

# **FINAL REPORT**

## **Title of the Project**

Self-Injurious Behaviors and Psychopathology among Adolescents  
and Young Adults in Bangalore

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## LIST OF ABBREVIATIONS

SIB	Self-injurious Behaviour
NSSI	Non-suicidal self-injury
FASM	Functional Assessment of Self-Mutilation
YSR	Youth Self Report
ASR	Adult Self Report

**1. Title of the Project:** Self-Injurious Behaviors and Psychopathology among Adolescents and Young Adults in Bangalore

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**5. Duration:** 18 months

**6. Date of completion:** 28<sup>th</sup> February, 2014

**7. Objectives as approved**

- (i) To assess the nature and prevalence of self injurious behaviours among adolescents and young adults in Bangalore.
- (ii) To assess the reasons for self injurious behaviours among adolescents and young adults in Bangalore.
- (iii) To study the socio-demographic and mental health correlates of self injurious behaviours among adolescents and young adults in Bangalore.

**8. Deviation made from original objectives if any, while implementing the project and reasons thereof.** n.a.

## **9. Experimental work giving full details of experimental set up, methods adopted, data collected supported by necessary tables, charts, diagrams and photographs.**

### ***Introduction and Review of Research Literature:***

Self-injurious behaviours are a complex and often hidden phenomenon and present challenges to clinicians and family members. Various terms have been used to identify this intentional and direct injuring of one's body tissue without suicidal intent or cultural sanction (Herpertz, 1995). These include self-injurious behaviour (SIB), self-mutilation; self-inflicted violence, deliberate self-harm and non-suicidal self-injury. Skin-cutting is most common but other forms include burning, scratching or hitting body parts, and interfering with wound healing (Favazza & Conterio, 1989). This excludes stereotypic behaviours among people with developmental disabilities or those that occur among individuals with psychotic disorders. SIB is often seen as a reaction to psychological crisis (Favazza & Rosenthal, 1993).

Early prevalence estimates came from clinical populations where self-injurious behaviours were found to occur across a wide range of psychiatric disorders. Worryingly high rates of 40-60% were reported in clinical samples of adolescents and 19-25% among adults (Nock, 2010). The rates in large community samples have been reported as approximately 4% (Klonsky, Oltmanns & Turkheimer, 2003). However, prevalence rates among adolescents in the community also warrant concern. Rates range from 13.8% to above 40% studies across different countries (Ross & Heath, 2002; Lloyd-Richardson, Perrine, Dierker, & Kelley 2007; O'Connor, Rasmussen, Miles, & Hawton, 2009). The life time prevalence varies across countries indicating the influence of unique socio-cultural aspects (Madge et al, 2008; Portzky, De Wilde, van Heeringen, 2008). Scattered research has studied the prevalence of self-injurious behaviours among undergraduate and graduate students and emphasized the importance of addressing this phenomenon in the college population (Whitlock, Eckenrode & Silverman, 2006). Clearly, adolescents and young adults form a vulnerable segment.

Self-injurious behaviour is not well recognized as a separate entity in Indian research and there are little information on its prevalence in either adults or adolescents in clinic or community samples. Scattered studies on adolescents focus on non-fatal suicidal behaviours or suicidal risk (Bhola, Rekha, Sathyanarayanan, Daniel & Thomas, 2014; Sidhartha & Jena, 2006; Singh, Manjula & Phillip, 2012; Pillai, Andrews, & Patel, 2009) whereas the conceptual understanding of SIB is non-suicidal self-injurious behaviour. Largely, studies that examined self-harm or suicidality have not made distinctions between non-suicidal and suicidal presentations. A standalone report by Nagaraja Rao, Sudarshan & Begum (2008) described a series of cases presenting with self-injurious behavior in a general hospital

setting and emphasized that it can occur in various psychiatric syndromes with a wide range of psychopathology. Kharsati (2013) explored self-injurious behaviours and its associations with attachment styles and emotion regulation and found high rates among college youth. Research in this area is still in its infancy and there are many unanswered questions.

These behaviours begin in middle adolescence, between 12 to 15 years and peak between 15-24 years with a mean age of 17 years and can last for weeks, months, or years, often in a cyclical pattern (Yates, 2004). Some findings suggest that about a quarter of those reporting self-injury started in the college years (Whitlock, Eckenrode, & Silverman, 2006; Jacobson & Gould, 2007; Whitlock, Muehlenkamp, et al., 2009). Although self-injury is unlikely to be a fleeting phenomenon, it often remains unrecognized, both in the clinic and in the community.

Risk factors among adolescents reflect developmental demands and challenge. These include female gender, history of physical, sexual, or psychological abuse; substance abuse, depressive mood, perfectionism, low optimism, anxiety, sexual orientation worries, bullying, academic difficulties, peer self-harm and relationship difficulties (O'Connor et al 2009, McMahon, Reulbach, Keeley, Perry, & Arensman, 2010). The care-giving environment is salient with factors such as parental criticism, poor family relationships, youth alienation from parents, and self-harm by other family members. Associations with socio-demographic variables have been inconsistent across studies, with some reporting no association with female gender.

In clinical populations, self-injury is strongly linked to childhood abuse, especially childhood sexual abuse. Self-injury is also linked to eating disorders, substance abuse, post-traumatic stress disorder, borderline personality disorder, depression, and anxiety disorders (Yates, 2004; Gollust et al 2008). While it is possible that both non-suicidal self-injury and suicidal ideation and attempts share many underlying psychosocial risk factors and manifestations of psychopathology, there may be some important differences as well.

Across studies conducted on community samples of adolescents and young adults, among the different kinds of childhood maltreatment, sexual abuse had strongest association with the self injurious behaviours and the emotional problems included anxiety, depression, suicidality, borderline and other personality disorders, aggression and dissociation (Asgeirsdottir et al, 2011; Fliege, Lee, Grimm & Klapp, 2009; Glassman, Weierich, Hooley, Deliberto & Nock, 2007).

SIB has been described as a compensatory regulatory and relational strategy arising from trauma-induced vulnerabilities like parental loss or deprivation, emotional neglect, physical or sexual abuse (Yates, 2004). There has been a recent focus on understanding the functions and motivations for self – injurious behaviour (Lloyd, Kelley & Hope, 1997; Messer & Fremouw, 2008; Nock & Prinstein, 2005; Suyemoto, 1998). Klonsky & Glenn (2009) assessed 13 potential functions of self-injurious behavior among college students representing both interpersonal (e.g. creating interpersonal boundaries; peer bonding) and intrapersonal (e.g. affect regulation; self-stimulation, self-punishment) functions. This behavior is often viewed solely as “attention-seeking behavior’ by family members, and sometimes by clinicians as well. Improved understanding of the reasons why people indulge in this self-damaging and self-defeating behavior could help plan individually tailored interventions.

There is a need for further research on self-injurious behaviours which are often under-recognised and inadequately understood. These episodic behaviours are typically performed in private, often concealed but cause psychological distress and direct physical harm to those engaging in this behavior and additionally cause difficulties for families, peers and health care providers. The clinical significance of self-injurious behaviours and their occurrence across various disorders have stimulated additional research in this domain.

There is a need to move beyond anecdotal reports and explore the prevalence rates in India so as to understand the scope of the problem. In a departure from most previous studies that focus on a limited age-range, the proposed research would examine these behaviours across the spectrum of adolescence and young adulthood.

As disclosure and helpseeking tends to be inadequate among these vulnerable individuals, a community based sample could help assess the extent and functions of SIB in the population. Community samples would also allow us to study individuals with a range of psychopathology which can help examine relationships between different functions of self-injurious behavior and different levels of psychopathology.

Links between self-injurious behaviour and psychopathology have been under-researched. Research needs to address several issues - Is self-injurious behaviour an indicator of certain types of psychopathology or associated psychosocial contexts among adolescents? Future research can then examine if the developmental trajectory of SIB be changed through early identification and intervention

during adolescence. Intersections between self-injurious behaviours and mental health parameters is an important research arena that can inform clinical practice, mental health promotion and early intervention among adolescents and young adults in India.

### **Need for the Study:**

The study aims to assess the nature and prevalence of self injurious behaviours among 1500 Indian adolescents and young adults in schools and colleges. It will also examine interpersonal and intrapersonal functions of self-injurious behavior and socio-demographic and mental health correlates.

Research evidence on the prevalence and functions of self-injurious behavior would have direct implications for assessment and treatment both in clinical and community settings in India as well as for resource allocation and service delivery options.

Research findings would have implications for recognition of risk factors and warning signs of psychopathology to enable early identification and intervention in this vulnerable developmental stage.

Given the significant barriers to help seeking and what we know about developmental trajectories of problems from adolescence into adulthood; reaching out to at-risk adolescents in educational settings would be one of our national mental health priorities.

Work in this under-researched area could provide culturally relevant information to teachers, parents, mental health professionals and other gatekeepers towards promotion of mental health and early identification in this population.

### **Research Design**

A cross-sectional design surveyed self-injurious behavior and the socio-demographic and mental health correlates among adolescents and young adults attending school and college in Bangalore.

### **Sample**

1571 school and college going (high school, pre university college and undergraduate Bachelors degree) boys and girls, from 8<sup>th</sup> standard to final year undergraduate degree formed the sample for the study. The list of schools and colleges in Bangalore formed the universe for sample selection and stratified random sampling was planned.

## Measures

**1. Socio-demographic data sheet:** The data sheet included items on age, gender, educational level, family composition and current living arrangements, the educational level and sector (government, aided or private institution).

**2. The Functional Assessment of Self-Mutilation (FASM; Lloyd, Kelley & Hope, 1997):** assesses methods, frequency and functions of self-injurious behaviour during the last 12 months.

The first part consists of a checklist of 11 different self-injurious behaviours (plus a fill-in 'other' category). A principal components analysis of the 11 behaviors yielded two factors (Lloyd *et al.* 1997). The first factor included items considered more clinically severe in nature, denoted as 'moderate/severe': cutting/carving, burning skin, self-tattooing, scraping skin, and erasing (i.e. using an eraser to rub skin to the point of burning and bleeding) skin. The second factor consisted of less severe behaviors, denoted as 'minor': hitting self, pulling hair, biting self, inserting objects under nails or skin, picking at a wound, and picking areas to draw blood. The FASM also assesses the length of time the individual contemplated the behaviour(s); age of onset; if performed under influence of drugs/alcohol; degree of physical pain experienced; and if any behaviour had a suicidal intent.

The second part of the FASM consists of 22 statements assessing motivations for self-injurious behaviours rated on a four-point Likert scale, ranging from never to often. Nock & Prinstein (2004) evaluated the structural validity of the FASM and confirmed the proposed four-factor theoretical model of NSSI functions, performed along two dichotomous dimensions. First, NSSI is either *intra-personal, automatically reinforcing* (e.g. to obtain a reduction in tension or create a more desirable state) or *interpersonal, socially reinforcing* (e.g. to alter one's environment). Second, NSSI is reinforced in either a *positive* (i.e. rewarded with a positive stimulus) or *negative* manner (i.e. rewarded by escaping a negative interpersonal demand).

The FASM has demonstrated acceptable psychometric properties within adolescent samples (Guertin *et al.* 2001; Esposito *et al.* 2003; Penn *et al.* 2003), yielding adequate internal consistency (coefficient  $\alpha=0.65-0.66$ ) for both minor and moderate/severe SIB scales. Adequate concurrent validity was established by significant associations with measures of suicide intent, past suicide attempt (Guertin *et al.* 2001), recent suicide attempt, hopelessness and depressive symptoms (Nock & Prinstein, 2005). The FASM has been used previously in an Indian study with youth aged 17 to 22 years (Kharsati, 2013).

**3. The Youth Self-Report (YSR; Achenbach, 1991; Achenbach & Rescorla 2001)** is a widely used self report measure of psychopathology among youth in the age range of 11-18 years. The YSR was used for the school and pre-university youth in the sample.

The first part of the YSR consists of 17 competence items. The second part contains 103 items, covering emotional and behavioural problems during the previous six months, and 16 socially desirable items. The 103 problem item section was used in the study. The YSR has eight Empirically Based Syndromes Scales derived through factor analysis. These include Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints (together constituting the 'Internalizing' scale), and Rule-Breaking behaviour and Aggressive Behaviour (together comprising the 'Externalizing Scale). Three other scales included Attention Problems, Social Problems and Thought Problems. The problem items are scored "0" if the behavior is "not true", "1" if the behavior is "somewhat or sometimes true" and "2" if the behavior is "very true or often true". A Total Problem score is derived by summing the scores for each problem item.

The T-scores derived from the normative U.S. samples for the YSR may not reflect the distribution of scores in the study sample. Therefore, the use of 90<sup>th</sup> percentile cutoffs derived from the sample has been recommended to identify individuals with potential problems in the present stud (Achenbach, 2014, personal communication).

The YSR has been used in Indian epidemiological and therapeutic studies (Bhola, & Kapur, 2000; Dalal, 1989; Mishra & Sharma, 2001; Pathak et al, 2011; Rozario, 1988).

**4. The Adult Self-Report (ASR: Achenbach, 1997; Achenbach & Rescorla 2003)** is a self-report questionnaire assessing psychopathology in the age range of 18 to 59 years. It was modelled after the Child Behaviour Checklist and the Youth Self Report and has the same format. The ASR was used for the college going youth in the sample.

The first part of the ASR comprises 14 competence items and this was not used in the proposed study. The second part contains 110 problem items, covering a broad range of emotional and behavioral problems during the past six months, and 15 socially desirable items. Similar to the YSR, it has 8 empirically based syndromes and summed scores for Internalizing, Externalizing, and Total Problems. The response format is 0=not true, 1=somewhat or sometimes true, and 2=very true or often true.

The T-scores derived from the normative U.S. samples for the ASR may not reflect the distribution of scores in the study sample. Therefore, the use of 90<sup>th</sup> percentile cutoffs derived from the sample has been recommended to identify individuals with potential problems in the present study (Achenbach, 2014, personal communication).

