adaptations that make it a more viable offering across treatment settings are also indicated. Because of the ongoing problems with nosology and overlap between NSSI and suicidality in the literature, progress in this field would be helpfully served by future studies that keep NSSI and suicidal behaviours separate and provide clear definitions regarding target behaviours and treatment interventions. Work towards a standardised nosology for self-harm behaviours must endure. It goes without saying that larger samples and controlled designs are needed where possible.

Equally important to the development of effective population specific treatments is the development of interventions that are viable in the treatment settings in which they are used. Most intervention studies focus on NSSI in the community or in outpatient settings with very little focus given to tertiary and acute settings such as inpatient or partial hospital settings or residential programs. Given the high rates of adolescent NSSI presenting to tertiary inpatient and hospital services, effective approaches for the management and treatment of NSSI in acute levels of care are desperately needed. Interventions that are lengthy (i.e. exceed average lengths of admission), require complex or multi-modal formats (i.e. assessment, individual therapy, group work, family therapy and/or on-call availability), require large or reliable staffing to implement them, or are costly to set-up, are unlikely to find traction in the public healthcare facilities that manage the majority of these clinical presentations. Whilst gold standard treatments that acquire their evidence base in research settings are always the target, in reality, treatments almost always fall short as they are vulnerable to the unreliability and unpredictability of clinical settings and populations. Treatment developers will need to give flexibility and viability more of a priority if evidence-based treatments are to be adopted by clinical settings. By the very nature of tertiary care settings, these require treatments that are brief, cost-effective, resource-efficient and flexible enough to be implemented in time and

staff stressed environments. Interventions that promote engagement and adherence to ongoing community or outpatient treatments are a critical first step to effective treatment (Spirito & Esposito-Smythers, 2006) in a population where treatment dropout is a common occurrence (Ougrin & Latif, 2011).

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References

Aaron, L., Hornberg, R., & Duckworth, K. (2009). Grading the states 2009: Reporting on the health of America's mentally ill. *A report on America's health care system for adults with serious mental illness*. Retrieved from

http://www.nami.org/gtsTemplate09.cfm?Section=Grading_the_States_2009

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, fifth ed.* American Psychiatric Publishing, Washington, DC.

Andover M., Schatten H., Morris, B. (2010). Treatment of Self-Injurious Behaviors (T-SIB): Preliminary results of an open pilot trial of an NSSI Intervention. Paper presented at the annual conference of the International Society for the Study of Self-Injury, Chicago.

Asarnow, J., Porta, G., Spirito, A., Emslie G, Clarke, G, Wagner, K, Vitiello, B, Keller, M, Birmaher, B, McCracken, J, et al (2011). Suicide attempts and nonsuicidal self-injury in the treatment of resistant depression in adolescents: findings from the TORDIA study. *Journal of the American Academy of Child Adolescent Psychiatry 50,* 772–781.

Brent, D., Emslie, G., Clarke, G., Wagner, K., Asarnow J., Keller, M. … & Zelazny, J.(2008). Switching to another SSRI or to venlafaxine with or without Cognitive Behavior Therapy for adolescent with SSRI-resistant depression. *Journal of the American Medical association, 299(8),* 901-913.

Christner, R., Stewart, J., & Freeman, A. (2007). *Handbook of cognitive-behavior group therapy with children and adolescents.* Taylor & Francis Groups, New York.

Evans K, Tyrer P, Catalan J, Schmidt U, Davidson K, Dent J, Tata P, Thornton S, Barber J, Thompson S (1999). Manual-assisted cognitive-behaviour therapy (MACT): a randomized controlled trial of a brief intervention with bibliotherapy in the treatment of recurrent deliberate self-harm. Psychol Med 1999, 29:19–25.

Favazza, A., & Rosenthal, R. (1993). Diagnosis issues in self-mutilation. *Hospital and*

   Community Psychiatry, 44, 134-40.

Fischer, G., Brunner, R., Parzer, P., Resch, F., & Kaess, M. (2013). Short-term

   psychotherapeutic treatment in adolescents engaging in non-suicidal self-injury: a

   randomized controlled trial. *Trials, 14(1),* 294-300.

Fleischhaker, C, Bohme, R., Sixt, B., Bruck, C., Schneider, C., & Schulz, E. (2011).

   Dialectical behaviour therapy for adolescents (DBT-A): a clinical trial for patients

   with suicidal and self-injurious behavior and borderline symptoms with a one-year

   follow-up. *Child and Adolescent Psychiatry and Mental Health, 5(3),* 1-10.

Glenn, C., Franklin, J., & Nock, M. (2015). Evidence-based Psychological Treatments for

   self-injurious thoughts and behaviors in youth. *Journal of Clinical Child & Adolescent*

   Psychology, 44(1), 1-29.

Gratz, K. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate

   self-harm Inventory. *Journal of Psychopathology and Behavioral   Assessment, 23,*

   253-263.

Gratz., K. (2003). Risk factors for and functions of deliberate self-harm: An empirical and

   conceptual review. *Clinical Psychology: Science and Practice, 10(2)*, 192-205.

Gratz, K. & Gunderson, G. (2006). Preliminary data on an acceptance-based emotion

   regulation group intervention for deliberate self-harm among women with borderline

   personality disorder. *Behavior Therapy, 37,* 25-35.

Gratz, K., Levy, R., & Tull, M. (2012). Emotion regulation a mechanism of change in an

   acceptance-based emotion regulation group therapy for deliberate self-harm among

   women with Borderline Personality Disorder. *Journal of Cognitive Psychotherapy,*

   26(4), 365-380.

Gratz, K., Tull, M., & Levy, R. (2014). Randomized controlled trial and uncontrolled 9-
month follow-up of an adjunctive emotion regulation group therapy for deliberate
self-harm among women with borderline personality disorder. *Psychological
Medicine, 44*, 2099-2112.

Gratz, K., & Roemer, L. (2008). The relationship between emotion dysregulation and
deliberate self-harm among female undergraduate students at an urban commuter
university. *Cognitive Behaviour Therapy, 37*, 14–25.

Gratz, K., & Tull, M. (2010). The relationship between emotion dysregulation and
deliberate self-harm among inpatients with substance use disorders. *Cognitive Therapy
and Research, 34,* 544–553.

Gratz, K., & Tull, M. (2011). Extending research on the utility of an adjunctive emotion
regulation group therapy for deliberate self-harm among women with borderline
personality pathology. *Personality Disorders Theory, Research and Treatment, 2,*
316-326.

Groves, S., Backer, H., van den Bosch, W., Miller, A. (2012). Review: Dialectical behaviour
therapy with adolescent. *Child and Adolescent Mental Health, 17(2),* 65-75.

James, A., Taylor, A., Winmill, L., & Alfoadari, K. (2008). A preliminary community study
of Dialectical BNehavior Therapy (DBT) with adolescent females demonstrating
persistent, deliberate self-harm. *Child & Adolescent Mental Health, 13(3),* 148-152.
doi: 10.1111/j.1475-3588.2007.00470.x

Johns Hopkins Medicine. Tertiary Care Definition [Website]. Retrieved from
http://www.hopkinsmedicine.org/patient_care/pay_bill/insurance_footnotes.html.
Accessed 27 June 2014.

Katz, L., Cox, B., Gunasekara, S., & Miller, A. (2004). Feasibility of dialectical behavior
therapy for suicidal adolescents. *Journal of the American Academy of Child and
Adolescent Psychiatry, 43(3),* 276-282.

Klonsky, D. (2007). The functions of deliberate self-injury: A review of the evidence.

Clinical Psychology Review, 27, 226-239.

Klonsky, D., & Muehlenkamp, J. (2007). Self-injury: A Research review for the

practitioner. *Journal of Clinical Psychology*, *63(11),* 1045-1056.

Klonsky, D., Oltmanns, T., Turkheimer, E. (2003). Deliberate self-harm in a nonclinical

population: prevalence and psychological correlates. *American Journal of Psychiatry,*

160 (8), 1501-1508.

Labelle, R., Pouliot, L., & Janelle, A. (2015). A systematic review and meta-analysis of

Cognitive Behavioural Treatments for suicidal and self-harm behaviours in adolescents.

Canadian Psychology, 56 (4), 368-378.

Lieberman, R., Toste, J., & Heath, N. (2009). Nonsuicidal self-injury in the schools:

prevention and intervention. In M. Nixon & N. Heath (Eds), *Self-Injury in Youth: The*

Essential Guide to Assessment and Intervention (pp. 195–216). New York: Taylor &

Francis Group.

Linehan, M. (1993). *Skills Training Manual for Treating Borderline Personality Disorder*.

New York: Guilford Press.

Lloyd, E., Kelley, M., & Hope, T. (1997). *Self-mutilation in a community sample of*

adolescents: descriptive characteristics and provisional prevalence rates. Presented

at Societal and Behavioral Medicine, New Orleans, LA.

Ogundipe, L.O., 1999. Suicide attempts vs. deliberate self-harm. *British Journal of*

Psychiatry 175, 90. Presented at Societal and Behavioral Medicine., New Orleans, LA.

Ougrin, D., Tranah, T., Stahl, D., Moran, P., & Asarnow, J. (2015). Therapeutic intervention

for suicide attempts and self-harm in adolescents: Systematic review and meta-analysis.

Journal of the American Academy of Child & Adolescent Psychiatry, 54(2), 97-107.

MacPherson, H., Cheavens, J., Fristad, M. (2013). Dialectical Behavior Therapy for

    Adolescents: Theory, Treatment Adaptations, and Empirical Outcomes. *Clinical Child*

    and Family Psychology Review, 16, 59-80.

McHugh, R., Murray, H., Hearon, B., Pratt E., Pollack, M., & Safren, S., & Otto, M. (2013).

    Predictors of dropout from psychosocial treatment in opioid-dependent outpatients. *The*

    American Journal of Addictions /American Academy of Psychiatrists in Alcoholism and

    Addictions, 22(1), 18-22.

Mufson, L., Weissman, M., Moreau, D., & Garfinkel, R. (1999). Efficacy of interpersonal

    psychotherapy for depressed adolescents. *Archives of General Psychiatry, 56,* 573– 579.

Muehlenkamp, J. (2006). Empirically supported treatments and general therapy guidelines

    for nonsuicidal self-injury. *Journal of Mental Health Counselling, 28*, 166-185.

Nock, M. (2010). Self-Injury. *Annual Review of Clinical Psychology, 6,* 339-363.

Nock, M. K., & Prinstein, M. J. (2004). A functional approach to the assessment of self-

    mutilative behavior. *Journal of Consulting and Clinical Psychology, 72*, 885–890.

Nock, M., Wedig, M., Janis, I., Deliberto, T. (2008). *Self-injurious thoughts and behaviors.*

    In J. Hunsely & E. Mash (Eds), *A Guide to Assessments that Work* (pp. 158–77). New

    York: Oxford University Press.

O'Carroll, P., Berman, A., Maris, R., Moscicki, E., Tanney, B., & Silverman, M. (1996).

    Beyond the tower of Babel: A nomenclature for suicidology. *Suicide and Life-*

    Threatening Behavior, *26,* 237–252

Olfson, M., Gameroff, M., Marcus, S., Greenberg, T., & Shaffer, D. (2005). National trends

    in hospitalization of youth with intentional self-inflicted injuries. *The American Journal*

    of Psychiatry, 162(7), 1328-1335.

Ougrin, D., & Latif, S. (2011). Specific psychological treatment versus treatment as usual in

    adolescents with self-harm. *Crisis, 32,* 74–80.

Ougrin, D., Tranah, T., Leigh, E., Taylor, L. & Asarnow, J. (2012). Practitioner review: Self-harm in adolescents. *Journal of Child Psychology and Psychiatry, 53,* 337–350.

Pattison, E., & Kahan, J. (1983). The deliberate self-harm syndrome. *American Journal of Psychiatry*, *140,* 867–872.

Rathus, J., & Miller, A.L. (2002). Dialectical Behaviour therapy adapted for suicidal adolescents. *Suicidal and Life Threatening Behavior, 32,* 146-157.

Salinsky, E., & Loftis, C. (2007). Shrinking inpatient psychiatric capacity: Cause for celebration or concern? *George Washington University, National Health Policy Forum, Issue brief, 823,* 1-21.

Selby, E., Bender, T., Gordon, K., Nock, M., & Joiner, T. (2012). Non-suicidal self-injury (NSSI) disorder: a preliminary study. *Personality Disorders: Theory, Research, and Treatment 3,*167–175.

Slee, N., Garnefski, N., van der Leeden, R., Arensman, E., Spinhoven, P. (2008). Cognitive behavioural intervention for self-harm: Randomised controlled trial. *The British Journal of psychiatry: The journal of mental science, 192(3),* 202-211.

Spirito A, Boergers J, Donaldson D, Bishop D, & Lewander W. (2002). An intervention trial to improve adherence to community treatment by adolescents after a suicide attempt. *Journal of the American Academy of Child and Adolescent Psychiatry, 41(4),* 435-442.

Sunseri, P. (2004). Preliminary Outcomes on the Use of Dialectical Behaviour Therapy to Reduce Hospitalization Among Adolescents in Residential Care. *Residential Treatment for Children & Youth, 21 (4),* 59-76.

Tantam, D., & Whittaker, J. (1992). Personality disorder and self-wounding. *British Journal of Psychiatry 161*, 451–464.

Taylor, L., Oldershaw, A., Richards, C., Davidson, K., Schmidt, U., Simic, M. (2011).

Development and pilot evaluation of a manualized cognitive- behavioural treatment

package for adolescent self-harm. *Behaviour and Cognitive Psychotherapy, 39*, 619–

625.

Washburn, J., Richardt, S., Styer, D., Gebhardt, M., Juzwin, K., Yourek, A., Aldridge, D.

(2010). Psychotherapeutic approaches to nonsuicidal self-injury in adolescents. *Child

and Adolescent Psychiatry and Mental Health, 6(14),* 1-8.

Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious behaviors in a college

population. *Pediatrics, 117,* 1939–1948.

Whitlock, J., & Knox, K. (2009). Intervention and prevention in the community. In M. K.

Nixon, & N. L. Heath (Eds), *Self-Injury in Youth: The Essential Guide to Assessment

and Intervention* (pp.173–94). New York: Taylor & Francis.

Woodberry, K., & Popenoe, E. (2008). Implementing dialectical behavior therapy with

adolescents and their families in a community outpatient clinic. *Cognitive and

Behavioral Practice, 15,* 277–286.

World Health Organization. (1986). Young people's health – a challenge for society. Report

of a WHO study group on young people and health for all by the year 2000. *Technical

Report Series, 731,* 1-117.

Zeman, J., Cassano, M., Perry-Parish, C., & Stegall, S. (2006). Emotion Regulation in

Children and Adolescents. *Developmental and Behavioral Pediatrics, 27(2),* 155-166.

STUDY TWO

Examining the correlation between emotion dysregulation and non-suicidal self-injury in a

clinical group of adolescents referred to hospital and a non-clinical control group

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Abstract

Leading theoretical and treatment models of nonsuicidal self-injury (NSSI) prioritise emotion dysregulation as the predominant function of this behaviour and avoidance of emotions as the means by which regulation is achieved. Empirical support for these models has focused on clinical, forensic, and community populations of adults despite substantial evidence for its heightened prevalence during adolescence. Confirming the validity of these theories in this vulnerable age group is crucial for the development of treatment interventions that can effectively tackle these high numbers of at risk young people. This study aimed to compare emotion dysregulation theory across a clinical and non-clinical sample of adolescents. Finding a significant correlation between these groups would reduce the possibility that these explanatory models of NSSI are exaggerated or distorted and, as a result, the potential problems that would arise in the treatment approaches that derive from them. To this end, adolescents presenting to hospital with NSSI ($n = 53$) and an age and gender matched non-clinical control group ($n = 42$) completed a set of measures selected to examine the salient variables derived from leading theories of NSSI. As with adult studies, and compared to the non-clinical controls, the clinical group rated themselves as significantly more emotionally dysregulated and emotionally avoidant and reported significantly higher levels of depression, anxiety and stress. In contrast to adults, the specific dimension of emotion dysregulation that predicted NSSI frequency in the adolescents was access to effective regulation strategies. These results suggest that current theories of NSSI in adults are relevant to younger populations but that treatments may require adolescent-specific targets.

Keywords: nonsuicidal self-injury, adolescence, emotion dysregulation, non-clinical control

STUDY TWO: NON-CLINICAL CONTROL COMPARISON

Nonsuicidal self-injury (NSSI) occurs across a wide range of ethnically and socially diverse populations (Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012) and is occurring at a disturbingly high rate amongst adolescents in particular (Klonsky, 2009), with studies reporting between 13-45% in community samples alone (Klonsky & Muehlenkamp, 2007; Moran et al., 2012; Nock & Prinstein, 2004). Following 30,000 interviews of 15-and 16-year old school students from seven different countries, the National Children's Bureau Centre in the United Kingdom found that NSSI is a major international problem with one in four teenagers reporting the presence of NSSI in the previous year (Madge et al., 2008). Even at lower bound estimates in the community, this behaviour is higher than in adult populations (Selby, Bender, Gordon, Nock, Joiner, 2012), more widespread and more frequent than a wide range of mental (Nock, 2010) and physical (Skegg, 2005) illnesses, and is associated with a variety of poor long-term outcomes (Green et al., 2011). Defined in this paper as the 'deliberate and repeated destruction or alteration of body tissue, for purposes that are not socially sanctioned, and without conscious suicidal intent' (Gratz, 2001; Klonsky et al., 2007), NSSI is a clinically important behaviour that warrants increased research attention in the age group in which it is most prevalent (Klonsky, 2009). The provision of an empirically sound theoretical base is an important basis from which to develop effective treatments for this worrying population.

Evidence suggests that NSSI is a multi-determined behaviour that has various psychological (e.g. self-critical cognitive style), biological (e.g., serotonergic dysfunction), and environmental (e.g., media, social modeling) factors involved in its development and maintenance (Nock, Teper, & Hollander, 2007), with integrated models receiving the most empirical support in recent literature (Chapman, Gratz & Brown, 2006; Nock et al., 2004; Yates, 2004; Yip, 2005;). Of these, the *Experiential Avoidance Model* (EAM; Chapman et al., 2006) is a useful basis for adolescent research because it integrates the empirically supported aspects of existing explanatory models (Messer & Fremouw, 2008), the most prominent being

the emotion regulatory function of this behaviour (Linehan, 1993; Nock et al., 2004). EAM

also benefits from being developed to apply to NSSI at a general level across various

populations (Chapman et al., 2006), rather than being focused on specific diagnoses such as

Borderline Personality Disorder (BPD). It also moves away from adult models that focus on

the quality of emotion dysregulation such as the emotional intensity and/or reactivity (e.g.

Livesley, Jang, & Vernon, 1998) and places a greater emphasis on the function of the emotion

or way in which a person responds to their emotional experience (e.g. Mennin, Heimberg,

Turk, & Fresco, 2005). As such, the EAM prioritises the emotion regulatory function of

NSSI, which is conceptualised as a maladaptive behaviour used to avoid unwanted emotions,

as well as other internal experiences such as thoughts or physical sensations, that an

individual finds distressing or uncomfortable. The resulting experience of relief from these

aversive internal states, whilst temporary, is negatively reinforcing so that the individual

maintains and habituates to the NSSI behaviour. More specifically, the EAM views emotion

dysregulation as a multidimensional construct involving: (a) a lack of awareness,

understanding, and acceptance of emotions; (b) a lack of access to adaptive strategies to

modulate the intensity and/or duration of emotional responses; (c) an unwillingness to

experience emotional distress as part of pursuing desired goals and; (d) the inability to engage

in goal-directed behaviours when experiencing distress. Empirical evidence for all four

constructs has been provided (Gratz, Rosenthal, Tull, Lejuez & Gunderson, 2006) with

evidence suggesting the especially detrimental consequences of emotional non-acceptance

and consequent emotional avoidance, relative to the other aspects of emotion dysregulation

(Gratz et al., 2006). It is important to consider that there are a range of inter-and intrapersonal

factors that precipitate and /or maintain the aversive internal experiences that are purported by

the EAM to result in NSSI (Klonsky, 2009, Nock, 2009), with depression (You & Leung,

2012), anxiety (Klonsky, Oltmanns, & Turkheimer 2003) and family and peer related stress

(Skegg, 2005) found to be particularly prominent in adolescent populations. Psychiatric

disturbance is most common and depressive disorders in particular show a strong link (Guerry & Prinstein, 2010) with around two-thirds of adolescents who present with NSSI scoring positively for depressive disorders (Green et al., 2011). The persistence of depressive disorder also predicts substantially increased risk of future self-harm in young adults when other factors are controlled for (Green et al., 2011). This strong correlation with psychiatric disturbance is expected if NSSI functions to avoid or reduce negative or distressing feelings as stipulated by the EAM.

Theoretical models that prioritise the emotion-regulatory function of NSSI, such as the EAM, are gaining increasing empirical support in community (Gratz & Roemer, 2008), forensic (Gratz & Tull, 2010; Trupin, Stewart, Beach, & Boesky, 2002), and clinical (Gratz & Tull, 2011) populations of adults, yet only a handful of studies have empirically evaluated predictions from these theories within clinical populations of adolescents where prevalence rates are at their highest. The majority of those that have, combine NSSI into the broad category of 'self-harm' that includes suicidal behaviours (e.g., Rossouw & Fonagy, 2012; Wood, Trainor, Rothwell, Moore, Harrington, 2001) where the young persons intent and hence the function of the behaviour is very different. The only studies that isolate NSSI as a target of treatment are evaluations of Dialectical Behavior Therapy (DBT; Linehan, 1993), an empirically supported treatment developed for BPD in adults who inevitably present with a high occurrence of NSSI behaviours. Adolescent adaptations of DBT (DBT-A; Miller, Rathus & Linehan, 2006) show similar promise but have yet to provide outcomes that are any more effective at targeting NSSI than treatment as usual (Fleischakker et al., 2011; Katz, Cox, Gunasekara, & Miller, 2004). Furthermore, no studies have clarified whether theories such as EAM adequately differentiate populations of NSSI sufferers from non-clinical, cognitively normal individuals, an important illustration for any comprehensive theoretical model. This study aims to examine the key psychological constructs implicated by EAM theory in the development and maintenance of NSSI in a population of adolescents who are referred to

hospital with NSSI compared to a non-clinical control group. The development of an

empirically supported theoretical model of NSSI in adolescents is a necessary precursor to the

development of evidence-based treatments for this at risk population. This study aimed to

begin this task.

Method

Participants

Table 1 details the demographic characteristics of participants in each group. Fifty-three

adolescents with NSSI and 42 age and gender matched non-clinical controls between 12 and

18 years participated in this study. The clinical group was comprised of adolescents who had

been referred by their community clinicians to an inpatient hospital unit and reported a history

of repeated NSSI with at least one incident in the last 6 months. The presence and frequency

of their NSSI was confirmed using a measure of NSSI that was included in the pre-treatment

batch of measures. Individuals were excluded from the NSSI group if their referring clinicians

indicated that they had borderline or below intellectual functioning, severe learning

difficulties, active psychosis, current suicidal ideation rated as 'severe' in lethality and/or a

suicide attempt rated as 'high' lethality in the past 6 months. The exclusion of adolescents

with suicidal behaviours was included because, whilst NSSI is a known risk factor for

suicidal behaviours (Lengel & Mullins-Sweatt, 2013), their function is fundamentally

different (i.e. to regulate emotions and to end life) and there is ample research that

demonstrates some key differences between them (Lengel et al., 2013). Individuals taking

medication were included, but were required to keep medication constant for the duration of

the treatment. The mean age of participants in the NSSI group was 15.63 ($SD = 1.21$) and

98.1% ($n = 52$) were female.

The non-clinical control group was recruited from adolescents living in the local area

whose parents and self-reports corroborated that they had: (a) no history of referral to a

Table 1

Demographic characteristics of all participants by group (N = 95)

	NSSI Group (*n* = 53)		Non-clinical control Group (*n* = 42)		χ^2	*p*
Age: mean (SD)	15.63	(1.21)	15.11	(1.33)		.05*
Gender: % within Group (*n*)					(1) = .03	.87
Male	1.9	(1)	2.4	(1)		
Female	98.1	(52)	97.6	(41)		
Ethnicity: % within Group (*n*)					(1) = 1.54	.78
White	75.5	(40)	85.7	(36)		
Other	24.5	(13)	14.3	(6)		
Family Makeup: % within Group (*n*)					(3) = .88	.83
Sole parent	20.8	(11)	19.0	(8)		
Two parent	69.8	(37)	73.8	(31)		
Step/blended	7.5	(4)	7.1	(3)		
Foster/kinship	1.95	(1)	0.0	(0)		
School Type: % within Group (*n*)					(3) =14.47	.02*
Public	58.5	(31)	59.5	(25)		
Private	1.9	(1)	23.8	(10)		
Catholic	37.7	(20)	14.3	(6)		
Not enrolled	1.9	(1)	2.4	(1)		
English Spoken: % within Group (*n*)					(1) = 1.31	.25
No	11.3	(6)	4.8	(2)		
Yes	88.7	(47)	95	(40)		

*Note. * p* = <.05.

mental health professional; (b) no evidence of a psychiatric disorder; (c) and no current or history of NSSI. The mean age of participants in the non-clinical group was 15.11 (*SD* = 1.33) and 97.6% (*n* = 41) were female.

Participants in both groups were predominantly Caucasians born in Australia who lived in two parent families and spoke English at home. The groups differed somewhat in terms of type of school attended, so whilst the majority of students in both groups attended public schools, more of the NSSI group attended catholic schools than private schools and more of the non-clinical group attended private schools than catholic schools.

STUDY TWO: NON-CLINICAL CONTROL COMPARISON

Measures

The clinical group completed the following diagnostic measure prior to inclusion in the NSSI group. In the absence of any consistently measured characteristic of NSSI other than its presence (Nock, 2010), NSSI frequency was chosen as the outcome measure given the likelihood that there are clinically significant differences between individuals who chronically engage in NSSI compared to those who engage in the act only once or twice in their lives (Gratz, 2001).

Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) is 17-item self-report measure that screens various aspects of NSSI including duration, type, severity, and lifetime frequency that was of particular interest in this study. The DSHI has been found to have high internal consistency, adequate construct, convergent and discriminant validity, and adequate test-retest reliability (Gratz, 2001) and has been used with adolescent populations (Lundh, Karim, & Quilisch, 2007).

Participants in both the clinical and non-clinical groups completed the following batch of measures for comparison.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36 item self-report measure that assesses clinically relevant difficulties in emotion regulation. Items correlate to the multi-dimensional constructs of emotion dysregulation identified by the EAM and are scored on six scales including Lack of Emotional Awareness (6 items), Lack of Emotional Clarity (5 items), Difficulties Controlling Impulsive Behaviors when Distressed (6 items), Difficulties Engaging in Goal-Directed Behavior When Distressed (5 items), Non-acceptance of Negative Emotional Responses (6 items), and Limited Access to Effective Emotion Regulation Strategies (8 items). Items are scored on a five-point scale ranging from 1 (*almost never)* to 5 *(almost always)* and it has utility in the measurement of emotion dysregulation in adolescent populations (Gratz et al., 2004; Neumann, van Lier, Gratz, &

Koot, 2010). The DERS has been found to have high internal consistency (α = .93), good test-retest reliability and adequate construct and predictive validity (Gratz et al., 2004).

Avoidance and Fusion Questionnaire for Youth (AFQ-Y8; Greco, Lambert & Baer, 2008) was used as a measure of emotional avoidance as it is a developmentally sensitive self-report measure of psychological inflexibility that is engendered by high levels of experiential avoidance, cognitive fusion and behavioural inhibition when faced with unwanted internal experiences (including emotional) consistent with the theory underlying Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999). The 8-item youth rated version was developed for research purposes and is rated on a five-point rating scale ranging from 0 (*not at all true)* to 4 (*very true*). It has been found to be psychometrically sound, with adequate reliability and validity for youth over the age of 9 years (Greco et al., 2008).

Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer & Smith, 2011) was developed as a self-report measure of mindfulness for school-aged children and adolescents. It assesses the degree to which children and adolescents observe internal experiences, act with awareness, and accept internal experiences without judging them. The 10-item version is rated on a five-point scale from 0 (*never true*) to 4 (*always true*) with research confirming that it is a developmentally appropriate measure with adequate reliability and validity (Greco et al., 2011).

The *Depression, Anxiety and Stress Scales* (DASS; Lovibond & Lovibond, 1995) is a 42-item self-report measure designed to measure the severity of depression, anxiety and stress symptoms in adults and adolescents as young as 12 years (Lovibond et al., 1995). Assessment of these negative emotional states was included given their strong correlation to NSSI (Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999). This study used a short 21-item version (DASS-21) rated on a four-point scale from 0 (*does not apply to me at all)* to 3 (*applies to me very much or most of the time*). Replication studies have found that the short version distinguishes between clinical symptoms and has equally strong internal consistency

and concurrent validity in the 'acceptable' to 'excellent' ranges to the full version (Antony,

Bieling, Cox, Enns, & Swinson, 1998).

Procedure

Adolescents who formed the clinical group were referred to an inpatient hospital and had

completed their measures as part of a larger batch of outcome measures used in a treatment

trial. The department referral form was used to capture relevant demographic information and

exclude participants not meeting the study criteria. Adolescents who were excluded continued

with their treatment as usual in the hospital. The non-clinical control group was recruited via

advertisements in the local community. They were recruited 3 months after the clinical group

to allow for age and gender matches to be selected. Once a potential participant had been

identified, a phone call to their parents established age and eligibility and provided relevant

information about the study. If the participant met all inclusion criteria for the study and they

(and their parent if aged under 16 years) verbally agreed to participate, a batch of measures

and consent forms was posted to them along with instructions on how to complete the

measures and a reply paid envelope. A total of 67 batches were posted and 31 were received

back. A follow up call resulted in 11 additional returns resulting in 42 control participants in

total.

All participants, and parents of participants under 16 years, provided informed consent.

This study was approved by both the Macquarie University Human Ethics Committee and the

Western Sydney Local Health District Human Ethics Committee (HREC2011/7/4.8(3550)

AU RED HREC/11/WMEAD/126).

Statistical Analysis

Descriptive statistics were presented to examine and compare the variables of interest

across the clinical and non-clinical control groups. Given that the groups differed significantly

on age, analyses were run using one-way analyses of co-variance (ANCOVA) with age

entered as the covariate for all comparisons (Table 2). Data from the clinical NSSI group was

then subjected to a forward and backward logistic regression to ascertain whether any of the

DERS subscales that make up the construct of emotion regulation were predictive of NSSI

frequency as hypothesised by EAM theory.

Results

Descriptive Statistics

Table 2 presents the descriptive statistics for the variables used in this study. As can

be seen the clinical and non-clinical groups differed significantly on all measures and their

subscales.

Correlational Analysis

A Pearson's correlation was run to predict NSSI frequency (using the DSHI) from

each subscale of the DERS. As presented in Table 3, DERS Strategy (i.e. limited access to

effective emotion regulation strategies) was the only variable that statistically significantly

predicted NSSI frequency, $F(1.51) = 6.801$, $p = .012$, $R^2 = .118$. No other DERS subscale

explained significant additional variance in NSSI frequency.

Normality Test

Normality was outside of normally accepted limits for the NSSI variable and so a

square-root transformation was performed to correct for the skew. The regression analyses

were then re-run using the transformed variable and there was no change to the pattern of

results. The non-transformed data was therefore used for ease of interpretation.