Ferdinand and Verhulst (1995) and Ferdinand, Verhulst & Wiznitzer (1995) reported on the good reliability and validity of the instrument.

### **Pilot study Phase:**

The Pilot study phase involved the following:

1. Taking consent from Dr. Elizabeth Lloyd Richardson to use and translate the FASM.
2. Obtaining site license from Prof. Thomas M. Achenbach to use and translate the YSR and ASR. The Kannada translation was approved by Prof. Achenbach and his research team.
3. All tools were translated and back translated and English and Kannada versions were finalized.
4. Activities and presentations for the pre and post assessment sessions which focus on “Stress and Coping” & “Debriefing, Self-care, Help seeking” were prepared.
5. The pilot study data collection included N=123 students from 3 schools and 2 colleges.
6. Minor modifications were made in some items of the questionnaires to facilitate comprehension.

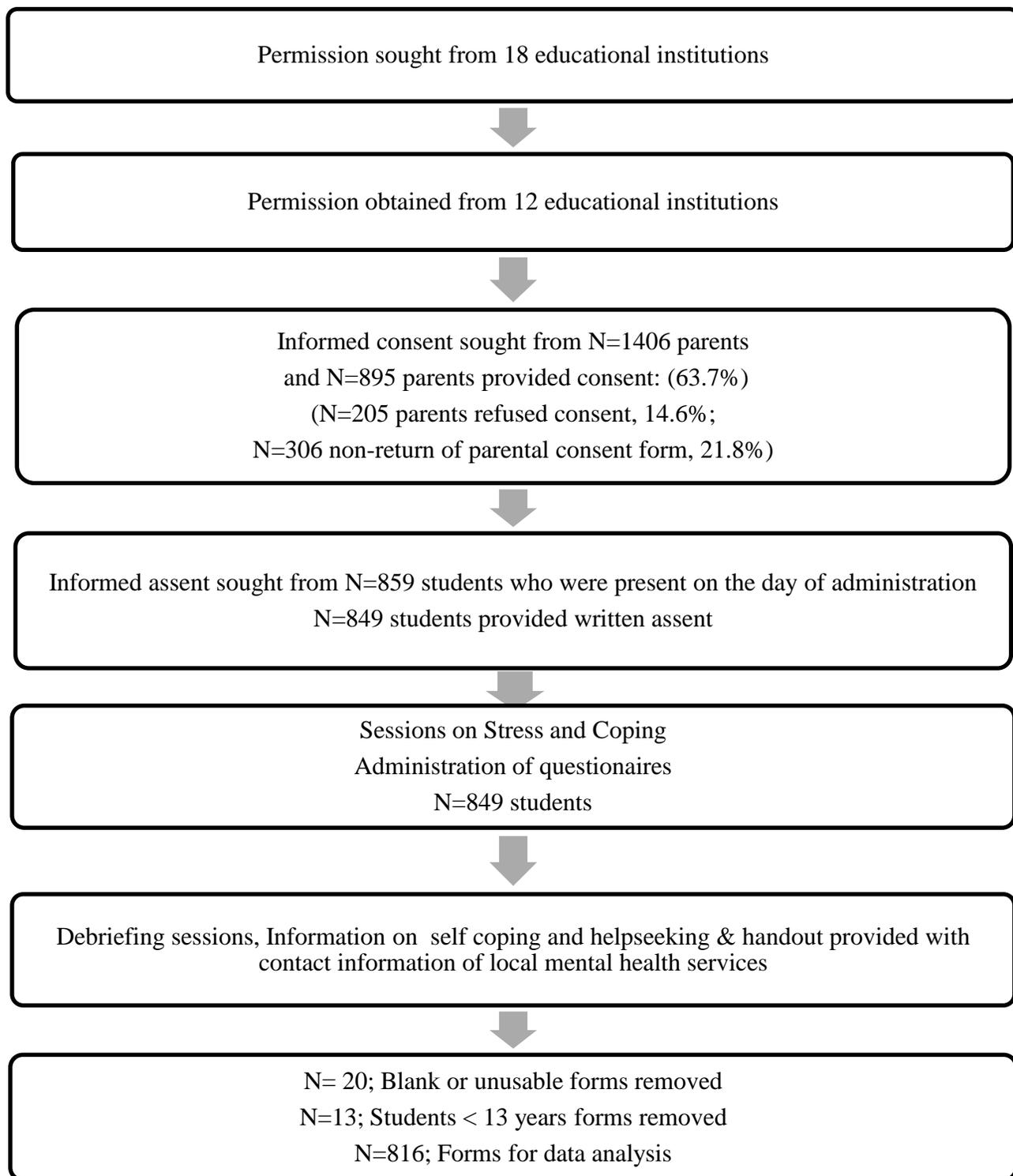
### **Procedure: Main Study**

The colleges and schools were selected and the administration was approached for consent for the study.

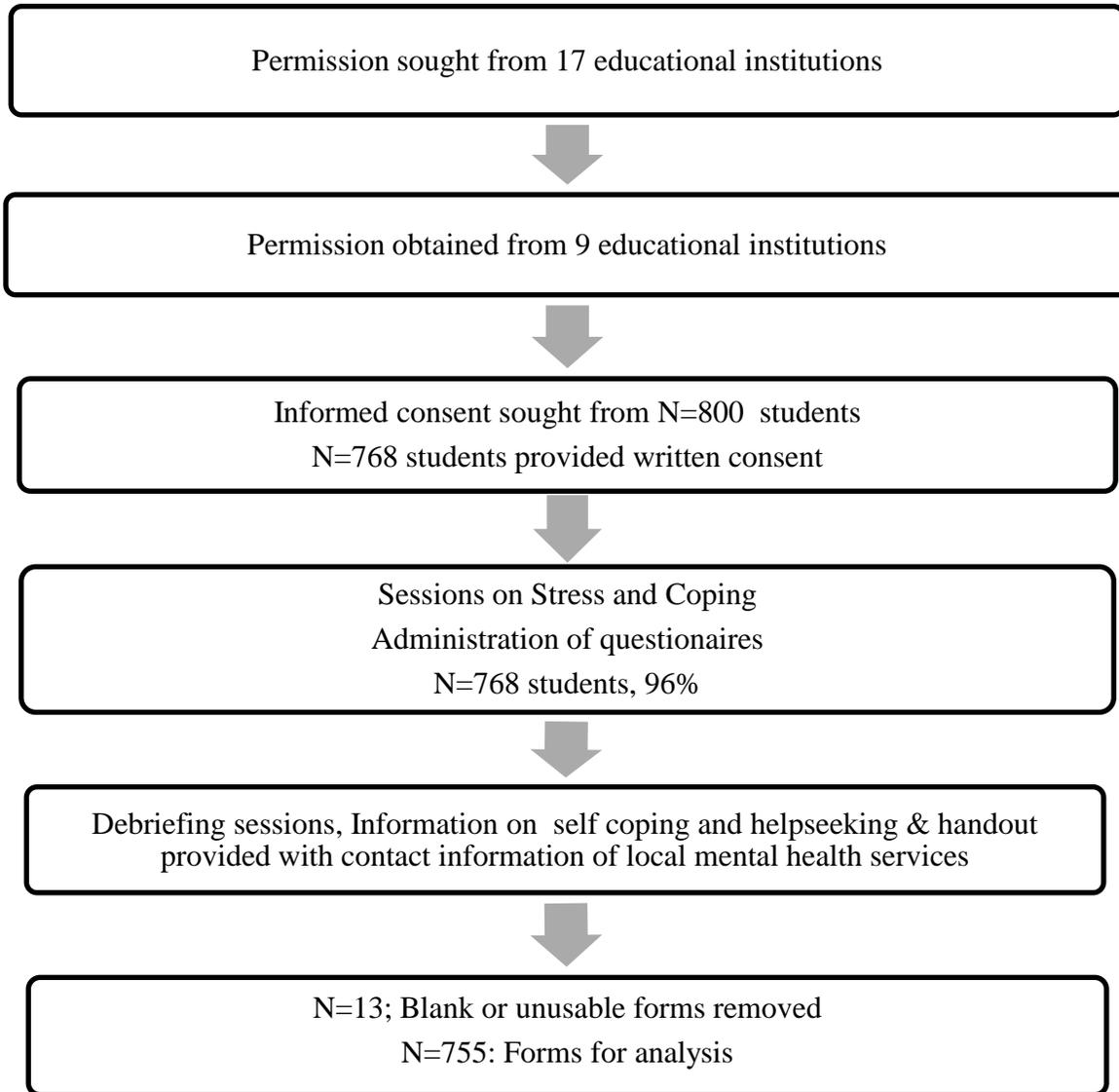
Figure 1 depicts the data collection procedure for the sample aged between 13 and 18 years (from Schools and Pre-University Colleges) and Figure 2 depicts the data collection procedure for the sample over 18 years (from Undergraduate colleges).

During the process of contacting schools, pre-university colleges and undergraduate colleges across Bangalore, there were some institutions where an appointment to meet the Administrative Head could not be obtained. The flow chart presents information based on institutions where meetings were held to obtain permission for conducting the study.

**Figure 1: Procedure for the study (Schools and Pre-University Colleges)**



**Figure 2: Procedure for the study (Undergraduate colleges)**



The questionnaires were distributed and administered in groups after obtaining assent and /or consent.

**Ethical considerations:**

1. The Institutional Ethical Review Board approval was obtained.
2. Confidentiality of the information was maintained.
3. Two group sessions on Stress and Coping were conducted before the administration of questionnaires conducted and group sessions on Self Care and Helpseeking were conducted subsequently.
4. Information about mental health services was provided to all participants. There was a provision for appropriate referrals for those individuals who sought help.

## **Statistical analysis**

Descriptive statistics, e.g. frequencies and percentages were used to assess the prevalence rates, types of self-injurious behaviours and self-reported motivations/reasons for self-injurious behaviours. Chi-square tests, t-tests and ANOVAS were used to compare different groups; e.g. Any SIB group and no SIB group, Moderate/Severe SIB group and Minor SIB only group, SIB with Suicidal Intent and SIB without Suicidal Intent, Males and Females. ANOVAs were also computed to analyse gender differences in psychopathology (internalising, externalising and total problems) on the YSR and ASR. The 90<sup>th</sup> percentile cutoffs were computed for the Internalising, Externalising and Total Problem Scales of the YSR and ASR. Separate logistic regression analyses were conducted to predict the occurrence of self-injurious behaviour and to predict the occurrence of self-injurious behaviour with suicidal intent. The Statistical Package for Social Sciences, SPSS, version 17.0 was used for data analyses.

## **Results**

The results are presented in the following sections:

### **Section 1:** Socio-demographic Profile of the Sample of Adolescents and Young Adults (N=1571)

### **Section 2:** Self-injurious Behaviours (past year) reported by High School, Pre-University and College Youth in Bangalore

- 2.1: Frequency, Characteristics & Methods of SIB (past yr) among Students in Bangalore
- 2.2: Comparison of Socio-Demographic variables between Any SIB (past year) and No SIB (past year) groups
- 2.3. Comparison of Frequency, Characteristics & Methods of SIB (past yr) between Female and Male Students in Bangalore
- 2.4. Rates of Moderate Severe SIB and Minor SIB Only in Age x Gender Groups
- 2.5: Self-Reported Functions/Reasons for Self-Injurious Behaviours among Students in Bangalore

### **Section 3:** Comparison between Moderate/Severe SIB and Only Minor SIB groups

- 3.1: Comparison of socio-demographic variables between Moderate/Severe SIB and Only Minor SIB groups
- 3.2: Comparison of SIB characteristics between Moderate/Severe SIB and Only Minor SIB groups
- 3.3: Comparison of Self-Reported Functions/Reasons for Self-Injurious Behaviours between Moderate/Severe SIB and Only Minor SIB groups

**Section 4:** Comparison between SIB with Suicidal Intent and SIB without Suicidal Intent groups

4.1: Comparison of socio-demographic variables between SIB with Suicidal Intent and SIB without Suicidal Intent groups

4.2: Comparison of SIB characteristics between SIB with Suicidal Intent and SIB without Suicidal Intent groups

4.3: Comparison of Self-Reported Functions/Reasons for Self-Injurious Behaviours between SIB with Suicidal Intent and SIB without Suicidal Intent groups

**Section 5:** Psychopathology among School, Pre-University and College Youth (N=1571)

5.1: Gender Differences in Mean Internalising, Externalising and Total Problem Scores among School, Pre-University and College Youth (N=1571)

5.2: Comparison of Mean Internalising, Externalising and Total Problem Scores (YSR/ASR) in Any SIB (past year) and No SIB (past year) groups

5.3: Comparison of Mean Internalising, Externalising and Total Problem Scores (YSR/ASR) in SIB with Suicidal Intent and SIB without Suicidal Intent group

**Section 6: Logistic regression analysis**

6.1 Binomial logistic regression analysis to predict the occurrence of self-injurious behaviour (past year)

6.2 Logistic regression analysis for variables predicting Self-injurious Behaviour with suicidal intent (past year)

## Section 1: Sociodemographic Profile of the Sample of Adolescents and Young Adults (N=1571)

Table 1 depicts the sociodemographic profile of the sample.

Table-1: Socio-Demographic details of the Sample (N=1571)

	M	sd
Age (in years)	17.5	2.52
	N	%
Age Level		
Under 18 years	834	54.3
18 years and above	702	45.7
Gender		
Female	905	57.8
Male	662	42.2
Educational Sector		
School	476	32.4
Pre-University	317	21.6
Under-graduate	676	46.0
Family System		
Nuclear	1089	70.2
Joint/Extended	462	29.8
Family Structure		
Intact family	1337	90.8
Non-Intact family	135	9.2
Sibling/s		
Yes	1459	93.5
No	102	6.5
Current Residence		
Parents	1393	89.8
Other	159	10.2

Total Ns may vary due to missing data

Table 1 indicated that the mean age of the sample (N=1571) was 17.5 years (sd=14.2). 54.3% of the sample was below 18 years, while 45.7% were 18 years and above.