Discussion

Theoretical conceptualisations of NSSI in adults have identified key constructs in the

development and maintenance of this serious problem, with emotion regulation and emotional

avoidance highlighted as primary contributors. This study aimed to compare these key

constructs in a sample of adolescents presenting to hospital with NSSI and an age and gender

Table 2

Descriptive statistics for measures of interest in the NSSI group (n = 53) and non-clinical control

groups (n = 42)

	NSSI group (n = 53)		Non-clinical control group (n = 42)		Analysis		
Scale	Mean	SD	Mean	SD	F	*df*	*p*
Difficulties in Emotion Regulation Scale (DERS)[b]							
Awareness	20.2	4.9	13.6	5.9	1.90	92	<.001
Clarity	16.9	4.6	6.8	3.3	9.69	92	<.001
Impulsivity	22.7	5.8	8.2	2.5	14.84	92	<.001
Goals	22.0	4.4	9.4	3.9	0.002	92	<.001
Non-acceptance	22.9	6.2	7.6	3.4	11.91	92	<.001
Strategy	31.53	6.9	8.0	3.6	12.60	92	<.001
Total score	134.6	23.3	53.5	15.6	3.32	93	<.001
Child and Adolescent Mindfulness Measure (CAMM)							<.001
Mindfulness	12.9	7.3	29.1	7.2	.26	93	<.001
Avoidance and Fusion Questionnaire -Youth (AFQ-Y)							<.001
Experiential Avoidance	22.8	5.4	5.2	2.4	19.47	93	<.001
Depression, Anxiety and Stress Scale (DASS)							<.001
Depression	32.7	7.8	6.1	4.1	15.98	93	<.001
Anxiety	24.8	8.5	5.2	3.5	26.29	93	<.001
Stress	28.2	8.2	9.4	6.7	2.28	93	<.001

Note. [a] Two-tailed t-test. [b] DERS subscales: Awareness = lack of emotional awareness, Clarity = lack of emotional clarity, Impulsivity = difficulties controlling impulsive behaviors when distressed, Goals = difficulties engaging in goal-directed behavior when distressed, Non-acceptance = non-acceptance of negative emotional responses and Strategy = limited access to effective emotion regulation strategies.

matched non-clinical control group. In summary, the findings lend empirical support to recent

integrated theories of NSSI, of which the EAM is one of the most empirically supported and

relevant for adolescent populations. Compared to a non-clinical control group, adolescents

presenting to hospital with NSSI reported significantly more emotion dysregulation and

emotional avoidance. More specifically, these differences held for all dimensions of the multi-

dimensional construct of emotion dysregulation, namely, a lack of emotional awareness, a

lack of emotional clarity, difficulties controlling impulsive behaviours when

STUDY TWO: NON-CLINICAL CONTROL COMPARISON

Table 3

Pearson correlations of DERS subscales

Variables	1	2	3	4	5	6
1. NSSI FREQUENCY [a]						
2. DERS Non-acceptance [a]	.112					
3. DERS Goals [a]	.228	.467				
4. DERS Impulsivity [a]	.290	.446	.430			
5. DERS Awareness [a]	.191	.240	.430	.192		
6. DERS Strategy [a]	.343 [*]	.523	.454	.520	.303	
7. DERS Clarity [a]	.035	.179	.372	.127	.291	.241

Note. [a] DERS subscales: Non-acceptance = non-acceptance of negative emotional responses, Goals = difficulties engaging in goal-directed behavior when distressed, Impulsivity = difficulties controlling impulsive behaviors when distressed, Awareness = lack of emotional awareness, Strategy = limited access to effective emotion regulation strategies, and Clarity = lack of emotional clarity.
[*] $p < .01$.

distressed, difficulties engaging in goal-directed behaviour when distressed, non-acceptance of negative emotional responses and limited access to effective emotion regulation strategies. The clinical adolescent group also scored significantly higher on psychological constructs of depression, anxiety and stress, in keeping with adult theory where individuals report high levels of aversive internal states both before NSSI and in general (e.g., Michel, Valach, & Waeber, 1994). More specifically, they report marked depressive affect (e.g., Simeon et al., 1992), anxiety (Simeon et al., 1992; Wilkins & Coid, 1991) and mixed anxiety and depression (e.g., Fulwiler, Forbes, Santangelo, & Folstein, 1997).

As with adult populations, adolescents who present with NSSI therefore appear to have impairments in emotion regulation, are more prone to emotional avoidance and experience high levels of internal distress. The only outcome of this study that does not fit with adult EAM theory is the relative importance attributed to the six dimensions of the construct of emotion regulation. Whilst adult studies increasingly point to the primary role played by non-acceptance of emotional distress (Gratz et al., 2004), a factor that is likely to increase the risk of emotional avoidance and hence NSSI, regression analysis of the clinical

STUDY TWO: NON-CLINICAL CONTROL COMPARISON

adolescent group found that access to emotion regulation strategies was the only dimension that explained a significant amount of variance (12%) in NSSI frequency. Compared to the clinical group, the non-clinical group of adolescents also showed a significantly higher ability in the skill of mindfulness, an example of an adaptive emotion regulatory skill that requires the young person to be aware, accept and stay present with their emotional distress. This does not negate the important role played by non-acceptance, or indeed any of the dimensions of emotion dysregulation, all of which were found to be significantly impaired compared to the non-clinical controls. It does however highlight the potentially crucial role of regulatory strategies in models and treatment approaches that target adolescents.

There may be a number of reasons why limited access to regulatory strategies appears particularly detrimental during adolescent years. One explanation is that some adolescents have simply not yet developed effective emotion regulation or moderation strategies. When faced with intense emotions or stress and with no or few effective strategies to moderate them, they may experience their emotions as intolerable and as a result may be more likely to use escape or avoidance strategies such as NSSI. Successful avoidance of these intense experiences using NSSI then sets up a cycle of repeated use and habituation to the use of NSSI as a learned coping mechanism through negative reinforcement. Some support for this hypothesis exists in younger adults (specifically female college students) where studies have shown access to emotion regulation strategies mediated the relationship between childhood emotional neglect and experiential avoidance among female college students (Gratz & Roemer, 2002). It also corresponds with longitudinal prevalence rates which show onset of NSSI in early adolescence, a peak in mid adolescence and a decline over early adulthood (Moran et al., 2012) as individuals likely acquire adaptive skills. Another explanation is that adolescents do have adaptive regulatory skills in their repertoire but they fail to access or implement them when emotionally aroused. One reason for this is that they may experience a breakdown in their cognitive or information processing systems when faced with intense

emotional arousal. Research has indicated that emotions constitute full system responses, consisting of physiological, expressive, cognitive, and behavioral components (Ekman & Davidson, 2004). Under conditions of intense emotional arousal, cognition and information processing tends to narrow with resulting difficulties in problem solving (Gellatly & Meyer, 1992; Keinan, 1987). Adolescents who experience intense emotions may therefore have difficulty thinking, planning, or implementing more functional regulatory strategies, and resort to quick, easily executable strategies such as NSSI to deal with their distress. This may also account for the consequent impairment in their capacity to engage in goal directed tasks when distressed, another important dimension of emotion regulation that appears impaired when NSSI is present. Furthermore, for adolescents who also have high levels of impulsivity, this tendency would likely be exaggerated, as impulsivity may heighten the tendency to choose the most easily accessible and convenient coping strategy to moderate their distress. They would also be more likely to repeat NSSI as they tend to focus on immediate gains and so are likely to preference fast acting maladaptive coping strategies that provide immediate relief, over adaptive ones that take longer to alleviate their distress and have longer-term consequences such as scarring. This is supported by the clinical group having significantly greater difficulty on the DERS dimension of 'controlling impulsive behaviours when distressed', and with an increasing number of studies that have found behavioural impulsivity to be strongly implicated in both the occurrence and maintenance of NSSI (Stanford & Jones, 2009; You & Leung, 2012). Recent longitudinal studies have confirmed the important contribution of depressive symptoms and behavioural impulsivity in particular to the occurrence of NSSI in a community sample of adolescents over a 2-year period, and highlighted the potentially crucial role played by these two constructs to both the occurrence and repetition of NSSI (You & Leung, 2012).

In summary (see Figure 1), like adults, adolescents with NSSI present with a marked impairment in their capacity to regulate emotional distress and appear to preference avoidance

strategies such as NSSI to manage them. Unlike their adult counterparts whose emotional non-acceptance plays a primary role, however, adolescents may initially resort to avoidance strategies such as NSSI because they do not have access to adaptive strategies to regulate or moderate their intense emotional distress. Clarifying this model, and the relative importance of specific aspects of it to the adolescent phase of developmental will have important treatment implications for the large numbers of at risk adolescents who are currently presenting to hospitals.

These findings should be considered in light of the study's limitations. The study needs replication with a larger longitudinal sample. Critically, this is a cross-sectional research study and so provides no insight into causal directions of the constructs under consideration. Confirming that emotion dysregulation precedes and predicts NSSI frequency, and that this pathway is mediated by emotional avoidance, will be an important longitudinal study to undertake in future studies with adolescents. Investigating the potentially different roles played by the dimensions that make up emotion regulation will also be worthwhile, such as the finding that limited access to regulatory strategies predicts NSSI frequency in adolescent-specific NSSI models. Another significant limitation is that the study used a non-clinical control group and it will be important to replicate it using a clinical control group that does not present with NSSI behaviour but that is matched on level of psychological distress. Depressive symptomology and/or behavioural impulsivity will be particularly important to investigate given their high prevalence and seemingly significant roles in NSSI (You & Leung, 2012). The predominantly female sample (93 females: 2 males) is another limitation, especially given recent findings of similar prevalence of NSSI in males as females, contradicting previous biases towards female populations. One study of EAM theory suggests that females show significantly greater impairment on the emotion regulation dimensions of emotional non-acceptance and access to effective strategies, whilst males demonstrate lower levels of emotional awareness (Gratz et al., 2004), and so the application of EAM in

adolescent male populations will be important to investigate. With regards to the measures used, the data were gathered solely from self-report questionnaires and future research would benefit from informant measures, interview data or specific techniques that reduce recall biases. Assessment of behavioural impulsivity was limited to a subscale of the DERS and future studies would benefit from including a specific and comprehensive assessment tool to examine the role of this potentially significant contributing construct. Finally, the sample was restricted to one hospital in a western district of Sydney and the demographic data suggest a bias towards a middle class sample of the population. The convenience sample were willing to undergo treatment and participate in the study and whilst this is not necessarily a disadvantage, as studying any phenomenon requires the selection of typical patients and matched controls (Nierenberg & Feinstein, 1986), replication in more general populations would be beneficial.

Clinical Implications and Future Directions

The clinical implications of these findings suggest the utility of adolescent treatments for NSSI that aim to increase adaptive emotion regulatory strategies and decrease non-accepting responses to distressing emotions. The consequent decrease in emotional avoidance that this would allow is expected to result in a decrease both in the maladaptive behaviours that function to avoid emotional experiences (such as NSSI) and the paradoxical increase in emotional distress that often arises as a consequence of this rigid emotional avoidance. Whilst it is important to include all the dimensions of emotion regulation in the treatment of NSSI, it may be particularly crucial to highlight emotion regulation strategies in adolescent models and treatments. The acquisition of these skills could be considered a normal task of adolescent development, but if a young person who has a predisposition to high emotional distress is never exposed to or unwilling to trial adaptive emotion regulatory, they may be at risk of
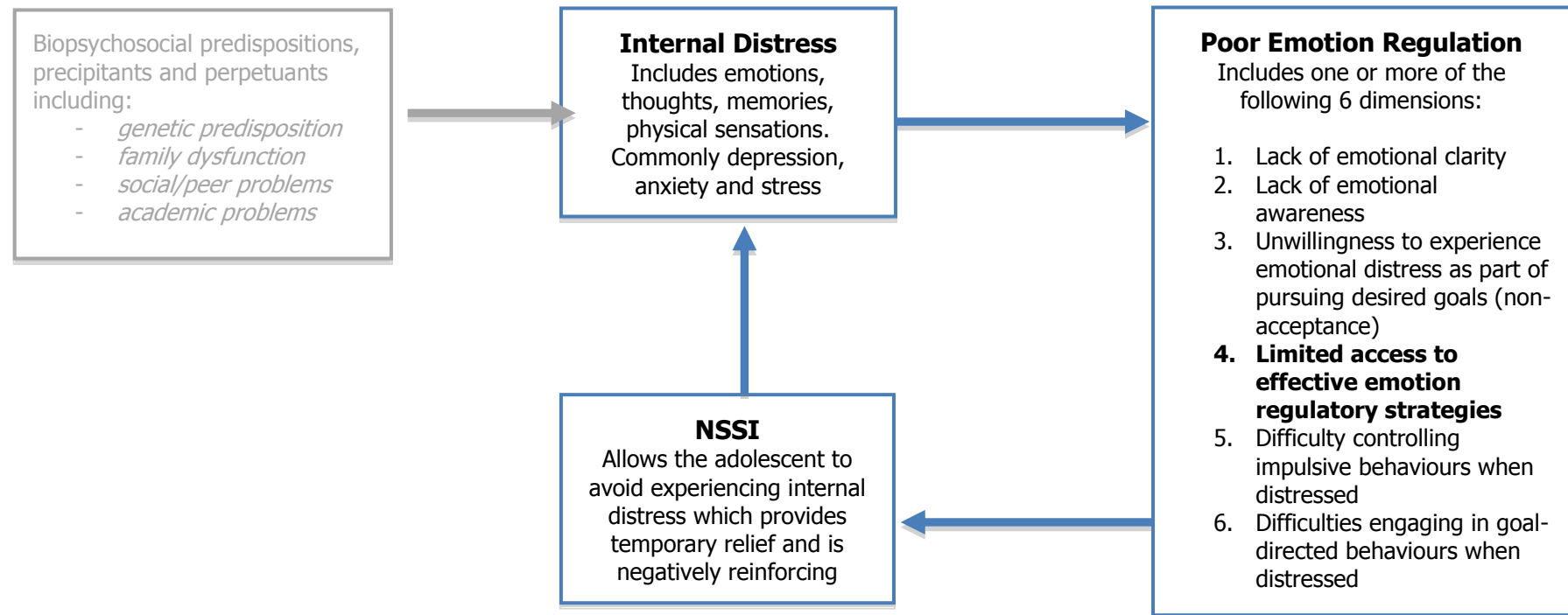
Figure 1. Diagrammatic representation of a section of the Experiential Avoidance Model (EAM) as it may apply to a clinical population of adolescents with NSSI.

a trajectory marked by non-acceptance and avoidance rather than a more normal trajectory of skill testing and acquisition. The potentially detrimental long term impacts of this can be tracked and explained even at a neurological level, with the experientially shaped destruction or pruning of neurons that occurs during the adolescent years, a process that is intensified by stress (Siegel, 2014). In the context of NSSI, the limited use or avoidance of adaptive emotion regulatory strategies may result in the sacrifice of these neuronal connections during adolescent pruning, whilst corresponding NSSI pathways are strengthened. Learning, trialing and using adaptive emotion regulation strategies may therefore be crucial for adolescents by allowing them to: (a) reduce intense physiological arousal associated with the emotion; (b) turn attention away from emotional stimuli; (c) inhibit impulsive or mood-driven behaviour, and (d) engage in behaviour oriented toward achieving non mood-dependent goals (Gottman & Katz, 1989). Several adaptive emotion regulatory skills exist for adolescents as part of existing treatment approaches, most notably DBT-A (Miller, Rathus et al., 2006) which includes a variety of age appropriate skills aimed at regulating and tolerating intense experiences (e.g. problem solving and distress tolerance skills) and reducing non-acceptance responses (e.g. radical acceptance, mindfulness and willingness) and hence the reliance on experiential avoidance strategies. In addition, several recent treatments such as Acceptance and Commitment Therapy (ACT; Hayes et al., 1999) specifically target non-acceptance and experiential avoidance by reducing rule-governed behaviour, increasing emotional willingness, teaching the paradoxical consequences of attempts to control/avoid emotions and increasing valued action. Pilot data on a new, ACT-consistent group treatment for NSSI suggests that this approach may be useful in reducing NSSI among women with BPD (Gratz & Gunderson, 2006), however, replication in adolescent samples is still needed. As mentioned, one important factor that contributes to the self-perpetuating cycle of NSSI is the way in which it interferes with the adolescents' ability to learn and execute new and alternative responses to stimuli. Skill acquisition may therefore need to be paired with

interventions that facilitate the learning of these new responses by helping to break this self-perpetuating cycle, such as those that seek to either reduce the reinforcing qualities of NSSI (for example, exposure where avoidance is marked) or those that apply other competing contingencies. The provision of competing contingencies may be more challenging given how effective NSSI is at terminating unwanted emotions in contrast to adaptive strategies which require an effort to learn and use, are not immediately rewarding, and require the adolescents to increasingly tolerate uncomfortable and distressing experiences for a higher purpose. Including motivational strategies and individually targeted value and goal-directed interventions (for example, the valued directions prioritised in ACT) are likely to form a crucial part of treatment to incentivise the selection of alternative and more adaptive responses. Similarly, where adolescents present with impulsivity, strategies tailored to the management of this behaviour will be crucial to treatment given its correlation with the maintenance and repetition of NSSI in adolescents in particular, and its potentially detrimental role in skill selection and learning.

Rather than a single static model, it may be useful for future studies to consider the EAM as a fluid developmental model, whereby the relative importance of the constructs involved in NSSI theory vary across population ages dependant on the needs and developmental tasks of that phase of life. The breadth of the model will also be useful to separate out, with the possibility of unique versions of the model that apply to cognitively normal individuals who self-harm as opposed to psychotically or developmentally impaired groups. Different representations for specified presentations such as BPD, depression or suicidal behaviours may also be warranted. For example, given the high correlation with BPD, does targeting certain constructs or dimensions of NSSI in adolescence help ameliorate the likely development of this disorder, or do adolescents who go on to develop BPD in adulthood require a different clinical picture or pathway in the model altogether? Where adolescents attempt suicide, is this a more severe version of the same NSSI model as many

authors have suggested (Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999; Hawton, Rodham, Evans, & Harriss, 2009) or a does this behaviour have a different trajectory altogether? Different adolescent-specific biological (e.g. low tolerance of distress or high arousal levels) and environmental (e.g. peer and familial conflict) contexts of NSSI and their role in triggering and perpetuating these trajectories will also inevitably need consideration for a comprehensive model.

Given the prevalence of NSSI in adolescents presenting to hospital, the potential long-term cost to the young person and the lack of any empirically validated treatment options, it is now critical that we respond to this growing problem by developing highly targeted and effective interventions for this age group. This study provides evidence for the utility of emotion regulatory models, and specifically the EAM, as a useful theoretical framework from which to begin to derive adolescent specific treatments and commence this work.

References

Antony, M, Bieling, P., Cox, B., Enns, M., & Swinson, R. (1998). Psychometric properties of

the 42-item and 21-item versions of the Depression, Anxiety and Stress Scales in

clinical groups and a community sample. *Psychological Assessment, 10,* 176-181.

Chapman, A., Gratz, K., & Brown, M. (2006). Solving the puzzle of deliberate self-harm: The

experiential avoidance model. *Behaviour Research and Therapy, 44,* 371-394.

Ekman, P., & Davidson, R. (2004). *The nature of emotion.* New York: Oxford University

press.

Fleischhaker, C, Bohme, R., Sixt, B., Bruck, C., Schneider, C., & Schulz, E. (2011).

Dialectical behaviour therapy for adolescents (DBT-A): a clinical trial for patients

with suicidal and self-injurious behavior and borderline symptoms with a one-year

follow-up. *Child and Adolescent Psychiatry and Mental Health, 5(3),* 1-10.

Fulwiler, C., Forbes, C., Santangelo, S., & Folstein, M. (1997). Self-mutilation and

suicide attempt: Distinguishing features in prisoners. *Journal of the American*

Academy of Psychiatry and Law, 25, 69–77.

Gellatly, I., & Meyer, J. (1992). The effects of goal difficulty on physiological arousal,

cognition, and task performance. *Journal of Applied Psychology, 77,* 694–704.

Giletta, M., Scholte, R., Engels, R., Ciairano, S, Prinstein, M. (2012). Adolescent nonsuicidal

self-injury: A cross-national study of community samples from Italy, the Netherlands

and the United States. *Psychiatry Research, 197,* 66-72.

Gottman, J, & Katz, L. (1989). Effects of marital discord on young children's peer interaction

and health. *Developmental Psychology, 25*, 373–381.

Gratz, K. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate

self-harm Inventory. *Journal of Psychopathology and Behavioral Assessment, 23,*

253-263.

Gratz, K. & Gunderson, G. (2006). Preliminary data on an acceptance-based emotion

regulation group intervention for deliberate self-harm among women with borderline

personality disorder. *Behavior Therapy, 37,* 25-35.

Gratz, K. & Roemer, L. (2002). Consequences of childhood maltreatment for the

development of emotion regulation strategies. In J. Luterek (Chair), *Recent*

investigations of emotional functioning in trauma. Symposium presented at the annual

meeting of the Association for Advancement of Behavior Therapy, Reno, NV.

Gratz, K. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and

dysregulation: Development, factor structure, and initial validation of the Difficulties

in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral*

Assessment, 26, 41-54.

Gratz, K., & Roemer, L. (2008). The relationship between emotion dysregulation and

deliberate self-harm among female undergraduate students at an urban commuter

university. *Cognitive Behaviour Therapy, 37*, 14–25.

Gratz, K., Rosenthal, M., Tull, M., Lejuez, C., & Gunderson, J. (2006). An experiential

investigation of emotion dysregulation in borderline personality disorder. *Journal of*

Abnormal Psychology, 4, 850-855.

Gratz, K. L., & Tull, M. T. (2010). The relationship between emotion dysregulation and

deliberate self-harm among inpatients with substance use disorders. *Cognitive Therapy*

and Research, 34, 544–553.

Gratz, K., & Tull, M. (2011). Extending research on the utility of an adjunctive emotion

regulation group therapy for deliberate self-harm among women with borderline

personality pathology. *Personality Disorders Theory, Research and Treatment, 2,*

316-326.

Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood and
adolescence: Development and evaluation of the Avoidance and Fusion Questionnaire
for Youth. *Psychological Assessment, 20(2)*, 93-102.

Greco, L., Baer, R., & Smith, G. (2011). Assessing Mindfulness in Children and
Adolescents: Development and Validation of the Child and Adolescent
Mindfulness Measure (CAMM). *Psychological Assessment, 23(3),* 606-614.

Green, J., Wood, A., Kerfoot, M., Trainor, G., Roberts, C., Rothwell, J., Woodham, A.,
Ayodeji, E., Barrett, B., Byford, S., & Harrington, R. (2011). Group therapy for
adolescents with repeated self -harm: randomised controlled trial with economic
evaluation. BMJ 2011;342:d682 doi:10.1136/bmj.d682.

Guerry, J., & Prinstein, M. (2010). Longitudinal prediction of adolescent nonsuicidal
self-injury: examination of a cognitive-vulnerability stress model. *Journal of
clinical Child and Adolescent Psychology, 239,* 77-89.

Hawton, K., Kingsbury, S., Steinhardt, K., James, A., & Fagg, J. (1999). Repetition of
deliberate self-harm by adolescents: the role of psychological factors. *Journal of
Adolescence, 22*, 369-378.

Hawton, K., Rodham, K., Evans, E., & Harriss, L. (2009). Adolescents Who Self Harm: A
Comparison of Those that go to Hospital and Those Who Do Not. *Child and
Adolescent Mental Health, 14(1),* 24-30.

Hayes, S., Strosahl, K., & Wilson, K. (1999). *Acceptance and commitment: An
experiential approach to behavior change*. New York: Guilford Press.

Katz, L., Cox, B., Gunasekara, S., & Miller, A. (2004). Feasibility of dialectical behavior
therapy for suicidal adolescents. *Journal of the American Academy of Child and
Adolescent Psychiatry, 43 (3),* 276-282.

Keinan, G. (1987). Decision making under stress: Scanning of alternatives under

controllable and uncontrollable threats. *Journal of Personality and Social

Psychology, 52,* 639–644.

Klonsky, D. (2009). The functions of self-injury in young adults who cut themselves:

Clarifying the evidence for affect regulation. *Psychiatry Research, 166,* 260-268.

Klonsky, D., Oltmanns, T., Turkheimer, E. (2003). Deliberate self-harm in a nonclinical

population: prevalence and psychological correlates. *American Journal of Psychiatry,

160(8),* 1501-1508.

Klonsky, D., & Muehlenkamp, J. (2007). Self-injury: A Research review for the practitioner.

Journal of Clinical Psychology, 63(11), 1045-1056.

Lengel, G., & Mullins- Sweatt, S. (2013). Nonsuicidal self-injury: Clinician and expert

ratings. *Psychology Research, 210,* 940-944.

Linehan, M. (1993). *Skills Training Manual for Treating Borderline Personality Disorder.*

New York: Guilford Press.

Livesley, W. J., Jang, K. L., & Vernon, P. A. (1998). Phenotypic and genetic structure of

traits delineating personality disorder. *Archives of General Psychiatry, 55,* 941-948.

Lovibond, S., & Lovibond, P. (1995). *Manual for the Depression Anxiety Stress* Scales, 2nd

Ed. Sydney: The Psychological Foundation of Australia.

Lundh, L., Karim, J., Quilisch, E. (2007). Deliberate self-harm in 15-year-old adolescents: A

pilot study with a modified version of the deliberate Self-harm Inventory.

Scandinavian Journal of Psychology, 48, 33-41.

Madge, N., Hewitt, A., Hawton, K., Jan de Wilde, E., Corcoran, P., Fehete, S., & Ystgaard,

M. (2008). Deliberate self-harm within an international community sample of young

people: Comparative findings from the Child & Adolescent Self-Harm in Europe

(CASE) Study. *Journal of Child Psychology and Psychiatry, 49(6),* 667–677

Mennin, D., Heimberg, R., Turk, C., & Fresco, D. (2005). Preliminary evidence for an

emotion dysregulation model of generalized anxiety disorder. *Behaviour Research

and Therapy, 43,* 1281–1310.

Messer, J., & Fremouw, W. (2008). A critical review of explanatory models for self-

mutilating behaviours in adolescents. *Clinical Psychology Review, 28*, 162-178.

Michel, K., Valach, L., & Waeber, V. (1994). Understanding deliberate self-harm: The

patients' views. *Crisis, 15,* 172–178.

Miller, M., Rathus, J., & Linehan, M. (2006). *Dialectical Behaviour Therapy with

Suicidal Adolescents.* New York: Guilford.

Moran, P., Coffey, C., Romaniuk, H., Olsson, C., Borschmann, R., Carlin, J., & Patton, G.

(2012). The natural history of self-harm from adolescence to young adulthood: a

population-based cohort study. *The Lancet, 379*, 236-243.

Neumann, A., van Lier, P., Gratz, K., & Koot, H. (2010). Multidimensional assessment of

emotion regulation difficulties in adolescents using difficulties in emotion regulation

scale. *Assessment, 17(1),* 138-149.

Nock, M. (2009) Why do people hurt themselves? New insights into the nature and

function of self-injury. *Current Directions in Psychological Science, 18,* 78-83.

Nock, M. (2010). Self-Injury. *Annual Review of Clinical Psychology, 6,* 339-363.

Nock, M., & Prinstein, M. (2004). A functional approach to the assessment of self-

mutilative behavior. *Journal of Consulting and Clinical Psychology, 72 (5),* 885-890.

Nock, M., Teper, R., & Hollander. (2007). Psychological treatment of self-injury among

adolescents. *Journal of Clinical Psychology: In Session, 63(11),* 1081-1089.

Rossouw, T., & Fonagy, P. (2012). Mentalization-based treatment for self-harm in

adolescents: A randomized controlled trial. *Journal of the American Academy of Child

& Adolescent Psychiatry, 51(12),* 1304-1313.

Selby, E., Bender, T., Gordon, K., Nock, M., & Joiner, T. (2012). Non-suicidal self-injury

(NSSI) disorder: a preliminary study. *Personality Disorders: Theory, Research, and

Treatment 3,* 167–175.

Siegel, D. (2014). *Brainstorm: The Power and Purpose of the Teenage Brain.* Los

Angeles, CA: Tarcher.

Simeon, D., Stanley, B., Frances, A., Mann, J. J., Winchel, R., & Stanley, M. (1992).

Self-mutilation in personality disorders: Psychological and biological correlates.

American Journal of Psychiatry, 149, 221–226.

Skegg, K. (2005). Self-harm. *The Lancet, 366*, 1471-1483.

Stanford, S., & Jones, M. (2009). Psychological subtyping finds pathological, impulsive, and

'normal' groups among adolescents who self-harm. *Journal of Child Psychology and

Psychiatry, 50(7),* 807-815.

Trupin, E., Stewart, D., Beach, B., & Boesky, L. (2002). Effectiveness of a dialectical

behavior therapy program for incarcerated female juvenile offenders. *Child and

Adolescent Mental Health, 7,* 121–127.

Wilkins, J., & Coid, J. (1991). Self-mutilation in female remanded prisoners: I. An indicator

of severe psychopathology. *Criminal Behaviour and Mental Health 1,* 247–267.

Wood, A., Trainor, G., Rothwell, J., Moore, A., Harrington, R. (2001). Randomized trial of

group therapy for repeated deliberate self-harm in adolescents. *Journal of the

American Academy of Child and Adolescent Psychiatry, 40,* 1246-1253.

Yates, T. (2004). The developmental Psychopathology of self-injurious behaviour:

Compensatory regulation in posttraumatic adaptation. *Clinical Psychology Review, 24,*

35-74.

Yip, K. (2005). A multi-dimensional Perspective of Adolescents' Self-Cutting. *Child and

Adolescent Mental Health, 10(2),* 80-86.

You, J., & Leung, F. (2012). The role of depressive symptoms, family invalidation and

behavioural impulsivity in the occurrence and repetition of nonsuicidal self-injury in

Chinese adolescents: A 2-year follow-up study. *Journal of Adolescence, 35,* 389-395.

STUDY THREE

Development of a brief group treatment manual for adolescents in hospital with nonsuicidal

self-injury

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STUDY THREE: TREATMENT MANUAL DEVELOPMENT

Abstract

Nonsuicidal self-injury (NSSI) is a clinically important behaviour that is most prevalent in adolescent populations and implicated in the high levels of tertiary service utilisation among young people. Despite the clinical relevance of this behaviour, there are no empirically supported treatments for NSSI in this population and development, evaluation and dissemination of effective and feasible treatments represent a high-priority. The Stage Model of Behavioural Therapies was devised as a guide for the development of behavioural treatments that have scientific merit and clinical validity in real world settings. The model demarcates three stages in a rigorous scientific process that leads from initial clinical innovation through efficacy research to effectiveness research. This study articulates the first stage of this process and the development of a structured treatment manual that has implications for the treatment of adolescents who present to hospital with NSSI. The result was a Stage 1 treatment manual based on current empirical and theoretical literature that prioritised economic and clinical utility and could be offered up for empirical scrutiny in a Stage II efficacy trial.

Keywords: treatment manual, stage model, adolescents, nonsuicidal self-injury, empirically supported treatments

STUDY THREE: TREATMENT MANUAL DEVELOPMENT

Historical Background

Scientists have used scientific methods to standardise treatment processes and evaluate their outcomes since the 1950s when reviews of psychotherapy (Eysenck, 1952; Levitt, 1957) indicated that traditional forms of psychotherapy were no more effective than providing no treatment at all. The result was the development of behavioural treatments that relied on the methods followed by scientific research rather than therapist reports or case studies, and the appearance of the first manuals in clinical practice in the 1960s (e.g. Patterson & Gullion, 1968). The use of manuals snowballed in the 1970s as interest in them gained momentum due largely to national health care reforms (e.g. managed care) that obligated psychologists to convince policy makers and funding bodies of the demonstrable utility of psychotherapy (Parloff, 1979). Treatment manuals have since provided a pathway to efficacious interventions for a variety of psychiatric disorders including Cognitive-Behavioral Therapy (e.g. Beck, Rush, Shaw, & Emery, 1979), interpersonal psychotherapy for depression (Klerman, Weissman, Rounsaville, & Chevron, 1984) and Dialectical Behavior Therapy (DBT) for Borderline Personality Disorder (BPD; Linehan, 1993). This exponential growth is predominantly due to the ability of manuals to assist in statements about treatment efficacy, and their value in research and education where they allow for the objective comparison of interventions, assist in the training and supervision of therapists, and aid in the development of audit programs to ensure treatment integrity (Heimberg, 1998; Lambert, 1998; Marques, 1998; Wilson, 1998). Manuals have their critics who argue among other things that manuals restrict therapist clinical artistry and innovation (Addis & Krasnow, 1999; Castonguay, Schut, Constantino, & Halperin, 1999; Henry, 1998; Norcross, 1999) and place excessive emphasis on technique over the working alliance and other common treatment processes (Elliot, 1998; Fonagy, 1999). However, they have become a virtual requirement of psychotherapy research (Luborsky & DeRubeis, 1984), clinical training programs, and clinical practice (Wilson, 1996) as the trend towards accountability and empirically based practice continues. Manuals

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that can facilitate and monitor a treatment's fidelity, integrity and cost are playing a particularly crucial role in public health care settings, as the number of adolescents referred for mental health care continues to grow (James, Clacey, Seagroatt, & Goldacre, 2010), and practitioners are forced to prioritise user-friendly treatments that are both time and cost-effective. Whilst efficacy is always a priority, the result is that only novel treatments that are also practical and appealing to clinicians are finding their way into clinical practice (Fonagy, 1999). Given the benefits and importance of manualised treatments, this paper describes the development of a treatment manual for adolescents with nonsuicidal self-injury (NSSI) that is grounded in empirical theory, structured to allow for empirical analysis and clinical skill, and that takes into consideration the very real constraints imposed on many healthcare facilities today.