The gender distribution included 57.8% females and 42.2% males.

In terms of the educational sector, 32.4% of the sample was from schools (8<sup>th</sup> standard to 10<sup>th</sup> standard), 21.6% were from pre-university colleges, and 46.0% were from undergraduate degree colleges.

The majority of the sample was from nuclear families (70.2%), lived with their parents (89.8%) and had sibling/s (93.5%). While about 90% of the sample belonged to intact families with both biological parents, 10.2% were from single parent families or reconstituted families following divorce or death of a parent.

## **Section 2: Self-injurious Behaviours (past year) reported by High School, Pre-University and College Youth in Bangalore**

### *2.1: Frequency, Characteristics & Methods of SIB (past year) among Students in Bangalore*

Table 2 provides information about the frequency, characteristics and methods of non-suicidal self-injurious behaviours reported by the school, pre-university and college youth for the past one-year period.

Table 2: Frequency, Characteristics & Methods of SIB (past year) among Students in Bangalore (N=1571)

	N	%
<i>Any SIB in the past year</i>	636	40.7
Moderate/Severe SIB	303	19.4
Moderate/Severe & Minor SIB	233	14.9
Moderate /Severe SIB only	70	4.5
Minor SIB only	333	21.3
<hr/>		
<i>Moderate/Severe SIB</i>		
Cut	128	8.2
Burned skin	120	7.7
Self tattoo	69	4.5
Scraped skin	64	4.1
Erased skin	38	2.5
<i>Minor SIB</i>		
Self hit	266	17.2
Pulled hair out	95	6.1
Picked at wound	213	13.8
Insert objects under skin	78	5.0
Bite self	304	19.6
Picked body areas to draw blood	92	5.9
<hr/>		
<i>Number of SIB methods endorsed</i>		
1 method	252	39.6
2 - 5 methods	348	54.7
6 – 10 methods	36	5.7
<i>Forethought about SIB</i>		
None	260	42.8
Few minutes	241	39.7
< 1 hour	38	6.3
> 1 hour but < 24 hours	26	4.3
> 1 day but < 1 week	17	2.8
> 1 week	25	4.1
<i>Experience of pain during SIB</i>		
No pain	187	31.4
Little pain	292	49.0
Moderate pain	56	9.4
Severe pain	61	10.2
<i>Substance use during SIB</i>	23	3.6
<i>Suicidal intent present</i>	106	16.7
<hr/>		
	M	sd
Age at first SIB (in years)	14.8	2.9
Total number of SIB methods	2.3	1.6

Participants could endorse more than one method of SIB; Total N's may vary due to missing data

Table 2 indicates that the rate of any self-injurious behaviour in the past year was 40.7%. While 19.4% of the sample reported engaging in moderate/severe forms (with or without minor forms) of SIB, 21.3% of the individuals reported using only minor methods of self-injury. Among those who reported self-injurious behaviours, the most common pattern (14.9%) was a combination of moderate/severe and minor forms of SIB, with only 4.5% engaging in moderate/severe methods alone. The mean age of the first self-injury was reported as 14.8 years (sd = 2.9; median = 15.0; mode = 15).

The most common method endorsed by the participants was biting self, a minor method of self-injury (19.6%). The other minor methods of self-injury reported most frequently were self-hitting (17.2%) and wound-picking (13.8%). Cutting or carving skin (8.2%) and burning skin (7.7%) were the most frequently reported moderate/severe methods of self-injury. The majority of participants (54.7%) reported between 2-5 methods of SIB in the past year while 39.6% engaged in a single method of SIB. A relatively small percentage (5.7%) of the sample reported the use of between 6 and 10 different methods of SIB. The mean number of types of SIB performed was 2.3 (sd = 1.6).

A majority of those endorsing SIB did not think about the acts before engaging in them (42.8%) or thought about the act for only a few minutes (39.7%). This indicates a relatively impulsive pattern of engaging in SIB. Most participants indicated experiencing little (49.0%) or no pain (31.4%) during the act. A relatively small proportion of self-injurers (3.6%) reported concurrent substance use.

The results indicated that 16.7% of the self-injurers reported that one or more of their behaviours was intended as a suicide attempt. Overall, 6.8% of the sample of youth reported acts of self-injury accompanied by the intent to kill self. Therefore, the overall rate of a clear pattern of non-suicidal self-injury among adolescents and young adults was 33.9%.

Additional analysis examined the association between certain contextual characteristics of self-injurious behaviour. Chi-square analysis indicated a significant association between levels of associated pain (no or little pain; moderate to severe pain) and the time period of contemplation/forethought (none – few minutes; less than an hour – less than a day; one day – a week) before engaging in self-injury ( $X^2 = 27.70$ ;  $p = .001$ ). The experience of more physical pain during SIB was associated with a longer period of contemplation. The association between pain and associated substance use and the association between time period of forethought and associated substance use was not analysed due to violation of chi-square assumptions.

2.2: Comparison of Socio-Demographic variables in Any SIB (past year) and No SIB (past year)

Groups

Table 3 displays the comparison of sociodemographic variables in the group of individuals reporting self-injurious behaviours (SIB) in the past year and the group of individuals who did not report this behaviour.

Table 3: Comparison of Socio-Demographic variables in Any SIB and No SIB groups (N=1571)

	Any SIB		No SIB		t	p
	M	SD	M	SD		
Age (in years)	17.2	2.4	17.7	2.6	3.70	.001***
	N	%	N	%	X <sup>2</sup>	p
Age Level						
Under 18 years	370	44.6	459	55.4	12.21	.001***
18 years & over	250	35.8	448	64.2		
Gender						
Female	319	35.6	576	64.4	23.61	.001***
Male	317	47.9	345	52.1		
Educational sector						
Government	159	39.8	240	60.2	.18	.913
Private	209	40.7	305	59.3		
Aided	264	41.2	377	58.8		
Educational Level						
School	201	42.4	273	57.6	17.24	.001***
Pre-university	154	49.0	160	51.0		
Under-graduate	238	35.5	433	64.5		
Family system						
Nuclear	436	40.3	645	59.7	.08	.783
Joint/Extended	189	41.1	271	58.9		
Family structure						
Intact family	528	39.8	799	60.2	1.11	.293
Non-Intact family	60	44.4	75	55.6		
Siblings						
Yes	589	40.6	862	59.4	1.13	.288
No	46	46.0	54	54.0		
Current Residence						
Parents	566	40.9	817	59.1	.60	.438
Others	60	37.7	99	62.3		

Total N's may vary due to missing data; \*\*\* p<.001, \*\* p<.01, \* p<.05

The results (Table 3) indicate a significant difference ( $p=.001$ ) in the mean age in the two groups; the mean age was significantly lower among in the self-injuring group. Chi-square analysis indicated a significant relationship between self-injurious behaviour and gender, age and educational level. The results indicated that 44.6% of the younger age group aged 13 to under 18 years reported SIB, compared with 35.8% of those aged 18 years and above ( $p=.001$ ).

Analysis indicated gender differences, with 47.9% of males reporting self-injurious behaviours, compared with 35.6% of females ( $p=.001$ ).

In terms of educational level, 35.5% of undergraduate college youth, compared with 42.4% of school-going youth (8<sup>th</sup> to 10<sup>th</sup> standard) and 49.0% of pre-university youth reported engaging in self-injurious behaviour ( $p=.001$ ).

There was no significant relationship between self-injurious behaviour and the sociodemographic variables; educational sector (government, private and aided institutions), family system, family structure, presence or absence of siblings and current residential arrangements.

### *2.3. Comparison of Frequency, Characteristics & Methods of SIB (past yr) among Female and Male Students in Bangalore*

The results (Table 4) indicated absence of association between gender and reported age of first self-injurious behaviour, the number of methods of self-injury and degree of pain associated with self injury.

There was a significant relationship between gender and presence of moderate/severe self injury ( $X^2 = 13.31$ ;  $p=.001$ ). Males were more likely to engage in moderate to severe forms of self-injury than were females. Separate analyses of the association between gender and each type of self-injury indicated a significant relationship only with self-tattooing ( $X^2 = 34.54$ ;  $p=.001$ ); 8.1% of males reported this behaviour compared with only 1.8% of females.

Table 4: Comparison of Frequency, Characteristics & Methods of SIB (past yr) among Female and Male Students in Bangalore

	Female		Male		t	p
	M	sd	M	sd		
<i>Age at first SIB</i>	14.89	2.76	14.66	2.95	-.582	.561
<i>No. of SIB methods</i>	2.29	1.55	2.36	1.67	.851	.395
	N	%	N	%	X <sup>2</sup>	p
<i>Moderate/Severe SIB</i>	146	16.3	157	23.7	13.31	.001***
<i>Minor SIB Only</i>	173	19.3	160	24.2	5.30	.021*
<i>Moderate/Severe SIB</i>						
Cut	71	8.0	57	8.7	.25	.619
Burned skin	60	6.8	60	9.1	2.79	.095
Self tattoo	16	1.8	53	8.1	34.54	.001***
Scraped skin	32	3.6	32	4.9	1.47	.225
Erased skin	17	1.9	21	3.2	2.49	.114
<i>Minor SIB</i>	173	19.3	160	24.2	5.30	.021*
Self hit	136	15.3	130	19.7	5.06	.024*
Pulled hair out	51	5.7	44	6.7	.54	.462
Picked at wound	94	10.6	119	18.1	17.74	.001***
Insert objects under skin	27	3.1	51	7.7	17.16	.001***
Bite self	174	19.6	130	19.7	.00	.972
Picked to draw blood	48	5.4	44	6.7	1.06	.304
<i>Forethought about SIB</i>						
None to few min	242	81.2	259	83.8	8.04	.018*
< 1 hr to < 24 hrs	27	9.1	37	12.0		
> 1 day to 1 week	29	9.7	13	4.2		
<i>Experience of pain during SIB</i>						
No/Little pain	263	82.7	216	77.7	2.36	.125
Moderate/ Severe pain	55	17.3	62	22.3		
<i>Substance use during SIB</i>	6	1.9	17	5.4	5.75	.016*
<i>Suicidal intent present</i>	71	24.7	35	12.3	14.54	.001***

Participants could endorse more than one method of SIB; Total N's may vary due to missing data; \*\*\* p<.001, \*\* p<.01; \* p<.05

Chi-square analysis also indicated that males were more likely to engage in minor forms of self-injury ( $X^2 = 5.30$ ;  $p=.012$ ); Males were more likely to report engaging in self-hitting ( $X^2 = 5.06$ ;  $p=.024$ ); wound picking ( $X^2 = 17.74$ ;  $p=.001$ ); and inserting objects under skin or nails ( $X^2 = 17.16$ ;  $p=.001$ ); than were females.

The results indicated a significant association between gender and substance use concurrent with self-injury ( $X^2 = 5.75$ ;  $p=.016$ ); Males were more likely to report this behaviour than were females.

The significant association between gender and suicidal intent associated with any one or more acts of reported self-injury ( $X^2 = 14.54$ ;  $p=.001$ ) suggested that females were more likely than males to report associated suicidal intent. While over 80% of both males and females reported an little or no forethought before engaging in self-injurious behaviour, males were more likely to report a period of thought ranging from more than an hour to less than a day. A higher percentage of females reported a longer period of contemplation ranging from more than a day to a week.

#### **2.4. Rates of Moderate Severe SIB and Minor SIB Only in Age x Gender Groups**

Table 5 reports the results of chi-analysis to further depict the relationships between gender and rates of SIB; both Moderate/Severe and Minor methods; in two age ranges; below 18 years and 18 years and above. This was aimed at exploring any differential patterns in gender differences in self-injurious behaviour among the younger and older age groups.

The results indicated a pattern of self injurious behaviour with males under 18 years reporting higher rates of moderate/severe self-injurious behaviour than younger females (M=26.9%, F=18.4%;  $X^2=8.60$ ;  $p=.003$ ) but no significant association with gender and likelihood of moderate/severe self-injury in the 18 years and above group ( $X^2=2.04$ ;  $p=.153$ ).

The pattern of results was reversed in the age group of youth aged 18 years and above. Chi-square analyses indicated a significant association in the 18 years and above group with males more likely to report using minor methods of self-injury when compared with females (M=24.6%, F=16.8%;  $X^2=6.310$ ;  $p=.012^*$ ). Males and females in the younger age group did not differ significantly in the likelihood of reporting use of only minor methods of self injury (M=23.5%, F=21.3%;  $X^2=.574$ ;  $p=.449$ ).

Table 5: Rates of Moderate/Severe SIB and Minor SIB Only in Age x Gender Groups

Age X Gender Groups	Moderate/Severe SIB		Minor SIB only	
	N	%	N	%
Under 18 years				
Female	82	18.4	95	21.4
Male	103	26.9	90	23.5
	$X^2=8.60; p=.003^{**}$		$X^2=.574; p=.449$	
18 years and above				
Female	64	14.7	73	16.8
Male	49	18.8	64	24.6
	$X^2=2.04; p=.153$		$X^2=6.310; p=.012^*$	

Participants could endorse more than one method of SIB; Total N's may vary due to missing data; \*\*,  $p < .01$ ; \*,  $p < .05$

Additional chi-square analysis was conducted, separately for the two developmental periods, to explore associations between gender and each of the methods of self-injury. Among adolescent males under 18 years, there was a higher rate of moderate/severe self-injury, with the difference manifested only in the higher rate of self-tattooing attempts (M=9.2% and F=3.1%;  $X^2=13.93; p=.001$ ). Although the overall rates of minor methods of self-injury did not differ among adolescent boys and girls, there was a significant male preponderance in acts of inserting objects under skin or nails (M =  $X^2=5.99; p=.014$ ). There was no significant association between gender and the following self-injurious behaviours among youth below 18 years of age; cutting/carving skin ( $X^2= .093 ; p=.760$ ), burning ( $X^2= 3.10; p=.078$ ); scraping skin ( $X^2= .235; p=.628$ ) ; erasing skin ( $X^2= 2.611; p=. 106$ ); hitting self ( $X^2=1.93; p=.165$ ); hairpulling ( $X^2= .063; p=.426$ ); wound picking ( $X^2= 3.77; p=.06$ ); biting self ( $X^2= 2.51; p=.133$ ); picking skin to draw blood ( $X^2= .002; p=.960$ ).