Treatment Context and Target

The Emotion Regulation Group for Adolescents (ERg-A) was developed at Redbank House, the Child, Adolescent and Family Psychiatry Department of a leading public hospital in Sydney, Australia. A multi-disciplinary team who provide a variety of therapeutic treatment interventions across various treatment modalities staff the unit. Patients are aged between 12 and 18 years with a range of chronic and severe emotional and behavioural disturbances that have persisted despite receiving primary and secondary mental health intervention. Reflective of the high and increasing prevalence rates in the literature (Klonsky, 2007; Nock, 2009), a significant number of Redbank House patients report NSSI that is embedded within complex multi-problem multi-diagnostic presentations. This supports recent reports that NSSI is a unique and important behaviour that occurs across a range of diagnoses (Favazza, 1998), levels of intellectual and developmental functioning (Klonsky, 2007), and in clinical and non-clinical populations (Messer & Fremouw, 2008). The historical practice of embedding NSSI as a symptom of BPD often endures in public settings, as it is encouraged

STUDY THREE: TREATMENT MANUAL DEVELOPMENT

by public healthcare admission and funding criteria that are dependent on specified

psychiatric diagnosis. The ERg-A treatment was developed in response to the high numbers

and broad range of clinically unwell but cognitively competent adolescents that present to

tertiary care and have within their repertoire the maladaptive coping strategy of NSSI

regardless of diagnosis. It uses as its definition of NSSI the 'deliberate and repeated

destruction or alteration of body tissue, for purposes that are not socially sanctioned, and

without conscious suicidal intent' (Gratz, 2001; Klonsky & Muehlenkamp, 2007).

Importantly, this distinguishes NSSI from suicidal behaviour in which there is intent to die, as

the apparent difference in function of these behaviours (i.e. to regulate emotions and to end

life) has important implications for treatment development. For the same reason, NSSI that

occurs exclusively in the context of developmental disorders, intellectual delays, psychotic

disorders, medical syndromes or socially sanctioned behaviours are not targets of ERg-A.

The ERg-A treatment targeted tertiary care facilities given the high numbers of

adolescents with NSSI presenting to emergency services and hospitals (James et al., 2010)

and the lack of any tailored treatment to respond to them (Donnelly, Schniering, & Rapee,

2015a). The intention was that it could then be adapted to be equally useful to a range of less

restrictive primary and secondary care facilities. Treatment feasibility was an important factor

of development as public healthcare setting are challenged by a number of systemic demands

that pose a threat to treatment fidelity. Most healthcare providers are embedded in quality

assurance systems, which are embedded within public health organisations, which are

embedded within a community context. At each level, clinicians are at the disposal of a

variety of interpersonal processes and policies that dictate how evidence-based treatments are

implemented and delivered. At ground level these challenges include, but are in no way

limited to, complex multi-diagnostic patient mixes, variability in staff skill and experience,

daily staff deployment and shortages, budget limitations and the need for compliance with a

wide range of unit procedures and health department policies and directives. At a state level

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healthcare providers are burdened by a tremendous pressure to provide high-quality treatment regimes to high-risk adolescents, despite state budget shortfalls (Aaron, Hornberg, & Duckworth, 2009). These have resulted in cuts to mental healthcare services that are now pressured to avoid or reduce psychiatric inpatient stays and encouraged to preference care in less costly and restrictive settings (Salinsky & Loftis, 2007). Despite this, acute care of this high-risk population will at times be inevitable, and so necessitate the availability of effective and viable treatments followed by transition back to competent community care teams. Without this, there is likely to be a continuation in the high rate of disengagement and drop-out from services currently observed (Burns, Dudley, Hazell, & Patton, 2005), followed by inevitable relapses and readmissions that come at a high cost to the adolescent and the service. Researchers and clinicians working with NSSI need to prioritise the development of treatments that effectively target this presenting problem and engage the young person in ongoing treatment. Providing this treatment in a manner that can realistically be implemented by stressed and under-resources tertiary care facilities and their staff is a necessity.

Treatment Manual Development

One credible approach to developing a treatment manual that renders it available to clinical scrutiny and evaluation is by using a Stage Model. Initially articulated for the development of behavioural therapies (Onken, Blaine, & Battjes, 1997), this structure was adapted by Carroll and Nuro (2002) for the development of treatment manuals as it recognises that the purpose, role and content of manuals should evolve with the stage of the development of a given treatment. With three stages of evolution, the model suggests: (I) starting with manual writing, feasibility testing and development of adherence/competency measures that ready the treatment for preliminary evaluation, then (II) evaluating efficacy (and possibly mechanisms of change or effective ingredients) in a randomised controlled trial (RCT), and (III) finally rolling out the treatment in clinical practice by evaluating effectiveness and

transportability of treatments for which efficacy has been demonstrated. The Stage Model is increasingly popular as it provides guidelines for both the content of manuals as they evolve through the stages of development and the strategies needed for making them 'clinician-friendly' to facilitate use across clinical communities (Dobson & Hamilton, 2002; Henggeler & Schoenwald, 2002; Mcmurran & Duggan, 2005). This is crucial as the challenge is not only in meeting the progressively rigorous methodological requirements of conducting clinical treatment trials, but the broader multi-layered challenges faced when moving evidence-based treatments into real-world clinical communities. Reassuringly, the Stage Model is supported by a Delphi study (Duncan et al., 2004) that found the factors considered by 'expert' clinicians working in clinical practice to be 'essential' or 'desirable' are similar to those included in Carroll and Nuro's guidelines for a Stage I treatment manual.

Table 1 outlines the boundaries, basic structure, and preliminary contents of a Stage 1 treatment that Carroll and colleagues ascertain is sufficient to provide initial evaluation of its feasibility. Given the extensive list of elements needed to begin a Stage II trial, and the aim of the model is to support the transition of manuals through to Stages II and III, Stage I has been narrowed down to two key phases of work: Stage Ia, which focuses on therapy development and manual writing, and Stage Ib, which focuses on feasibility testing of a final or nearly final version of the therapy (Rounsaville, Carroll, & Onken, 2001). All other activities then hinge on the completion of a working version of the treatment manual. The duration and scope of work to be completed in Stage I also depends to a large part on the level of the therapy's development at the commencement of grant approval (Rounsaville et al., 2001) or in this case at the point of publication. At the time of writing, the ERg-A manual was based on 10 years of implementing empirically supported treatments combined with non-experimental clinical experience and incremental changes to increasingly adapt the treatment to the target audience and the treatment facility. In its most recent revision the author used the Stage Model

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framework to ensure that the manual met all the criteria stipulated for a Stage I treatment

manual in order to ready it for a Stage II efficacy trial (see Table 1).

Development of the ERg-A Stage Ia Treatment Manual

Theoretical and Philosophical Underpinnings

The Erg-A manual is grounded in the theoretical and philosophical underpinnings of third

wave treatments such as Functional Analytical Psychotherapy (FAP, Hayes, Wilson, Gifford,

Follette, & Strosahl, 1996) Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, &

Wilson, 1999) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, &

Teasdale, 2001) and, in particular, Dialectical Behavior Therapy (DBT; Linehan, 1993) which

has the most empirical evidence (Groves, Backer, van den Bosch, & Miller, 2012) that

prioritise it as meaningful development in behaviour therapy. The synthesis of a dialectical

worldview with cognitive-behavioural skills has highlighted the utility of DBT for addressing

NSSI and other crisis-driven behaviours that often present in its target audience of adult

females with BPD. Its potential for treating equally complex and distressed clinical

populations of adolescents resulted in the adaptation of DBT for Adolescents (DBT-A; Miller,

Rathus & Linehan, 1997) and a 16 to 24 week program of individual therapy, weekly family

skills groups and regular support consults by telephone. Whilst duration and intensity still

preclude it from many public healthcare settings, recent reviews describe DBT-A as a

promising treatment for adolescents exhibiting life-threatening behaviours and urges with

positive effects seen in decreased depressive symptoms, decreased behavioral incidents,

reduced hospital admissions and inpatient stays, decreased incidents of self-harm, and

increased completion of treatment (Groves et al., 2012). Unfortunately symptom reduction in

trials has not been any greater than TAU (Groves et al., 2012) and only a small pre-post trial

specifically targeted NSSI behaviours (as opposed to broader self-harm targets that includes

suicidal behaviours) in adolescents with promising outcomes (Fleischhaker et al., 2011).

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Whilst the efficacy of DBT-A in targeting NSSI specifically awaits RCT trials, its philosophical and structural elements make it a particularly attractive treatment when working with this population. Firstly, as evidenced above, adolescents treated with DBT-A make improvements on a variety of measures of functioning across a wide range of treatment settings and the studies reviewed suggest that it is well tolerated by adolescents and their families (Groves et al., 2012). The reports are corroborated by the high rate of treatment completion reported in these studies (Groves et al., 2012) which is a strong indicator of an intervention's acceptability and particularly compelling for adolescents populations who are considered the most difficult to engage and retain in treatment (James, Taylor, Winmill, & Alfoadari, 2008). DBT-A also provides a clear hierarchy of treatment strategies and targets for behavioural shaping, making it particularly appealing to clinicians who report the day-to-day management of multiple and complex problems make treating adolescent NSSI especially challenging and anxiety provoking (Crowe, 2000). Whilst DBT-A therefore holds promise for this population, its empirical base still needs to be established and its viability in tertiary facilities remains restrictive.

In order to arrive at a shorter and less intensive program that was still effective, the ERg-A treatment needed to build on that offered by DBT-A by defining a specific treatment focus that addresses the underlying function of NSSI (Hayes, Wilson, Gifford, Folette & Strosahl, 1996), and do so in a way that was viable for real-world tertiary services. Evidence for a number of functions of NSSI have been presented with an overwhelming majority endorsing an emotion-regulation function (Favazza, 1993; Gratz, 2003). Development of the treatment was underpinned by one such model articulated by Chapman and colleagues (Chapman, Gratz & Brown, 2006) who integrated empirically supported explanatory models and drew from related empirically supported behavioral therapies such as DBT. Its relevance is endorsed by a number of additional factors that make it attractive for the treatment of

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Table 1

ERg-A manual elements corresponding to the general outline and criteria articulated for a Stage I treatment manual (Carroll & Nuro, 2002)

	Criteria for a Stage 1 Treatment Manual		ERg-A Manual
Section	Content area	Issues to be addressed	Issue addressed
I. Overview, description, and rationale	A. General description of the approach	Overview of treatment and goals	Included in Introduction (page 1, 2 & 3)
	B. Background and rationale for the treatment	Theoretical rationale; Empirical underpinnings of treatment Rationale for application of this treatment to this population	Included in Introduction (page 2, 3, 4 & 7)
	C. Theoretical mechanisms of action	Brief summary of hypothesised mechanisms of action, critical "active ingredients"	Included in Introduction (page 6)
II. Conception of the disorder or problem	A. Etiological factors	Summary of treatments conception of the forces or factors that lead to the development of the disorder in a particular individual	Included in Introduction (page 3 & 4)
	B. Factors believed to be associated with behaviour change	According to treatment/theory, what factors or processes are thought to be associated with change or improvement in the problem or disorder?	Included in Introduction (page 3 & 4)
	C. Agent of change (e.g., patient, therapist, group)	What is the hypothesised change agent? Who, or what, is thought to be responsible for the change?	Included in Introduction (page 3 & 4)
	D. Case formulation	What is the conceptual framework around which cases are formulated and understood?	Included in Introduction (page 2, 3 & 4)
	E. How are the symptoms assessed by the therapist?	Therapist strategy for assessment of the disorder/problem Specification of any standardised measures to be used	Included in Appendices (Appendix I)
III. Treatment goals	A. Specification/determination of treatment goals	Specification of principal treatment goals Determination of primary versus secondary goals Strategies for prioritisation of goals, goal-setting with patient	Included in Introduction (page 9, 10 & 11)
	B. Evaluation of patient goals	Strategies the therapist uses to identify and evaluate patient goals	Included in Introduction (page 7 & 8)
	C. Identification of other target behaviours and goals	Clarification of other problem areas that can be targeted as secondary goals of the treatment versus those that must be handled outside of the treatment	Included in Introduction (page 9, 10 & 11)
	D. Negotiation of change in goals	Strategies for renegotiation of goals as treatment progresses	Included in Introduction (page10)
IV. Contrast to other approaches	A. Similar approaches	What are the available treatments for the disorder or the problem that are most similar to this treatment? How do these differ from this treatment?	Included in Introduction (page 3 & 4)
	B. Dissimilar approaches	What treatments for the disorder or problem are most dissimilar to this approach?	Included in Introduction (page 5)

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Table 1 (continued)

ERg-A manual elements corresponding to the general outline and criteria articulated for a Stage I treatment manual (Carroll & Nuro, 2002)

Criteria for a Stage 1 Treatment Manual			ERg-A Manual
Section	Content area	Issues to be addressed	
V. Specification of defining interventions	A. Unique and essential elements	What are the specific active ingredients, which are unique and essential to this treatment?	Waltz model included with 'unique', essential', recommended' and proscribed' elements detailed in the Introduction (pages 14-17) and repeated symbolically throughout the sessions for ease of reference.
	B. Essential but not unique elements	What interventions are essential to this treatment but not unique	
	C. Recommended elements	What interventions or processes are recommended but not essential or unique?	
	D. Proscribed elements	What interventions or processes are prohibited or not characteristics of this treatment? What interventions may be harmful or counter-therapeutic in the context of this treatment?	
VI. Session content	A. Explication of unique and essential elements	Where appropriate, detailed, session-by-session content with examples and vignettes	Symbolically as above
VII. General format	A. Format of delivery	Individual, group, family, or mixed sessions? If group, closed- or open-ended format?	Included in Introduction (page 8)
	B. Frequency and intensity of sessions	How often do sessions occur? How long are sessions? How many sessions should be delivered over what period of time?	Included in Introduction (page 8)
	C. Flexibility in content	Are there essential versus "elective" content areas? Is there flexibility in sequencing session content areas?	Yes, see Section V.
	D. Session format	Length of sessions Guidelines for within session structure	Included in Introduction (pages 8 & 9)
	E. Level of structure	Does the therapist set an agenda of each session? Is this done collaboratively? How does the therapist set an agenda for each session? What determines the level of structure in this treatment? Who talks more?	Included in Introduction (pages 6, 12, 13, 14, 15)
	F. Extra-session tasks	Are extra-session (e.g. homework) tasks a part of this treatment? What is the purpose of extra sessions/ tasks? How are specific tasks or assignments selected? How does the therapist present a rationale for the tasks? How does the therapist assess patient implementation of tasks? How does the therapist respond to the patient's completion of an assignment?	Home task details in Introduction (pages 12 & 13). No other extras tasks added (time-limited treatment).

adolescent NSSI in high-level care. It is developmentally suitable as it is based on theoretical literature of emotion regulation in children with an emphasis on problems related to experiencing the full range of emotions when they are present rather than the adult literature that focuses on the control and reduction of negative emotions (Cole, Michel, & Teti, 1994; Thompson, 1994). It was also developed to apply to NSSI at a general level across various populations regardless of their presenting problems and moves away from conceptualising NSSI within the symptom complex of BPD or suicidal behaviours as has been historical practice (Selby, Bender, Gordon, Nock, & Joiner, 2012). Furthermore, the model has underpinned the development of an Emotion Regulation Group Treatment (ERGT, Gratz & Gunderson, 2006) for adults with NSSI that is briefer than previous efforts and easier to implement. A recent trial provided some promising preliminary results with abstinence of NSSI by 55% of its participants by the end of the treatment (Gratz et al., 2006; Gratz & Tull, 2011). Finally, an assessment tool that specifically measures the multi-dimensional construct of emotion regulation as conceptualised by the model has been developed, with studies revealing strong psychometric properties (Difficulties in Emotion Regulation Scale, DERS; Gratz & Roemer, 2004) and utility in adolescent populations (Neumann, van Lier, Gratz & Koot, 2010). The Chapman model is a functional theory of NSSI that is based on the premise that NSSI is a negatively reinforced strategy for avoiding, reducing or terminating unwanted emotional distress or arousal. In a vicious cycle, repeated negative reinforcement trials strengthen the association between unpleasant emotional arousal and NSSI, such that NSSI becomes an automatic escape response. Despite its obvious negative consequences, NSSI is therefore quite functional on a certain level as it is especially effective at terminating unwanted emotional states and is maintained and strengthened through the process of escape conditioning and powerful negative reinforcement. Although it proposes that NSSI is primarily a behavior of *emotional* avoidance, it also may function to help individuals avoid or escape from thoughts, memories, somatic sensations, or other aversive internal experiences or

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the external conditions that elicit them. The authors therefore situate NSSI within the broader

class of *experiential avoidance* behaviours and so refer to their theory as the Experiential

Avoidance Model or EAM. Whilst NSSI likely has multiple determinants, this literature

increasingly points to emotion regulation in general, and emotional avoidance in particular, as

the underlying functions of NSSI behaviours that need to be the target of effective brief

interventions

Content and Structural Adaptations

Development of the Stage Ia ERg-A treatment manual needed to draw from this

existing theoretical and empirical database whilst making adaptations that were

developmentally appropriate and engaging for an adolescent audience and economically and

clinically feasible for tertiary care facilities (see Table 1).

Mode of treatment. Whilst complete empirically supported treatment packages

undeniably have their place in clinical practice, efforts need to be directed towards identifying

which individual components of any given package are effective for targeted clinical

populations where time and resource limitations play a major role in treatment integrity.

Reassuringly, literature reviews have found that current 'best' evidence suggests that multi-

component interventions are no more effective than simple interventions designed to increase

patient participation rates (Burns et al., 2005). With increasing prevalence rates, and

healthcare limitations and restrictions on resources, a group format was chosen for the ERg-A

as it can afford clinicians the ability to deliver therapy to multiple patients in a limited

timeframe, maximising efficiency without compromising effectiveness. Patients can also be

seen sooner, preventing an increase in difficulties or the decline in coping that may arise

during long waits on waitlists or long waits for individual sessions. In contrast to incidental

therapy, manualised content can be clearly and easily handed over during transitions to other

services in the continuum of care. Groups also appear to be well tolerated by adolescent

populations (Moran, Pathak, Sharma, 2009) despite this age groups propensity for treatment

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non-attendance and drop-out (Burns et al., 2005). Research suggests that this may be because groups facilitate safe discussion (Crowe & Bunclark, 2000), provide a safe environment in which to 'test out' and practice new skills, and provide a normalising effect through validation and social support that make young people feel less 'different' and alone (Yalom & Leszez, 2005). There is some emerging evidence for the efficacy of group approaches that reduce repetition of NSSI in adults (Gratz et al., 2011), providing reassurance that contagion effects in groups is either non-existent or works positively against self-harming behavior (Burns et al., 2005).

Duration of treatment. Brief treatments that have some empirical support for adolescent NSSI are currently limited to a 2-week version of the DBT-A package including skills groups, individual therapy and milieu coaching (Katz, Cox, Gunasekara, & Miller, 2004), and a 14-week acceptance based group-only intervention for adult NSSI that has yet to be trialed in adolescent populations (Gratz et al., 2011). Defining how short the ERg-A treatment could be to provide an 'adequate' change in clinically relevant symptoms of NSSI was a challenging task and needed to be considered in line with the goals of a tertiary service positioning in the continuum of care. An adequate treatment outcome for tertiary services may need to be set as a sufficient degree of behavioural control over NSSI and sufficient emotional relief and psychological recompensation to permit safe and lasting reintegration back into the community with ongoing mental health care follow-up. Taking this into consideration, and following consideration of the existing clinical literature, the author's clinical judgment following a number of variable length pilot trials, and the average length of stay on the unit, the ERg-A treatment length was eventually set at 6 group sessions. A flexible delivery was developed allowing for implementation over the course of a week (i.e. daily), 2 weeks (i.e. 3 sessions per week) or 3 weeks (i.e. biweekly) depending on service need. If admissions extend past the 6 week maximum, content can be repeated or expanded to include a greater depth and number of skills and targets.

Clinical content of treatment. A brief intervention needs to be well defined and specifically target the underlying function of the maladaptive behaviour. Consistent with a growing body of empirical data (Fleishhaker et al., 2011) suggesting that subjective distress, mood symptoms and maladaptive behaviours can be expected to change relatively quickly (i.e., over a matter of weeks), whereas changes in social impairment may occur more slowly (i.e., over the course of years), NSSI behaviours and related mood and distress were the specific targets of this treatment. The associated expectation is that it should be followed by longer term and less intensive community treatment to target interpersonal and vocational functioning and hence overall quality of life. This sequence of targets also corresponds well with DBT Treatment Levels that would place ERg-A as a level 1 treatment, and community or ongoing care as levels 2 to 4 (Linehan 1993). In terms of its underlying function, EAM theory specifies that NSSI functions to regulate emotions, or more specifically avoid emotions (and other internal experiences), that adolescents finds aversive. The clinical implication of this suggested that ERg-A should aim to decrease emotional avoidance, which in turn is expected to decrease the NSSI that facilitates this response, whilst simultaneously increasing adaptive emotion regulation skills (Donnelly, Schniering, Rappee, 2015b). It therefore draws heavily on acceptance-based interventions that teach the deleterious impacts of avoidance behaviours and highlight the utility of mindfulness and distress tolerance skills that encourage a non-judgemental stance and the ability to tolerate, accept and remain present with aversive experiences. Given how effective NSSI is at reducing emotional distress in the short term, the treatment also emphasises ACT-based interventions that focus on an individual's core values and future directions as ways of augmenting motivation and commitment to change (Hayes, Strosahl, & Wilson, 1999). From a philosophical standpoint, decreasing the habitual reliance on the emotional avoidance and hence the need for NSSI, whilst simultaneously increasing the likelihood of adaptive emotion regulation skills is the core dialectical framework of the intervention. This requires consistent use of a variety of DBT-A dialectical and qualitative

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strategies (Miller et al., 2006) that are incorporated throughout the manual. Whilst generalisation is important, the main priority of the treatment is acquisition, competency and commitment to the use of some alternative and adaptive skills for the sake of the individuals values and future life goals. Substitution of alternative maladaptive avoidance strategies such as substance misuse and eating disorders is a potential trajectory that is closely monitored by treating clinicians.

Adolescent adaptations to treatment. Due in a large part to neuroimaging techniques, the 1990's saw major advances in our knowledge of how an adolescent brain functions. The result was a major shift from the view of 'fixing' or 'curing' adolescent problems to helping them learn healthy alternatives and tailoring delivery of this assistance to their developmental levels and needs. The ERg-A treatment adopted this view and the primary goal of replacing maladaptive NSSI behaviours with alternative skills for tolerating and accepting emotional distress that are safe, adaptive and developmentally appropriate. A variety of these strategies had already been successfully adapted for use with children and adolescents (e.g., Greco & Hayes, 2008, Miller et al., 2006) and were available to be introduced into the manual. Additional skills were born out of previous pilot groups of the ERg-A and participant recommendations. Delivery was then finely tuned to meet the developmental needs of an adolescent to ensure applicability, accessibility and acceptability by using formats (e.g. online or electronic mediums and multi-sensory experiences), arrangements (including demonstrations, role-plays, games and exercises) and content (namely current and/or adolescent specific social examples, scenarios and debates) deemed interesting, attractive and relevant to this age group. Feedback from participants who had previously taken part in pilot groups was particularly informative in this regard. Additional adolescent-friendly adaptations included simplified material and handouts with colourful visuals and images, minimal copy in large fonts, appropriate language and extended use of acronyms and metaphors.

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The development of an *ERg-A Skills Rating Scale* (SRS; Appendix B) for the manual formed an important part of Stage 1a to inform initial treatment development and as a means of obtaining ongoing participant feedback. The SRS was developed using ratings of 1 (*not at all helpful)* to 4 (*extremely helpful)* to rate both clinical and structural elements of the treatment.

Feasibility and acceptability of treatment. For the ERg-A treatment to be successfully disseminated, a rigorous effort was needed in Stage Ia to make the manual user-friendly for clinicians and flexible for use across a range of clinical settings. As well as a brief duration, this required an emphasis on delivery that limited resources and minimised burden on services and staff. At its most basic, the ERg-A group treatment can be run with only session printouts, a computer, low-cost refreshments, a room that can seat all participants and some age-appropriate distress tolerance tools such as music and reading materials relevant to this age group. It ideally requires two therapists but depending on participant numbers and circumstances it can be run by one experienced group leader, although training and supervision requirements are stipulated. Time and effort are afforded to the pre-treatment stages which are considered crucial to engagement and the adolescents 'willingness' to try new ideas and options. A number of recommendations from the extensive literature on clinician-friendly manuals were also incorporated such as the provision of troubleshooting guidelines, anticipation of real-world problems with solutions and the provision of frequent summaries and outlines (Carroll et al., 2002).

The value of therapist skill and creativity that arises during in-the-moment exchanges with participants, balanced with a structure that ensured treatment fidelity, was an important challenge of this stage of development. A model by Waltz and colleagues (Waltz, Addis, Koerner, & Jacobson, 1993) was an extremely valuable tool in this regard as it provided a framework for manual that allows for clinician skill whilst ensuring adherence to the treatments effective ingredients. The model does this by delineating content into four defining

characteristics, namely: (1) unique and essential elements, (2) essential but not unique elements, (3) recommended elements, and (3) proscribed elements. These delineations promote treatment integrity that can be evaluated and are significantly more flexible and user-friendly for clinicians to highlight elements they must adhere to and those to which they can use more clinical judgment and creativity. Table 2 is an extract from the ERg-A manual demonstrating how this model was applied.

Integrity of treatment. The development of a therapist adherence tool for the ERg-A treatment was a crucial part of Stage 1a development. Adherence tools are particularly important to the integrity of brief treatments that have to ensure that their effective ingredients are being delivered in the time available. The Waltz model was again used as it provided a useful platform on which an *ERg-A Adherence Rating Scale* (ARS; Appendix C) for the treatment group could be developed. The aim of this scale was to monitor the extent to which group therapists used the interventions and approaches prescribed ('unique and essential' and 'essential but not unique') by the manual and avoided those 'proscribed'.

Development of the ERg-A Stage Ib Treatment Manual

Although manual development and writing is central to Stage Ia, establishing feasibility data and provision of some evidence that future research efforts are warranted are the goals of Stage Ib. Feasibility and acceptability data, including peer reviews and pilot trials that obtained therapist and participant feedback, provided the data that contributed to the development of the ERg-A Stage Ib manual. **Pilot Trials**

Four pilot trials provided feedback from both participants using the ERg-A Skills Rating Scale (SRS) and group leaders via written feedback, a focus group and the ERg-A Adherence Rating Scale (ARS). Feedback was focused around the potential efficacy, acceptability and feasibility of the ERg-A treatment.

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Table 2

Example of ERg-A treatment manual elements categorised into the four defining levels of adherence defined by Waltz and colleagues (1993)

Defining Characteristics	ERg-A Manual elements
I. Unique and essential	Additional time spent in pre-treatment phase to enhance commitment & willingness
	Three essential clinical "learning points" stipulated at the start of each session
	Use of core DBT strategies and hierarchy of targets
	Close liaison with community treating teams, especially at termination stage
II. Essential but not unique	DBT level 1 treatment; clinicians guided by DBT-A group hierarchy of targets and strategies
	Establish therapeutic alliance & rapport
	Set treatment and session goals
	Provide treatment rationale & theory
	Use of adolescent specific language, examples and developmental needs
	Attention to planning for termination
III. Acceptable but not necessary	Exploration of individual examples & dilemmas (within confidentiality limits)
	Self-disclosure (for clinical purposes, if appropriate)
	Focus on generalisation to other environments
	Addition of exercises, examples, metaphors etc
IV. Proscribed	Psychotropic medications
	Allow individual focus/crisis to distract from group content
	Focus on unconscious or historical/childhood causes determinants of individual cases (DBT levels 2-4 treatment)
	Sharing of self-harm stories or methods or participant contact details

Participant Feedback.

Group content. Seventeen participants provided feedback about group content that they found the most acceptable. These were particularly important data given that this population are notorious for treatment drop-out and disengagement (Burns et al., 2005). Feedback was collected using the Erg-A SRS (Appendix B) which provides ratings of 1 (*not at all helpful)* to 4 (*extremely helpful)* on the helpfulness of the clinical content and structural elements of the group. It also includes an open section for any additional feedback. In terms of clinical content (see Table 3 and Graph 1) participant feedback ranged from 1 to 4 for most content but all had a median of either 3 or 4 which was very positive. Mean ratings ranged from 2.67 ($SD = 0.83$) for session 2 ('Mindfulness HOW skills and non-judgment') to 3.33 ($SD = 0.78$)

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for question 9 ('Identifying your valued directions in life'). Question 2 and 3 related to mindfulness modules and questions 9 and 10 to values and value-based directions. Content based on acceptance and value-directions (session 5) also achieved the only medians of 4.

The high ratings achieved by the value-based sessions was encouraging as these were explicitly added to the treatment based on theory and research on the importance of these constructs for motivation and commitment to change (ACT; Hayes ret al., 1999). Values were also considered important to this specific age group given that consideration of self-identity and the future are important developmental tasks for adolescents and this is corroborated in the feedback. Open feedback suggested that participants who gave the value-based sessions low ratings found thinking about their future too difficult as they "couldn't see one" or didn't like the one they saw. Given that avoidance of uncomfortable thoughts is a core functional impairment of this population, this was an expected response from some participants, and provided an excellent in-situ learning opportunity for them to attempt to remain in contact with these challenging internal experiences. The positive response to the acceptance-based sessions (questions 7, 8 & 10) was also encouraging as avoidance (or non-acceptance of distressing emotions) was a primary target of the intervention in line with EAM theory. This is particularly reassuring given this populations preference for avoidance and escape strategies and so predictions that they would be negative or dismissive of acceptance-based sessions that expected them to be in contact with difficult experiences and ideas. Interestingly, these results are consistent with previous findings by Miller and his colleagues (Miller, Wyman, Huppert, Glassman & Rathus, 2000) who found it "impressive and surprising" (p.186) that the most highly rated skills by adolescent members of their DBT group came under the umbrella of acceptance skills and involved tolerating uncomfortable feelings

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Table 3

Participant ratings from 1 (not at all helpful) to 4 (extremely helpful) on the Skills Rating Scale for

the clinical elements of the ERg-A treatment group (N =17)

Session	Clinical Content	Mean	SD	Median	Minimum	Maximum
Session 1	Introduction, engagement & overview	3.00	1.00	3	1	4
Session 1	Mindfulness WHAT skills	2.93	0.92	3	1	4
Session 2	Mindfulness HOW skills & Non-judgment	2.67	0.83	3	1	4
Session 3	Distress Tolerance	3.07	0.96	3	1	4
Session 3	Distress Tolerance	3.19	0.88	3	1	4
Session 4	Understanding Avoidance	3.00	1.00	3	1	4
Session 4	Identifying Avoidance	3.15	0.77	3	2	4
Session 4	Costs/Benefits of Avoidance	3.04	0.98	3	1	4
Session 5	Valued Directions	3.33	0.78	4	2	4
Session 5	Acceptance	3.00	1.04	3	0	4
Session 5	Acceptance & Valued Direction	3.26	0.86	4	2	4
Session 6	Valued Action Planning & Termination	3.30	0.78	3	2	4
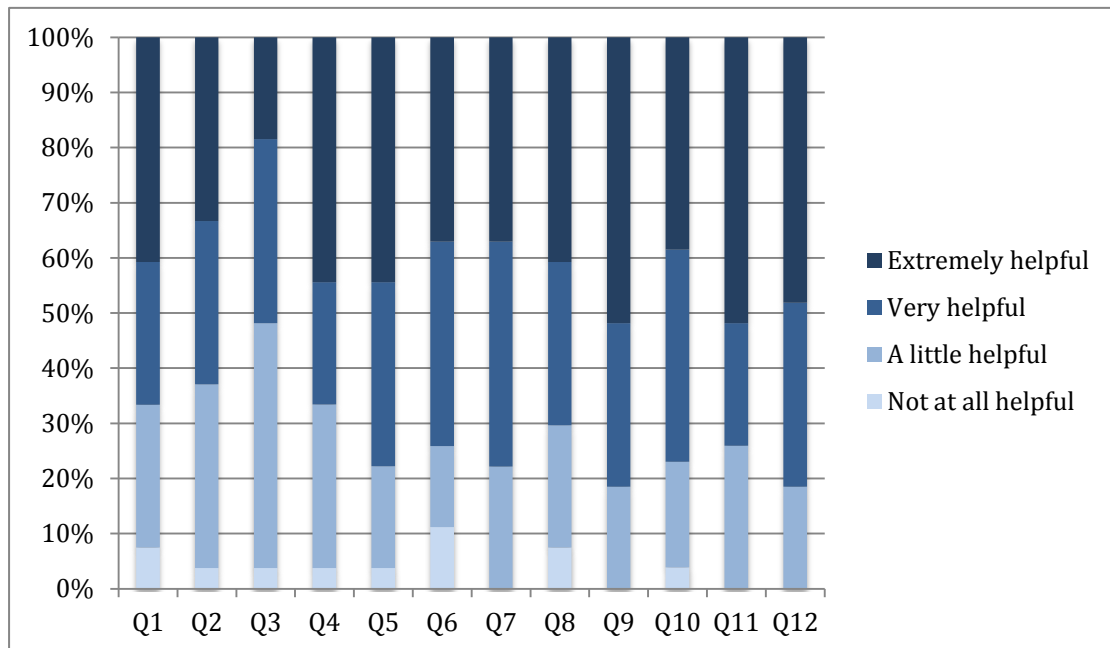
Graph 1. Percentage of Erg-A participants that rated the clinical content questions (Q1-Q12) on the Skills Rating Scale as 1 (*not at all helpful*), 2 (*a little helpful*), 3 (*very helpful*), or 4 (*extremely helpful*).

without actively attempting to change or avoid them. Miller and colleagues suggest this may due to acceptance skills being newer to their patients repertoire. Feedback from ERg-A participants suggest it may also be an honest reflection of the importance of these skills to the young participants who acknowledge that a maintaining factor of their distress is a reliance on avoidance of discomfort. Open feedback suggests that adolescents actually find the concepts of avoidance and non-acceptance informative as they had not conceptualised their difficulties in this way before, or indeed had any meaningful explanation for their actions. This knowledge was experienced as validating, as participants felt less "abnormal" or "stupid", and more helpful as acceptance was reported as a believable, tangible and specific goal to begin work on. One participant acknowledged that acceptance skills "pushed me out of my comfort zone" which was tolerable as it was "in a safe place". Participants also noted the helpfulness of metaphors that made the concept of acceptance more concrete and easy to grasp. A majority of participants suggested that the concept be introduced earlier in the treatment so that more time could be dedicated to it. Earlier versions of the group only covered acceptance in one session towards the end of treatment as the author wrongly assumed that the concept would be too difficult and challenging and put participants off the group. In response to this feedback acceptance-based sessions were increased and elements of acceptance were weaved into many aspects of the group from the start.