Among youth aged 18 years and above, although there were no significant differences on overall rates of self-injurious behaviours using moderate/severe method/s, there was an association between gender and self-tattooing behaviour (M=5.4%; F=.5%;  $X^2 = 17.25; p=.001$ ). Among the minor forms of self injury, gender was significantly associated with wound picking behaviours (M=16.6%, F=7.3%;  $X^2 = 14.62; p=.001$ ) and inserting objects under the skin (M=6.6%, F=1.9%;  $X^2 = 10.10; p=.001$ ).

## 2.5. Self-Reported Functions/Reasons for Self-Injurious Behaviours among Students in Bangalore

Table 6 describes the frequency of self-reported functions/reasons for self-injurious behaviours reported by the sample of adolescents and young adults.

Table 6: Frequency of self-reported reasons for SIB (N=636)

Function	N	% <sup>a</sup>
<i>Automatic negative reinforcement</i>		
To stop bad feelings	166	31.1
To relieve feeling “numb” or empty	63	11.8
<i>Automatic positive reinforcement</i>		
To punish yourself	128	23.8
To feel relaxed	198	37.5
To feel something, even if it were pain	151	28.0
<i>Social negative reinforcement</i>		
To avoid having to do something unpleasant	126	23.4
To avoid school, work	115	21.0
To avoid punishment or paying consequences	120	22.6
To avoid being with people	125	23.4
<i>Social positive reinforcement</i>		
To get control of a situation	188	35.5
To get other people to act differently or change	91	17.1
To try and get a reaction from someone, even if negative	82	15.6
To get your parents to understand or notice you	197	37.5
To make others angry	100	18.9
To be like someone you respect	147	27.6
To give yourself something to do when alone	173	32.9
To give yourself something to do with others <sup>b</sup>	128	24.3
To receive more attention from your parents or friends	211	39.4
To feel more part of a group	141	26.7
To let others know how desperate you were	104	19.8
To get attention	164	30.4
To get help	185	34.8

<sup>a</sup> % includes items marked ‘sometimes’ or ‘often’ on the 4 point scale, <sup>b</sup> This item was excluded from the Nock & Prinstein Four Function Model

Table 6 indicates that the most common reasons reported by participants were ‘To receive more attention from your parents or friends’ (39.4%), ‘get parents to understand and notice you (37.5%) and ‘to feel relaxed’ (37.5%) . Other frequently endorsed reasons included; ‘to get control of a situation; (35.5%), ‘to get help’ (34.8%), ‘to give self something to do when alone’ (32.1%) and ‘to stop bad feelings’ (31.1%). The most frequently reported functions were related both to reducing negative affective states or generating feelings and to modifying or regulating the social environment.

The least frequently endorsed motives were ‘to get a reaction from someone, even if negative’ (15.6%) and ‘to relieve feeling numb or empty’ (11.8%).

The Four Function model (Nock & Prinstein, 2004) classifies the different possible functions of self-injurious behaviour into the categories of ‘automatic’ negative and positive reinforcement and ‘social’ negative and positive reinforcement. Overall, between 11.8% and 37.5% of the self-injurers engaged in SIB to regulate their emotions (automatic reinforcement items). SIB functioned to modify or regulate their social environment for between 15.6%-39.4% of self-injurers (social-reinforcement items). The social negative reinforcement category which reflects the use of SIB to escape from interpersonal demands was least frequently endorsed by self-injurers (21.0% - 23.4%).

Additional analysis indicated that a majority of self-injurers reported multiple reasons for their behaviour ( $M = 5.5$  reasons;  $sd = 4.75$ ; median = 5 reasons). 57.3% of self-injurers reported between 2 and 10 reasons for SIB; 13.4% of the individuals reported between 11 and 16 reasons and relatively smaller proportions endorsed a single reason (7%) or between 17 and 22 reasons (2.3%). Among the self-injurers, 21.1% did not endorse any of the listed reasons underlying their engagement in SIB.

### **Section 3: Comparison between Moderate/Severe SIB and Only Minor SIB groups**

The results in Section 3 compare the characteristics and functions of SIB between groups of individuals with a pattern of self-injurious behaviours using moderate/severe method/s and those reporting the use of minor methods only.

3.1: Comparison of SIB characteristics between Moderate/Severe SIB and Only Minor SIB groups

Table 7: Comparison of Socio-Demographic variables in Moderate/Severe SIB and Only Minor SIB Groups (N=636)

	Moderate/ Severe SIB N=303		Minor SIB only N=333		t	p
	M	SD	M	SD		
Age (in years)	17.0	2.38	17.36	2.35	-1.42	.16
	N	%	N	%	X <sup>2</sup>	p
Age Level						
Under 18 years	185	50.0	185	50.0	1.38	.241
18 yrs & over	113	45.2	137	54.8		
Gender						
Female	146	45.8	173	54.2	.901	.343
Male	160	50.5	157	49.5		
Education sector						
Government	64	40.3	95	59.7	4.62	.099
Private	102	48.8	107	51.2		
Aided	134	50.8	130	49.2		
Educational Level						
School	101	50.2	100	49.8	2.20	.333
Pre-university	76	49.4	78	50.6		
Under-graduate	104	43.7	134	56.3		
Family system						
Nuclear	207	47.5	229	52.5	.24	.877
Joint/Extended	91	48.1	98	51.8		
Family structure						
Intact family	246	46.6	282	53.4	.56	.496
Non-Intact family	31	51.7	29	48.3		
Siblings						
Yes	283	48.0	306	52.0	.78	.378
No	19	41.3	27	58.7		
Current Residence						
Parents	272	48.1	294	51.9	1.41	.235
Others	24	40.0	36	60.0		

Total N's may vary due to missing data; \*\*\* p<.001, \*\* p<.01, \* p<.05

The analysis (Table 7) indicates that no significant differences between the Moderate/Severe SIB group and the group engaging in only Minor SIB on the sociodemographic variables of age, gender, educational level, educational sector (government, private and aided institutions), family system, family structure, presence or absence of siblings and current residential arrangements.

3.2: Comparison of SIB characteristics between Moderate/Severe SIB and Only Minor SIB groups

Table-8: Comparison of SIB characteristics in Moderate/Severe SIB and Minor only SIB groups

	Moderate/Severe SIB N= 303		Minor SIB only N= 333		t	p
	M	sd	M	sd		
<i>Age at first SIB</i>	14.15	2.63	14.53	2.72	-1.25	.21
<i>No. of reasons for SIB</i>	6.09	4.93	5.07	4.54	2.53	.01**
	N	%	N	%	X <sup>2</sup>	p
<i>Forethought about SIB</i>						
None to few min	202	45.9	238	54.1	6.02	.05*
< 1 hr to < 24 hrs	31	55.4	25	44.6		
> 1 day to 1 week	25	64.1	14	35.9		
<i>Experience of pain during SIB</i>						
No or Little pain	136	43.2	179	56.8	12.11	.001***
Moderate or Severe pain	57	64.0	32	36.0		
<i>Substance use during SIB</i>	16	72.7	6	27.3	5.90	.02*
<i>Suicidal intent present</i>	74	69.8	32	30.2	25.62	.001***

\*\*\* p<.001, \*\* p<.01; \* p<.05

Analysis was conducted to compare the characteristics of self-injurious behaviours between the self-injuring youth who used moderate/severe methods and those who used only minor methods of self-injury. Table 8 depicts patterns of differences in characteristics of self-injurious behaviour between self-injuring youth using moderate/severe methods and those reporting use of minor methods of SIB. The Moderate/Severe SIB groups reported a significantly higher number of functions served by their self-injurious behaviour (p<.01). Analysis indicated that 72.7% of self-injuring individuals who used substances during the behaviour, reported using moderate to severe SIB methods (p=.02). Over 2/3<sup>rds</sup> of individuals (69.8%) who reported suicidal intent during at least one act of self-injury reported use of moderate/severe methods, with the remaining using minor methods alone (p=.001). The experience of pain was significantly associated with severity of self-injury (p=.001). In terms of forethought before engaging in self-injurious behaviour, a higher frequency of individuals with Moderate/Severe SIB thought about the act for a longer duration of time (p=.001).

3.3: Comparison of Self-Reported Functions/Reasons for Self-Injurious Behaviours between Moderate/Severe SIB and Only Minor SIB groups

Table-9: Comparison of rate of self-reported reasons in Moderate/Severe SIB & Minor SIB Groups

Function	Moderate/ Severe SIB N=303		Minor SIB Only N=303		x <sup>2</sup>	p
	N	% <sup>a</sup>	N	% <sup>a</sup>		
<i>Automatic negative reinforcement</i>						
To stop bad feelings	92	55.4	74	44.6	7.02	.008**
To relieve feeling “numb” or empty	35	55.6	28	44.4	1.92	.166
<i>Automatic positive reinforcement</i>						
To punish yourself	80	62.5	48	37.5	15.97	.001***
To feel relaxed	162	49.1	168	50.9	2.20	.137
To feel something, even if it were pain	84	55.6	67	44.4	6.49	.01*
<i>Social negative reinforcement</i>						
To avoid having to do something unpleasant	68	54.0	58	46.0	3.01	.08
To avoid school, work	56	48.7	59	51.3	.19	.66
To avoid punishment or paying consequences	68	56.7	52	43.3	5.27	.02*
To avoid being with people	67	53.6	58	46.4	2.38	.12
<i>Social positive reinforcement</i>						
To get control of a situation	83	44.1	105	55.9	.94	.33
To get other people to act differently or change	47	51.6	44	48.4	.91	.34
To try and get a reaction, even if negative	46	56.1	36	43.9	3.00	.08
To get parents to understand or notice you	94	47.7	103	52.3	.01	.95
To make others angry	57	57.0	43	43.0	4.98	.03*
To be like someone you respect	79	53.7	68	46.3	4.14	.04*
To give yourself something to do when alone	79	45.7	94	54.3	.17	.68
To give yourself something to do with others	63	49.2	65	50.8	.44	.51
To receive more attention from parents/friend	95	45.0	116	55.0	.72	.40
To feel more part of a group	66	46.8	75	53.2	.03	.86
To let others know how desperate you were	57	54.8	47	45.2	2.98	.08
To get attention	90	54.9	74	45.1	5.15	.023*
To get help	102	55.1	83	44.9	8.48	.004**

Total Ns may vary due to missing data; \*\*\* p<.001, \*\* p<.01; \* p<.05, <sup>a</sup> % includes items marked ‘sometimes’ or ‘often’ on the 4 point scale

The chisquare analysis (Table-9) indicates a significant relationship between severity of self-injurious behaviours and select self-reported functions of the SIB.

The following functions of self-injurious behaviour were reported more frequently by individuals using moderate/severe self-injury methods when compared with their occurrence in those using only minor methods; To stop bad feelings, To punish self, To avoid punishment or paying consequences, To make others angry, To be like someone respected, To get attention and To get help.

There was no significant relationship between the severity level of self-injurious behaviours and the frequency of endorsement of the other functions of self-injury.

#### **Section 4: Comparison between SIB with Suicidal Intent and SIB without Suicidal Intent groups**

Section 4 describes the analyses comparing self-injuring youth with suicidal intent associated with at least one act of self-injury and those with a pattern of non-suicidal self-injury.

##### *4.1: Comparison of socio-demographic variables in SIB with Suicidal Intent and SIB without Suicidal Intent groups*

The results (Table 10) indicate that certain socio-demographic variables differentiated between groups of self-injurers with and without any associated suicidal intent.

Gender differences were present ( $X^2=14.54$ ,  $p=.001$ ): with 24.7% of self-injuring females expressing the presence of suicidal intent associated with one or more of these acts. Comparatively, only 12.3% of self-injuring males reported associated suicidal intent.

The chi-square analysis indicated a significant association between educational sector and presence of suicidal intent with self-injury ( $X^2=7.91$ ,  $p=.019$ ). While 23.3% of self-injurers from aided institutions reported associated suicidal intent, the comparable percentages from private and government institutions were 17.0% and 12.1% respectively. Therefore, among this vulnerable subset of self-injurers, aided institutions had the largest representation, followed by private and government institutions.