Given that Mindfulness comes under the umbrella of an acceptance-based skill (Linehan, 1993), the slightly lower rating of Mindfulness sessions (questions 1, 2 and 3) was somewhat unexpected. Open feedback revealed that, in contrast to the theory and discussion around avoidance and acceptance, the actual implementation or 'doing' of it (which was made explicit and experiential in the mindfulness sessions) was considerably more challenging and at times "boring" and "frustrating". Whilst emphasis on Mindfulness practice in the group was retained as it is a core skill considered crucial to introduce for ongoing work, the importance of validating and making explicit the challenge of mindfulness as a skill was

noted. The feedback also prompted the adaptation and collection of alternative/ additional mindfulness skills and formats that were more varied, creative and engaging for this age group.

Finally, open feedback revealed that the participants felt over-exposed to distress tolerance skills which they had been taught many times by previous clinicians. Whilst this feedback may only be relevant to this sample given the participants were in tertiary care and hence are likely to have been exposed to many previous treatments, a variety of 'stronger', more accessible and more creative distress tolerance skills were collected for this session. A shift in focus was also made to include obstacles to use (given they were still engaging in NSSI) as well as skill acquisition. Some of these obstacles were reported as a "fear of change" or "what will be left of me" (without NSSI to define them), and the idea that NSSI had become a "habit that is comfortable".

Group structure. Feedback from the SRS on the structural elements of the group was also positive (Table 4). Whilst participant ratings of most structural elements ranged from 1 to 4, the lowest median rating was 3 ($M = 2.63$, $SD = 0.93$). This rating is not surprising as it related to the usefulness of homework exercises but is encouraging given how adolescents are known to react negatively to home tasks (Miller et al, 2006). Making home tasks palatable and useful is an ongoing challenge. Median ratings of 4 were given for clarity of explanations given by group leaders and speed of delivery which was encouraging but specific to the leaders involved and not generalisable. A median of 3 was given for the amount of content in each session which participants reported to be a little too much to take in and hence was adjusted. The theme of the group being a (emotionally and physically) safe space came up frequently in open feedback, with participants reporting that "trust" in the group leaders and members was crucial to their ability to take on and share information. Rules around safety in the group were therefore reinforced in the manual and specific information and examples about the management of behaviours that jeopardise safety were added for group leaders.

Table 4

Participant ratings from 1 (not at all helpful) to 4 (extremely helpful) on the Skills Rating

Scale for structural elements of the ERg-A treatment group (N =17)

Structural Element	Mean	SD	Median	Minimum	Maximum
Explanation of skills	3.33	0.88	4	2	4
Speed of delivery	3.26	0.90	4	1	4
Amount of information	3.26	0.71	3	2	4
Handouts used	3.22	0.80	3	2	4
Exercises used	3.30	0.87	4	2	4
Quick quiz	2.89	1.16	3	1	4
Home task exercises	2.63	0.93	3	1	4

The importance of engagement with group leaders in pre-group orientation sessions was also

highlighted. Group handouts and exercises were given a median rating of 3 and 4

respectively, which was encouraging given the effort put into making them acceptable and

engaging for this audience. Open feedback suggested that interactive feedback, either via

online mediums or group exercises, were more "interesting" and "memorable" than paper

handouts. Whilst paper handouts were retained in the group as they are considered useful for

participants to personalise and take home, more interactive exercises were included where

possible and group leaders were encouraged to prioritise these over didactic learning where

appropriate. Ratings ($M = 2.89$, $SD = 1.16$) and open feedback revealed that the quiz used to

summarise content at the end of every session was well liked by more vocal group members,

whilst those that described themselves as "quiet" or "shy" found it too competitive and

intimidating to have to call out answers. The quiz was therefore adapted to include an option

to respond in writing. Certificates were also given for content-relevant achievements observed

throughout sessions and group leaders were instructed to look out for opportunities to reward

STUDY THREE: TREATMENT MANUAL DEVELOPMENT

quieter group members. Open feedback also revealed that a major concern for participants was the brevity of the group as they felt they had only engaged with fellow members and content in time for the treatment to terminate, a process they found particularly difficult. They described wanting more cathartic time to "get stuff out" and were concerned about returning to less empathic or understanding parents and families. Brevity was a primary goal of development and important in order to encourage engagement with long-term community therapists rather than the tertiary treatment group so this feedback highlighted the challenge of terminating short-term treatments. Termination procedures were reviewed to ensure they were given adequate explanation and time to process. The final session was altered to include parents who were invited to the second half of the last session. The aim of this was for parents to be a part of the discussion on termination and its challenges as well as to remind and reward parents of their role in treatment and to encourage validation of their adolescents efforts. De-compensation was openly discussed at this time and timeous appointments with community clinicians stressed (appointment are arranged with the clinician at the start of treatment). Finally, participants reported a major benefit of the group was feeling accepted and "comfortable" with other group members and feeling less "alone", in contrast to socialising with school friends where they felt abnormal and that "something is wrong with me". They also reported that they felt more comfortable divulging "real" information to a group of adolescents than an individual clinician as it felt safer. No contagion was reported or observed, however this is difficult to monitor outside of the group and unlikely to have been revealed to group leaders who stressed a strict no contact policy and closely monitored the discussion of NSSI and related symptoms in the group. A final comment went to the quality of the snacks provided during the break which could apparently be improved on!

Encouragingly, feedback from these pilots is in keeping with previous research that supports group formats for this age group. Whilst no formal feedback other than outcome data was obtained from parents, some informal feedback described themes of relief at getting help

for their adolescent, feeling less alone after meeting with other parents in the same predicament, and a desire for the group to be longer due to concerns about maintenance. A number of parents also reported that they were keen to be more involved in treatment. Whilst not a target of ERg-A, given its focus on brevity and feasibility, this is important feedback that highlights the crucial need for family groups or sessions as part of longer-term community treatment. Adding a parent or family skills group as an optional adjunct to ERg-A for services that can accommodate it remains a consideration for future trials. Given there is some evidence to suggest that treatments for adolescent self-harm that offer an optional parent group (3 session of psychoeducation) had no significant impacts on functioning and a low uptake (Taylor et al., 2011), the content and recruitment of this addition will need careful consideration to make it effective and appealing.

Group leader feedback.

Focus groups. Four colleagues who were not involved in the treatment development but co-led the pilot trials and hence had hands-on implementation experience were asked to give written feedback and attend a focus group. Feedback centered on comments, recommendation and/or additions to: (1) the structure and organisation of the manual, (2) clarity and usability of the manual, and (3) the clinical content of the manual. Overall the manual was described as clear, concise, and easy to follow, with and average of 2 hours needed to adequately prepare and familiarise oneself with session content. Feedback resulted in amendment to some of the structural and procedural elements including the addition of extra troubleshooting sections related to the management of difficult behaviours (specifically getting to group late, not doing homework and discussion of inappropriate topics), realistic time management guides (some sections had too much content and/or did not allow for unpredictable behaviours that needed management), clarity on definitions of leader and co-leader roles, and additional time for termination procedures. In addition, a number of minor alterations were made to the clinical content following feedback about what exercises,

formats and content participants responded well to, and those that were observed as harder to grasp, required more time or did not appear to be engaging for the adolescents. For example, they all all noticed participants energy around the acceptance-based sessions and made recommendations about re-ordering sessions or introducing these concepts earlier, which corresponded well with the participant feedback. All four clinicians endorsed the Waltz Model (using the four defined characteristics 'unique', 'essential', 'acceptable', 'proscribed') as an extremely useful guide that alerted them to important or active ingredients whilst also giving permission to use their own clinical creativity and input. It was recommended that symbols representing the four characteristics be weaved through the manual to make choice points more explicit and accessible.

ERg-A Adherence Ratings Scale. The same four clinicians were asked to complete the *ERg-A Adherence Rating Scale* (ARS; Appendix C) after each session and comment on its usability. They were asked if they had any problems completing the scale and if so the nature of the problem (e.g. layout, wording, time taken), and whether they had any suggestions for improving the scale. They reported the tool was quick and easy to use with the only recommendation being a minor alteration to the wording on the scale for clarity. All four clinicians noted that their experience with DBT and in running and managing groups of adolescents was crucial to the running of the group. They noted that without this experience it would be very challenging to simultaneously manage group interactions, follow the group material, and ensure that the effective ingredients were being delivered adequately. This was noted in regard to specifications for therapist selection, training and supervision. Being a co-leader as a requirement of training was also considered a useful suggestion. Formal testing of the ARS in future studies will be required.

Expert Opinion

In an effort to improve the external validity of the Stage 1a ERg-A manual, increase its transportability, and reduce any research-to-practice gaps, feedback on the treatments

clinical content, usability and feasibility was requested from two independent clinicians in the field of adolescent psychology who had no previous exposure to the treatment manual. One clinician worked in private practice and the second in another psychiatric unit that saw inpatients and outpatients. These clinicians can be defined as senior clinical psychologists with more than ten years' experience in working with adolescents with NSSI, including some group work. Whilst both had experience with the implementation of manualised treatments in their practice and experience in DBT, only one had experience in treatment manual development. Overall, both sets of feedback endorsed the manuals potential as a clinically useful and feasible treatment were they to implement it in their respective facilities. The Waltz model was again highlighted as a particularly useful clinical guide. Feedback on a number of minor structural changes was provided and incorporated into the manual. Clinically, questions were raised regarding the amount of content in each session and whether it was too heavy, which was taken into account and reduced where possible/ suggested. Generalisability of the skills to the home and options for parent involvement were also raised as potential issues and have been discussed.

Finalising the ERg-A Stage 1 Manual

The essential end product of Stage I treatment development is the provision of a working version of a therapist manual specifying treatment procedures and elements than can be tested in Stage II efficacy studies. Questions regarding the standards by which Stage I proposals should be judged, the nature of the work to be completed in this stage, and the criteria for moving onto Stage II was addressed by the National Institute on Drug Abuse (NIDA) Treatment and Research Branch who held a series of workshops between 1995 – 1998 (Rounsaville et al., 2001). Emerging from these workshops was a list of the key elements of behavioural therapies that are needed to begin work at both Stages I and II of

development. These guidelines were used as a final measure of confidence in the ERg-A

Stage 1 manuals suitability for a Stage II efficacy trial and are summarised in Table 5.

Clinical Implications and Future Directions

The increasing prevalence of NSSI behaviours in adolescent populations, the lack of any

efficacious treatments to guide tertiary care providers, and the significant cost of NSSI to the

well-being of these young people, were the driving forces behind the development of a

treatment that targets adolescents who present to hospital with NSSI. The ERg-A treatment is

grounded in theory and research that has the most empirical support to date and emphasises

clinical and economic utility for adolescent populations in tertiary care. As with the

evaluation of any new pharmacological or psychological treatment, formal testing of

feasibility and efficacy are required in a Stage II RCT. This paper details the first stage in this

process with the provision of a structured Stage I treatment manual for evaluation of the

Erg-A.

The limited amount of analytical data, small sample sizes, and reliance on self-reports

in the above feedback from participants and clinicians are limitations to this study as is the

lack of any measurable data on the pilot groups impacts on the target behaviours. Successful

tests of treatment integrity require both an assessment of therapist *adherence* to the treatment

protocol (provided by the ARS), and a determination that the intervention is being performed

competently by the therapist (Waltz et al., 1993), and this is yet to be developed. Future

studies will need to formally assess the ARS and consider development of specific

competency measures and training frameworks to ensure the treatments fidelity across clinical

settings. The Waltz Model is likely to provide a useful platform on which to develop and

assess these, as will recent literature that emphasises the specific competencies needed when

treating children and adolescents (Beida, Barnish & Kendall, 2009).

Table 5

ERg-A manual elements that correspond to the guidelines stipulated for transition from a Stage I to

Stage II treatment manual

Section	Content Area	ERg-A manual
I. Elaborated rationale	Empirical evidence supporting effectiveness of this approach Variations by subgroups	Expanded on in Introduction (pages 3, 4, 6 & 7)
II. Troubleshooting	Strategies for dealing with common clinical problems	Existing in Stage I manual (page 6)
III. Managing transitions	Guidelines for clinical decision-making through stages of treatment	Expanded in Stage I manual (page 17)
IV. Nonspecific or common aspects of treatment	A. Patient-therapist relationship	Existing in Stage I manual (page15)
	B. Relationship of common and unique elements	Expanded in Stage I manual (page16)
V. Compatibility with other treatments	A. Permissibility and limits of adjunctive treatments	Added at Stage 1b
	B. Role of self-help groups	Not applicable
VI. Therapist selection, training, supervision	A. Explication of unique and essential elements	Existing in Stage 1 manual (pages 15 & 16)
	B. Therapist training	Minimal and specific qualifications and/or experience for therapist selection stipulated. Adherence Rating Scale developed. Competency measure/ratings to be introduced.
	C. Therapist supervision	Existing in Stage 1 manual (page 14)
VII. Clinical care standards	Specifications of guidelines for managing clinical issues	Expanded on in Stage 1 manual (page 10, 11 & 16)

The ultimate goal of a Stage I treatment manual is to develop the elements required to

test the efficacy of the new therapy in a Stage II RCT. This study demonstrates how the ERg-

A treatment manual meets this goal. The efficacy of the treatment will now need to be

established to determine whether further research efforts are warranted in Stage III

effectiveness trials that look to demonstrate transportability across diverse populations and

clinical settings.

References

Aaron, L., Hornberg, R., & Duckworth, K. (2009). Grading the states 2009: Reporting on the health of America's mentally ill. *A report on America's health care system for adults with serious mental illness*. Retrieved from http://www.nami.org/gtsTemplate09.cfm?Section=Grading_the_States_2009

Addis, M., & Krasnow, A. (2000). A national survey of practicing psychologists' attitudes toward psychotherapy treatment manuals. *Journal of Consulting and Clinical Psychology*, *68*, 331– 339.

Beck, A., Rush A., Shaw, B., & Emery, G. (1979). *Cognitive Therapy of Depression.* New York: Guilford press.

Beidas, R., Barmish, A., & Kendall, p. (2009). Training as usual: Can therapist behaviour change affect reading a manual and attending a brief workshop on cognitive behavioural therapy for youth anxiety? *The Behavior Therapist, 32*, 97-101.

Burns, J., Dudley, M., Hazell, P., & Patton, G. (2005). Clinical management of deliberate self-harm in young people: the need for evidence-based approaches to reduce repetition. *Australia and New Zealand Journal of Psychiatry, 39(3),* 121-128.

Carroll, K., & Nuro, K. (2002). One size cannot fit all: A stage model for psychotherapy manual development. *Clinical psychology: Science and Practice, 9(4),* 396-406.

Castonguay, L., Schut, A., Constantino, M., & Halperin, G. (1999). Assessing the role of treatment manuals: Have they become necessary but nonsufficient ingredients of change? *Clinical Psychology: Science and practice, 6,* 449-455.

Chapman, A., Gratz, K., & Brown, M. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour Research and Therapy, 44,* 371-394.

Cole, P., Michel, M., & Teti, L. (1994). The development of emotion regulation and

dysregulation: A clinical perspective. *In N. A. Fox (Ed.), Development of Emotion*

Regulation: Biological and Behavioural Considerations. Monographs of the Society

for Research in Child Development, 59, 73-300.

Crowe, M., & Bunclark, J. (2000). Repeated self-injury and its management. *International*

Review of Psychiatry, 12, 48-53.

Crowe, M., & Bunclark, J. (2000). Repeated self-injury and its management. *International*

Review of Psychiatry, 12, 48-53.

Donnelly, H., Schniering, C., & Rapee, R. (2015a). The current status of evidence-based

treatments available to adolescents who presents to hospital with nonsuicidal self-

injury: A critical review, Department of Psychology, University of Macquarie,

Sydney, University.

Donnelly, H., Schniering, C., & Rapee, R. (2015b). Examining the function of emotion

dysregulation in adolescent referred to hospital with non-suicidal self-injury compared

to a non-clinical control group. Unpublished manuscript, Department of Psychology,

University of Macquarie, Sydney, University.

Dobson, K., & Shaw, B. (1988). The use of treatment manuals in cognitive therapy:

Experience and issues. *Journal of Consulting and Clinical Psychology, 56,* 673-680.

Elliot, R. (1998). Introduction: A guide to the empirically supported treatments controversy.

Psychotherapy Research, 8, 115-125.

Eysenck, H. (1952). The effects of psychotherapy: An evaluation. *Journal of Consulting*

Psychology, 16, 319–324.

Favazza, A. (1993). Diagnostic issues in self-mutilation. *Hospital and Community Psychiatry,*

44, 134-140.

Favazza, A. (1998). The coming of age of self-mutilation. *Journal of Nervous and Mental*

Disease, 186, 259-268.

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Fleischhaker, C, Bohme, R., Sixt, B., Bruck, C., Schneider, C., & Schulz, E. (2011). Dialectical behaviour therapy for adolescents (DBT-A): a clinical trial for patients with suicidal and self-injurious behavior and borderline symptoms with a one-year follow-up. *Child and Adolescent Psychiatry and Mental Health, 5(3),* 1-10.

Fonagy, P. (1999). Achieving evidence-based psychotherapy practice: A psychodynamic perspective on the general acceptance of treatment manuals. *Clinical Psychology: Science and Practice, 6,* 442-44.

Gonzales, A., & Bergstrom, L. (2013). Adolescent nonsuicidal self injury (NSSI) interventions. *Journal of Child and Adolescent Psychiatric Nursing, 26*, 124-130.

Gratz, K. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate self-harm Inventory. *Journal of Psychopathology and Behavioral Assessment, 23,* 253-263.

Gratz., K. (2003). Risk factors for and functions of deliberate self-harm: An empirical and conceptual review. *Clinical Psychology: Science and Practice, 10(2)*, 192-205.

Gratz, K. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26,* 41-54.

Gratz, K. & Gunderson, G. (2006). Preliminary data on an acceptance-based emotion regulation group intervention for deliberate self-harm among women with borderline personality disorder. *Behavior Therapy, 37,* 25-35.

Gratz, K., & Tull, M. (2011). Extending research on the utility of an adjunctive emotion regulation group therapy for deliberate self-harm among women with borderline personality pathology. *Personality Disorders: Theory, Research and Treatment, 2(4),* 316-326.

Greco, L., & Hayes, S. (2008). *Acceptance and Mindfulness Treatment for Children & Adolescents*. New Harbinger: New Harbinger Publications.

Groves, S., Backer, H., van den Bosch, W., Miller, A. (2012). Review: Dialectical behaviour therapy with adolescent. *Child and Adolescent Mental Health, 17(2),* 65-75.

Hayes, S., Strosahl, K., & Wilson, K. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.

Hayes, S., Wilson, K., Gifford, E., Follette, V., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64,* 1152-1168.

Heimberg, R. (1998). Manual based treatment: An essential ingredient of clinical practice in the 21st century. *Clinical Psychology: Science and Practice, 5,* 387-390.

Henry,W. (1998).Science, politics, and the politics of science: The use and misuse of empirically validated treatment research. *Psychotherapy Research, 8,* 126-140.

Klerman, G., Weissman, M., Rounsaville,B., & Chevron, E. (1984). *Interpersonal psychotherapy for depression.* New York: Basic Books.

James, A., Taylor, A., Winmill, L., & Alfoadari, K. (2008). A preliminary community study of Dialectical BNehavior Therapy (DBT) with adolescent females demonstrating persistent, deliberate self-harm. *Child & Adolescent Mental Health, 13(3),* 148-152. doi: 10.1111/j.1475-3588.2007.00470.x

James, A., Clacey, J., Seagrott, V., & Goldacre, M. (2010). Adolescent inpatient psychiatric admission rates and subsequent one-year mortality in England: 1998-2004. *The Journal of Child Psychology and Psychiatry, 51(12), 1*395-1404. doi: 1111/j.1469-7610.2010.02293.x

Katz, L., Cox, B., Gunasekara, S., & Miller, A. (2004). Feasibility of dialectical behavior therapy for suicidal adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 43 (3),* 276-282.

Klonsky, D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review, 27*, 226-239.

Klonsky, D., & Muehlenkamp, J. (2007). Self-injury: A Research review for the practitioner. *Journal of Clinical Psychology*, *63(11),* 1045-1056.

Lambert, M. (1998). Manual-Based Treatment and CIinical Practice: Hangman of Life or Promising Development? *Clinical Psychology Science and Practice, 5,* 391-395.

Levitt, E. (1957). The results of psychotherapy with children: An evaluation. *Journal of Consulting Psychology, 21,* 189–196

Linehan, M. (1993). *Skills Training Manual for Treating Borderline personality Disorder*. New York: Guilford Press.

Luborsky, L., & DeRubeis, R. (1984). The use of psychotherapy treatment manuals: A small revolution in psychotherapy research style. *Clinical Psychology Review, 4*, 5-15.

McMurran, M., & Duggan, C. (2005). The manualization of a treatment programme for personality disorder. *Criminal Behaviour and Mental Health, 15,* 17-27.

Messer, J., & Fremouw, W. (2008). A critical review of explanatory models for self-mutilating behaviours in adolescents. *Clinical Psychology Review, 28*, 162-178.

Miller, M., Rathus, J., & Linehan, M. (2006). *Dialectical Behaviour Therapy with Suicidal Adolescents.* New York: Guilford.

Miller, A., Wyman, S., Huppert, J., Glassman, S., & Rathus, J. (2000). Analysis of Behavioural Skills Utilized by Suicidal adolescents Receiving Dialectical Behavior Therapy. *Cognitive and Behavioral Practice, 7,* 183-187.

Marques, C. (1998). Manual-Based Treatment and Clinical Practice. *Clinical Psychology Science and Practice,* 5, 400-402.

Moran, H., Pathak, N., & Sharma, N. (2009). The mystery of the well-attended group: a model of personal construct therapy for adolescent self-harm and depression in a community CAMHS service. *Counselling Psychology Quarterly, 22(4),* 347-359

Neumann, A., van Lier, P., Gratz, K., & Koot, H. (2010). Multidimensional assessment of

emotion regulation difficulties in adolescents using difficulties in emotion regulation

scale. *Assessment, 17(1),* 138-149.

Nock, M. (2009). Why do people hurt themselves? New insights into the nature and

function of self-injury. *Current Directions in Psychological Science, 18,* 78-83.

Norcross, J. (1999). Collegially validated limitations of empirically validated treatments.

Clinical Psychology: Science and Practice, 6, 472-476.

Onken, L., Blaine, J., & Battjes, R. (1997). Behavioural therapy research: A conceptualization

of a process. In S. Henggeler & R. Amentos, *Innovative approaches for difficult to

treat populations* (pp. 477-485). Washington, DC: American Psychiatric press.

Parloff, M. (1998). Is psychotherapymore than manual labor? *Clinical Psychology:

Science and Practice, 5,* 376-381.

Rounsaville, B., Carroll, K., & Onken, L. (2001). NIDA's stage model of behavioural

therapies research: Getting started and moving on from Stage 1. *Clinical Psychology:

Science and Practice, 8,* 133-142.

Salinsky, E., & Loftis, C. (2007). Shrinking inpatient psychiatric capacity: Cause for

celebration or concern? *George Washington University, National Health Policy

Forum, Issue brief, 823,* 1-21.

Segal, Z., Williams, J., & Teasdale, J. (2001). *Mindfulness-based cognitive therapy for

depression: A new approach to preventing relapse.* New York: Guilford Press.

Selby, E., Bender, T., Gordon, K., Nock, M., & Joiner, T. (2012). Non-suicidal self-injury

(NSSI) disorder: a preliminary study. *Personality Disorders: Theory, Research, and

Treatment 3,* 167–175.

Taylor, L., Oldershaw, A., Richards, C., Davidson, K., Schmidt, U., & Simic, M. (2011). Development and pilot evaluation of a manualized cognitive-behavioral treatment package for adolescent self-harm. *Behavioural and Cognitive Psychotherapy, 39,* 619-625.

Waltz, J., Addis, M., Koerner, K., & Jacobson, N. (1993). Testing the integrity of a psychotherapy protocol: Assessment of adherence ad competence. *Journal of Consulting and Clinical Psychology, 61,* 620-630.

Wilson, G. (1996). Manual-based Treatments: The clinical application of research findings. *Behavior, Research and Therapy, 34,* 295-314.

Wilson, G. (1998). Manual-based treatment and clinical practice. *Clinical Psychology: Science and Practice, 5,* 363-375.

Yalom, I. & Leszcz, M. (2005). *The Theory and Practice of Group Psychotherapy, 5th ed.* New York: Basic Books.

STUDY FOUR

Randomised controlled trial of a brief group treatment targeting emotion dysregulation in adolescents referred to hospital with nonsuicidal self-injury

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STUDY FOUR: RCT BRIEF GROUP TREATMENT

Abstract

Nonsuicidal self-injury (NSSI) is a clinically important behaviour with high prevalence among clinical populations of adolescents. While brief group treatments that directly target the function of NSSI show promise, their efficacy and viability have not been evaluated in clinical populations of adolescents. This study aimed to examine the efficacy of a new 6-session group treatment developed to specifically target emotion dysregulation in adolescents who present to hospital with NSSI using a randomised controlled trial (RCT). Participants were 12-18 year olds awaiting admission to an inpatient hospital program who were randomly assigned to receive their treatment as usual (TAU) in the community ($n = 27$) or the group treatment in addition to their usual community treatment (treatment +TAU; $n = 28$). Despite more severe pre-treatment symptomatology, the treatment group evidenced significant pre-post improvements on primary outcome measures of frequency ($F(1,51) = 5.323$, $p = .025$, $\eta_P^2 = .095$) and type ($F(1,51) = 18.737$, $p = < .001$, $\eta_P^2 = .269$) of NSSI, emotion regulation ($F(1,51) = 58.677$, $p = < .001$, $\eta_P^2 = .535$), experiential avoidance ($F(1,51) = 14.260$, $p = < .001$, $\eta_P^2 = .219$), and symptoms of depression and stress that were all maintained at 3-month follow-up. No significant difference was found in terms of anxiety or family functioning. Most participants described the group as 'helpful' or 'extremely helpful' and 96.4% of them completed the treatment. Importantly, whilst both groups engaged in ongoing community care, the treatment group required significantly fewer emergency service contacts in the 3 months post treatment. The results are encouraging but need to be replicated on a larger-scale and in alternative clinical settings with its limitations addressed.

Keywords: nonsuicidal self-injury, adolescent, emotion regulation, brief treatment, randomised controlled trial

Nonsuicidal self-injury (NSSI) is defined as the 'deliberate and repeated destruction or alteration of body tissue, for purposes that are not socially sanctioned, and without conscious suicidal intent' (Gratz, 2001; Klonsky & Muehlenkamp, 2007). This behaviour has increased significantly over the past 20 years (Semmens & Powell, 2009) and is particularly high in adolescents (Brausch & Girresch, 2012), with recent reviews reporting between 40-61% of adolescent psychiatric patients engaging in NSSI (Darche, 1990; DiClemente, Ponton, & Hartley, 1991). This behaviour is not only occurring at an alarmingly high rate, but the age of onset of NSSI is reported to be between 12 and 14 years (Nock, 2009) with rates consistently higher among adolescents than amongst adults (Nock, 2010). Adolescents who engage in self-harm are also notorious for treatment drop-out (Ougrin & Latif, 2011) with less than 50% who present to hospital attending follow-up care in the community (Groholt & Ekberg, 2009; Spirito et al., 1992) and consequently a high number that re-present to emergency departments within months of discharge (Green et al., 2011). Offering effective interventions to these young people is not only crucial because of the significant impacts of NSSI on their long term psychosocial functioning (Kerfoot, 1996), but to reduce the ever-increasing cost and burden on expensive and limited inpatient beds (Wood, Trainor, Rothwell, Moore, Harrington, 2001). Keeping unsafe adolescents out of inpatient psychiatric settings altogether makes theoretical sense because of its potential to reinforce repetition of NSSI (Linehan, 1993). Nonetheless, clinical guidelines (National Institute for Health and Clinical Excellence, 2006) dictate that emergency services, inpatient psychiatric or part-hospitalisation admissions will at times be necessary and effective treatments need to be available. Effective tertiary treatment does not translate into abstinence as traditional hospital supervision and prevention methods have shown that extinguishing NSSI is not possible as patients continue to harm themselves secretly or in subtle ways (Crowe & Bunclark, 2000). Rather, tertiary care aims to minimise NSSI and associated distress adequately to provide sufficient relief for transition to treatments in the community that allow for skill generalisation and maintenance. Thus

transition into community care is a crucial element of treatment planning to prevent reliance on hospital readmissions that are costly, clinically unhelpful and often see the unintentional increase in NSSI as a means of gaining access to crisis staff and services. The availability of effective treatments for this challenging group of young people and the facilities that treat them is clearly a priority.

Recent reviews of interventions for adolescent NSSI find few treatments that have been designed exclusively for NSSI and even fewer that have been evaluated specifically with adolescents (Brausch et al., 2012; Donnelly, Schniering, & Rapee, 2015a; Gonzales & Bergstrom, 2013; Washburn et al., 2012). Not surprisingly most NSSI research is embedded within the adult literature on depression, BPD and suicidal behaviours where NSSI is a common co-occurrence (Fischer, Brunner, Parzer, Resch & Kaess, 2013; Taylor et al., 2011; Wood et al., 2001). This is despite the behaviour existing across a broad range of clinical and non-clinical populations and the suggestion that it is clinically important in its own right (Favazza & Rosenthal, 1993). The only therapeutic approaches with some relevance to adolescent NSSI are downward extensions of interventions designed for adults with Borderline Personality Disorder (BPD). These include Mentalization-Based Treatment (MBT; Bateman & Fonagy, 2008), which is a psychodynamic psychotherapy that targets affect regulation and impulsivity and has shown significant reductions in NSSI, depression and inpatient days compared to TAU in adults (Bateman & Fonagy, 1999). Whilst promising, the only RCT of the adolescent version combined NSSI and suicidal behaviours into one outcome measure of self-harm, rendering its efficacy for the treatment of NSSI specifically inconclusive (MBT-A; Rossouw & Fonagy, 2012). The second approach is Dialectical Behavior Therapy (DBT; Linehan, 1993) which is based on the Biopsychosocial Theory of BPD which postulates that a biological dysfunction in the emotion regulatory system combined with invalidating social-environmental factors in early development underpin the development of BPD in adults. A number of RCTs with adults show the superiority of DBT to

TAU in reducing the frequency and severity of NSSI, inpatient psychiatric days and rates of treatment drop-out (Koons et al., 2001; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Linehan, Comtois, Murray et al., 2006; Robins & Chapman, 2004; Verheul et al., 2003). Unfortunately, the only RCT with adolescents did not yield any additional reduction in NSSI behaviours compared to TAU (Katz, Cox, Gunasekara, & Miller, 2004) and efficacy of the adolescent adaptation of DBT (DBT-A; Miller, Rathus & Linehan, 2006) is limited to a single pre-post comparison study (Fleischakker, Bohme, Sixt, Bruck, Schneider & Schulz, 2011). Finally, preliminary evidence for the 'Cutting Down Program' (Fischer et al., 2013), a brief, individual treatment based on Manual-Assisted Cognitive Behaviour Therapy (MACT; Evans et al., 1999) that draws from both DBT and Cognitive Behaviour Therapy (CBT), is promising but the outcomes of a recently completed RCT are not yet published. In summary, there are no treatments defined specifically for adolescent NSSI and adaptations of adult approaches await randomised controlled trials that specifically target NSSI. Furthermore, despite some effort to consider brief and cost effective versions of these approaches for high needs settings (Katz et al., 2004), the empirically supported packages of both DBT-A and MBT-A require the service to provide multiple treatment modes for a period of 16-weeks and 12-months respectively. The duration and intensity of these programs is not conducive to adolescents and not sufficient given the high prevalence rates requiring treatment. They are also unlikely to be viable in traditional clinical settings that are pressured to deliver increasingly brief admissions using tightly controlled budgets and resources (Aaron, Hornberg, & Duckworth, 2009).

Time-limited treatments that utilise a group format show particular promise in meeting this populations treatment needs. Brief group treatments have the potential to reach large numbers of clients (Gunderson, 2001) and are less resource intensive and costly (Lomonaco, Scheidlinger, & Aronson, 2000). Evidence also suggests that adolescents are generally accepting of group formats (Moran, Pathak, Sharma, 2009) that provide validation, increase

social support, reduce shame (Najavits, Weiss, & Leise, 1996) and facilitate safe discussion amongst youth (Crowe et al., 2000). There is also preliminary support for the utility of group treatments for clinical adolescents who present with self-harm generally (Wood et al., 2001). Specialised brief approaches have also shown increased rate of return for follow-up care in adolescents presenting to emergency departments with self-harm (Ougrin et al., 2011), suggesting that brief approaches that target engagement in treatment are not only clinically and fiscally attractive, but may be important given their more primary potential to ensure adolescents actually turn up for treatment.

For a brief group treatment to be effective it must have a specific and well-defined focus that specifically targets the functional processes that produce and maintain the maladaptive behaviour being treated (Gratz & Gunderson, 2006). With regard to NSSI, leading theories (DBT for adolescents or DBT-A; Miller, Rathus & Linehan, 2007; Experiential Avoidance Model or EAM; Chapman, Gratz & Brown, 2006; Acceptance and Commitment Therapy or ACT; Hayes, Strosahl, & Wilson, 1999) conceptualise the behaviour as having an emotion regulatory function that allows individuals to avoid having to experience emotional distress. Importantly, targeting the multi-dimensional construct of emotion dysregulation has potential utility in adolescent populations (Neumann, van Lier, Gratz & Koot, 2010), with the suggestion that limited access to effective emotion regulatory strategies plays a seemingly crucial role compared to the other five dimensions of this construct (namely, a lack of emotional awareness, a lack of emotional clarity, difficulties controlling impulsive behaviors when distressed, difficulties engaging in goal-directed behaviors when distressed and non-acceptance of negative emotional responses) during this developmental stage (Donnelly, Schniering & Rapee, 2015b). Despite mounting empirical support for these leading theories (Messer & Fremouw, 2008), no treatment has specifically targeted these key constructs as the primary mechanisms of change in the population in which it is most prevalent. This dearth of empirical research, coupled with an urgent need for effective and viable treatments, provided

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the rationale for developing a brief group therapy for adolescents with NSSI that is clinically and economically feasibility for the tertiary services that treat them. The Emotion Regulation Group Treatment for Adolescents (ERg-A; Donnelly, 2014) targets emotion regulation in general, and experiential avoidance in particular, and aims to reduce reliance on maladaptive avoidance strategies such as NSSI, using an approach that is specifically designed to be engaging and motivating for this high-risk group of young people. It was hypothesised that the consequent reduction in emotional and psychosocial distress that are the inevitable consequences of these behaviours would then allow for cost-effective and sustainable community service follow-up, and a reduced reliance on emergency contacts and inpatient stays. The aim of the study was to examine the efficacy of the ERg-A using a RCT to compare the active treatment to absence of the intervention. Specifically, groups were compared on a range of outcome measures including frequency and type of NSSI, emotion dysregulation and emotional avoidance, as well as commonly co-occurring factors namely depression, anxiety, and family functioning (Klonsky, Oltmanns, & Turkheimer, 2003; Messer et al., 2008; Nock, 2010; Ross & Heath, 2002; Skegg, 2005). It was expected that compared to treatment as usual (TAU) only, the addition of the ERg-A treatment would show a significantly greater reduction across these variables over time. Drop out of ongoing community treatment and need for emergency service contacts following discharge were also expected to be significantly lower in the treatment group.

Method

Participants

Participants in this study were adolescents who had been referred to the Department of Child, Adolescent and Family Psychiatry of Westmead Public Hospital in Sydney, Australia. As a department requirement, referrals are only accepted if they have an identified community treating team that can liaise with the treating clinicians during the admission and can continue

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with care post discharge. Participants included all referrals to the service that reported a history of NSSI with at least one episode in the last 6 months. Their presentation was confirmed using the Deliberate Self-Harm inventory (DSHI; Gratz, 2001) that was included in the pre-treatment batch of measures. Males entered the study at the rate of 1:28 (males to females) and were included to reflect the true population. Adolescents were excluded from the study if their referral form (completed by their treating clinician in the community) indicated that they: (a) had a diagnosis of borderline or below intellectual functioning, substantial learning difficulties, acute psychosis or substance misuse; (b) had one or more suicide attempts rated as 'high' lethality within the past 6 months; (c) had current suicidal ideation rated as 'severe' or (d) had participated in a DBT or ACT skills group in the past 6 months. The exclusion of adolescents with suicidal behaviours was included because, whilst NSSI is a known risk factor for suicidal behaviours (Lengel & Mullins-Sweatt, 2013), their function is fundamentally different (i.e. to regulate emotions and to end life) and there is ample research that demonstrates some key differences between them (Lengel et al.,2013). Participants taking medication were included but were required to keep medication constant for the duration of the treatment. Table 1 details the demographic characteristics of participants by treatment and control conditions. The two groups were well matched. Participants were aged between 12 and 18 years in both the treatment ($M = 15.60$, $SD = 1.03$) and control ($M = 15.65$, $SD = 1.39$) conditions. The majority were white females who spoke English as a first language and came from two parent families who were financially secure.

Fifty-six eligible participants were randomly assigned to either the treatment condition or the waitlist control condition. Participants assigned to the treatment condition received the ERg-A group intervention in addition to TAU in the community, whilst participants assigned to the control condition continued with TAU in the community. One participant dropped out of the treatment group and two out of the waitlist control resulting in 53 (ERg-A group treatment + TAU = 27; TAU only = 26) adolescents who completed the study.

Table 1

Demographic characteristics of participants who received the ERg-A group treatment in addition to

TAU and those that received TAU only (N =53)

	Group +TAU (n = 27)		TAU (n = 26)		χ^2	p^a
Age: mean (SD)	15.60	(1.03)	15.65	(1.39)		.882
Age parents first concern: mean (SD)	11.24	(3.38)	12.20	(4.19)		.363
Gender: % within Group (*n*)					(1) = 0.98	.322
% Male *(n)*	3.70	(1)	0.00	(0)		
% Female *(n)*	96.3	(26)	100.0	(26)		
Ethnicity: % within Group (*n*)					(1) = 2.31	.129
% White	66.7	(18)	84.6	(22)		
% Other	33.3	(9)	15.4	(4)		
English Spoken: % within Group					(1) = .00	.961
% No (*n*)	11.1	(3)	11.5	(3)		
% Yes (*n*)	88.9	(24)	88.5	(23)		
Family Makeup: % within Group					(3) = 2.83	.419
% Sole parent (*n*)	14.8	(4)	26.9	(7)		
% Two parent (*n*)	70.4	(19)	69.2	(18)		
% Step/blended (*n*)	11.1	(3)	3.8	(1)		
% Foster/kinship (*n*)	3.7	(1)	0.0	(0)		
Number of adults living at home: mean (SD)	1.93	(0.62)	2.00	(0.85)		.717
Number of children living at home: mean (SD)	2.15	(1.10)	1.85	(0.93)		.285
Family income: % within Group					(3) = 2.10	.552
% $1-20,000 (*n*)	0.0	(0)	3.8	(1)		
% $20,001- $40,000 (*n*)	11.1	(3)	19.2	(5)		
% $40,001 - $80,000 (*n*)	33.3	(9)	34.6	(9)		
% $80,001 or more (*n*)	55.6	(15)	42.3	(11)		
School Type: % within Group (*n*)					(3) = 2.21	.529
% Public (*n*)	59.3	(16)	57.7	(15)		
% Private (*n*)	3.7	(1)	0.0	(0)		
% Catholic (*n*)	33.3	(9)	42.3	(11)		
% Not enrolled (*n*)	3.7	(1)	0.0	(0)		
School grade: mean (SD)	10.04	(1.15)	9.88	(1.42)		.670

Note. [a]Two-tailed t-test.

Measures

The following outcome measures were administered to both groups pre and post each

treatment cycle. The treatment group also completed the measures at a 3-month follow-up.

Frequency and type of NSSI. The Deliberate Self-Harm Inventory (DSHI; Gratz,

2001) is a 17-item self-report measure that screens various aspects of NSSI including

frequency, duration, severity and type. The DSHI has been found to have high internal

consistency, adequate construct, convergent and discriminant validity, and adequate test-retest

reliability (Gratz, 2001). The DSHI was selected above related measures as it is empirically

validated, is a behaviourally based measure that ensures reports of precise behaviours, and

because it provides an assessment of the frequency and type of NSSI in particular (as opposed

to simply its presence or absence) as these have important clinical implications (Gratz, 2001).

Importantly the DSHI is also based on the conceptual definition of NSSI used and referred to

in this study and it has been used with adolescent populations (Lundh, Karim, & Quilisch,

2007).

Difficulties in emotion regulation. The Difficulties in Emotion Regulation Scale

(DERS; Gratz & Roemer, 2004) is a 36 item self-report measure that assesses clinically-

relevant difficulties in emotion regulation across six domains (non-acceptance of negative

emotions, inability to engage in goal directed behaviour when experiencing negative

emotions, difficulty controlling impulsive emotions when experiencing negative emotions,

limited access to emotions regulation strategies perceived as effective, lack of emotional

awareness and lack of emotional clarity). Items are scored on a five-point scale ranging from

1 (*almost never)* to 5 *(almost always).* The DERS has been found to have high internal

consistency ($\alpha = .93$), good test-retest reliability and adequate construct and predictive

validity (Gratz & Roemer, 2004). It also has utility in adolescent populations (Neumann et al.,

2010).

Experiential avoidance. The Avoidance and Fusion Questionnaire for Youth (AFQ-Y8;

Greco, Lambert & Baer, 2008) is a developmentally appropriate self-report measure of

psychological inflexibility engendered by high levels of cognitive fusion and experiential

avoidance consistent with the theory underlying ACT (Hayes et al., 1999). The 8-item youth

rated version used was developed for research purposes and is rated on a five-point rating

scale ranging from 0 (*not at all true)* to 4 (*very true*). It has been found to be psychometrically

sound, with adequate reliability and validity for youth over the age of 9 years (Greco et al., 2008).

Mindfulness. The Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer & Smith, 2011) was developed as a self-report measure of mindfulness for school-aged children and adolescents. It assesses the degree to which children and adolescents observe internal experiences, act with awareness, and accept internal experiences without judging them. The 10-item version is rated on a five-point scale from 0 (*never true*) to 4 (*always true*) with research confirming that it is a developmentally appropriate measure with adequate reliability and validity (Greco et al., 2011).

Depression, anxiety and stress symptoms. The Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) is a 42-item self-report measure designed to measure the severity of depression, anxiety and stress symptoms. The DASS has good internal consistency and test-retest reliability, as well as adequate construct and discriminant validity in clinical and non-clinical samples (Antony, Bieling, Cox, Enns, Swinson, 1998; Brown, Chorpita, Korotitsch, & Barlow, 1996) and can be used for adolescents as young as 12 years (Lovibond, et al., 1995). This study used a short 21-item version (DASS-21) rated on a four-point scale from 0 (*does not apply to me at all)* to 3 (*applies to me very much or most of the time*). Replication studies have found that the short version also distinguishes between clinical symptoms and has equally strong internal consistency and concurrent validity in the 'acceptable' to 'excellent' ranges (Antony et al., 1998).

General mental health - parent rated. The Strengths and Difficulties Questionnaire – Parent Version (SDQ-P4-16; Goodman, 1997) is a 25-item parent-rated measure of general psychopathology as well as protective factors across five core domains (emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviours). The SDQ is rated on a three-point scale from 0 (*not true*) to 2 (*certainly true*). The SDQ is a well-known and widely used measure with good psychometric properties

(Goodman, 2001). The parent-rated version was used as an additional assessment of the adolescents' general psychopathology.

General mental health - clinician rated. The Children's Global Assessment Scale (CGAS; Shaffer, Gould et al., 1983) is a numeric scale (1 through 100) used by mental health clinicians to assess the global level of functioning and severity of mental illness of children and adolescents. The CGAS has been found to be reliable between raters and time and has demonstrated both discriminant and concurrent validity (Shaffer et. al., 1983). CGAS ratings by each adolescent's community clinician provided an additional informant rating of the adolescent's overall functioning.

Family functioning - parent rated. The McMaster's Family Assessment Device (FAD; Epstein, Baldwin & Bishop, 1983) is a 60-item parent-report measure that incorporates six dimensions of activity believed essential for the functioning of all families. A seventh dimension of General Functioning (GF) gives a measure of overall health and/or pathology of a family. The GF subscale includes 12-items rated on a four-point scale from 0 (*strongly agree, this statement describes my family very accurately)* to 3 (*strongly disagree, this statement does not describe my family at all*) and has been shown to be both a reliable and valid short version of the FAD (Byles, Byrne, Boyle, Offord, 1998). The GF scale is a useful measure of family functioning when values of specific dimensions are not relevant. Because family functioning is frequently cited in the literature as being strongly associated with emotional and behavioural problems in adolescents, it was included amongst the self-report measures for the main caregiver in this study.

Additional post treatment measures captured data on adherence and acceptability of the ERg-A treatment.

Treatment completion. Every participants in the ERg-A treatment group was given a dichotomous rating of *yes* or *no* based on whether they completed the six sessions or not. Group attendance policy allowed participants to miss 1 session from illness but they were

required to catch up on the sessions' content with a group leader at an agreed upon time.

Participants who missed more than 1 session due to illness were considered non-completers

for the purposes of the study but were offered the opportunity to reapply for future groups.

Attendance at TAU during the treatment periods was also collected for both groups.

Treatment acceptability. A Skills Rating Scale for Adolescents (SRS; Appendix B)

was administered post-treatment to participants in the ERg-A treatment group. Twelve items

relating to the group content and 7 items relating to the group structure, format and delivery

were rated on a scale from 1 (*not at all helpful*) to 4 (*extremely helpful*). Open questions were

also included to allow for additional feedback from participants.

Additional follow-up measures captured data on tertiary service contacts and engagement

with ongoing community services 3 months after the treatment.

Adherence to ongoing treatment in the community. Community clinicians were

contacted 3-months after treatment to ascertain whether participants in both groups had been

attending ongoing care. Clinicians were asked to rate if their clients (a) *attended regularly*

(attended as contracted with valid reasons for cancellations), (b*) attended irregularly*

(attended as contracted with some unexplained absences or cancellations), (c) *attended but*

dropped out (initially attended as contracted but had not attended in the last three or more

weeks), or (d) *did not attend*.

Number of psychiatric hospitalizations. Information regarding the number (defined as

two or more overnight stays in a hospital or inpatient setting) of unplanned inpatient

psychiatric admissions following treatment was collected from community clinicians of both

groups at the 3-month follow-up. This information was collected to provide some indication

of whether the treatment was adequate to allow for ongoing and longer-term treatment in the

community. Overnight stays with discharge back to community care the next day were not

counted as admissions as overnight observation is often a health requirement when safety

issues present and do not interfere with ongoing care in the community.

Frequency and intensity of NSSI behaviours - clinician rated. Community clinicians were also asked whether the (a) frequency and (b) intensity of their clients NSSI behaviours had *increased*, *stayed the same* or *decreased* after the treatment. These additional questions aimed to collect some anecdotal informant feedback regarding the treatment group's NSSI behaviours at follow-up.

Treatments

Emotion Regulation group for Adolescents (ERg-A). The intervention assessed in this study was delivered in a group format with a maximum of six adolescents per group. The six-session program ran over 3 weeks and consisted of 2-hour twice-weekly sessions. These were preceded by an initial orientation and commitment session attended by both the participant and their parent/s. This initial session included administrative procedures and adolescent and parent motivation and commitment strategies, for example, the requirement of adolescent action (telephone call with the clinician) to arrange the session, early orientation of parents to their roles and responsibilities and discussion of potential obstacles to the treatment. Two group leaders conducted each group session. One was always a clinical psychologist and the treatment developer (HJD) who has ten years' experience running groups with adolescents and has formal training in DBT (Behavioral Tech, LLC). The co-leader varied across groups but was a child and adolescent clinician with experience in running group therapy. Group leaders were guided by a detailed treatment manual (Donnelly, 2014), completed an Adherence Rating Scale after each session and had supervision with the treatment developer to enhance treatment integrity. The ERg-A group draws on current NSSI theory and aims to reduce the participants habitual avoidance of distressing emotions, whilst increasing their repertoire and use of safe emotion regulatory strategies. Acquisition of a set of effective and trusted regulation strategies, increased awareness and understanding of emotion dysregulation and an increased willingness to stay present and experience the full range of emotions is in turn expected to decrease both the NSSI that functions to avoid negative emotional

experiences and the paradoxical increase in emotional distress that often arises as a consequence of rigid emotional avoidance. The opportunities these alternative responses make available in terms of the adolescents' valued life choices and directions are strongly emphasised and considered crucial to motivate and facilitate these challenging changes. The ERg-A treatment therefore draws heavily from DBT-A, EAM and ACT theories that prioritise adaptive emotion regulatory strategies along with mindfulness-and acceptance-based interventions and value based living. Group leaders are also guided by the use of DBT-A strategies and treatment targets that are known to keep a historically difficult-to-treat adolescent population engaged in treatment (Rathus & Miller, 2002). Group content was adapted to engage adolescents with predominantly experiential exercises and discussions organised around socially and developmentally relevant content that was delivered using adolescent-friendly mediums such as the internet. Given the treatments' emphasis as a segue-way into ongoing community care, group leaders maintained close liaison with community teams throughout the group, and terminated treatment via a comprehensive handover session shortly after the last session. Finally, in addition to its brief duration, all administrative and structural aspects of the ERg-A treatment were developed with a strong emphasis on clinical and economic feasibility in an effort to make it viable and transportable across clinical settings. The treatment manual, including a detailed description of its development, is available from the primary author.

Waitlist control. Participants allocated to the waitlist control condition were told that they would receive the treatment group as part of their admission as soon as their place in the hospital program became available. During their wait, participants continued TAU in the community under the care of their treating clinician. While some elements of DBT and/or ACT are inherent in many community treatments, formal DBT or ACT treatments formed part of the exclusion criteria.

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Procedure

All adolescents placed on the department waitlist during the study period were screened using the department referral form, which is completed by treating clinicians in the community. Minor additions to the department referral form allowed for relevant inclusion and exclusion criteria to be captured. Telephone calls to potential participants' parents provided treatment and study details. One to 2 weeks ($M = 9.4$ days, $SD = 1.8$ days) prior to the start of each treatment group, participants were required to liaise with the clinician to organise an initial orientation and commitment session for them and their parent/s to introduce the family to the theory and nature of the treatment, detail the research processes and procedures, create a safety management plan and treatment contract, and to complete consent forms and pre-treatment measures. Community clinicians were contacted by phone to confirm their ongoing involvement in treatment post discharge, discuss the study and treatment aims, provide pre-treatment ratings and create safety plans. Random allocation occurred as soon as 10-12 participants (based on the maximum of 6 group participants) had agreed to participate and been screened and orientated. Allocation was through the use of a random number generator in blocks of 5 or 6. Participants assigned to the treatment condition then received the group intervention in addition to TAU in the community, whilst waitlist controls continued their TAU only for the 3-week period whilst they waited for a bed on the unit to become available. A total of 5 treatments programs were run in succession over a period of 10.5 months. Participants and their parents completed the post-treatment measures at the end of each treatment. Three months after each treatment group finished, follow-up measures and questionnaires were posted to participants and their parents in the treatment group with reply paid envelopes. Community clinicians were contacted by phone or email to obtain their follow-up data.

The study was approved by both the Macquarie University Human Research Ethics Committee and the Sydney West Local Health District Human Ethics Committee

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(HREC2011/7/4.8(3550) AU RED HREC/11/WMEAD/126). Research team members were

not blind to conditions but all outcome measures were self-reports. All parents signed

informed consent for themselves and for their children if aged less than 16 years, and

adolescents signed informed consent for themselves. Participants were reimbursed $20AUD

for their time.

Statistical Analysis

Descriptive statistics were performed to examine and compare the treatment and

control groups. To ascertain whether there were changes to the outcome measures over the

course of the intervention, two-way between group ANOVAs compared the treatment and

control groups pre and post each group treatment. One-way within group ANOVAs were also

run to ascertain whether any outcomes found in the treatment group were maintained at

follow up.

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Results

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Participant Flow and Follow-up

Figure 1 shows the trial profile for all 5 randomised controlled treatment programs.

During the trial period (10.5 months) 67 adolescents were referred to the service with NSSI.

Of these 4 met exclusion criteria and 7 potential participants refused to be part of the trial.

The remaining 56 adolescents were randomly allocated in blocks of 5 or 6 to the treatment

and control conditions. One participant dropped out of the treatment group and 2 out of the

control group during the trial resulting in dropout rates of 3.5% and 7.4% respectively. The

adolescent who dropped out of the treatment group reported that her NSSI was not her major

concern and hence she did not think the group would be a useful treatment focus for her. Of

the two participants who dropped out of the control condition, one was reported by their

community clinician to be lost to care and the second was admitted to an acute care facility

out of the area. Fifty-three adolescents completed the study in the treatment ($n = 27$) and

control *(n = 26)* conditions and all of these were available for follow-up at 3-months. This is

not surprising given that they were on a waitlist for admission to a highly regarded treatment

facility.

Descriptive Statistics

Complete clinical data for both groups are detailed in Table 2. Whilst no significant

difference was reported between the groups in terms of when the adolescents first became

unwell, adolescents in the treatment group were reported by their parents to have more mental

health difficulties in total than those in the control group despite randomisation. More

specifically, parents reported that the treatment group differed significantly in terms of NSSI

acts, NSSI thoughts, anxiety, impulsivity and low self-esteem, however, no significant

differences were reported between the groups in terms of depression or social skills.

Furthermore, no significant difference was found between the groups in terms of

professionals seen for help with these difficulties, number of hours spent in treatment per

week, or emergency service contacts and inpatient hospital stays in the past year as a result of

these difficulties. All 53 participants reported that they were being prescribed medication.

Pre-post Treatment Outcomes

To determine whether changes over time between the groups were significant, a series

of two-way ANOVAs (pre- vs. post-treatment) were conducted on assessment measures (see

Tables 3 and 4). As shown in Table 4, all outcome measures other than the Awareness and

Clarity dimensions of the DERS and the FAD-GF evidenced significant positive main effects

across time. Between group differences were not significant for any outcomes except for

overall mental health of the adolescents which community clinicians reported as significantly

higher in the treatment group. These effects were qualified by significant group by time

interactions for most of the primary outcome measures including a reduction in NSSI

frequency ($F(1,51) = 5.323$, $p = .025$, $\eta_P^2 = .095$), a reduction in the number of different types

of NSSI ($F(1,51) = 18.737$, $p = < .001$, $\eta_P^2 = .269$), and reduced difficulties with emotion
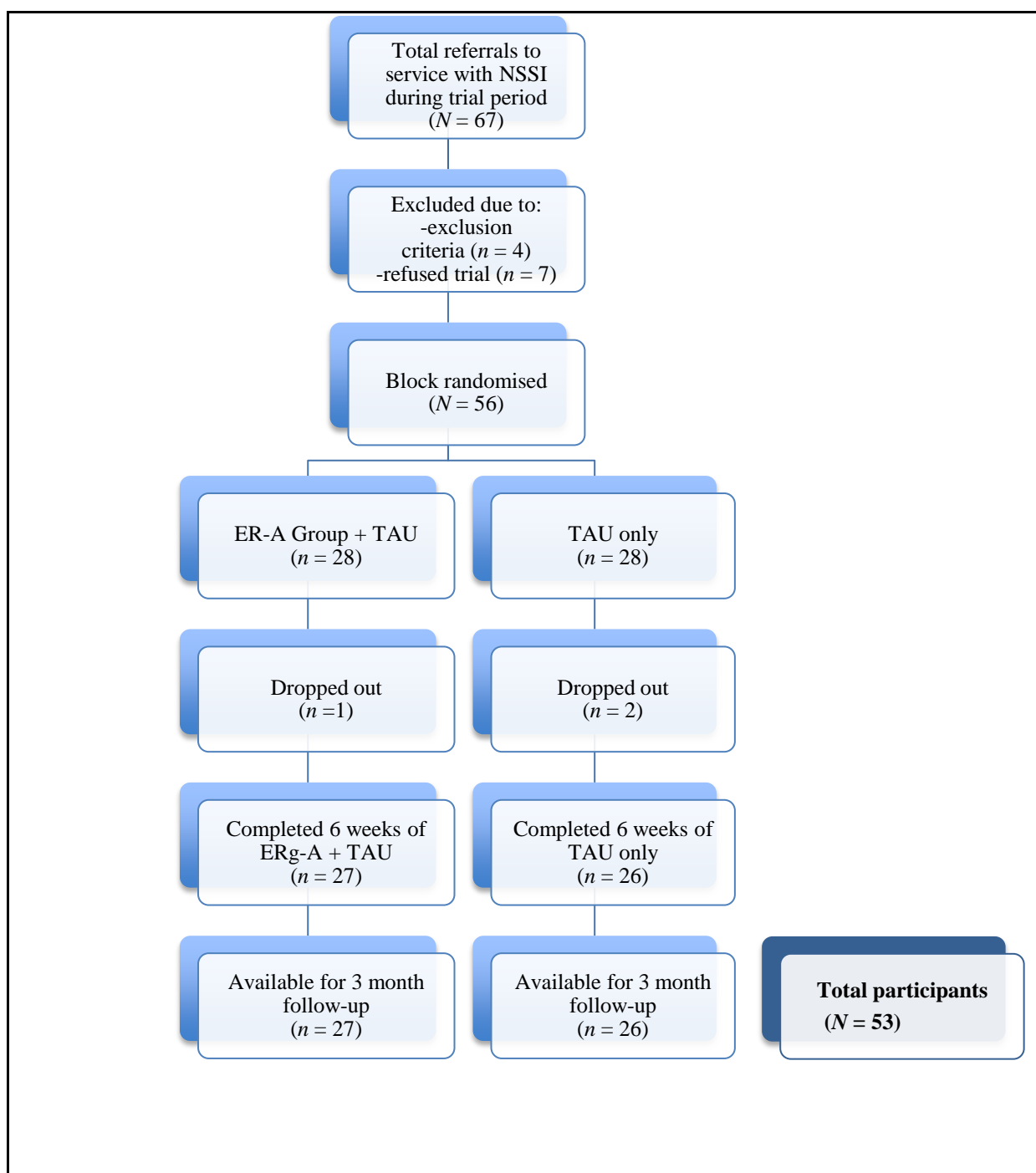
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Figure 1. Trial profile for a randomised controlled trial of the Emotion Regulation Group for Adolescents (ERg-A).

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Table 2

Clinical characteristics of participants who received ERg-A treatment in addition to TAU and those

that received TAU only (N = 53)

		ERg-A + TAU (n = 27)		TAU (n = 26)		χ^2	p
Number of current adolescent difficulties reported by parent: mean (SD)		7.15	(1.75)	4.81	(2.59)		<.001***
Specific difficulties parent reported adolescent had: % within Group (n)							
NSSI acts	Yes	100.0	(27)	73.1	(19)	(1) = 8.38	.004**
	No	0.0	(0)	26.9	(7)		
NSSI thoughts	Yes	92.6	(25)	65.4	(17)	(1) = 5.96	.015*
	No	7.4	(2)	34.6	(9)		
Depression	Yes	100.0	(27)	92.3	(24)	(1) = 2.16	.142
	No	0.0	(0)	7.7	(2)		
Anxiety	Yes	88.9	(24)	50.0	(13)	(1) = 9.51	.002**
	No	11.1	(3)	50.0	(13)		
Impulsivity	Yes	63.0	(17)	26.9	(7)	(1) = 6.94	.008**
	No	37.0	(10)	73.1	(19)		
Low self-esteem	Yes	96.3	(26)	61.5	(16)	(1) = 9.73	.002**
	No	3.7	(1)	38.5	(10)		
Social skills difficulties	Yes	51.9	(14)	34.6	(9)	(1) = 1.60	.206
	No	48.1	(13)	65.4	(17)		
Number of hours currently in treatment per week: mean (SD)		5.75	(4.98)	4.98	(2.87)		.497
Treatment history by professional: % within Group (n)							
General practitioner	Yes	81.5	(22)	80.8	(21)	(1) = .00	.947
	No	18.5	(5)	19.2	(5)		
Private psychologist	Yes	77.8	(21)	57.7	(15)	(1) = 2.45	.117
	No	22.2	(6)	42.3	(11)		
Private psychiatrist	Yes	51.9	(14)	53.8	(14)	(1) = .02	.884
	No	48.1	(13)	46.2	(12)		
Occupational therapist	Yes	14.8	(4)	7.7	(2)	(1) = .67	.413
	No	85.2	(23)	92.3	(24)		
Pediatrician	Yes	11.1	(3)	7.7	(2)	(1) = .18	.670
	No	88.9	(24)	92.3	(24)		
CAMHS	Yes	25.9	(7)	23.1	(6)	(1) = .06	.810
	No	74.1	(20)	76.9	(20)		
School counselor	Yes	70.4	(19)	65.4	(17)	(1) = .15	.697
	No	29.6	(8)	34.6	(9)		
Other treatment	Yes	7.4	(2)	7.7	(2)	(1) = .00	.969
	No	92.6	(25)	92.3	(24)		
Number of emergency service contacts in past year related to adolescent difficulties: mean (SD)		4.50	(0.60)	4.40	(0.70)		.579
Number of hospital inpatient stays in past year related to adolescent difficulties: mean (SD)		1.93	(0.63)	2.00	(0.85)		.734

Note. * p < .05. ** p < .01. *** p < .001.

dysregulation ($F(1,51) = 58.677$, $p = <.001$, $\eta_P^2 = .535$). Significant group by time

interactions were also observed for each of the six constructs of emotion regulation (all p's =

$<.05$, all $\eta_P^2 = >.143$), reduced experiential avoidance ($F(1,51) = 14.260$, $p = <.001$, $\eta_P^2 =$

$.219$), improved mindfulness ($F(1,51) = 32.640$, $p = <.001$, $\eta_P^2 = .390$), lower levels of

depression ($F(1,51) = 37.068$, $p = <.001$, $\eta_P^2 = .421$) and stress ($F(1,51) = 11.420$, $p = .001$,

$\eta_P^2 = .183$), and improved general mental health according to parents ($F(1,51) = 8.300$, $p =$

$.006$, $\eta_P^2 = .140$) and clinicians ($F(1,51) = 14.252$, $p = <.001$, $\eta_P^2 = .218$). No significant

differences of this kind were found for anxiety $(F(1,51) = 3.560$, $p = .065$, $\eta_P^2 = .065)$ or

family functioning ($F(1,51) = 3.312$, $p = .075$, $\eta_P^2 = .069$). Pairwise comparisons were

conducted to compare the treatment and control group post-treatment scores where there was

a significant interaction. Compared to the control groups post-treatment scores, the treatment

group evidenced significantly lower levels of emotion dysregulation ($t(51) = 2.460$, $p = .017$)

and depression ($t(51) = 2.205$, $p = .032$), significantly higher levels of mindfulness ($t(51) =$

2.445, $p = .018$), significant reduction in experiential avoidance ($t(51) = 3.456$, $p = .001$), and

significant improvement in their overall mental health rated by clinicians, (t$(51) = 3.845$, $p =$

$<.001$). There were no significant differences between the groups at post-treatment for NSSI

frequency ($t(51) = 1.036$, $p = .305$), NSSI type ($t(51) = .888$, $p = .379$), stress ($t(51) = .205$, p

$= .839$) or parent rated mental health ($t(51) = .739$, $p = .463$).

Follow-up Outcome Measures

To determine whether pre-post treatment changes sustained at 3-month follow-up,

one-way ANOVAs were conducted on assessment measures within the treatment group

separately (see Table 3). These were followed by pairwise comparisons when significant.