Table 10: Comparison of socio-demographic variables in SIB with Suicidal Intent and SIB without Suicidal Intent groups (N=653)

	With Suicidal intent		Without Suicidal intent		t	p
	M	SD	M	SD		
Age (in years)	17.4	2.3	17.1	2.4	1.263	.209
	N	%	N	%	X <sup>2</sup>	p
Age Level						
Under 18 years	60	17.7	279	82.3	.64	.415
18 years and over	45	20.5	175	79.5		
Gender						
Female	71	24.7	217	75.3	14.54	.001***
Male	35	12.3	250	87.7		
Educational sector						
Government	18	12.1	131	87.9	7.91	.019**
Private	32	17.0	156	83.0		
Aided	54	23.3	178	76.7		
Educational Level						
School	32	16.8	158	83.2	.91	.634
Pre-university	26	18.6	114	81.4		
Under-graduate	42	20.6	162	79.4		
Family system						
Nuclear	71	18.2	320	81.8	.18	.674
Joint/Extended	34	19.7	139	80.3		
Family structure						
Intact family	85	17.8	392	82.2	.04	.850
Non-Intact family	10	18.9	43	81.1		
Siblings						
Yes	101	19.0	430	81.0	2.18	.140
No						
Current Residence						
Parents	93	18.2	417	81.8	.08	.776
Others	9	16.7	45	83.3		

Total N's may vary due to missing data; \*\*\* p<.001, \*\* p<.01, \* p<.05

4.2: Comparison of SIB characteristics in SIB with Suicidal Intent and SIB without Suicidal

Intent group

Table -11: Comparison of SIB characteristics in SIB with Suicidal Intent and SIB without Suicidal Intent Groups

	Suicidal intent		No suicidal intent		t	p
	M	sd	M	sd		
<i>Age at first NSSI</i>	14.95	2.67	14.11	2.01	2.18	.028*
<i>No. of NSSI methods endorsed</i>	3.41	2.01	2.11	1.42	6.28	.001***
<i>No. of reasons for NSSI</i>	7.33	4.99	5.21	4.66	3.84	.001***
	N	%	N	%	X <sup>2</sup>	p
<i>Moderate/Severe SIB</i>	74	69.8	199	42.6	25.62	.001***
<i>Minor SIB Only</i>	32	30.2	268	57.4	25.62	.001***
<i>Moderate/Severe SIB</i>						
Cut	50	48.1	69	14.8	56.97	.001***
Burned skin	17	16.5	91	19.6	.51	.473
Self tattoo	17	27.9	44	9.5	4.14	.042*
Scraped skin	17	16.3	39	8.4	5.99	.014*
Erased skin	10	9.6	23	5.0	3.35	.067
<i>Minor SIB</i>						
Self hit	69	65.7	172	37.1	28.78	.001***
Pulled hair out	28	26.9	59	12.7	13.37	.001***
Picked at wound	36	35.0	161	34.7	.00	.961
Insert objects under skin	18	17.6	57	12.3	2.07	.150
Bite self	59	56.2	268	46.1	3.35	.062
Picked to draw blood	34	32.4	51	11.1	30.45	.001***
<i>Forethought about NSSI</i>						
None - Few min	67	65.0	371	86.7	33.69	.001***
< 1 hr but < 24 hrs	16	15.5	38	8.9		
< 1 day to 1 week	20	19.4	19	4.4		
<i>Experience of pain during NSSI</i>						
No or Little pain	37	54.4	267	87.8	25.30	.001***
Moderate or Severe pain	31	45.6	57	17.6		
<i>Substance use during NSSI</i>						
	8	7.6	14	3.1	5.05	.025*

\*\*\* p<.01, \*\* p<.01; \* p<.05

The chi-square analysis indicates significant associations between self-injury with associated suicidal intent and rates of moderate/severe and minor SIB and various characteristics of self-injurious behaviour.

Self-injurers with suicidal intent were more likely to report using moderate/severe methods of self-injury ( $X^2= 30.31$ ;  $p=.001$ ) than were self injurers without suicidal intent. This group of self-injurers had a significantly higher likelihood ( $X^2= 56.97$ ;  $p=.001$ ), of reporting cutting or carving skin (48.1%) than self-injurers without associated suicidal intent/intent (14.8%). Among the moderate/severe methods of self-injury, they had a higher likelihood of self-tattooing ( $X^2= 4.14$ ;  $p=.042$ ) and scraping skin ( $X^2= 5.99$ ;  $p=.014$ ).

Self-injuring youth with associated suicidal intent engaged in a higher number of SIB methods ( $M=3.41$ ,  $sd=2.01$ ;  $t= 6.28$ ;  $p=.001$ ), than did non-suicidal self-injurers ( $M=2.11$ ,  $sd=1.42$ ). Results indicated a significantly higher likelihood of their reporting self-hitting, pulling hair out and picking skin to draw blood ( $p=.001$ ).

Overall, the chi-square analyses of SIB methods suggested propensity for self-injurers with associated suicidal intent to engage in multiple methods. However, this was manifested in a greater tendency to use Moderate/Severe SIB method/s, either in isolation or in combination with various Minor methods. In fact, they were less likely to report use of minor methods alone (30.2%); the percentage was higher (57.4%) among non-suicidal self-injuring youth ( $X^2= 25.62$ ;  $p=.001$ ).

Other characteristics of SIB that distinguished the two groups include a comparatively longer duration of contemplation before the self-injury ( $X^2= 33.69$ ;  $p=.001$ ), higher levels of associated pain ( $X^2= 25.30$ ;  $p=.001$ ) and a greater likelihood of concurrent substance use ( $X^2= 5.05$ ;  $p=.025$ ) among the self-injuring youth with suicidal intent.

#### *4.3: Comparison of Self-Reported Functions/Reasons for Self-Injurious Behaviours between Groups of Self Injurers with and without Suicidal Intent.*

Table 12: Comparison of rate of self-reported reasons in SIB with Suicidal Intent and SIB without

## Suicidal Intent Groups

Function	With Suicidal Intent N= 106		Without Suicidal Intent N= 467		x <sup>2</sup>	p
	N	% <sup>a</sup>	N	% <sup>a</sup>		
<i>Automatic negative reinforcement</i>						
To stop bad feelings	40	42.6	119	28.5	7.03	.008**
To relieve feeling “numb” or empty	21	22.3	41	9.9	11.19	.001***
<i>Automatic positive reinforcement</i>						
To punish yourself	48	51.6	78	18.6	44.86	.001***
To feel relaxed	36	38.7	152	36.9	.107	.743
To feel something, even if it were pain	35	36.5	114	27.1	3.30	.069
<i>Social negative reinforcement</i>						
To avoid having to do something unpleasant	32	33.3	92	21.9	5.59	.018*
To avoid school, work	24	24.7	89	20.9	.69	.406
To avoid punishment or paying consequences	24	27.7	89	21.5	1.66	.197
To avoid being with people	31	33.7	58	21.2	6.51	.011*
<i>Social positive reinforcement</i>						
To get control of a situation	39	41.9	145	35.0	1.57	.210
To get other people to act differently or change	25	26.9	63	15.1	7.32	.007**
To try and get a reaction, even if negative	20	22.2	61	14.7	3.07	.080
To get parents to understand or notice you	42	44.7	151	36.9	1.95	.163
To make others angry	23	24.2	74	18.0	1.92	.166
To be like someone you respect	36	37.9	103	24.8	6.67	.010**
To give yourself something to do when alone	41	42.7	123	30.1	5.59	.018*
To give yourself something to do with others	32	49.2	89	21.7	6.38	.012*
To receive more attention from parents/friend	38	40.0	165	39.7	.004	.952
To feel more part of a group	33	34.4	101	24.6	3.84	.050*
To let others know how desperate you were	24	26.1	77	18.8	2.50	.114
To get attention	33	33.7	122	29.3	.74	.023*
To get help	39	41.5	137	33.2	2.34	.126

Total Ns may vary due to missing data; \*\*\* p<.001, \*\* p<.01; \* p<.05, <sup>a</sup> % includes items marked ‘sometimes’ or ‘often’ on the 4 point scale

Chi-square analysis indicated a significant association between the presence of suicidal intent among self-injurers and the frequency of select functions of self-injurious acts, both intrapersonal and interpersonal (Table 12).

Self-injurers endorsed both the negative reinforcement functions; to stop bad feelings ( $p=008^{**}$ ) and to relieve feeling “numb” or empty ( $p=.001^{***}$ ) more frequently than the group of self-injurers without suicidal intent. The subgroup of self-injuring youth with suicidal intent had a significantly higher rate of using self-injury to achieve a reduction in tension or other negative affective states. This subgroup was also more likely to self-injure as a means to punish self ( $p=.001^{***}$ ), as an attempt to create a desired feeling state.

Self-injury was more likely to serve the function of avoiding something unpleasant ( $p=.018^*$ ) or avoiding being with people ( $p=.011^*$ ) among the group of self-injurers with suicidal intent. This subgroup was also more likely to report reasons for self-injury that could modify their social environment. These included; to get other people to act differently or change ( $p=.007^{**}$ ), to be like someone they respected ( $p=.010^{**}$ ), to give self something to do when alone ( $p=.018^*$ ) or when with others ( $p=.012^*$ ), to feel more part of a group ( $p=.050^*$ ), and to get attention ( $p=.023^*$ ).

## **Section 5: Psychopathology among School, Pre-University and College Youth (N=1571)**

### *5.1: Gender Differences in Mean Internalising, Externalising and Total Problem Scores among School, Pre-University and College Youth (N=1571)*

Omnibus MANOVAs revealed significant gender effects when comparing Youth Self Report (YSR) problem patterns of behaviour in males and females with Wilks'  $\lambda = .853$ ,  $F(8, 775.000) = 16.648$ ,  $p = .000$ . Since the overall Wilks'  $\lambda$  was significant, univariate ANOVAs were computed to determine gender differences on each of the subscales and broadband factors on the YSR.

Omnibus MANOVAs revealed significant gender effects when comparing Adult Self Report (ASR) problem patterns of behaviour in males and females with Wilks'  $\lambda = .894$ ,  $F(9, 718) = 9.47$ ,  $p = .000$ . Since the overall Wilks'  $\lambda$  was significant, univariate ANOVAs were computed to determine gender differences on each of the subscales and broadband factors on the YSR.

Table 13: Comparison of YSR and ASR problem mean scores in Female and Male Students

	Female		Male		F	p
	M	sd	M	sd		
<b>YSR</b>						
<i>Internalising</i>	21.11	8.66	18.11	8.70	23.43	.001***
Anxious/Depressed	10.07	4.18	8.41	4.24	30.40	.001***
Withdrawn	6.12	2.94	5.63	2.80	5.84	.016*
Somatic Complaints	4.92	3.48	4.07	3.33	12.17	.001***
<hr/>						
<i>Externalising</i>	13.59	7.09	15.14	8.26	7.95	.005**
Rulebreaking	3.96	3.16	5.39	3.62	34.53	.001***
Aggressive	9.63	4.98	9.75	5.36	.112	.738
<hr/>						
Social Problems	7.14	3.17	6.95	3.67	.582	.446
Thought Problems	6.36	3.83	6.71	3.83	.671	.197
Attention Problems	7.14	3.10	6.50	3.27	7.86	.001**
<hr/>						
<i>Total Problems</i>	55.34	21.22	53.42	23.57	1.45	.229
<hr/>						
<b>ASR</b>						
<i>Internalising</i>	24.05	11.21	22.68	10.93	2.50	.115
Anxious/Depressed	13.53	6.35	12.21	6.03	7.25	.007**
Withdrawn	5.63	3.36	6.07	3.37	2.81	.094
Somatic Complaints	4.90	3.80	4.40	3.60	2.92	.088
<hr/>						
<i>Externalising</i>	18.18	8.63	19.80	9.64	5.34	.021*
Rulebreaking	4.69	3.49	6.16	4.27	24.60	.001***
Aggressive	9.66	4.83	10.68	4.83	.86	.353
Intrusive	3.82	2.17	4.12	2.38	2.88	.090
<hr/>						
Social Problems						
Thought Problems	5.64	3.13	5.97	3.43	1.69	.194
Attention Problems	10.34	4.53	10.68	4.83	.864	.353
<hr/>						
<i>Total Problems</i>	72.98	28.16	74.62	29.28	.540	.463

\*\*\* p<.001, \*\* p<.01; \* p<.05

The one-way ANOVAs assessed gender differences in psychopathology reported by school/pre-university students on the YSR (Table 13).

Results indicated gender differences in overall Internalising problems on the YSR ( $F=23.43$ ;  $p= .001$ ), and all the subscales; Anxious-Depressed ( $F=30.40$ ;  $p=.001$ ) , Withdrawn ( $F=5.84$ ;  $p= .016$ ) and Somatic Complaints ( $F=12.17$ ;  $p= .001$ ). Females from school/pre-university had significantly higher levels of problems in these domains when compared with males from school/pre-university.

The direction was reversed on the Externalising scales and its constituent subscale Rulebreaking behaviour; males reported significantly higher overall externalising problems ( $F=7.95$ ;  $p= .005$ ) and rule-breaking behaviour ( $F=34.53$ ;  $p= .001$ ). There were no significant gender differences in the level of aggressive behaviours.

On the other subscales of the YSR, analyses indicated no significant gender differences on social and thought problems. There was a significantly higher level of attentional difficulties reported by females when compared with males.

The one way ANOVAs examined gender differences in psychopathology assessed on the ASR among youth attending undergraduate college aged 18 years and above. There was an absence of significant gender difference on total problem levels, overall internalizing problem levels and most ASR subscales, except for anxious-depressed problems and rulebreaking behaviour.

Females had significantly higher anxious-depressed problems than males ( $F=7.25$ ;  $p=.007$ ) while males reported higher levels of overall externalizing problems ( $F=5.34$ ;  $p=.012$ ) and rulebreaking behaviour than did females ( $F=24.60$ ;  $p=.001$ ).

5.2: Comparison of Mean Internalising, Externalising and Total Problem Scores (YSR/ASR) in Any SIB (past year) and No SIB (past year) groups

The results of analyses comparing the mean Internalising, Externalising and Total Problem Scores (YSR/ASR) among youth with self-injurious behaviours and those with no reported self-injurious behaviour are presented in Table 14. The number of items with missing data was computed for the YSR (N=816) and ASR (N=755) questionnaires. Questionnaires which had more than 8 items missing were excluded from the analysis (Achenbach, 2014, personal communication). The YSR had 3.9% of the questionnaires excluded as invalid (N=32) and the ASR had 3.0% of questionnaires excluded (N=23).

Table 14: Comparison of Mean Internalising, Externalising and Total Problem Scores (YSR/ASR) in Any SIB (past year) and No SIB (past year) groups

	Any SIB		No SIB		F	p
	M	sd	M	sd		
<b>YSR</b>						
Internalising	22.61	9.34	17.16	7.53	81.50	.001***
Externalising	16.86	7.98	12.27	6.85	74.80	.001***
Total Problems	62.72	23.38	47.45	18.99	101.25	.001***
<b>ASR</b>						
Internalising	27.62	11.29	21.38	10.53	55.63	.001***
Externalising	22.45	9.29	16.60	8.09	78.63	.001***
Total Problems	86.40	27.99	66.37	26.30	92.63	.001***

\*\*\* p<.001, \*\* p<.01; \* p<.05

The results indicated that self-injuring youth in school, pre-university and undergraduate college had significantly higher internalizing, externalizing and total problems (p=.001) than did youth who did not report self-injurious behaviour. Similar analyses were conducted separately for males and females and the differences remained significant in both groups.