Participants in the treatment group reported significant changes on the DSHI over time from

pre-treatment to follow-up on both frequency ($F(2,25) = 25.099$, $p = <.001$, $\eta_P^2 = .668$) and

types of NSSI ($F(2,25) = 25.839$, $p = <.001$, $\eta_P^2 = .674$). Reductions across time from pre-

treatment to follow-up were also reported for emotion dysregulation ($F(2,25) = 37.170$, $p = <$ .001, $\eta_P^2 = .748$), emotional avoidance ($F(2,25) = 8.527$, $p = .002$, $\eta^2_P = .406$), depression ($F(2,25) = 29.479$, $p = < .001$, $\eta_P^2 = .702$), anxiety ($F(2,25) = 7.783$, $p = .002$, $\eta_P^2 = .384$), stress ($F(2,25) = 8.378$, $p = .002$, $\eta_P^2 = .401$) and parent ($F(2,25) = 8.779$, $p = .001$, $\eta_P^2 = .413$) and clinician ($F(2,25) = 9.198$, $p = .001$, $\eta_P^2 = .424$) rated mental health. There was no significant change in the participants overall family functioning across time from pre-treatment to follow-up, $F(2,25) = 1.804$, $p = .185$, $\eta_P^2 = .126$. As evidenced in Table 5, pairwise comparisons for all significant interactions showed significant reductions from pre-treatment to post-treatment and changes were maintained at follow-up 3-months later, except for anxiety and types of NSSI which continued to show a significant decline at follow-up.

Treatment Completion

Twenty-seven (96.4%) out of 28 participants recruited for the treatment condition completed the group. This was in addition to an average of 1.03 ($SD = 0.14$) weekly individual sessions (ranging from bi-weekly to fortnightly) as part of their TAU. Similarly, 26 (92.9%) of the 28 participants recruited for the control group were still seeing their usual community clinician post treatment and reported attending an average 0.92 ($SD = 0.02$) sessions per week. TAU was described similarly in both conditions as either supportive treatment for the adolescent, with or without their parent, or individual cognitive-behavioural work.

Treatment (ERg-A) Acceptability

More than 77% of participants rated the skills taught in the group as 'very helpful' or 'extremely helpful' with a mean helpfulness rating across treatment elements of 3.02 ($SD = 0.81$) on a scale from 1 (*not at all helpful*) to 4 (*extremely helpful*). Anecdotally the acceptance and value-based sessions generated the most enthusiasm in sessions with participants requesting to increase the amount of this content. Electronic and online media,

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Table 3

Means and standard deviations over time of outcome measures for the ERg-A plus TAU group and

TAU control group at pre-treatment, post-treatment and 3-month follow-up

		ERg-A +TAU (*n* = 27)			TAU (*n* = 26)	
		Pre-mean (SD)	Post-mean (SD)	Follow-up (SD)	Pre-mean (SD)	Post-mean (SD)
DSHI						
	Frequency of NSSI	240.33 (170.40)	20.22 (56.62)	7.04 (7.54)	162.54 (134.88)	33.38 (32.09)
	Different types of NSSI	7.52 (4.07)	3.19 (2.39)	2.04 (1.87)	4.31 (2.72)	3.85 (3.00)
DERS [a]						
	Total emotion dysregulation	139.67 (19.70)	118.19 (19.86)	111.48 (20.05)	129.23 (25.87)	133.50 (25.23)
	Acceptance	23.89 (5.44)	19.44 (5.04)	18.67 (4.59)	22.00 (6.88)	22.27 (6.35)
	Impulsivity	23.00 (5.93)	19.44 (5.58)	18.37 (6.03)	22.38 (5.78)	22.31 (5.48)
	Goals	22.56 (3.55)	19.78 (4.51)	19.22 (3.87)	21.50 (5.08)	21.85 (6.27)
	Awareness	20.70 (5.26)	18.41 (4.23)	17.07 (4.52)	19.73 (4.61)	20.35 (4.61)
	Strategies	33.33 (5.87)	26.78 (7.09)	24.59 (4.61)	29.65 (7.41)	29.08 (6.91)
	Clarity	17.41 (4.28)	14.96 (4.30)	14.41 (4.19)	16.50 (5.02)	17.62 (5.50)
AFQY-8	Avoidance	22.56 (6.43)	18.11 (5.79)	18.52 (6.84)	22.96 (4.27)	22.92 (4.18)
CAMM	Mindfulness	12.63 (7.81)	17.15 (6.41)	18.67 (7.02)	13.27 (6.88)	12.77 (6.63)
DASS						
	Depression	35.04 (6.69)	24.67 (9.22)	22.41 (8.85)	30.23 (8.14)	29.96 (8.19)
	Anxiety	27.26 (8.17)	24.74 (9.42)	21.93 (7.92)	22.27 (8.21)	22.08 (7.92)
	Stress	29.63 (8.40)	26.04 (8.30)	23.74 (9.40)	26.62 (7.78)	26.50 (8.04)
SDQ-P [b]	General mental health	18.89 (6.31)	15.70 (6.09)	15.70 (5.62)	17.15 (4.46)	16.81 (4.73)
CGAS [c]	General mental health	48.11 (10.17)	55.52 (7.05)	56.67 (7.60)	46.81 (8.99)	47.04 (8.93)
FAD-GF [b]	Family functioning	2.22 (0.78)	2.14 (0.79)	2.25 (0.74)	2.17 (0.62)	2.27 (0.63)

Note a. [a] DERS subscales: Total = overall difficulty with emotion regulation, Acceptance = non-acceptance of negative emotional responses, Impulsivity = difficulties controlling impulsive behaviors when distressed, Goals = difficulties engaging in goal-directed behaviors when distressed, Awareness = lack of emotional awareness, Strategies = limited access to effective emotion regulation strategies, Clarity = lack of emotional clarity. [b] Parent rated. [c] Clinician rated.

Note b. Pre-mean = lifetime NSSI frequency at baseline; Post-mean = NSSI frequency from baseline to post-treatment; Follow-up = NSSI frequency from post-treatment to follow-up 3 months later.

Table 4

Two-way ANOVAs of changes over time (pre- vs. post-treatment) between the treatment (ERg-A)

and control groups (N =53).

	Main effect across time			Between group difference		
	F (1,51)	p	η_P^2	F (1,51)	p	η_P^2
DSHI						
Frequency of NSSI	78.488	< .001	.606	1.777	.188	.034
Different types of NSSI	28.736	< .001	.360	3.052	.087	.056
DERS [a]						
Total emotion dysregulation	26.216	< .001	.340	.163	.688	.003
Acceptance	12.168	.001	.193	.094	.760	.002
Impulsivity	17.880	< 0.001	.260	.588	.459	.011
Goals	5.143	.028	.092	.166	.686	.003
Awareness	3.315	.075	.061	.161	.690	.003
Strategies	33.657	< .001	.398	.151	.699	.003
Clarity	1.711	.197	.032	.515	.476	.010
AFQY-8						
Experiential avoidance	14.762	< .001	.224	3.867	.055	.070
CAMM						
Mindfulness	20.928	< .001	.291	1.010	.320	.019
DASS						
Depression	41.125	< .001	.446	.014	.906	< .001
Anxiety	4.835	.032	.087	2.917	.094	.054
Stress	12.987	.001	.203	.344	.560	.007
SDQ-P						
General mental health [b]	12.842	.001	.201	.049	.825	.001
CGAS						
General mental health [c]	16.144	< .001	.240	4.774	.034	.086
FAD-GF						
Family functioning [b]	0.022	.882	< .001	.029	.865	.001

Note. [a] DERS subscales: Total = overall difficulty with emotion regulation, Acceptance = non-acceptance of negative emotional responses, Impulsivity = difficulties controlling impulsive behaviors when distressed, Goals = difficulties engaging in goal-directed behaviors when distressed, Awareness = lack of emotional awareness, Strategies = limited access to effective emotion regulation strategies, Clarity = lack of emotional clarity. [b] Parent rated. [c] Clinician rated.

metaphors and content that generated discussion around real-life social contexts and

dilemmas also generated positive feedback in the open comments.

Adherence to Follow-up Treatment in the Community

According to community clinicians there was no difference between groups in terms

of attendance at follow-up treatment in the community with the majority of participants in

both the treatment ($n = 19$) and control ($n = 20$) conditions attending regular community

therapy 3 months after the group treatment. Similarly, only 2 participants in the control

condition and 1 in the treatment condition were reported to have dropped out of care by the 3-

month follow-up. One participant in the control group did not attend any follow-up without

explanation (Graph 1).

Number of Psychiatric Hospitalisations Following Treatment

According to community clinician reports at follow-up, 1 participant from the

treatment group attended hospital once and 3 attended on two occasions, suggesting 23

participants did not need tertiary service contacts during this period. This compares

favourably to the control condition where 7 participants had one contact, 7 had two contacts,

3 required three contacts and a further 1 required more than three contacts (Graph 2). The

control group ($M = 1.31$, $SD = 1.16$) therefore required significantly more tertiary or

emergency service contacts than the treatment group ($M = 0.26$, $SD = 0.66$), $p = < 0.001$), in

the 3 months following treatment.

Frequency and Intensity of NSSI at Follow-up

As shown in Graph 3, community clinicians rated the frequency of NSSI at follow-up

to have *decreased* (71.43%) for the majority of their clients who had taken part in the ERg-A

treatment. A further 6 (21.43%) were reported to have *stayed the same* and 2 (7.14%)

increased in frequency. Whilst many clinicians felt unable to rate the intensity of their clients

NSSI accurately ($n = 13$), those that did ($n = 14$) reported that 5 (18.52%) ERg-A participants

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Table 5

Pairwise comparisons for all significant treatment (ERg-A) interactions from pre to post-treatment and from post to follow-up at 3-months.

		Pre to post treatment (*p*)	Post treatment to follow-up (*p*)
DSHI			
	Frequency of NSSI	< .001***	.231
	Different types of NSSI	< .001***	.015*
DERS [a]			
	Total emotion dysregulation	< .001***	.075
	Acceptance	< .001***	.222
	Impulsivity	< .001***	.175
	Goals	.002*	.327
	Awareness	.006*	.050
	Strategies	< .001***	.151
	Clarity	.004*	.423
CAMM	Mindfulness	< .001***	.189
AFQY-8	Experiential avoidance	.001**	.631
DASS			
	Depression	< .001***	.136
	Anxiety	.030*	.047*
	Stress	< .001***	.181
SDQ-P	General mental health [b]	.001**	1.000
CGAS	General mental health [c]	< .001***	.142

Note. [a] DERS subscales: Total = overall difficulty with emotion regulation, Acceptance = non-acceptance of negative emotional responses, Impulsivity = difficulties controlling impulsive behaviors when distressed, Goals = difficulties engaging in goal-directed behaviors when distressed, Awareness = lack of emotional awareness, Strategies = limited access to effective emotion regulation strategies, Clarity = lack of emotional clarity. [b] Parent rated. [c] Clinician rated.
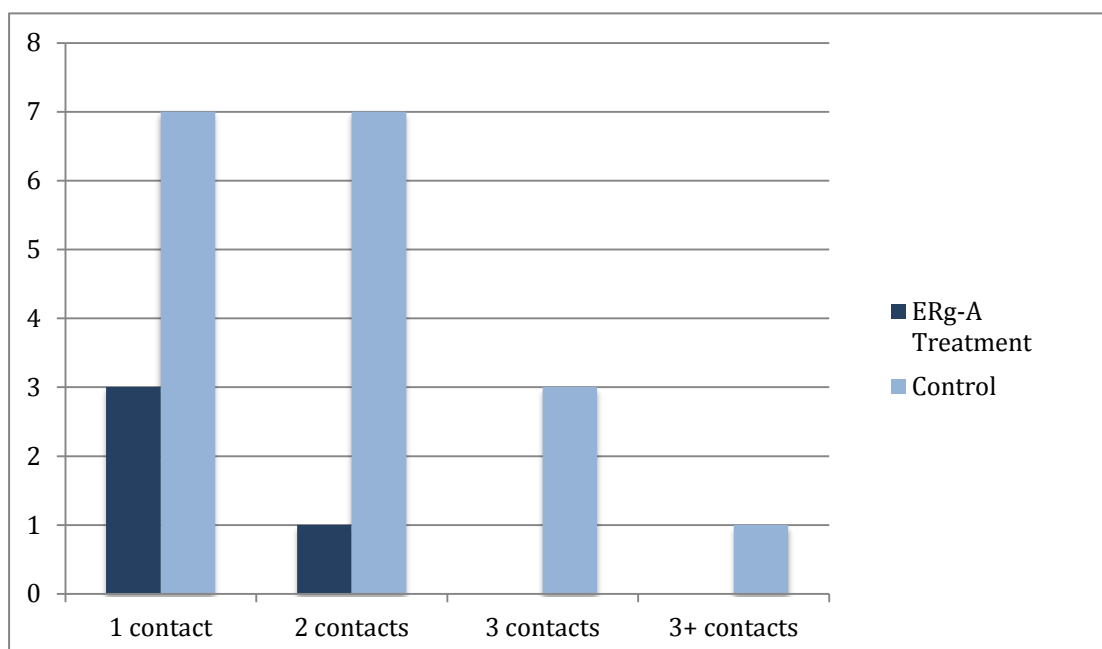* *p* < .05. ** *p* < .01. *** *p* < .001.

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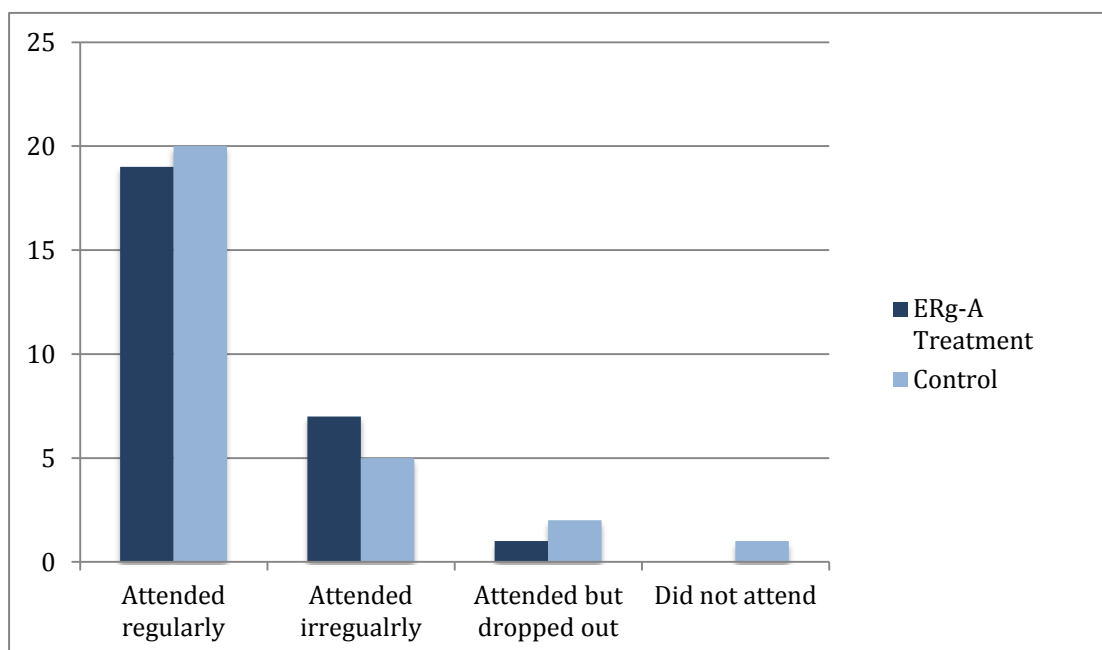
Graph 1. Number of participants in the ERg-A treatment group compared to the control group that either attended or dropped-out of ongoing community treatment at 3-month follow-up.

Graph 2. Number of tertiary service contacts (two or more nights in hospital or an inpatient setting) in the ERg-A treatment group compared to control group at 3-month follow-up.
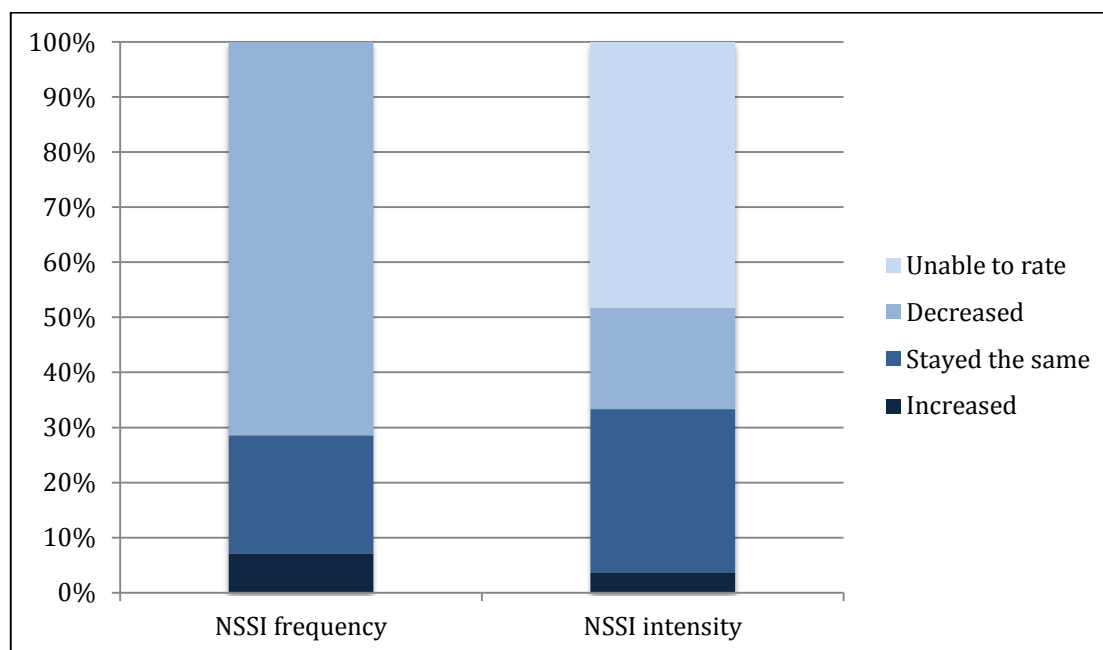
Graph 3. Clinician ratings of NSSI frequency and intensity by participants in the ERg-A treatment group at 3-month follow-up.

had *decreased* the intensity of their NSSI, 8 (29.63%) had *stayed the same* and 1 (3.70%) had

increased. No corresponding data was available for the control group for comparison.

Discussion

This is the first reported RCT of any treatment that has been developed to specifically

target NSSI in a clinical population of adolescents and the results are promising. Whilst both

groups improved over time, and despite greater symptomology reported pre-treatment, the

treatment group showed a significantly greater improvement from pre-to-post treatment on

frequency and type of NSSI, emotion dysregulation (all 6 subscales), experiential avoidance,

depression, stress and mindfulness compared to TAU. Importantly, these gains were all

maintained by the treatment group 3 months later. These results were not only statistically but

clinically relevant with improvements in the treatment group corroborated by both parent and

clinician reports of general mental health and clinician observations of intensity and

frequency of NSSI after the trial period. Most participants (77%) in the treatment group also rated the group content as 'helpful' or 'extremely helpful'. The reduction in NSSI as well as depression is particularly promising because the presence of depression with NSSI has been shown to be predictive of future NSSI, treatment response and possibly future suicide attempts (Asarnow et al., 2011; Wilkinson, Kelvin, Roberts, Dubicka & Goodyer, 2011). There is also a high comorbidity between depression and NSSI (Green et al., 2011), as evidenced by all participants in this study, and previous trials of specialist treatments have not been able to show a reduction in both constructs more than TAU (Ougrin, Tranah, Leigh, Taylor, Asarnow, 2012). The results also extend current NSSI theory and research in adult populations that underscore the importance of targeting emotion regulation in short-term treatments (Gratz & Tull, 2011), and adds to the adolescent NSSI literature as previous trials have failed to specifically target NSSI (Russouw & Fonagy, 2012; Wood et al., 2001), could not be shown to be superior to treatment as usual (Katz et al., 2004), or have required between 14 weeks to 12 months to demonstrate an effect (Gratz et al., 2011; Katz et al., 2012; Rossouw et al, 2012). Successful implementation in adult populations have been attributed to the treatments grounding in acceptance based theory and their emphasis on engaging in actions consistent with valued directions, which is similar to the behavioural activation thought to be the active ingredient in brief CBT for depression (Gratz et al., 2011). Given the similar emphasis in EAg-R, this may be one reason for the positive outcomes observed, especially given that the exploration of values and value-based living are important developmental tasks for adolescents (Gratz et al., 2006). This is supported by the ERg-A participants evidencing a significant increase on the 'Acceptance' and 'Goals' subscales of the DERS, improvements in their capacity for mindfulness on the CAMM, and reduction in their avoidance on the AFQ, as well as anecdotal feedback highlighting the valued-direction and acceptance modules as most informative and motivating (Donnelly, Schniering, Rappee, 2015c). Similarly, the treatment groups significant improvement on the 'Strategy' subscale of

the DERS corroborates previous findings that highlight the importance of treatments that

promote the acquisition of adaptive skills to replace the NSSI behaviours (Donnelly et al.,

2015). This may be a particularly crucial target of treatment for adolescent populations given

that learning adaptive management skills for experiences such as emotional distress are key

developmental tasks of this age group. Interestingly, the DERS subscales that measure a lack

of emotional 'Awareness' and 'Clarity' did not change significantly in either group.

Awareness and clarity of emotions are pre-requisites to all the other dimensions of emotion

regulation that showed a significant change over time such as non-acceptance of negative

emotions, learning adaptive emotion regulation strategies, controlling impulsivity when

distressed and the ability to engage in goal-directed behaviours when distressed. It may

therefore simply be the case that these specific constructs or dimensions of emotion regulation

are less impaired or play a relatively less important role in this clinical population. This

tertiary care population may also simply be more educated in this content given their likely

exposure to previous treatments. Isolation and clarification of the active ingredients of ERg-A

will be important for future studies.

Given the ongoing challenge of keeping adolescents in treatment and the inevitable

link between dropout and high rates of relapse and readmissions (Burns, Dudley, Hazell, &

Patton, 2005), ERg-A seems to be highly acceptable to adolescents and retains them in

treatment (96.5%). Whilst attendance at TAU in the control group was only slightly lower

(92.6%), this condition cannot be directly compared given the control group were engaged in

their TAU and awaiting a place in a highly regarded tertiary care unit. In contrast the

treatment group had to attend the group over and above their usual community sessions and

overcome the logistical barriers typical to adolescent outpatient therapy such as transport

logistics and competition from more attractive social activities and engagements. Although

this may be a reflection of the group's relatively short duration, it may also reflect the social

reinforcers provided by the group format or the adolescent-friendly content and format of

materials which participants said where engaging and attractive. The inclusion of DBT-A treatment targets and strategies may also have played a role in this regard as they have been reported as crucial in helping to engage, validate and maintain highly distressed young people in treatment (Miller et al, 2006). Pre-group procedures and the orientation and commitment session that were geared towards enhancing both adolescent and parent motivation and engagement may also have played a role. Again, it is reliant on future trials to confirm which factors contributed to the acceptability and completion rates observed.

The majority of participants from both groups were still in ongoing community treatment at 3-month follow-up. Importantly, the treatment group did not only continue successfully with ongoing care but were significantly less reliant than the control group on emergency and inpatient services during this period. What aspect of ERg-A led to this change cannot be determined from the data collected. It may be a specific clinical factor such participants beginning to trust and rely on newly acquired strategies or using appropriate community networks for support. It may also be the result of a non-specific factor such as the comprehensive care coordination at the start and end of the ERg-A treatment. It will be important to understand what allowed for this crucial outcome as reduced reliance on crisis and tertiary services suggest that the ERg-A group could have both clinical and economic value for healthcare services.

The groups did not demonstrate significant difference in terms of anxiety, but both groups evidenced a reduction in anxiety over the course of the treatment that continued to show a decline at follow-up. Anxiety has shown strong associations to NSSI in adolescents, or more specifically to the emotional arousal that often prompts the behaviour (Glen & Klonsky, 2014), yet there was no significant change compared to controls despite the treatment group specifically targeting NSSI. Interesting, the trial of another treatment specifically targeting adolescent self-harm (suicidal behaviours and NSSI) significantly reduced trait but not state anxiety (Taylor et al., 2011). It may be that being engaged in any

treatment and the support this provides is an anxiety-reducing factor in itself, but that chronic anxiety requires longer or more targeted intervention. Further clarification of the role played by anxiety in adolescent NSSI is required. Family functioning did not show any significant change over time for either group. This may be due to the individual focus of the treatment, its brevity or the broad scale measure (FAD-GF) that may not have captured potentially discrete changes in likely complex family dynamics. This does not dispute the importance of family-focused approaches in the treatment of adolescent NSSI, but rather highlights family work, along with other social and functional impairments known to require longer-term approaches (Green et al., 2011) as key targets for ongoing community treatment. Whilst families and parents are not directly targeted in the treatment, ERg-A does aim to introduce, orientate and motivate them to their ongoing role in the adolescent getting and staying well. Orientation and completion sessions are geared towards communicating to families their crucial roles given that they form the adolescents major support and/or response network and one of the most important environments they have to generalise their skills to. Interestingly a treatment for adolescent self-harm (Taylor et al., 2011) using an optional parent group comprising 3 psychoeducation sessions showed no significant impacts and low uptake. Finding ways to encourage parental and family involvement, and identifying content that is effective and appealing, needs further consideration.

It is important to reiterate that whilst the ERg-A treatment group were not symptom free after the treatment or at the 3-month follow-up on any of the outcome measures, the treatment did not aim for complete recovery but rather a reduction in the adolescents distress to levels that would allow for discharge from hospital into follow-up community care. There is a fine balance between keeping a young person in hospital long enough to ensure they are safe and adequately equipped to cope with real-life stress in the community, and short enough so as not to set them up to become reliant on hospital staff and services. Economic and administrative restrictions on costly inpatient services will inevitably play and increasingly

role in these decisions, but as rates of NSSI in clinical adolescent populations continue to rise, and the challenges of treating them remain ever present, it is imperative that effective and feasible interventions are made available. ERg-A may be one such intervention.

Limitations and Future Research

Although these findings are promising, they need to be considered in light of several limitations. The key limitation to this study is that the randomisation led to pre-treatment scores of the treatment group that were more severe than the control group for several of the outcome measures raising the possibility that the different rates of change between the groups were due to statistical artifact such as regression to the mean. However, some evidence suggests that the greater improvement shown by the treatment group is a real treatment effect. First, the treatment group improved significantly more than the control group on post-group scores on a number of relevant variables (i.e. emotion dysregulation, experiential avoidance and depression) limiting the likelihood that regression to the mean or floor effects were the cause of the conclusions. The fact that NSSI frequency and type did not show an equivalent change is interesting. Exploration of the qualitative feedback from participants suggests this may be due to "habit" and not feeling able to trust their newly acquired skills yet, so that whilst a shift in how the participant manages their internal distress has been made, they are not yet ready to give up on known and trusted regulatory methods. The fact that NSSI types, which have been inked to severity (Lloyd-Richardson, 2005), continued to show a significant decline at follow up, supports this possibility and the idea that giving up NSSI may be a somewhat gradual process as the young person comes to trust new skills and notice the longer term positive impacts of these. Whilst indirect, this is further supported by clinician reports suggested 43% of their clients showed a reduction in frequency of NSSI behaviours at follow-up. The fact that self-reported NSSI frequency did not show a continued decline at follow-up is a concern as it too is a measure of NSSI severity (Gratz, 2001). Longer-term studies will be

crucial to understanding the course of NSSI abstinence following treatment. Further evidence that the treatment results were not due to statistical artifact lies in the number of emergency service contacts reported at follow-up. These contacts were significantly lower in the treatment group than the control group suggesting that, despite the NSSI frequency scores, there were important functional changes that resulted from the ERg-A intervention. Also, there were no between-group differences on baseline scores in terms of how long the groups had struggled with reported difficulties, number of professionals seen for help or hours spent in treatment per week, or in terms of emergency service contacts or inpatient hospital stays in the previous year as a result of these difficulties, suggesting symptom severity may be more similar between groups than initially reported by the participants.

A second study limitation is the small sample of participants that limits our confidence in the generalisability of the results. Fortunately, effect-sizes were robust and there was sufficient power to detect them despite the size of the sample, but a larger study would yield more precise findings and more reliably estimate the efficacy of the intervention.

Finally, despite finding measurable short-term changes in outcome measures, questions remain regarding the transportability and viability of these improvements. The sample was a relatively homogenous group recruited from only one district health service. Despite clinicians of varying disciplines and experience being recruited to run the ERg-A groups, it is not clear whether these results would be seen in other clinical settings with other clinicians leading the groups and more diverse populations. To give one example, the treatment only attracted 1 male and given that recent findings show similar prevalence of NSSI in males and females (Briere & Gil, 1998; Whitlock, Eckenrode, & Silverman, 2006), its impacts on male participants is an important pending question. Furthermore, cost-effectiveness is an important indicator of feasibility, and whilst ERg-A was developed and designed to be a low resource approach, the results do not provide any meaningful conclusion about the cost-effectiveness of the treatment. Given the focus on viability and transportability

of treatment across public and other mental health care services, a cost-analysis will be useful to carry out in future. Sustainability of changes in the community is also a crucial factor and whilst the maintenance of gains at 3-months is encouraging, studies with longer-term follow-up will be important.

Clinical Implications

With prevalence rates of adolescents reporting to hospitals with NSSI steadily increasing, health care costs rising precipitously, and availability of hospital beds decreasing (Ritschel, Cheavens, & Nelson, 2012), it is incumbent upon the field to devise empirically supported and viable treatment options that meet the needs of these at risk young people and the services that treat them. To date no such treatment is available, so that clinicians are forced to rely predominantly on adult centred treatment approaches, that target broadly related presentations such as BPD, and that have timescales and complexity that are more conducive to outpatient and community models. Clinical and economic relevance underscored the development of a viable treatment approach that specifically targeted this increasingly problematic presentation in adolescent populations. This study suggests that a brief group treatment that is highly targeted and thoughtfully designed may be an effective adjunct to treatments in real-world settings. Given ERg-A is a brief, group-only approach that relies on few resources, it has the potential to reach high numbers of patients and can be implemented with relative ease and speed into routine clinical practice across a range of public healthcare settings. Importantly participants completing the group appear to be equipped to engage with ongoing community care and are less reliant on emergency services. This is a crucial outcome both fiscally for healthcare services, but more importantly, prognostically in terms of the young persons' academic, emotional, social and psychological well-being.

STUDY FOUR: RCT BRIEF GROUP TEATMENT

References

Aaron, L., Hornberg, R., & Duckworth, K. (2009). Grading the states 2009: Reporting on the health of America's mentally ill. *A report on America's health care system for adults with serious mental illness*. Retrieved from http://www.nami.org/gtsTemplate09.cfm?Section=Grading_the_States_2009

Antony, M, Bieling, P., Cox, B., Enns, M., & Swinson, R. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10,* 176-181.

Asarnow, J. R., Porta, G., Spirito, A., Emslie, G., Clarke, G., Wagner, K., Vitiello, B., Keller, M., Birmaher, B., McCracken, J., Mayes, T., Berk, M., & Brent, D. (2011). Suicide attempts and nonsuicidal self-injury in the treatment of resistant depression in adolescents: Findings from the TORDIA study. *Journal of the American Academy of Child & Adolescent Psychiatry, 50,* 772–781.

Bateman, A., & Fonagy, P. (1999). Effectiveness of partial hospitalization in the treatment of borderline personality disorder: A randomized controlled trial. *American Journal of Psychiatry, 156,* 1563-1569.

Bateman, A., & Fonagy, P. (2008). 8-year follow-up of patients treated for borderline personality disorder: Mentalization-based treatment versus treatment as usual. *American Journal of Psychiatry, 165,* 631-638.

Brausch, A., & Girresch, S. (2012). A Review of Empirical Treatment Studies for Adolescent Nonsuicidal Self-Injury. *Journal of Cognitive Psychotherapy, 26(1),* 3-18.

Briere, J., & Gil, E. (1998). Self-mutilation in clinical and general population samples: Prevalence, correlates, and functions. *American Journal of Orthopsychiatry, 68*, 609–620.

Brown, T., Chorpita, B., Korotitsch, W., & Barlow, D. (1997). Psychometric properties of the

Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research

and Therapy, 35,* 79–89.

Burns, J., Dudley, M., Hazell, P., & Patton, G. (2005). Clinical management of deliberate

self-harm in young people: the need for evidence-based approaches to reduce

repetition. *Australia and New Zealand Journal of Psychiatry, 39(3),* 121-128.

Byles, J., Byrne, C., Boyle, M., & Offord, D. (1988). Ontario Child Health Study –

reliability and validity of the General Functioning subscale of the McMasters

Family Assessment Device. *Family Process, 27,* 97-104.

Chapman, A., Gratz, K., & Brown, M. (2006). Solving the puzzle of deliberate self-harm: The

experiential avoidance model. *Behaviour Research and Therapy, 44,* 371-394.

Crowe, M., & Bunclark, J. (2000). Repeated self-injury and its management. *International

Review of Psychiatry, 12,* 48-53.

Darche, M. (1990). Psychological factors differentiating self-mutilating and non-self-

mutilating adolescent inpatient females. *The Psychiatric Hospital, 21,* 31–35.

DiClemente, R., Ponton, L., & Hartley, D. (1991). Prevalence and correlates of cutting

behavior: Risk for HIV transmission. *Journal of the American Academy of Child and

Adolescent Psychiatry, 30,* 735–739.

Donnelly, H. (2014). Emotion Regulation group for Adolescents (ERg-A). Unpublished

manual. Department of Psychology, University of Macquarie, Sydney, University.

Donnelly, H., Schniering, C., & Rapee, R. (2015a). The current status of evidence-based

treatments available to adolescents who presents to hospital with nonsuicidal self-

injury: A critical review, Department of Psychology, University of Macquarie,

Sydney, University.

Donnelly, H., Schniering, C., & Rapee, R. (2015b). Examining the function of emotion

dysregulation in adolescent referred to hospital with non-suicidal self-injury compared

to a non-clinical control group. Unpublished manuscript, Department of Psychology,

University of Macquarie, Sydney, University.

Donnelly, H., Schniering, C., & Rapee, R. (2015c). Development of a brief group treatment

manual for adolescents in hospital with nonsuicidal self-injury, Department of

Psychology, University of Macquarie, Sydney, University.

Epstein, N., Baldwin, L., & Bishop, D. (1983). The McMasters Family Assessment Device.

Journal of Marital and Family Therapy, 9 (2), 171-180.

Evans, K., Tyrer, P., Catalan, J., Schmidt, U., Davidson, K., Dent, J., Tata, P., Thornton, S.,

Barber, J., & Thompson, S. (1999). Manual-assisted cognitive-behaviour therapy

(MACT): a randomized controlled trial of a brief intervention with bibliotherapy in

the treatment of recurrent deliberate self-harm. *Psychological Medicine, 29*, 19–25.

Favazza, A., & Rosenthal, R. (1993). Diagnosis issues in self-mutilation. *Hospital and

Community Psychiatry, 44,* 134-40.

Fischer, G., Brunner, R., Parzer, P., Resch, F., & Kaess, M. (2013). Short-term

psychotherapeutic treatment in adolescents engaging in non-suicidal self-injury: a

randomized controlled trial. *Trials, 14(1),* 294-300.

Fleischhaker, C, Bohme, R., Sixt, B., Bruck, C., Schneider, C., & Schulz, E. (2011).

Dialectical behaviour therapy for adolescents (DBT-A): a clinical trial for patients

with suicidal and self-injurious behavior and borderline symptoms with a one-year

follow-up. *Child and Adolescent Psychiatry and Mental Health, 5(3),* 1-10.

Gonzales, A., & Bergstrom, L. (2013). Adolescent non-suicidal self injury (NSSI)

interventions. *Journal of Child and Adolescent Psychiatric Nursing, 26*, 124-130.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal

of Child Psychology and Psychiatry, 38,* 581-586

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 40(11),* 1337-1345.

Gratz, K. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate self-harm Inventory. *Journal of Psychopathology and Behavioral Assessment, 23,* 253-263.

Gratz, K. & Gunderson, G. (2006). Preliminary data on an acceptance-based emotion regulation group intervention for deliberate self-harm among women with borderline personality disorder. *Behavior Therapy, 37,* 25-35.

Gratz, K. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26,* 41-54.

Gratz, K., & Tull, M. (2011). Extending research on the utility of an adjunctive emotion regulation group therapy for deliberate self-harm among women with borderline personality pathology. *Personality Disorders: Theory, Research and Treatment, 2(4),* 316-326.

Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood and adolescence: Development and evaluation of the Avoidance and Fusion Questionnaire for Youth. *Psychological Assessment, 20(2)*, 93-102.

Greco, L., Baer, R., & Smith, G. (2011). Assessing Mindfulness in Children and Adolescents: Development and Validation of the Child and Adolescent Mindfulness Measure (CAMM). *Psychological Assessment, 23(3),* 606-614.

Green, J., Wood, A., Kerfoot, M., Trainor, G., Roberts, C., Rothwell, J., … & Harrington,

R. (2011). Group therapy for adolescents with repeated self-harm: randomised

controlled trial with economic evaluation. British Medical Journal, 342, 1-12.

doi:10.1136/bmj.d682

Gunderson, J. G. (2001). *Borderline personality disorder: A clinical guide.* Washington, DC:

American Psychiatric Press.

Hayes, S., Strosahl, K., & Wilson, K. (1999). *Acceptance and commitment therapy: An

experiential approach to behavior change*. New York: Guilford Press.

Katz, L., Cox, B., Gunasekara, S., & Miller, A. (2004). Feasibility of dialectical behavior

therapy for suicidal adolescents. *Journal of the American Academy of Child and

Adolescent Psychiatry, 43(3),* 276-282.

Klonsky, D., & Muehlenkamp, J. (2007). Self-injury: A Research review for the practitioner.

Journal of Clinical Psychology, 63 (11), 1045-1056.

Klonsky, D., Oltmanns, T., & Turkheimer, E. (2003). Deliberate self-harm in a nonclinical

population: prevalence and psychological correlates. *American Journal of Psychiatry,

160 (8),* 1501-1508.

Koons, C., Robins, C., Tweed, J., Lynch, T., Gonzelez, A., Morse, J.. (2001). Efficacy   of

dialectical behavior therapy in women veterans with borderline personality   disorder.

Behavior Therapy, 32, 371–390.

Lengel, G., & Mullins- Sweatt, S. (2013). Nonsuicidal self-injury: Clinician and expert

ratings. *Psychology Research, 210,* 940-944.

Linehan, M. (1993). *Skills Training Manual for Treating Borderline Personality Disorder*.

New York: Guilford Press.

Linehan, M., Comtois, K. , Murray, A., Brown, M., Gallop, R., Heard, H., … &

Lindenboim, N. (2006). Two-year randomized controlled trial and follow-up of

dialectical behavior therapy vs therapy by experts for suicidal behaviors and

borderline personality disorder. *Archives of General Psychiatry, 63,* 757–766.

Lomonaco, S., Scheidlinger, S., & Aronson, S. (2000). Five decades of children's group

treatment – an overview. *Journal of child and Adolescent Group Therapy, 10(2),* 77-96.

Lovibond, S., & Lovibond, P. (1995). *Manual for the Depression Anxiety Stress* Scales, 2nd

Ed. Sydney: The Psychological Foundation of Australia.

Lundhi, L., Karim, J., Quilisch, E. (2007). Deliberate self-harm in 15-year-old adolescents: A

pilot study with a modified version of the deliberate Self-harm Inventory.

Scandinavian Journal of Psychology, 48, 33-41.

Miller, M., Rathus, J., & Linehan, M. (2006). *Dialectical Behaviour Therapy with Suicidal

Adolescents.* New York: Guilford.

Messer, J., & Fremouw, W. (2008). A critical review of explanatory models for self-

mutilating behaviours in adolescents. *Clinical Psychology Review, 28*, 162-178.

Moran, H., Pathak, N., & Sharma, N. (2009). The mystery of the well-attended group: a

model of personal construct therapy for adolescent self-harm and depression in a

community CAMHS service. *Counselling Psychology Quarterly, 22(4),* 347-359

Najavits, L., Weiss, R., Liese, B. (1996). Group cognitive-behavioral therapy for Neumann,

A., C van Lier, P., Gratz, K., & Koot, H. (2010). Multidimentional Assessment of

Emotional Regulation Difficulties in Adolescents using the Difficulties in Emotion

Regulation Scale. *Assessment, 17,* 138-149.

National Institute for Health and Clinical Excellence. (2006). *Depression in children and

young people: Identification and management in primary, community and secondary

care.* London: NICE.

Neumann, A., van Lier, P., Gratz, K., & Koot, H. (2010). Multidimensional assessment of emotion regulation difficulties in adolescents using difficulties in emotion regulation scale. *Assessment, 17(1),* 138-149.

Nock, M. (2009). Why do people hurt themselves? New insights into the nature and function of self-injury. *Current Directions in Psychological Science, 18,* 78-83.

Nock, M. (2010). Self-Injury. *Annual Review of Clinical Psychology, 6,* 339-363.

Ougrin, D., & Latif, S. (2011). Specific psychological treatment versus treatment as usual in adolescents with self-harm. *Crisis, 32,* 74–80.

Ougrin, D., Tranah, T., Leigh, E., Taylor, L. & Asarnow, J. (2012). Practitioner review: Self-harm in adolescents. *Journal of Child Psychology and Psychiatry, 53,* 337–350.

Ougrin, D., Zundel, T., Ng, A., Banarsee, R., Bottle, A., & Taylor, E. (2011). Trial of therapeutic assessment in London: Randomised con- trolled trial of therapeutic assessment versus standard psychosocial assessment in adolescents presenting with self-harm. *Archives of Disease in Childhood, 96,* 148–153.

Rathus, J., & Miller, A.L. (2002). Dialectical Behaviour therapy adapted for suicidal adolescents. *Suicidal and Life Threatening Behavior, 32,* 146-157.

Ritschel, L., Cheavens, J., & Nelson, J. (2012). Dialectical behaviour therapy in an intensive outpatient program with a mixed diagnostic sample. *Journal of Clinical Psychology, 68(3)*, 221-235.

Ross, S., & Heath, N. (2002). A study of the frequency of self-mutilation in a community sample of adolescents. *Journal of Youth and Adolescence, 31*, 67-77.

Rossouw, T., & Fonagy, P. (2012). Mentalization-based treatment for self-harm in adolescents: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 51(12),* 1304-1313.

Shaffer, D., Gould, M., Brasic, J., Ambrosini, P., Fisher, P., Bird, H., & Aluwahlia, S. (1983). A Children's Global Assessment Scale (CGAS). *Archives of General Psychiatry, 40(11),* 1228-1231.

Semmens, A., & Powell, C. (2009). Study of self-harm in children and young people: do we follow the NICE guidelines? *The Welsh Paediatric Journal, 31*, 17-19.

Skegg, K. (2005). Self-harm. *The Lancet, 366*, 1471-1483.

Spirito, A., Plummer, B., Gispert, M., Levy, S., Kurkjian, J., Lewander, W., … & Devost, L. (1992). Adolescent suicide attempts: outcomes at follow-up. *American Journal of Orthopsychiatry, 62,* 464–468

Taylor, L., Oldershaw, A., Richards, C., Davidson, K., Schmidt, U., & Simic, M. (2011). Development and pilot evaluation of a manualized cognitive-behavioral treatment package for adolescent self-harm. *Behavioural and Cognitive Psychotherapy, 39,* 619-625.

Verheul, R., Van Den Bosch, L., Koeter, M., De Ridder, M., Stijnen, T., & Van Den Brink, W. (2003). Dialectical behaviour therapy for women with borderline personality disorder: 12-month, randomised clinical trial in The Netherlands. *British Journal of Psychiatry,182*, 135–40.

Washburn, J., Richardt, S., Styer, D., Gebhardt, M., Juzwin, K., Yourek, A., Aldridge, D. (2010). Psychotherapeutic approaches to nonsuicidal self-injury in adolescents. *Child and Adolescent Psychiatry and Mental Health, 6(14),* 1-8.

Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious behaviors in a college population. *Pediatrics, 117,* 1939–1948.

Wilkinson, P., Kelvin, R., Roberts, C., Dubicka, B., & Goodyer, I. (2011). Clinical and psychosocial predictors of suicide attempts and nonsuicidal self-injury in the Adolescent Depression Antidepressants and Psychotherapy Trial (ADAPT). The *American Journal of Psychiatry, 168(5),* 495–501.

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Wood, A., Trainor, G., Rothwell, J., Moore, A., Harrington, R. (2001). Randomized trial of

group therapy for repeated deliberate self-harm in adolescents. *Journal of the

American Academy of Child and Adolescent Psychiatry, 40,* 1246-1253.

Nonsuicidal self-injury (NSSI) is one of the most pervasive and understudied mental health phenomena. Its rate of occurrence in general, and in clinical adolescent populations in particular, is concerning and may continue to increase. There is an equally concerning lack of effective treatment options available to front line clinicians. Developing a reliable and feasible treatment for this complex behaviour is now a priority for researchers and underscored the series of studies in this thesis. Commencing with a review of the current status of clinical treatment efforts to date, this thesis worked toward a treatment approach that has the potential to meet the economic and clinical demands that currently face the NSSI community. Following is a summary of these efforts, the key findings, and take-home messages. Implications and recommendations for clinical practice are made in the context of the existing healthcare service provision, future need, and in light of the studies limitations.

Key Findings

Four key findings can be summarised from the studies in this thesis and the existing literature:

Study 1. NSSI is most prevalent in clinical adolescent populations, but there is currently no efficacious or feasible treatment to offer when they present to tertiary healthcare services.

Study 2. Adult theoretical models of NSSI point to emotion regulation as the primary functional target for treatment and this is corroborated in adolescent populations.

Study 3. The Emotion Regulation Group for Adolescents (ERg-A) is a brief, developmentally appropriate and manualised treatment that directly targets the primary function of NSSI in a manner that is accessible to tertiary public healthcare providers.

Study 4. A randomised controlled trial of ERg-A resulted in measurable positive changes on a number of key constructs of NSSI theory, and a larger Stage II efficacy trial is indicated.

DISCUSSION

Summary of Research Findings

Study 1: The Current Literature Base for the Treatment of Adolescent NSSI

The dire state of this body of research was clarified in this initial study. Very few adolescent NSSI studies have been published. Those that have been published provide limited empirical guidance and are stymied by terminology problems that litter the literature. Encouragingly, this need has been identified and multiple NSSI-related study grants have been awarded and are currently underway. The outcomes of these will inevitably take time, and in the interim, the number of presentations continue to rise, pressure on hospital beds continues to increase, and clinicians need guidance. The best the available literature has to offer in terms of viable and evidence-based interventions points to brief approaches (Gratz & Gunderson, 2006; Katz, Cox, Gunasekara, Miller, 2004; Wood, Trainor, Rothwell, Moore, & Harrington, 2001) that are reasonably easy and cost-effective to implement and can be clinically effective. Building on the best of the past, namely, cognitive behaviour theray (CBT), they add new wisdom from Dialectical Behaviour Therapy (DBT; Linehan, 1993), Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2001) and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) to arrive at treatments that are theoretically sound, highly targeted, and principle driven. Importantly, researchers and treatment developers are beginning to consider these approaches in the context of real-world clinical settings. The future of treatment effectiveness and fidelity relies on a balance between good quality theory and research and the very real challenges of dissemination and implementation into clinical practice.

Study 2: Theoretical Models of NSSI in Adolescent Populations

Brief treatments rely on precise theoretical models to draw from. Whilst limited attention has been given to adolescent NSSI in the literature in general, the adult literature has made progress in terms of our theoretical understanding of NSSI and is a sensible place from which to build this foundation. This body of research has resulted in a handful of key

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integrated theoretical models (Chapman, Gratz, & Brown, 2006; Nock & Prinstein; 2004, 2005; Yates, 2004; Yip, 2005), all of which highlight the primary function of emotion dysregulation, and probably emotional avoidance, in the development and maintenance of NSSI. Study 2 adds to this body of work by suggesting this theory may also be relevant to adolescent populations given that emotion regulation and emotional avoidance significantly differentiated a non-clinical control group from an age and gender-matched group of adolescents with NSSI. The study also suggests that subtle differences in line with developmental phase, such as the importance of skill acquisition and learning at this age, will be important to distinguish in adolescent models.

Study 3: The Emotion Regulation Group for Adolescents (ERg-A)

The ERg-A was developed with some key aims in mind. Firstly, it aimed to target the population of adolescents who present to hospital with NSSI. As such, it needed to be brief, effective and deliverable in an often highly stressed and under-resourced environment. This required a thoughtful balance of its structure and format with a well-defined and highly specified clinical target. Stage Model theory provided the framework on which to achieve these aims so that the Stage I ERg-A manual is grounded in the most efficacious theory to date and allows for real-world implementation and clinician skill. Importantly, it now invites both empirical and practical scrutiny by researchers and clinicians alike.

Study 4: A Randomised Controlled Trial of ERg-A

Preliminary results support the efficacy of this brief, group-based intervention for adolescent NSSI. It appears to effectively target the primary functions of emotion dysregulation, and emotional avoidance, as well as depression which is a commonly co-occurring factor that can contribute to its severity and chronicity (Green et al., 2011; Kerfoot, 1996). Importantly it was deemed highly acceptable to the adolescent participants who were retained in treatment. It may also contribute to retention in ongoing community treatment and

reduce the need for future crisis and inpatient services. These outcomes provide a strong basis

for further efficacy studies that can account for its limitations.

Theoretical Implications of Findings

The most consistent and worrying conclusion from this thesis is that there is currently

no compelling evidence for a validated intervention for NSSI in clinical populations of

adolescents. As demonstrated in Study 1, efforts have been made to modify treatments that

have shown efficacy in related fields (Brent, et al., 2008; Fischer, Brunner, Parzer, Resch, &

Kaess, 2013; Fleischhaker et al., 2011) and in the adult sector (Gratz et al., 2006; Andover &

Gibb, 2010; Andover, Schatten, Morris, & Miller, 2014). However, despite clinical trials that

show receiving specific forms of these treatments show some decrease in NSSI, changes

observed in experimental conditions have not been significantly greater than in control

conditions (DBT-A) or results are still preliminary (T-SIB and MACT). The length and

complexity of many of these approaches also limit them to facilities that are not restricted by

admission length or resources and hence the majority of tertiary care services. This thesis

makes a few key contributions to this literature, not least its effort in initiating the challenging

task of finding a treatment solution for adolescents with NSSI in tertiary care.

Evidence-based theories and models are a crucial part of treatment development and

have led to encouraging progress in adult populations. This research contributes to the

literature by beginning to bring adolescent theory up-to-date and in line with this movement.

It lends support to NSSI theories that prioritise emotion regulation and add to the literature the

likelihood that they are equally applicable to adolescents. Of these models, the *Experiential

Avoidance Model* (EAM; Chapman et al., 2006) appears to be a useful basis from which to

continue this work as it integrates many aspects of leading explanatory models (Klonsky,

2007; Messer & Fremouw, 2008), overcomes key nosological problems by explicitly defining

and targeting NSSI, and emphasises the functional rather syndromal nature of NSSI. A

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functional model is more applicable to the developmental tasks of adolescents and

informative in terms of treatment targets. EAM researchers are also beginning the important

task of identifying the actual mechanisms by which NSSI achieves emotion regulation, with

current research pointing to experiential avoidance as a likely contender (Chapman et al.,

2006). Consistent with EAM theory in adults, all dimensions of emotion regulation appear to

be important targets of adolescent treatments, but in contrast, the acquisition of adaptive and

effective regulatory skills may be particularly crucial to adolescent models. Interestingly, the

somewhat challenging skill of acceptance, prioritised by many new wave approaches and

ERg-A, appears to be both effective and attractive to this age group. As with all adolescent

treatment adaptations, motivation and commitment strategies and age-appropriate formats and

content will be crucial to future treatments' to enhance retention and positive outcomes in this

population.

The findings from this research also support previous studies (Bannan, 2010; Gratz et

al., 2006; Wood et al., 2001) that show that brief, group-formats can be effective with this

population. This is important as the potential reach, viability and acceptability of new

treatments will play an increasingly relevant role and dictate whether they are adopted by

public healthcare facilities. A manualised approach was also considered crucial because

manuals are often required by research and funding bodies, they enhance treatment fidelity,

and they encourage uptake through ease of training and implementation.

Finally, in contrast to the vast majority of studies in the NSSI literature, this research

program made a considered effort to model consistency in terminology and behavioural

definitions by investigating and targeting NSSI behaviours specifically throughout the thesis.

Practical Implications of Findings

The preceding studies suggest the potential of significant progress following a highly-

targeted, short-term group treatment that can be operated with limited resources and minimal

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burden on young patients and pressured clinicians. This development is timely, given the

substantial impact that adolescent NSSI is having on the healthcare system with suggestions

that less than 10% of management decisions concerning NSSI are cost effective in terms of

clinical and health service outcomes and less than half of these patients receive appropriate

psychosocial care in the emergency departments ("SCIE Research Briefing 16", 2005). One

of the primary reasons for this is that healthcare providers are burdened by a tremendous

pressure to provide high-quality treatments paired with increasing budget cuts to mental

health services (Aaron, Hornberg, & Duckworth, 2009), and the expectation of reduced

psychiatric inpatient length of stays and referrals to less costly and restrictive settings

(Salinsky & Loftis, 2007). Given these pressures, it is incumbent upon the field to devise

treatments that meet the needs of practitioners and patients regardless of where they enter the

service. The group that are currently neglected are those adolescents who need to be admitted

for brief inpatient care or who do not warrant restricted inpatient admissions but need more

structured and intensive support than typical community treatments. Brief and effective

treatments such as ERg-A might provide the solution in that they can provide a treatment path

into (step-down) and out of (step-up) high quality community care. Clinically, ERg-A has the

potential to manage and stabilise acute NSSI symptoms via a decrease in symptom severity

and related distress (as opposed to normative functioning, which is more closely related to the

goal of outpatient psychotherapy) without needing lengthy and costly inpatient stays. It may

also prevent the common problem related to relapse and compliance with community care

without the need for readmission to hospital. This goal is consistent with a growing body of

empirical data, which suggest that subjective distress, mood symptoms, and maladaptive

behaviours can be expected to change most quickly (i.e., over a matter of weeks), whereas

changes in social and vocational impairment can be expected to occur more slowly

(Fleishhakker et al., 2011). This research highlights the potential clinical utility of targeted,

short-term treatments for NSSI-specific mood and behavioral symptoms paired with longer

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term, less intensive community treatments that target skill generalisation and maintenance and a focus on interpersonal and vocational functioning. Practically, ERg-A can be integrated into existing service offerings with reasonable ease and has several advantages to both adolescent patients and practitioners compared to current offerings. Brief groups are inevitably more cost effective (Lomonaco, Scheidlinger, & Aronson, 2000) and allow for larger numbers of adolescents to be targeted (Blum, Pfohl, St. John, Monahan, & Black, 2002; Gunderson, 2001) with relatively few resources required to run them and minimal burden on an already stressed staff. They also have significant psychological and social implications for adolescents who are not completely removed from their natural environments thus decreasing the potential alienation and stigma that inpatient or hospital stays can present. This also encourages generalisation of skills to natural environments and situations that promote maintenance.

In sum, ERg-A has the potential to offer important bridges across current public mental health services by way of a more gradual and sustainable link from crisis or brief inpatient hospital stays to less intensive community care, or an intermediary step between standard community outpatient care for adolescents in increasing levels of crisis or distress who are trying to avoid hospital stays. Figure 1 demonstrates a proposed Model of Care for adolescent NSSI that supplements existing healthcare services with brief treatment approaches such as ERg-A.

Limitations of the Thesis

Whilst a number of more minor design problems have been acknowledged and discussed in each individual study, a few key limitations need to be briefly highlighted. Despite the challenges around ethics and recruitment for this population, the quantitative studies (2 and 4) will inevitably need replication with a larger longitudinal sample for meaningful and temporal conclusions to be made. Longer-term studies will be particularly crucial to understanding the

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course of NSSI abstinence following treatment. The studies attracted predominantly female participants which is also limiting given recent findings that contradict previous biases toward females by finding similar prevalence of NSSI in both genders. One study of EAM theory suggests that females show significantly greater impairment on the emotion regulation dimensions of emotional non-acceptance and access to effective strategies (similar to Study 1), whilst males demonstrate lower levels of emotional awareness (Gratz & Roemer, 2004), and so the application of EAM in male populations will be important to investigate. Another significant limitation of this research is that NSSI theory was only considered in a non-clinical control group of adolescents (Study 2). It will be important to replicate the results using clinical control groups that do not present with NSSI behaviour but are matched on level of psychological distress such as depression, anxiety and stress. Similarly, comparing adolescents with NSSI to clinical groups of adolescents with other avoidant behaviours (such as drug and alcohol abuse and eating disorders) will be important to ascertain how specific the EAM and similar models are to NSSI. This will help to ascertain which aspects or constructs are unique to NSSI and which can be generalised to adolescent populations who present with avoidance behaviours more broadly. Finally, given the important role of the RCT (Study 4) to this body of work, it is concerning that, despite randomisation, pre-treatment scores were more severe in the treatment group than the control group for several of the outcome measures. It will be important for future trials to confirm that the different rates of change observed between the groups in the RCT study are not due to a statistical artifact.
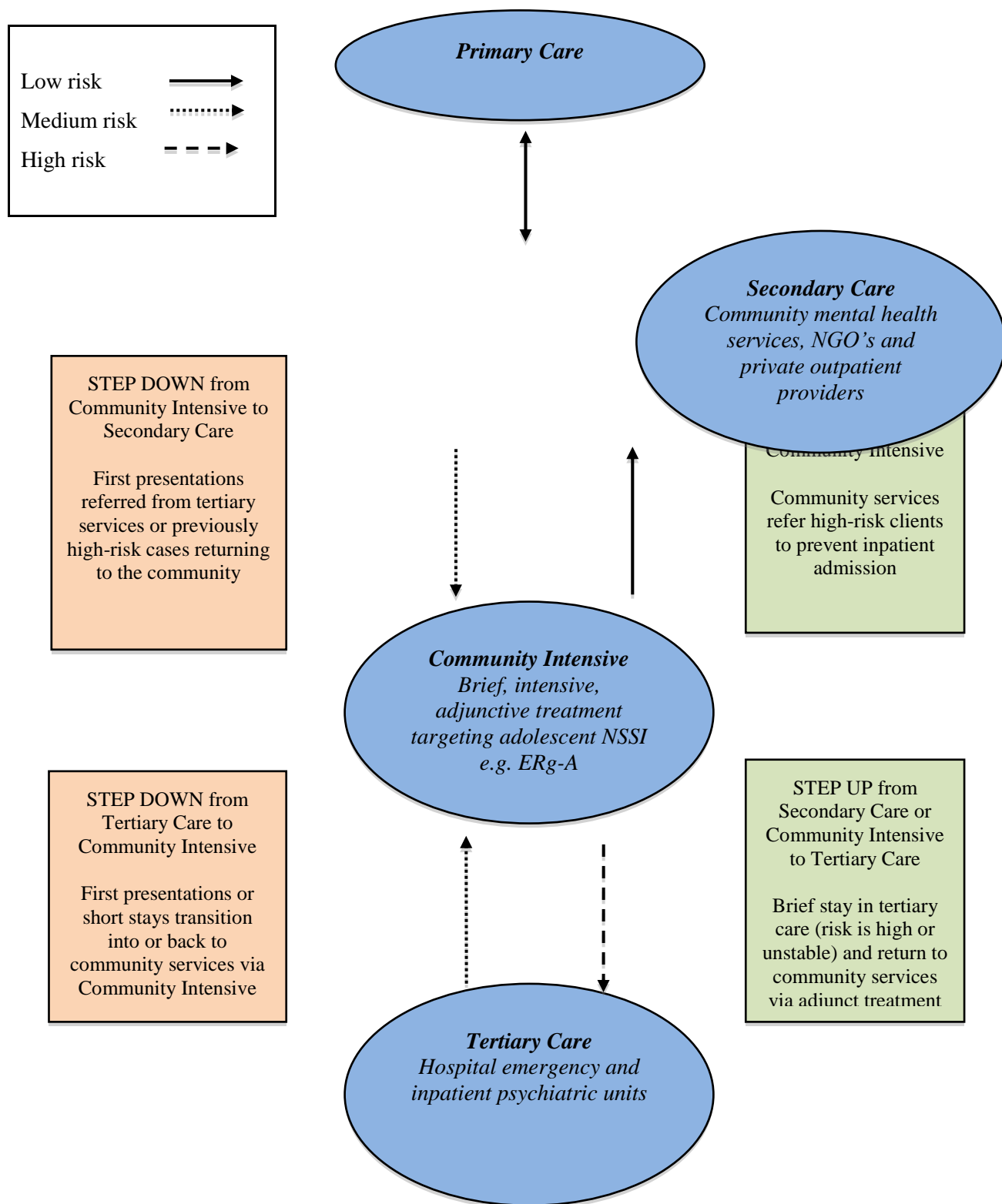
DISCUSSION

Figure 1. Suggested Model of Care for adolescent NSSI that utilises brief group treatments such as ERg-A to supplement existing public healthcare services.

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Future Research

The development and evaluation of the ERg-A Stage I treatment manual in this thesis is a natural first step for additional Stage II replications that address the above limitations and provide further efficacy data. Testing the treatments viability and transportability across a range of clinical settings in Stage III effectiveness trials is the longer-term goal. These future trials rely on further research that clarifies and expands current adolescent NSSI theory and works towards defining a comprehensive adolescent-specific model. Whilst the focus of this research was the primary function of NSSI, comprehensive models will need to account for the multi-dimensional nature of NSSI to provide an authoritative explanation of this complex behaviour. As such, future researchers will need to consider how other functions with modest support (namely, self-punishment, anti-dissociation, interpersonal-influence, anti-suicide, sensation-seeking, and interpersonal boundaries functions) are conceptually and empirically related to NSSI. Furthermore, in addition to the psychological factors of NSSI, a comprehensive model will need to account for the many adolescent-specific precursors and maintaining factors of NSSI that are likely to include biological (e.g. serotonergic dysfunction), environmental (e.g. family functioning) and social (e.g. social media, social modelling) variables. Given the important task of social development during adolescence (Howell, Lynch, Platzman, Smith, & Coles, 2006), the social determinants of NSSI, such as its links to social isolation (Skegg, 2005), deficits in social communication (Nock, 2010), peer victimisation (Giletta, Scholte, Engels, Ciairano, Prinstein, 2012) and social contagion (Nock et al., 2005; O'Connor, Rasmussen & Hawton, 2012) will be key. An impressive body of work by Nock and colleagues using their functional approach to self-mutilation (Nock et al., 2004, 2005) is a promising integrated theory in this regard. It provides a dimension on which to ascertain the social function of NSSI behaviours, whilst maintaining current lore that the primary function of NSSI is emotion regulation. Given that adolescents usually live with their families, the interpersonal factors that may contribute to or protect young people from NSSI

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in their home environment will be crucial to clarify in theoretical models and treatment

interventions.

Whilst it is intimated that brief, highly targeted group treatments are best placed to meet

current need, the infancy of the adolescent NSSI field dictates that parallel avenues of

research persist. Brief psychosocial interventions for NSSI at the point of assessment are

worthy of note in this regard as there is reason to believe that they may improve engagement

with follow up treatment (Ougrin, Tranah, Leigh, Taylor, & Asarnow, 2012) a critical first

step in delivering effective treatment. Indeed, there are many other psychological treatment's

components that may have potential but have yet to be considered for NSSI, such as

motivational interviewing (Miller & Rollnick, 2002) which could be valuable in dealing with

the challenge of ambivalence shown by this population when selecting between adaptive

strategies and NSSI (Klonsky, Muehlenkamp, Lewis, & Walsh, 2011;Washburn et al, 2012).

There have also been advances in pharmacological approaches that aim to alleviate the

psychiatric conditions associated with NSSI by targeting the serotonergic, dopaminergic and

opioid systems (Ougrin, 2012). While their effectiveness for NSSI is still preliminary (Nock,

2010) this will also be an important arena for ongoing research.

In order to arrive at an empirically based, theoretically sound treatment for adolescent

NSSI, one major obstacle that needs to be overcome is that of terminology and definition

which continues to handicap research and practice. The use of inconsistent, interchangeable

and often ambiguous terminology continues to be rife in the literature. NSSI disorder was put

forward for consideration as an independent diagnosis in the latest edition of the Diagnostic

and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association,

2013), following three or more decades of professionals suggesting NSSI should stand alone

as a discrete and clearly defined behaviour (Favazza, 1998; Favazza & Rosenthal, 1990;

Muehlenkamp, 2005; Pattison & Kahan, 1983; Selby, Bender, Jordan, Nock, & Joiner, 2012).