5.3: Comparison of Mean Internalising, Externalising and Total Problem Scores (YSR/ASR) in SIB with Suicidal Intent and SIB without Suicidal Intent Groups

Table 15: Comparison of Mean Internalising, Externalising and Total Problem Scores (YSR/ASR) in SIB with Suicidal Intent and SIB without Suicidal Intent Groups

	With suicidal intent		Without suicidal intent		F	p
	M	sd	M	sd		
<b>YSR</b>						
Internalising	27.88	9.14	21.56	8.90	24.18	.001***
Externalising	20.80	6.77	16.19	7.93	17.18	.001***
Total Problems	77.51	20.01	59.85	22.81	30.30	.001***
<b>ASR</b>						
Internalising	34.24	12.32	26.51	10.56	18.28	.001**
Externalising	25.70	9.82	21.83	9.23	6.25	.005**
Total Problems	99.59	29.85	83.95	26.89	11.82	.001**

\*\*\* p<.001, \*\* p<.01; \* p<.05

The results indicated that self-injuring adolescents and young adults with suicidal intent associated with one or more acts of self-injury had significantly higher levels of internalizing externalizing and total problems (on both the YSR and ASR) than self-injuring youth without suicidal intent.

## 6.0 Logistic regression analysis

Two separate logistic regression analyses were conducted; the first to predict the occurrence of self-injurious behaviour and the second to predict the occurrence of self-injurious behaviour with suicidal intent.

Prior to the analyses, separate cutoff scores were calculated for the Internalising, Externalising and Total Problem Scales of both the YSR and the ASR. The norms and T-score cutoffs derived from the normative U.S. samples of the YSR and ASR would not be applicable to the Indian sample (Achenbach, 2014, personal communication). Therefore, the 90<sup>th</sup> percentile point was used to calculate cutoffs that would classify an individual falling above 90<sup>th</sup> percentile as in the borderline/clinical range and those below the cutoff as belonging to the normal range. The YSR and ASR have differing number of items and therefore mean scores on the two scales are not comparable. This classification based on 90<sup>th</sup> percentile cutoffs allowed the logistic regression analysis to be calculated across the entire age range of the sample.

### 6.1 Binomial logistic regression analysis to predict the occurrence of self-injurious behaviour

Binomial logistic regression analyses explored the predictors of self-injurious behaviour (past year) among the range of socio-demographic variables and psychopathology measures of internalizing and externalizing problems assessed on the YSR and ASR.

Chi square analysis and t-tests were first done to examine the association between these variables and self-injurious behaviour (past year) to identify those to be entered into the regression analysis. Based on this, select variables including *Sociodemographic variables*- age level categories (under 18 years, 18 years and above), gender (female, male), *Psychopathology* - internalizing problems (above 90<sup>th</sup> percentile, below 90<sup>th</sup> percentile) and externalizing problems (above 90<sup>th</sup> percentile, below 90<sup>th</sup> percentile) were entered into the regression analysis as potential predictors of self-injurious behaviour (past year). Table 16 depicts the results of the logistic regression analysis.

Table 16: Logistic regression analysis for variables predicting Self-injurious Behaviour (past year)

Variables	Categories	B	SE	Odds Ratio 95% CI	p
Age level	18 years and above	.307	.112	1 (Reference)	.006**
	Below 18 years			1.4 (1.1-1.7)	
Gender	Female	.504	.114	1 (Reference)	>.000***
	Male			1.7 (1.3-2.1)	
Internalizing Problems	Below 90 <sup>th</sup> percentile	1.344	.200	1 (Reference)	>.000***
	Above 90 <sup>th</sup> percentile			3.8 (2.6-5.7)	
Externalizing Problems	Below 90 <sup>th</sup> percentile	.911	.192	1 (Reference)	>.000***
	Above 90 <sup>th</sup> percentile			2.5 (1.7-3.6)	

B: logistic regression coefficients; SE: standard error; CI: confidence interval. \* p value <.05. \*\* p value <.001.

The results indicated that among the sociodemographic variables, gender and age level were significantly associated with the occurrence of self-injurious behaviour in the past year. Youth below 18 years were 1.4 times as likely to engage in self-injurious behaviour than youth aged 18 years and above (OR=1.4, 95% CI: 1.1-1.7). Males were more likely to report engaging in self-injurious behaviours than were females (OR=1.7, 95% CI: 1.3-2.1). The presence of internalizing problems in the borderline/clinical range had a significant association with occurrence of SIB; Youth with internalizing problems in the borderline/clinical range were 3.8 times as likely to report self-injurious behaviour (past year) than youth scoring below the 90<sup>th</sup> percentile cutoff on internalizing problems (OR=3.8, 95% CI: 2.6-5.7). The presence of externalizing problems in the borderline/clinical range predicted a higher likelihood (OR=2.5, 95% CI: 1.7-3.6) of SIB.

## 6.2 Binomial regression analysis to predict the occurrence self-injurious behaviour with associated suicidal intent

A separate logistic regression analysis examined the predictors of self-injurious behaviour (past year) with associated suicidal intent among the group of self-injurers. The potential variables were selected among the range of socio-demographic variables, characteristics of SIB and psychopathology measures of internalizing and externalizing problems assessed on the YSR and ASR. Based on the results of chi-square analysis and t-tests, select variables were entered into the regression analysis; *Sociodemographic variables* – education sector (government, private, aided institutions), gender (female, male), *SIB Characteristics* - Forethought before SIB (3 levels), Experience of Pain during SIB (2 levels), Concurrent use of substances during SIB, Number of methods of SIB reported, Presence vs. Absence of Moderate/Severe methods of self-injury, *Psychopathology* - internalizing problems (above 90<sup>th</sup> percentile, below 90<sup>th</sup> percentile) and externalizing problems (above 90<sup>th</sup> percentile, below 90<sup>th</sup> percentile)

Table 17: Logistic regression analysis for variables predicting Self-injurious Behaviour with suicidal intent (past year)

Variables	Categories	B	SE	Odds Ratio 95% CI	p
Gender	Male	.893	.346	1 (Reference)	.01**
	Female			2.4 (1.2-4.8)	
No. of SIB methods	-	.419	.092	1.5 (1.3-1.8)	>.000***
Pain during SIB	No/Little pain	1.152	.352	1 (Reference)	.001***
	Moderate/ Severe pain			3.2 (1.6-6.3)	
Internalising Problems	Below 90 <sup>th</sup> percentile	1.141	.346	1 (Reference)	>.000***
	Above 90 <sup>th</sup> percentile			3.1 (1.6-6.2)	

B: logistic regression coefficients; SE: standard error; CI: confidence interval. \* p value <.05. \*\* p value <.001.

Among the sociodemographic variables, gender alone had a significant association with the pattern of self-injury associated suicidal intent. In contrast to the results of the previous regression analysis, Self-injuring females were 2.4 times more likely than males to report suicidal intent during one or more of the acts (OR=2.4; 95% CI = 1.2-4.8).

Among the characteristics of self-injurious behaviour, both the number of methods of SIB endorsed and the degree of pain associated with the act, had significant associations with the reports of suicidal intent during one or more acts of self-injury. For every one point increase in number of methods employed, the odds of SIB with suicidal intent increased 1.5 times (OR=1.5; 95% CI (1.3-1.8). Reports of moderate to severe pain associated with self-injurious acts increased the likelihood of suicidal intent associated with SIB (OR = 3.2; 95% CI = 1.6-6.3).

The association between mental health vulnerabilities and increase in the likelihood of suicidal intent associated with self-injury pointed to the predictive role of internalizing problems. Self-injuring individuals with internalizing problems in the above 90<sup>th</sup> percentile range had 3.2 times higher risk of reporting suicidal intent with SIB when compared against individuals with lower levels of internalising problems.

## **10. Detailed analysis of results indicating contributions made towards increasing the state of knowledge in the subject.**

The results are discussed in sections reflecting the primary objectives of the study

- Nature and prevalence of self injurious behaviours among adolescents and young adults in Bangalore.
- Reasons for self injurious behaviours among adolescents and young adults in Bangalore.
- Socio-demographic and mental health correlates of self injurious behaviours among adolescents and young adults in Bangalore.

### *10.1.0 Nature and Prevalence of Self-injurious Behaviours among Adolescents and Young Adults in Bangalore*

The first objective of the study is to study the nature and prevalence of self-injurious behaviour among adolescents and young adults in Bangalore.

#### *10.1.1 Prevalence of Self-injurious Behaviours among Adolescents and Young Adults in Bangalore.*

Self-injurious behaviours are being recognized as a growing public health problem among youth across many countries and the results of the present study support this contention. The high prevalence of self-injuring behaviour (40.7%) among adolescents and young adults from schools, pre-university colleges and undergraduate colleges in India is a matter of concern. A narrower focus on individuals who employ more severe methods of self-injury (e.g. cutting or carving skin, burning skin, scraping skin till it bleeds) reduces the overall figures, but remains worrying at 19.4%. Most of these youth utilize a combination of methods of varying severity, while 21.3% reported the more minor forms of inflicting injury on themselves (e.g. biting or hitting self).

How should we view these rates in the context of other studies with community samples of youth? Results of studies with adolescents and young adults in the community have spanned a staggeringly wide range from about 5.5% (Csorba, Szelesne, Steiner, Farkas, & Nemeth, 2005) to 46.5% (Lloyd – Richarson , Perrine, Dierker & Kelley, 2007). Inconsistencies in international research on this phenomenon (Muehlenkamp, Claes, Havertape & Plener, 2012) present difficulties in making these comparisons. One of the major obstacles in comparing prevalence estimates from different studies are

the methodological frameworks (sampling, tools, time frames; lifetime prevalence, 12-month or 6-month prevalence). Some studies have used single-item measures of self-injury and these usually yield lower rates. Behavioural checklists, like the FASM we used, tend to elicit higher prevalence rates (Muehlenkamp, Claes, Havertape & Plener, 2012). A selection of studies using the FASM reported 12-month prevalence rates of 36% among adolescent girls aged 10-15 years (Hilt, Cha & Nolen-Hoeksma, 2008), 37.2% among adolescents in grades 9 to 12 (Yates et al, 2008), 46.5% among adolescents in grades 9-12 (Lloyd – Richarson , Perrine, Dierker & Kelley, 2007), 31.2% among Indian college youth aged 17-22 years (Kharsati, 2013); and 33.6% among Chinese adolescents aged 10-18 years (Tang, Ma, Guo, Ahmed, Yu Y, et al., 2013). These rates are all towards the higher end of prevalence rates reported across the range of studies exploring self-injurious behaviours.

The varying definitions and terminology that encompass self-injurious behaviours also contribute to the varying rates found in literature (Muehlenkamp, Claes, Havertape & Plener, 2012). While some studies, including ours, have a broader definition of self-injury which assesses both milder (e.g. wound-picking) and more severe forms (e.g. cutting), many others restrict inquiry to the more severe behaviours or those with repetitive patterns which may have more clinical relevance. A focus on self-injury using moderate/severe self-injury methods in the present study would substantially reduce the prevalence to 19.4%, a rate that still identifies a significant segment of vulnerable youth.

Conceptual confusion is related to the intersections between non-suicidal self-injurious behaviours, self-injurious behaviours accompanied by suicidal intent and non-fatal suicide attempts. This is complicated by the fact that all these behaviours can co-occur or manifest in a fluctuating manner in a single individual. In the present study, 6.8% of the sample reported suicidal intent associated with one of more acts of self-injury. An adjusted estimate of clearly non-suicidal self-injurious behaviours, after excluding these individuals is 33.9%.

The majority of individuals endorsed multiple methods of self-injury, often with a combination of moderate/severe and minor methods. Consonant with previous research (Hasking, Momeni, Swannell & Chia, 2008; Kharsati, 2013; Klonsky & Muehlenkamp, 2007; Lloyd-Richarson, Perrine, Dierker & Kelley, 2007; Madge et.al, 2008; Labouliere, 2009; Moran et al, 2012), cutting or carving skin was the most common among the moderate/severe methods. Self-hitting and biting were among the most frequent minor forms of self-injury among and this has received support in previous research as well (Kharsati, 2013; Lloyd-Richarson , Perrine, Dierker & Kelley, 2007).

Although the present study identified a range of self-injurious behaviours among youth, it is important to recognize that all of them may not be equally relevant. In addition, self-report measures are limited by the possibility of misinterpretation by respondents (Walsh, 2002). In addition, some of the behaviours assessed by the FASM, e.g. hairpulling, may not significant forms of self-injury while there is debate about tattooing being considered as a form of self-injury or self-expression (Aizenman & Jensen, 2011; Walsh, 2012).

In their incisive review, Muehlenkamp, Claes, Havertape & Plener (2012) suggest that an initial screening assessment should ideally be followed up by an interview to ensure a shared understanding of self-injurious behaviour. This would reduce the chances of inflated and inaccurate figures and increased validity of research findings.

Despite the conceptual and methodological variations across studies, there is consensus that self-injurious behaviours, though often covert, call for concerted social and clinical attention.

#### 10.1.2. *Self Injury and Age of Onset*

Self injurious episodes typically emerge during the adolescent development period; a transitory stage marked by rapid changes in various domains. Our results point to the age of onset as 14.8 years (sd=2.9) and this is supported by evidence from various studies (Kharsati, 2013; Labouliere, 2009; Moran et al, 2012; Nixon, Cloutier & Jansson, 2008; Whitlock, Eckenrode & Silverman, 2006). The self-injurious behaviors have a fluctuating course after onset and tend to recur until decrease in young or middle adulthood.