In their proposal for an NSSI diagnosis, Shaffer and Jacobson (2009) asserted, "any new

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disorder in DSM must be common, impairing, and distinctive, both with respect to clinical

presentation and antecedent and future characteristics" (p. 10). They provided evidence that

NSSI meets all of these criteria as NSSI has high prevalence among various age groups,

especially adolescents, it can lead to physical, social, emotional, and academic impairment

and can occur apart from and can be clearly distinguished from suicide attempts. Despite

compelling evidence and support, NSSI disorder was relegated to Section III (Emerging

Measures and Models) of the DSM-5 making it a 'condition that requires further study'. This

does not provide the impact of a full diagnosis but is an important first step for the NSSI

community. The emerging diagnosis will have important repercussions as it will support

improvements in treatment and research, aid communication among clinicians and

researchers, clarify prognosis regarding associated symptoms (e.g., increased risk of suicide)

and reduce diagnostic inaccuracies (e.g., a making assumptions that an adolescent self-injurer

will develop BPD). While a formally accepted diagnosis will need to wait future DSM

revisions, it is imperative that this pending decision does not hinder the momentum that is

gradually building in the NSSI literature as efficacious treatments are urgently needed and

cannot wait. At a minimum, there can be an informal agreement in the field on a logical and

user-friendly set of terms for the group of maladaptive behaviours where a person inflicts

harm on himself or herself. Whilst acknowledging that defining and ordering the intricacies of

this complex group of behaviours is a challenging task, and one not to be minimised or

rushed, this issue has been competently discussed and argued as far back as Favazza's

seminal work in 1998 (Favazza, 1998). Consensus is long overdue and needs to begin to find

traction in the literature or there will continue to be detrimental consequences for NSSI

treatments and their consumers. In particular the relationship between NSSI and suicidal

behaviours needs to find some synthesis, as effective treatments and their implementation rely

on accurate identification and description of each behaviour, its underlying function, and the

individuals' intent. The development and availability of assessment tools that reliably

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measure these behaviours will help significantly with this dilemma. As a potential starting point, the author considered terms currently in use in the literature (e.g., self-harm, deliberate-self-harm, parasuicide, self-mutilation, nonsuicidal self-injury, nonsuicidal self-harm, self-abuse, self-inflicted violence) and proposes the nosology set out in Table 1 consistent with popular use. The only potentially controversial suggestion is the replacement of NSSI, as referenced in this thesis and perhaps most commonly used, with NSSH as a logical extension of self-harm (SH). The justification for this is that 'self-injury' cannot be used given its abbreviation would be SI which is an established reference to 'suicidal ideation'. Table 2 is a quick glance of the main distinguishing features detailed in Table 1 and begins to demonstrate the spectrum of self-harm behaviours in terms of severity.

Finally, although not a focus of this thesis, it is important to make a brief mention of assessment tools given they have implications for future research. A number of useful assessment measures exist that measure various aspects of NSSI behaviours such as the type, severity and frequency of the behaviour (Gratz, 2001), the different functions of the behaviour (Gratz et al., 2004; Lloyd, Kelley, & Hope, 1997), and importantly that distinguish low-frequency experimentation requiring little or no formal treatment to clinically severe presentations prompting hospitalisation (Klonsky et al., 2011). However, a standardised instrument that is both empirically valid and comprehensive in its assessment of all these NSSI-specific behaviours is not yet available (Klonsky, 2007). One of the challenges of assessing NSSI is that it is episodic in nature and typically performed in private outside of the view of the clinician and researcher. Most studies, including those in this thesis, are therefore limited to retrospective, aggregate self-report data that is useful but limited by a wide range of reporting errors and biases. One area of research that has begun to address this limitation is ambulatory monitoring whereby a participant uses self-monitoring devices (e.g. hand-held computers) in his or her natural environment in order to record their internal experiences as well as contextual events in real time outside of the laboratory (Gratz, Rosenthal, Tull,

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Table 1

Recommended nosology of standard abbreviations and definitions for self-harm behaviours

Behaviour	Abbreviation	Definition
Suicide	S	Death due to suicide
Suicide Attempt	S.A.	Harm to self that warrants professional medical and psychological intervention [a] and where intent to die is present at the time of the act [b]
Suicidal Ideation	S.I.	Thoughts of suicide or ending ones life regardless of intent (specify with or without a plan and number of previous attempts)
Suicidal Self-Harm	S.S.H.	Harm to self that may warrant professional medical attention in addition to psychological intervention and where intent to die is made explicit
Self-Harm	S.H.	Harm to self that may warrant professional medical attention in addition to psychological intervention and where intent to die is unknown or ambivalent
Non-Suicidal Self-Harm	N.S.S.H.	Harm to self that may warrant professional medical attention in addition to psychological intervention and where intent not to die is made explicit
Specifiers		With psychotic features With a cognitive impairment With a developmental delay With a medical condition Socially or culturally sanctioned Age-related

Note. [a] There may be cases that never come to the attention of services and hence do not receive professional medical or psychological intervention. This does not negate the need for professional intervention in these instances. [b] Adolescents can attempt suicide and later report no intent to actually end their life but rather equate the attempt with high levels of distress and impulsivity. This does not negate the seriousness of the act and the potential for it to have life ending consequences.

Table 2

Key distinguishing features of self-harm behaviours recommended in Table 1

Behaviour	Abbreviation	Professional Intervention Warranted		Intent to die
		Medical	Psychological	
Suicide	S	√	N/A	√
Suicide Attempt	S.A.	√	√	√
Suicide Ideation	S.I.	N/A	√	√
Suicidal Self-Harm	S.S.H.	case by case	√	√
Self-Harm	S.H.	case by case	√	unknown or ambivalent
Non-Suicidal Self-Harm	N.S.S.H.	case by case	√	X

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Lejuez, & Gunderson, 2006; Fahrenberg & Mayrtek, 1996; Muehlenkamp, Engel, Wadeson, Crosby, Wonderlich, 2009). These can be supplemented with ambulatory monitoring of physiological emotional arousal to elucidate environmental precipitating factors and specific emotions associated with NSSI. The addition of in-vivo imaginal exposure methods has also been suggested to asses physiological arousal and neuronal or neurochemical functioning (Chapman et al., 2006). The addition of these new assessment approaches to existing retrospective self-report data in future studies could provide information that is vastly more absolute and reliable. Importantly, they have the potential to expose the mechanisms underlying NSSI, such as emotional avoidance predicted by EAM. NSSI is a complex and often anxiety provoking behaviour. A comprehensive assessment tool, with established psychometric properties, that is validated across age ranges, would significantly strengthen efforts to clearly define NSSI and advance our understanding and clinical work in this area.

Conclusion

Intervening with adolescents who present to hospital with NSSI in ways that are effective for the young person, their family and the clinicians that treat them poses a considerable challenge to child and adolescent mental health researchers. The preceding four studies highlight the current epidemic of high-risk adolescents with NSSI and the plight of mental health practitioners that face this growing problem on a daily basis without any confident way to respond. Adolescent NSSI is one of the most pervasive mental health phenomena to impact young people. The increased attention it is now getting from mental health professionals and funding bodies is encouraging, but the dearth of research that can be readily applied in normal conditions still leaves front-line clinicians clamoring for reliable and viable treatment options. ERg-A provides a promising avenue for future research efforts for those committed to the development of an effective treatment to hamper the upward trend of NSSI in this vulnerable population.

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References

Aaron, L., Hornberg, R., & Duckworth, K. (2009). Grading the states 2009: Reporting on the

health of America's mentally ill. *A report on America's health care system for adults*

with serious mental illness. Retrieved from

http://www.nami.org/ gtsTemplate09.cfm?Section=Grading_the_States_2009

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental

Disorders, fifth ed. American Psychiatric Publishing, Washington, DC.

Andover, M., & Gibb, B. (2010). Nonsuicidal self-injury, attempted suicide, and suicidal

intent among psychiatric inpatients. *Psychiatry Research, 178(1),* 101-105.

Andover, M., Schatten, H., Morris, B., & Miller, I. (2014). Development of an

intervention for nonsuicidal self-injury in young adults: An open pilot trial.

Cognitive and Behavioral Practice, http://dx.doi.org/10.1016/j.cbpra.2014.05.003

Blum, N., Pfohl, B., St. John, D., Monahan, P., & Black, D. (2002). STEPPS: A cognitive-

behavioral systems-based group treatment for outpatients with borderline personality

disorder-A preliminary report. *Comprehensive Psychiatry, 43*, 301-310.

Brent, D., Emslie, G., Clarke, G., Wagner, K., Asarnow, J., Keller, M., … Zelazny, J. (2008).

Switching to another SSRI or to Venlafaxine with or without cognitive behavioral

therapy for adolescents with SSRI- resistant depression: the TORDIA randomized

controlled trial. *Journal of the American Medical Association, 299(8),* 901–913.

Chapman, A., Gratz, K., & Brown, M. (2006). Solving the puzzle of deliberate self-

harm: The experiential avoidance model. *Behaviour Research and Therapy, 44,* 371-

394.

Fahrenberg, J., & Myrtek, M. (Eds.). (1996). *Ambulatory assessment: Computer-assisted*

psychological and psychophysiological methods in monitoring and field studies.

Ashland, Ohio: Hogrefe & Huber Publishers.

DISCUSSION

Favazza, A. (1998). The coming of age of self-mutilation. *Journal of Nervous and Mental Disease, 186*, 259-268.

Favazza, A. R., & Rosenthal, R. J. (1990). Varieties of pathological self-mutilation. *Behavioral Neurology, 3,* 77–85.

Fischer, G., Brunner, R., Parzer, P., Resch, F., & Kaess, M. (2013). Short-term psychotherapeutic treatment in adolescents engaging in non-suicidal self-injury: a randomized controlled trial. *Trials, 14(1),* 294-300.

Fleischhaker, C., Bohme, R., Sixt, B., Bruck, C., Schneider, C., & Schulz, E. (2011). Dialectical behaviour therapy for adolescents (DBT-A): a clinical trial for patients with suicidal and self-injurious behavior and borderline symptoms with a one-year follow-up. *Child and Adolescent Psychiatry and Mental Health, 5(3),* 1-10.

Giletta, M., Scholte, R., Engels, R., Ciairano, S., Prinstein, M. (2012). Adolescent nonsuicidal self-injury: A cross-national study of community samples from Italy, the Netherlands and the United States. *Psychiatry Research, 197,* 66-72.

Gratz, K. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate self-harm Inventory. *Journal of Psychopathology and Behavioral Assessment, 23,* 253-263.

Gratz, K. & Gunderson, G. (2006). Preliminary data on an acceptance-based emotion regulation group intervention for deliberate self-harm among women with borderline personality disorder. *Behavior Therapy, 37,* 25-35.

Gratz, K. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26,* 41-54.

DISCUSSION

Gratz, K., Rosenthal, M., Tull, M., Lejuez, C., & Gunderson, J. (2006). An experiential Investigation of emotion dysregulation in borderline personality disorder. *Journal of Abnormal Psychology, 4,* 850-855.

Green, J., Wood, A., Kerfoot, M., Trainor, G., Roberts, C., Rothwell, J., … & Harrington, R. (2011). Group therapy for adolescents with repeated self-harm: randomised controlled trial with economic evaluation. British Medical Journal, 342, 1-12. doi:10.1136/bmj.d682

Gunderson, J. (2001). *Borderline personality disorder: A clinical guide.* Washington, DC: American Psychiatric Press.

Hayes, S., Strosahl, K., & Wilson, K. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.

Howell, K., Lynch, M., Platzman, K., Smoth, G., & Coles, C. (2006). Prenatal alcohol exposure and   ability, academic, achievement, and school functioning in adolescence: A longitudinal follow-up. *Journal of Pediatric psychology, 31,* 116-126.

Katz, L., Cox, B., Gunasekara, S., Miller, A. (2004). Feasibility of dialectical behavior therapy for suicidal adolescent inpatients. *Journal of the American Academy of Child and Adolescent Psychiatry, 43,* 276–282.

Kerfoot, M. (1996). Suicide and deliberate self-harm in children and adolescents: a research update. *Children and Society, 10,* 236-41.

Klonsky, D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review, 27*, 226-239.

Klonsky, D., Muehlenkamp, J., Lewis, S., & Walsh, B. (2011). *Nonsuicidal self-injury: Advances in   psychotherapy, evidence-based practice.* Cambridge, MA.

Linehan, M. (1993). *Skills Training Manual for Treating Borderline personality   Disorder*. New York: Guilford Press.

DISCUSSION

Lloyd, E., Kelley, M., & Hope, T. (1997). Self-mutilation in a community sample of

adolescents: descriptive characteristics and provisional prevalence rates. Poster s

Session presented at the   annual meeting of the Society for Behavioral Medicine, New

Orleans, LA.

Lomonaco, S., Scheidlinger, S., & Aronson, S. (2000). Five decades of children's group

treatment -an overview. *Journal of child and Adolescent Group Therapy, 10(2),* 77-96.

Messer, J., & Fremouw, W. (2008). A critical review of explanatory models for self-

mutilating behaviours in adolescents. *Clinical Psychology Review, 28*, 162-178.

Miller, W., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change*.

New York, NY: Guilford Press.

Muehlenkamp, J. (2005). Self-injurious behavior as a separate clinical syndrome. *American

Journal of Orthopsychiatry,75,* 324–33.

Muehlenkamp, J., Engel, S., Wadeson, A., Crosby, R., Wonderlich, S., Simonich, H., &

Mitchell J. (2009). Emotional states preceding and following acts of nonsuicidal self-

injury in bulimia nervosa patients. *Behaviour and Research Therapy. 47,* 83–87.

doi:10.1016/j.brat.2008.10.011

Nock, M. (2010). Self-Injury. *Annual Review of Clinical Psychology, 6,* 339-363.

Nock, M., & Prinstein, M. (2004). A functional approach to the assessment of self-

mutilative behavior. *Journal of Consulting and Clinical Psychology, 72,* 885-890.

Nock, M., & Prinstein, M. (2005). Contextual features and behavioral functions of self-

mutilation among adolescents. *Journal of Abnormal Psychology, 114,* 140-146.

Ougrin, D. (2012). Commentary: Self-harm in adolescents: the best predictor of death by

suicide – reflections on Hawton et al. (2012). *Journal of Child Psychology and

Psychiatry, 53(12)*, 1220-1221.

Ougrin, D., Tranah, T., Leigh, E., Taylor, L. & Asarnow, J. (2012). Practitioner review: Self-

harm in adolescents. *Journal of Child Psychology and Psychiatry, 53,* 337–350.

DISCUSSION

Pattison, E., & Kahan, J. (1983). The deliberate self-harm syndrome. *American Journal of Psychiatry*, *140,* 867–872.

Salinsky, E., & Loftis, C. (2007). Shrinking inpatient psychiatric capacity: Cause for celebration or concern? *George Washington University, National Health Policy Forum, Issue brief, 823,* 1-21.

Segal, Z., Williams, J., & Teasdale, J. (2001). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse.* New York: Guilford Press.

SCIE research briefing 16: Deliberate self-harm (DSH) among children and adolescents: who is at risk and how is it recognized? (2005, August). *Social Care Institute of Excellence.* Retrieved from http://scie.org.uk/publications/briefings/briefing16/

Selby, E., Bender, T., Gordon, K., Nock, M., & Joiner, T. (2012). Non-suicidal self-injury (NSSI) disorder: a preliminary study. *Personality Disorders: Theory, Research, and Treatment, 3,*167–17.

Skegg, K. (2005). Self-harm. *The Lancet, 366*, 1471-1483.

Washburn, J., Richardt, S., Styer, D., Gebhardt, M., Juzwin, K., Yourek, A., Aldridge, D. (2010). Psychotherapeutic approaches to nonsuicidal self-injury in adolescents. *Child and Adolescent Psychiatry and Mental Health, 6(14),* 1-8.

Wood, A., Trainor, G., Rothwell, J., Moore, A., Harrington, R. (2001). Randomized trial of group therapy for repeated deliberate self-harm in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 40,* 1246-1253.

Yates, T. (2004). The developmental Psychopathology of self-injurious behaviour: Compensatory regulation in posttraumatic adaptation. *Clinical Psychology Review, 24,* 35-74.

Yip, K. (2005). A multi-dimensional Perspective of Adolescents' Self-Cutting. *Child and Adolescent Mental Health, 10(2),* 80-86.

APPENDIX A: CRITICAL REVIEW OF SELF-HARM IN ADOLESCENTS

Table A1

Selected characteristics of treatments available to adolescents with self-harm where the definition of self-harm does not clearly differentiate NSSI

Study	N	Participants	Age (years)	Study Design	Intervention	Outcome
Asarnow, et al., 2011	181	ED with SA or SI	10-18	RCT 2 month follow-up	Family Intervention for Suicide Prevention	No significant difference in rates of repeated self-harm
Chanen et al., 2008	86	Outpatients with BPD	15-18	RCT 24 month follow-up	Cognitive Analytic Therapy	No significant difference compared to TAU control condition
Cotgrove et al, 1995	105	Referral to hospital with self-harm	< 17	RCT 12 month follow-up	Acute care + token allowing readmission	No significant difference in rates of repeated self-harm
Deykin et al., 1986	319	A&E presentations with SSI	13-17	Non-randomised control trial	Direct support (advocacy, financial and social support)	No significant difference to standard hospital care control condition
Diamond et al., 2010	66	Referral to ED with severe SI or depression	12-17	RCT 6 month follow-up	Attachment Based Family Therapy	No significant difference in rates of repeated self-harm
Donaldson et al., 2005	39	Presentations to ED or inpatient unit with SA	12-17	RCT 6 month follow-up	Skills based treatment	No significant difference in rates of repeated self-harm
Esposito-Smythers et al., 2011	40	Inpatients with SA, SI or alcohol/cannabis disorder	13-17	RCT 18 month follow-up	CBT for suicide and substance misuse	Significant difference in rates of SI but not SA.
Green et al., 2011	336	Outpatient with self-harm	12-17	RCT 12 month follow-up	Developmental group psychotherapy + TAU	No significant difference in rates of repeated self-harm
Harrington et al., 1998	162	Self-poisoning referred to mental health teams	< 16	RCT 6 month follow-up	Home-based family intervention + TAU	No significant difference in rates of repeated self-harm
Hazell et al., 2009	72	Outpatients with NSSI, SA, SI, suicide attempt/ideation	12-16	RCT 12 month follow-up	Developmental Group Psychotherapy + TAU	No significant difference in rates of repeated self-harm
Holland et al., 2009	448	Inpatients with SA or significant SI	13-17	RCT 12 month follow-up	Youth nominated support team	No significant difference in rates of repeated self-harm

Note. RCT, randomised controlled trial; TAU, treatment as usual; ED, Emergency Department; NS, not significant; NSSI, nonsuicidal self-injury; SA, suicide attempt; SI, suicidal ideation BPD; Borderline Personality Disorder; CBT, Cognitive Behaviour Therapy; DBT, Dialectical Behaviour Therapy; ACT, Acceptance and Commitment Therapy.

APPENDIX A: CRITICAL REVIEW OF SELF-HARM IN ADOLESCENTS

Table A1 (continued)

Selected characteristics of treatments available to adolescents with self-harm where the definition of self-harm does not clearly differentiate NSSI

Study	N	Participants and setting	Age (years)	Study Design	Intervention	Outcome
Huey et al., 2004	160	Inpatients SA or SI	10-17	RCT	Multi-systemic Therapy	Reduces SA from pre to post-treatment compared to inpatient TAU control group. No significant difference for SI between groups.
James et al., 2008	16	Outpatients with SSI	15-18	Pilot pre-post design	DBT	Reduced SSI from pre to post-treatment and to f/up
James et al., 2011	25	Outpatients with SSI	13-17	Pilot pre-post design	DBT	Reduced SSI from pre to post-treatment
Katz et al., 2004	62	Psychiatric inpatients with SI or SA	14-17	Non-randomised control trial	DBT	Reduces SSI in both groups but no significant difference between groups. Fewer behavioural incidents in treatment group.
King et al., 2006	289	Inpatients after SA or significant SI	12-17	RCT	Youth nominated support team + TAU	No significant difference in rates of repeated self-harm
King et al., 2009	448	Inpatients after SA or significant SI	13-17	RCT 12 month follow-up	Youth nominated support team + TAU	Reduced SI compared to TAU control condition at 6 weeks only. No significant diff. for SA between groups.
Mehlum et al., 2014	77	Community outpatients with SSI	12-18	RCT	DBT for Adolescents (DBT-A)	Treatment superior to an enhanced usual care control condition
Ougrin et al., 2011	70	Hospital or mental health following SA or NSSI	12-18	RCT 3 month follow-up	AAU and therapeutic assessment	No significant diff. in rates of repeated self-harm but treatment group was significantly more engaged in treatment
Ougrin et al., 2013	70	A&E with recent SSI	12-18	RCT 2 year follow-up	Therapeutic Assessment	No significant difference in SSI compared to inpatient acute unit control condition

Note. RCT, randomised controlled trial; TAU, treatment as usual; ED, Emergency Department; NS, not significant; NSSI, nonsuicidal self-injury; SA, suicide attempt; SI, suicidal ideation BPD; Borderline Personality Disorder; CBT, Cognitive Behaviour Therapy; DBT, Dialectical Behaviour Therapy; ACT, Acceptance and Commitment Therapy.

APPENDIX A: CRITICAL REVIEW OF SELF-HARM IN ADOLESCENTS

Table A1 (continued)

Selected characteristics of treatments available to adolescents with self-harm where the definition of self-harm does not clearly differentiate NSSI

Study	N	Participants and setting	Age (years)	Study Design	Intervention	Outcome
Pineda et al., 2013	48	Outpatients with comorbid SSI	12-17	RCT 6 month follow-up	Resourceful Adolescent Parent Program (RAP-P)	Reduced SSI behaviours compared to routine care control condition
Rathus et al., 2002	111	Outpatient BPD with SA or SI	mean 16.1	Non-randomised control trial	DBT	Reduced SI pre to post-treatment. No significant difference in SA over time
Rotheram-Borus et al., 2000	140	ED presentation with SA	12-18	Non-randomised control trial	Specialised ED care (psychoeducation + family session + staff training)	No significant difference in SI compared to standard care control condition
Russouw et al., 2012	80	Outpatients with SSI	12-17	RCT 9 month follow-up	Mindfulness Based Therapy for Adolescents (MBT-A)	Reduced SSI compared to community TAU in post-treatment assessment only
Schuppert et al., 2009	43	Outpatients with BPD	14-19	Pre-post design	Emotion Regulation Group	No significant difference in rates of repeated self-harm
Spirito et al., 2002	76	ED or paediatric unit with SA	12-18	Non randomised control trial	Compliance enhancement and disposition planning	No significant difference in rates of repeated self-harm
Sunseri, 2004	68	Speciality outpatient clinic with SI		Uncontrolled open trial over 5 years	DBT	No control to make conclusions but reported reduction in SI, days spent in hospital and time in restraint/seclusion.
Taylor et al., 2011	24	Outpatients with SSI	12-18	Pilot pre-post design	Manualised CBT (The Cutting Down Program)	Reduced SSI over treatment and maintained at follow-up
Wood et al., 2001	63	Outpatient with repeated SA or NSSI	12-16	RCT 7 month follow-up	Developmental Group Psychotherapy + TAU	Fewer SSI repeaters compared to routine care control condition. No significant difference in SI between groups
Woodberry et al., 2008	46	Outpatient with SA, NSSI or unstable affect	13-18	Open pre-post trial	DBT	Observed improvement in indices of NSSI and SSI

Note. RCT, randomised controlled trial; TAU, treatment as usual; ED, Emergency Department; NS, not significant; NSSI, nonsuicidal self-injury; SA, suicide attempt; SI, suicidal ideation BPD; Borderline Personality Disorder; CBT, Cognitive Behaviour Therapy; DBT, Dialectical Behaviour Therapy; ACT, Acceptance and Commitment Therapy.

APPENDIX A: CRITICAL REVIEW OF SELF-HARM IN ADULTS

Table A2

Selected characteristics of treatments available to adults or mixed age groups where the definition of self-harm does not clearly differentiate NSSI

Study	N	Participants and setting	Age (years)	Study Design	Intervention	Outcome
Bannan, 2010	18	ED presentation for SI	18 - 65	RCT 2 month follow-up	CBT with problem solving	Reduction in SI nut no significant difference compared to control
Gibbons et al., 1978	400	ED presentation for SI	≥ 17	RCT 12 month follow-up	CBT with problem solving	Reduction in SI but no significant difference compared to control condition
Evans et al., 1999	34	Outpatient with SI and personality disturbance	16 - 50	RCT 6 month follow-up	Manual-Assisted Cognitive behaviour Therapy (MACT)	Reduction in SI but no significant difference compared to control Cost of care < 46 % with MACT
Hawton, et al., 1987	80	General hospital presentation for SI	≥ 16	RCT 12 month follow-up	CBT with problem solving	Reduction in SI but no significant difference compared to control condition
Huey et al., 2004	156	ED with SSI + antisocial		RCT 12 month follow-up	Multisystemic Therapy	MST superior to hospitalised control
McLeavey et al., 1994	39	ED presentation for SI	15 - 45	RCT 12 month follow-up	CBT with problem solving	Reduction in SI but no significant difference compared to control condition
Patsiokas et al., 1985	15	Hospitalised for SI	Not stated	RCT no follow-up	CBT with problem solving	No significant difference compared to cognitive restructuring or control
Robinson et al., 2012	164	Community outpatients with SSI	15-24	RCT 12 and 18 months follow-up	Psychoeducation + TAU	Reduced SSI but no significant difference compared to TAU control
Rudd, et al., 1996	264	Partial outpatients with SA or SI	15-24	RCT 12 month follow-up	Time-limited CBT	Reduced SI but no significant difference compared to TAU control
Salkovskis et al., 1990	20	ED presentation for SI	16 - 65	RCT 12 month follow-up	CBT with problem solving	Reduction in SI but no significant difference compared to control condition
Slee et al., 2008	90	Community mental health with SI	15-35	RCT 9 month follow-up	CBT for self-harm	Significant reduction in SI compared to control condition
Tyrer et al., 2003	480	ED presentation for SI	16 - 65	RCT 1 year follow-up	Manual-Assisted Cognitive behaviour Therapy (MACT)	No significant statistical difference compared to control condition.

Note. RCT, randomised controlled trial; TAU, treatment as usual; ED, Emergency Department; NS, not significant; NSSI, nonsuicidal self-injury; SA, suicide attempt; SI, suicidal ideation BPD; Borderline Personality Disorder; CBT, Cognitive Behaviour Therapy; DBT, Dialectical Behaviour Therapy; ACT, Acceptance and Commitment Therapy.

Appendix B:
Skills Rating Scale developed for the ERg-A treatment

Skills Rating Scale (SRS)

Instructions: Below is a list of topics/ skills you have covered in group. Please use the following scale to rate which ones you found most helpful to manage your self-harm. Please make sure you rate all the skills as best you can (only leave skills blank if you did not attend the session).

1 = Not at all Helpful	2 = A little Helpful	= Very Helpful	4 = Extremely Helpful			
			1	2	3	4
Mindfulness (controlling your mind vs it controlling you)			○	○	○	○
The 3 minds (emotion, reasonable, wise)			○	○	○	○
Getting into Wise Mind (the 'STOP! GO' skills)			○	○	○	○
Managing Emotion Mind in a crisis by Riding the Wave			○	○	○	○
Managing Emotion Mind using 'DISTRACTS ME' skills			○	○	○	○
Identifying your inner struggle (your 'punisher')			○	○	○	○
Identifying your current life story and its costs/benefits			○	○	○	○
Avoidance (of pain) and its costs/benefits			○	○	○	○
Identifying your valued direction (the life you want)			○	○	○	○
The concept of acceptance and acceptance skills			○	○	○	○
Setting goals for your valued life (bull's eye)			○	○	○	○
Putting together your valued action plan (last session)			○	○	○	○

Instructions: Please rate the following aspects of the group according to how helpful they were for you.

1 = Not at all Helpful	2 = A little Helpful	= Very Helpful	4 = Extremely Helpful			
			1	2	3	4
Explanation of the skills by group leaders			○	○	○	○
Speed at which group leaders led the sessions			○	○	○	○
The amount of information covered in each session			○	○	○	○
The handouts used in the sessions			○	○	○	○
The exercises used in the sessions			○	○	○	○
The quick quiz at the end of each session			○	○	○	○
The home task exercises			○	○	○	○

APPENDIX B: ERg-A SKILLS RATING SCALE

Appendix B (continued):
Skills Rating Scale developed for the ERg-A treatment

Instructions: If you have other information about the group you can share with us we would really appreciate it. Please feel free to be as honest as you can as your feedback will help us improve this group for others.

1. What did you like most about the group?

_____

_____

_____

_____

2. What would you change about the group?

_____

_____

_____

_____

3. Do you have any other comments or feedback?

_____

_____

_____

_____

_____

_____

Thank you

APPENDIX C: ERg-A ADHERENCE RATING SCALE

Appendix C:
Extract from the ERg-A Adherence Rating Scale

Adherence Rating Scale (ARS)

<u>Instructions:</u> Please use the following scale to rate how the session went. If you answer 2 ('No') or 3 ('Unsure') to any of the questions please provide a brief explanation in the comment section.

Session No: _____ Number of participants present: _____

1 = Yes	2 = No	= Unsure	4 = Not applicable			
			1	2	3	4
Did you ensure all 3 'learning points' were well understood by all participants? Comment: _____ _____ _____			○	○	○	○
Did you adhere to the DBT hierarchy of targets during the session? Comment: _____ _____ _____			○	○	○	○
Did you get through all the content for the session? Comment: _____ _____ _____			○	○	○	○
Did you need to spend time off the session agenda? Comment: _____ _____ _____			○	○	○	○
Did you spend 50% or more of the session doing experiential activities (e.g. discussions, activities, demonstrations)? Comment: _____ _____ _____			○	○	○	○

APPENDIX D: ETHICS APPROVAL LETTER

NSW GOVERNMENT | **Health**
Western Sydney
Local Health District

Our Ref: **HREC2011/9./4.12(3350) AU RED HREC/11/WMEAD/126**

16 December 2011

Ms Holly Donnelly
Adolescent and Family Unit
Redbank House
Westmead Hospital

Dear Ms Donnelly

Project title: 'Evaluation of a Brief Acceptance-based DBT Group for Adolescents who self-harm'

Thank you for your letter dated 8 December 2011 addressing the matters raised in the HREC's letter dated 4 October 2011 following single ethical review of the above project at its meeting held on 27 September 2011.

This HREC has been accredited by the NSW Department of Health as a lead HREC to provide the single ethical and scientific review of proposals to conduct research within the NSW public health system. This lead HREC is constituted and operates in accordance with the National Health and Medical Research Council's *National Statement on Ethical Conduct in Human Research* and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

I am pleased to advise that the HREC has now granted ethical approval of this **single site** research project to be conducted at:

- Westmead Hospital - Chief Investigator Ms Holly Donnelly

The following documentation has been reviewed and approved by the HREC:
- NEAF submission code AU/1/6189015
- Protocol Version 2 dated 8 December 2011
- Revised Participant Information and Consent Form Version 2 dated 8 December 2011

Please note the following conditions of approval:
- The Chief Investigator will immediately report anything which might warrant review of ethical approval of the project in the specified format, including unforeseen events that might affect continued ethical acceptability of the project.
- The Chief Investigator will immediately report any protocol deviation / violation, together with details of the procedure put in place to ensure the deviation / violation does not recur.

APPENDIX D: ETHICS APPROVAL LETTER

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- Proposed amendments to the research protocol or conduct of the research which may affect the ethical acceptability of the project, must be provided to the HREC to review in the specific format. Copies of all proposed changes must also be provided to the relevant research governance officer.
- The HREC must be notified, giving reasons, if the project is discontinued at a site before the expected date of completion.
- The Chief Investigator must provide an annual report to the HREC and a final report at completion of the study, in the specified format. HREC approval is valid for 12 months from the date of final approval and continuation of the HREC approval beyond the initial 12 month approval period is contingent upon submission of an annual report each year. A copy of the Annual / Final Research Report Form is attached and can be obtained electronically from the Research Office on request.
- It should be noted that compliance with the ethical guidelines is entirely the responsibility of the Chief Investigator.
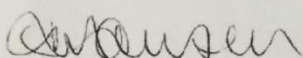
You are reminded that this letter constitutes *ethical approval only*. You must not commence this research project at a site until separate authorisation from the Chief Executive or delegate of that site has been obtained. Copies of this letter, together with any approved documents as enumerated above, must be forwarded to all site investigators for submission to the relevant Research Governance Officer.

A summary of the HREC Standard Operating Procedures is attached for your reference. Should you have any queries about the HREC's Terms of Reference, Standard Operating Procedures or membership, please contact the HREC Executive Officer through the Research Office on 9845 8183 or emailing researchoffice@swahs.health.nsw.gov.au.

In all future correspondence concerning this study, please quote approval number *HREC2011/9./4.12(3350) AU RED HREC/11/WMEAD/126*

The HREC wishes you every success in your research.

Yours sincerely

Ms Tina Goodenough
HREC Executive Officer
WSLHD Human Research Ethics Committee