Favazza & Conteiro, 1989) proposed a wider range, with onset of self-injury between the ages of 14 and 24 years. Some studies (Heath, Toste, Nedcheva & Charlebois, 2008; Whitlock, Eckenrode & Silverman, 2006) found that almost 40% of self-injurers reported first time engagement in the range of 17- 24 years. Frequency analysis of our data indicated that about one-third of self-injurers indicated that their SIB emerged after age 15 and 18.3% reported age of onset as 18 years and above.

The period of adolescence, often cited as a period of ‘storm and stress’ (Hall, 1904), seems to be a vulnerable period for the emergence of self-injurious behaviour. This implies that promotive and

preventive interventions addressing distal and proximal risk factors for self-injury need to be timed at earlier stages of development. However, self-injury can begin later as well, even in the pre-university and college years, and these youth must not be neglected. Clearly, efforts to help self-injuring youth must have a base both in schools and colleges.

### 10.1.3. *Self-injury and Forethought*

Do self-injuring youth dwell on and plan acts of self-injury or do they engage in these behaviours without much forethought? The overwhelming evidence from previous research corroborates our results pointing to little or no forethought among a majority of self-injurers (Hilt, Cha, & Nolen-Hoeksema, 2008; Kumar, 2010; Lloyd-Richardson, Perrine, Dierker & Kelly, 2007; Nock & Prinstein, 2005). Individuals using moderate/severe methods of self injury tended to think for a longer duration compared with those endorsing minor methods alone. However, the majority of individuals in both groups reported little or no premeditation before engaging in self-injury (78.3% of the moderate/severe methods group and 85.9% of the minor methods only).

Clinical experience and empirical evidence both suggest the role of impulsiveness in self-injury (Herpertz, Sass & Favazza, 1997; Herpertz, Steinmayer, Marx & Oidtmann, 1995) but studies have produced mixed results. Self-reported impulsiveness has been linked to the absence of forethought before engaging in NSSI (Herpertz, Sass & Favazza, 1997). In contrast, Janis & Nock (2009) illustrated the absence of higher levels of impulsivity among self-injurers on performance-based tasks of impulsivity.

Janis & Nock (2009) presented a thoughtful exposition of the multiple possible explanations for this discrepancy. They speculated that self-injurers may view themselves as more impulsive but may not be consciously aware of the cognitive processes of thinking and planning before engaging in acts of self-injury. Alternatively, self-injurers may use their engagement in self-injury as an index of impulsiveness while completing self-report measures or might display impulsivity only in specific contexts rather than it being a trait variable. On the other hand, performance-based tasks might not capture the construct of 'real-life' impulsivity in an accurate manner. The complexities associated with the role of impulsivity in self-injury imply that theories must also account for the fact that a proportion of self-injurers do report longer periods of forethought.

Studies have implicated difficulties in modulating emotions (Klonsky & Muehlenkamp, 2007) and this combined with the apparent lack of premeditation among self-injuring youth has implications for comprehensive evaluation of self-injury processes for prevention of repeated episodes. The brief time window for contemplation would add to the difficulties in interventions with these vulnerable youth.

#### 10.1.4 *Self Injury and Associated Levels of Pain*

The findings indicated that a majority of the youth experienced little (49.0%) or no pain (31.4%) during the act. This apparent decrease in pain sensitivity has been consistently noted across a range of studies (Hilt, Cha, & Nolen-Hoeksema, 2008; Hooley, Ho, Slater & Lockshin, 2010; Lloyd-Richardson, Perrine, Dierker & Kelly, 2007) and is one of the perplexing aspects of this behaviour. In a recent study, Indian college students (17 to 22 years) reported a similar pattern of little (46.6%) or no pain (27.1%) associated with their self-injurious acts (Kharsati, 2013). A laboratory-based study revealed that women diagnosed with borderline personality disorder who report analgesia during self-injury had a higher pain threshold and pain tolerance than a matched group who reported pain during acts of self-injury (Russ et al, 1992). Similar to the findings reported by (Nock & Prinstein, 2005), higher pain levels reported by youth in the present study were associated with longer periods of contemplation prior to the act.

The present study found no gender differences in the experience of pain during self injury but the use of moderate/severe methods was linked to higher levels of pain when compared with minor methods of self-injury. This pattern was supported in previous research (Lloyd-Richardson, Perrine, Dierker & Kelly, 2007) while another study found no significant association between severity of self-injury method and the levels of pain reported (Kharsati, 2013). Analysis of associated pain levels also differentiated the group of self-injurers with suicidal intent as more likely to experience moderate/severe pain levels than the group with a clearly non-suicidal presentation. One of the potential explanations may be the higher number of SIB methods with the over-representation of moderate to severe methods of self-injury in this group.

The underlying mechanisms for the apparent reduced pain sensitivity remain unclear, with theories ranging from dispositional factors resulting from elevated levels of endorphins in the body, habituation due to abuse in an earlier developmental stage or related to the release of endogenous opioids released in repeated acts of self-injury (Nock, 2008). Alternatively, Hooley, Ho, Slater & Lockshin (2010) link pain endurance to a highly self-critical cognitive style among self-injurers, who may believe that they deserve pain and suffering.

Groschwitz & Plener (2012) reviewed neurobiological research related to analgesia and hypalgesia (decreased pain sensitivity) pointing towards an insufficient stress response among self-injurers. They proposed that non-suicidal self-injury can be understood as a strategy to down-regulate high experienced emotions. Franklin, Aaron, Arthur, Shorkey, & Prinstein (2012) underlined the relationship between diminished pain perception and emotion dysregulation.

Future laboratory-based studies were recommended to understand the regulation of both pain and emotion among self-injurers. The endogenous opioid system (EOS) is receiving increasing attention as a possible mediator of affect regulation in non-suicidal self-injury. Bresin & Gordon (2013) reviewed evidence which suggest that self-injuring individuals have lower baseline levels of endogenous opioids. Further, the act of self-injury releases opioids and these in turn regulate affect.

Grossman & Siever (2001) described two major ways of understanding the role of the EOS in self-injury. The ‘addiction hypothesis’ suggests chronic overstimulation of the EOS system, leading to tolerance and withdrawal with self-injury serving to increase the opioid levels again. The alternate ‘pain hypothesis’ suggests a constitutional abnormality in the EOS system eventually leading to dysphoric experiences of numbness and dissociation. Self-injury may serve to stimulate the sensation of feeling again. These models have implications for understanding the characteristics and functions of self-injurious behaviour and the difficulties experienced in trying to stop or reduce self-injury. While they do suggest the need to explore targeted pharmacotherapy for repetitive self injury, further research would be important. Grossman & Siever (2001) note that the phenomenon of self-injury is best understood within a biopsychosocial model and complementary psychological interventions would be essential.

The results of the present study underscore the need for future research on the biological underpinnings of self-injurious behaviour. Both theoretical models and empirical studies still need to explore questions about differences in pain sensitivity between various groups of self-injurers.

#### 10.1.5 *Self-injury and Concurrent Substance Use*

The findings indicated that a small minority of youth (3.6% of self-injuring youth) engaged in self-injurious acts while under the influence of substances. Concurrent substance abuse was more likely among male self-injurers than among female self-injuring youth and this pattern was also noted in a study among 14,372 college youth in U.S.A. (Whitlock et al, 2011). This gender imbalance concurs

with the consensus on the rates of substance abuse and dependence among males (Brady & Randall, 1999). Self-injurers who endorsed moderate/severe methods were more likely to report concurrent substance use than were youth using minor forms of self-injury alone. These results were corroborated by previous studies (Kharsati, 2013; Lloyd-Richardson, Perrine, Dierker & Kelly, 2007). Research has also reported links between self-injurious behaviours and the presence of substance use disorders (Unger, Kipke, Simon, Montgomery & Johnson, 1997). Concurrent substance abuse was also disproportionately higher among self-injurers with associated suicidal intent in contrast to self-injurers who denied any suicidal intent.

On a speculative note, the misuse of alcohol or other substances among people who self-harm may represent part of a pattern of impulsive and/or risky behaviours (Favazza, DeRosear, & Conterio, 1989) and is considered as part of indirect self-harming behaviours (Walsh, 2012). Khantzian (1997) proposed a self-medication hypothesis explaining substance use as helping with self-regulation difficulties; a shared vulnerability indicated in individuals who self-injure

#### *10.2.0 Self-reported reasons for self injurious behaviours among adolescents and young adults in Bangalore.*

The second objective was to explore the self-reported reasons for engaging in self-injurious behaviour among the adolescents and young adults. These behaviours may often be misunderstood and seen as solely as attention-seeking and manipulative acts. These speculations may reflect lack of awareness of empirical evidence on the complex and diverse functions served by acts of self-injury.

Nock (2009) asked the question, ‘Why do people harm themselves?’ and this resonates with parents, teachers, peers and mental health practitioners who encounter self-injuring youth. A range of theoretical models have described varied antecedent and consequent events that may cause or maintain SIB (Suyemoto, 1998; Yates, 2004). There is considerable overlap between two parsimonious models proposed; the Klonsky & Glenn (2009) model that distinguishes intrapersonal and interpersonal reasons and the Nock & Prinstein model (2004) which proposed four primary functions of SIB. The section assessing functions in the measure of SIB (FASM) used in the present study contains items classified into these four domains; (i) automatic-negative reinforcement (e.g. removal of unpleasant affect) (ii) automatic-positive reinforcement (e.g. to feel something, even it were pain) (iii) social-negative

reinforcement (to avoid punishment from others (iv) social-positive reinforcement (e.g. to gain attention from others or to communicate unhappiness)). .

Research in this area concurs that there is rarely a single reason underlying self-injurious acts. Youth in the present study reported multiple reasons ( $M= 5.5$  reasons;  $sd = 4.75$ ; median = 5 reasons) with the majority endorsing between two and ten reasons. Another study using the FASM to assess the occurrence of self-injury reported similar numbers among college youth in India ( $M = 5.6$  reasons,  $sd=4.6$ ; Kharsati, 2013) and among adolescents in U.S.A. ( $M=4.6$  reasons,  $sd=5.56$ ; Lloyd-Richardson, Perrine, Dierker & Kelly, 2007). Certain subgroups of self-injurers seem to report a higher number of reasons underlying these self-damaging acts; individuals with using moderate to severe methods compared with those using minor methods and the self-injurers reporting wanting to kill themselves during one or more of these acts when compared with those who denied suicidal intent.

Diversity is present in the most commonly reported reasons for self-injury across various studies (Klonsky, 2007). The most frequently reported functions in the present study were related both to reducing negative affective states or generating feelings ('to feel relaxed' - 37.5%; 'to stop bad feelings' - 31.1%) as well as to modifying or regulating the social environment ('to receive more attention from your parents or friends'-39.4%; 'get parents to understand and notice you - 37.5%; 'to get control of a situation – 35.5%; 'to get help' - 34.8% and 'to give self something to do when alone'- 32.1%). There was a significant overlap with the top five most frequently reported reasons for self-injury among self-injuring Indian students (Kharsati, 2013); to feel relaxed, to get control of a situation, to stop bad feelings, to punish self, to receive more attention from your parents or friends. The results of a study with adolescents from American high school reported the most common reasons as 'to try to get a reaction from someone', 'to get control of a situation' and 'to stop bad feelings' (Lloyd-Richardson, Perrine, Dierker & Kelly, 2007). Although, there are differences across studies, some commonalities in self-reported reasons are also evident.

Klonsky (2007) summarized the findings of 18 studies, among psychiatric inpatients, individuals with borderline pathology and adolescent or adult community samples that strongly implicated the affect-regulation function of SIB; such as to release tension, feel relaxed, and alleviate a range of negative feelings. Studies that examined detailed self-reports of phenomenology in community samples of self-injurers revealed negative emotions like anger, hurt, loneliness, emptiness followed by alleviation of these emotions post self-injury (Briere & Gil, 1998; Laye-Gindhu & Schonert-Reichl, 2005). Two

among the most frequently endorsed reasons by participants in the present study, ‘to feel relaxed’ (37.5%) and ‘to stop bad feelings’ (31.1%), reflected the affect-regulation function. The role of self-injury in stopping bad feelings was reported more prominently by youth with *moderate/severe patterns* of injury when compared with those endorsing minor methods alone. Self-injury also served to ‘stop bad feelings’, and relieve a sense of ‘numbness or emptiness’ more often among *self-injurers reporting suicidal intent* (who also tended to use moderate/severe methods of self-injury more than those without any suicidal intent). Within the larger group of self-injurers, regulation of affect was more likely to motivate or reinforce self-damaging acts in these two subgroups.

The role of self-punishment received moderate support in earlier research (Klonsky, 2007), albeit more strongly in the community sample of adolescents (Laye-Gindhu & Schonert-Reichl, 2005) than among the studies with inpatients. In the present study, 23.8% of self-injuring youth attributed their behaviour to the need to punish themselves. Interestingly, this function was expressed more frequently among self-injurers using moderate to severe methods (62.5%), when compared with youth reporting minor methods of self-injury (37.5%). Self-punishment was also reported by a significantly higher proportion of self-injurers reporting suicidal intent associated with one or more acts (51.6%), compared with those who denied suicidal intent (18.6%).

Klonsky (2007) remarked that the SIB may serve to regulate affect more often among adults and one might expect a slightly different pattern of reasons among adolescent self-injurers. In the present study, youth revealed a number of reasons that served to impact upon their social environment; with the most frequently reported ones being; ‘to receive more attention from your parents or friends’, ‘get parents to understand and notice you’, ‘to get control of a situation; ‘to get help’. Conversely, the bulk of studies have cited internal psychological reasons and affect-regulation as most salient for self-injurers (Gratz, 2003; Nock & Prinstein, 2004; Rodham, Hawton & Evans, 2004; Walsh, 2012). Nock & Prinstein (2005) pointed out that self-injurious behaviours tend to be done in private and are often hidden, reducing their potential impact on the social environment. More recently however, a number of studies have discussed the importance of social/interpersonal motivations for self-injury as well (Brown, Comtois & Linehan 2002; Lloyd-Richardson, Perrine, Dierker & Kelly, 2007; Rodham, Hawton & Evans, 2004).

The use of self-injury to draw attention, concern and understanding from others in the environment among youth in the present study can be understood in the light of a substantial body of prior research.

Various distal risk factors like disturbed parent-child attachment, invalidating caregiving environments, maternal/paternal neglect have been delineated (Hamza, Willoughby & Good, 2012). Within these difficult caregiving contexts, self-injurious behaviour may function as an idiom of distress to communicate distress and draw the attention of caregivers or others in the environment. The focus is shifting towards a better understanding of the role of social reinforcement, with Nock (2008) proposing a three component model; (i) self-injury as a high-intensity signal of distress in social contexts, which is reinforced by the caregiving behaviour it elicits (ii) self-injury as a show of strength and to ward off perceived threats (iii) self-injury as a behaviour to affiliate with a social group.

Overall, the self-injuring youth in the present study endorsed functions in all four domains of the Nock & Prinstein model (2004). Functions reflecting both automatic positive and negative reinforcement domains were endorsed by between 11.8% and 37.5% of the self-injurers. Self-injuring youth endorsed the use of SIB to increase or generate desired social responses more frequently (social positive reinforcement items; 15.6%-39.4%), than to reduce or eliminate social demands, interactions or responsibilities.(social negative reinforcement items; 21.0% - 23.4%). There were a few distinctive patterns in the frequency of motives across different domains associated with severity level of self-injury methods as well as presence or absence of associated suicidal intent.

The statement that self-injurious behaviour may serve multiple functions or different functions at different times and in varied contexts (Nock, 2008), underlines the important of an individualized approach. Clearly, there can be no 'one size fits all' model of understanding the functions of self-injury. Implications for therapy with any self-injuring individual would include the need to explore perceptions of the motivations for these acts and tailor functionally relevant treatment techniques and approaches based.

While Nock (2008) proposed the matching of therapeutic approaches to the functions served by SIB, these approaches were overwhelmingly individual focused. A few illustrative examples are; distress tolerance training, mindful emotional awareness, cognitive restructuring for individuals who endorse the automatic reinforcement functions; a range of social problem solving skills training, interpersonal skills training, distress tolerance training focused on self-injurers who report dominant social reinforcement functions.

With the intersection of theoretical and research perspectives on the contributions of the caregiving environment and parent-child attachment to the emergence of SIB and the relevance of social-positive reinforcement functions (reported in previous research and the present study), the potential role of adjunct family therapy interventions has been relatively neglected. In support of the need to include an interpersonal/family perspective, a study by Hilt, Nock, Lloyd-Richardson, & Prinstein (2008) revealed that self-injuring adolescents reported significant increases in the quality of their relationships with fathers over time.

The understanding of reasons for SIB in the present study is limited by the lack of information about whether a particular reason was endorsed at a particular time or a cluster of reasons are endorsed at a particular time. It also did not assess whether all the reasons endorsed were from a single domain or from the different domains.

A critical appraisal of research in this area begins with the question about whether people can accurately report on processes and motives that underlie their self-injurious acts. Future research could look for associations between groups of variables such as disclosure, site of injury and helpseeking pattern and the reporting of intra and/or interpersonal motives.

Bentley, Nock & Barlow (2014) elaborated key research questions and suggested the use of diverse research paradigms such as laboratory-based studies, longitudinal studies, the inclusion of multi-method assessment, and statistical methods such as component analysis and moderator analysis. These included the need to understand the mechanisms involved in the automatic negative reinforcement function, examination of distinctions between automatic positive and negative reinforcement functions and exploration of the specific links between distal risk factors and the types of function/s served by self-injurious behaviour. The initial work by Turner, Chapman & Layden (2012) examined the affective traits, social and emotional skill deficits and interpersonal styles associated with specific self-reported reasons for self injury. Future studies need to build on these findings and derive implications for effective interventions.

The understanding of the social-interpersonal reasons for SIB are poorly understood and understudied (Hagen, Watson & Hammerstein, 2008) and the potential for research in this area is supported by the findings of the present study.

Turner, Chapman & Layden (2012) asserted that a better understanding of the functions of NSSI could be used to inform clinical hypotheses regarding areas of dysfunction, associated psychopathology and personality functioning, as well as to inform risk assessment and treatment targets for individuals engaging in self-injurious behaviour.

### *10.3.0 Socio-demographic and mental health correlates of self injurious behaviours among adolescents and young adults in Bangalore.*

#### *10.3.1 Socio-demographic correlates of self injurious behaviours among adolescents and young adults in Bangalore.*

The findings identified *age* and *gender* as socio-demographic variables that were differentially associated with rates of self-injurious behaviour of varying severity among youth. Overall, the younger age-group (below 18 years) reported higher rates of self-injurious behaviour (44.6%) when compared with youth aged over 18 years – 35.8% (primarily the sample drawn from undergraduate colleges).

Previous research corroborates that rates of self-injury tend to be higher among adolescents than among adults in the community. A longitudinal study by Moran, Coffey, Romaniuk, Olsson, Borschmann, Carlin, & Patton (2012) documented a reduction in rates through adolescence to young adulthood. Adolescence marks a period of biological change and brain development with vulnerabilities in domains of emotional control risk-taking becomes prominent (Dahl, 2004). The evidence may not be conclusive though, as there have been many more studies conducted with adolescent samples.

Overall, the prevalence of self-injury among adolescents in the present study was towards the higher end of rates reported in previous research with adolescents (Lloyd-Richarson, Perrine, Dierker & Kelley, 2007; Hilt, Cha, & Nolen-Hoeksema, 2008; Muehlenkamp & Gutierrez, 2004; Ross & Heath, 2002; Shek & Yu, 2012; Tang, Ma, Guo, Ahmed, Yu, et al., 2013; Yates et al 2008; You, Leung, Fu & Lai, 2012).

The present study also identified rates among college-going young adults that were at the higher end of the range documented in previous studies (Favazza et al., 1989, Gratz et al., 2002, Hasking, Momeni, Swannell & Chia, 2008; Hamza, Willoughby & Good, 2012; Kharsati, 2013; Labouliere, 2009; Paivio and McCulloch, 2004).

The study indicated higher prevalence among males when compared with females; a finding that has not received much support in previous research, except in a few studies (Favazza, DeRosear & Conterio, 1989).

The examination of gender differences in these two developmental periods indicated the adolescent males (13 years to below 18 years) reported a higher rate of moderate/severe self-injury, with the difference manifested only in the higher rate of self-tattooing attempts. Although the overall rates of minor methods of self-injury did not differ among adolescent boys and girls, there was a significant male preponderance in acts of inserting objects under skin or nails.

The reverse trend was noted among youth aged 18 years and above. While there were no gender differences in rates of moderate/severe self-injury, young adult males reported significantly higher rates of self-injury using minor methods alone. This was specifically manifested in wound-picking behaviours and insertion of objects under nails or skin. Interestingly, similar to the adolescent group, young adult males also engaged in acts of self-tattooing more frequently than young adult females (although the overall rates of moderate/severe SIB showed no gender differences).

Although, some studies have illustrated a female preponderance in behaviours such as cutting or scraping (Sornberger, Heath, Toste, & McLouth, 2012; Van Camp, Desmet & Verhaeghe, 2011), the present study indicated that both adolescent and young adult females did not differ in the rates of self-injury by cutting the skin.

Van Camp, Desmet & Verhaeghe (2011) speculated on the reasons for the narrowing of the gender gap in rates and patterns of self-injury. They discussed a change in gender role patterns and a shift from boys and men externalising distress towards also using methods reflecting internalisation of distress (e.g. cutting). While males were said to prefer aggressive methods such as hitting themselves (Laye-Gindhu & Schonnet-Reichl, 2005), the present study found no significant gender differences in this form of self-injury.

Studies have moved beyond examining gender differences in overall prevalence rates and explored differences in types of self-injury methods used, the location of injury and occasional vs. repetitive patterns (Sornberger, Heath, Toste, & McLouth, 2012; Van Camp, Desmet & Verhaeghe, 2011; Whitlock, Eckenrode & Silverman, 2006).

Although self-injurious behaviours were traditionally viewed as a female phenomenon, this may be seen more consistently in clinical populations and not as frequently in community samples (Heath, Schaub, Holly & Nixon, 2009). Recent conceptualisations and measures of self-injurious behaviours have eliminated behaviours such as wound-picking and tattooing as either overly broad or violating current conceptualisations of self-injurious behaviours. With most self-injurious behaviours in the present study indicating no gender differences, it is possible that elimination of wound-picking and self-tattooing behaviours from the analysis would narrow the male-female difference in rates of self-injury among both adolescents and young adults.

Previous research (Van Camp, Desmet & Verhaeghe, 2011) supported the lack of distinction between males and females with respect of the age on onset of self-injury. The patterns of self-injurious behaviours demonstrated other interesting gender differences; with associated substance use being more common among males, Associated suicidal ideation and a longer period of contemplation prior to injury distinguished female self-injurers. These findings have important implications for areas to be specifically explored among male and female self-injurers, with the concomitant implications for intervention.

In conclusion, the findings underscore the vulnerability of *both* genders with respect to self-injurious behaviours. Both adolescent males and females demonstrate many similarities in terms of many of the self-injurious methods employed, with some notable variations. Future research needs to focus on potential areas of convergence as well the possible unique patterns in the characteristics and patterns of self-injurious behaviours between youth of both genders.

### *10.3.2. Mental health correlates of self injurious behaviours among adolescents and young adults in Bangalore.*

While exploration of self-injurious behaviours in clinical populations has examined its intersections with varied psychiatric diagnoses like borderline personality disorder, antisocial personality disorders, generalized anxiety disorder, depression and post-traumatic stress disorder, substance use (Nock, Joiner, Gordon, Lloyd-Richardson & Prinstein, 2006), corresponding research with community samples has been limited.

The present study illustrated that overall psychological distress, represented by the total problems scores on the YSR and ASR, was significantly higher among adolescents and young adults engaging in self-injurious behaviours. Mental health vulnerabilities in the form of both internalizing and externalizing problems were at higher levels among youth who inflicted self-injury on themselves.

Although, not a primary objective of the study, additional analysis indicated gender differences were present in the expected direction (Bartels, van de Aa, van Beijsterveldt, Middeldorp & Boomsma, 2011; Sandoval, Lemos & Vallejo, 2006), with females reporting higher problems in the internalizing domain and males in the externalizing domain. These differences were seen more consistently across anxious/depressed, withdrawn, somatic complaints and total internalizing problems and the total externalizing problems and rulebreaking behaviour, for the youth aged between 13 and below 18 years. Among the older age-group, the gender differences were not as prominent, with females having higher levels of anxious/depressed symptoms and males with higher rulebreaking behaviour and overall externalising problems.

The logistic regression analysis examined the potential contributions of both socio-demographic and mental health vulnerabilities to the occurrence of self-injurious behaviours. Males were 1.7 times more likely than females to report self-injurious behaviour; this included any self-injurious behaviour using moderate/severe or minor methods only, either singly or in combination. The younger age-group, aged between 13 to below 18 years, largely from high school and pre-university college, were 1.4 times as likely to report SIB, than young adults, aged 18 years and above. Youth with internalizing problems in the borderline/clinical range were 3.8 times more likely to report SIB than those below that range. While the presence of externalizing behaviours in borderline/clinical range also predicted a higher likelihood of self-injurious behaviours, the odds were lower (Odds ratio=2.5). The results demonstrate that presence of *both* internalizing and externalizing difficulties contributed to a higher risk of self-injurious behaviour in the past one year period. These results suggest an association between self-injury and general psychological distress.

The results may be viewed in the context of previous research which has tended to focus more on links with internalizing difficulties like anxiety and depression (Gollust, Eisenberg & Golberstein, 2008; Hankin & Abela, 2011; Hawton, Rodham, Evans & Weatherall, 2002; Ross & Heath, 2002). Ross & Heath (2002) discussed the implications of higher depressive and anxiety symptoms among adolescent self-injurers. Self-injurious behaviours may function as a means to control tension and sadness

experienced in stressful environments. Accordingly, treatment approaches would need to focus on alleviating the underlying emotional distress and focusing on stress management techniques and more adaptive coping styles. Gollust, Eisenberg, & Golberstein (2008) reported that presence of concurrent depressive and anxiety disorders increased the likelihood of non-suicidal self-injury among university students.

Laye-Gindhu & Schonert-Reichl (2005) conducted one of few studies that included both aspects of problems in both internalising and externalising domains in exploring the 'why' of self-harm behaviours among school-going adolescents. Emotional distress, low-self-esteem, aggressive and antisocial behaviour were all associated with an increased likelihood of engaging in self-injurious acts. Brunner et al (2007) reported that symptoms of depression/anxiety and delinquent aggressive behaviour (assessed on the YSR) were significantly associated with self-harm in both adolescent boys and girls. Baetens, Claes, Muehlenkamp, Grietens & Onghena (2012) used the Youth Self-Report with a community sample of Flemish adolescents. Consonant with our findings, the results showed significant differences between adolescents with and without NSSI on all psychopathological subscales. Externalising difficulties were significantly associated with occurrence of NSSI. The findings of the present study are bolstered by this cluster of studies that relates both internalized and externalized presentations of distress to the occurrence of self-injurious behaviour. Brunner & Ross (2007) discussed the nature of intersections between SIB and psychopathology; for some individuals SIB may represent a transient period of distress whereas in others, it may be an important indicator of current psychopathology or vulnerability for future difficulties.

The cross-sectional design of the present study precludes any exploration of the directionality of the relationship between mental health vulnerabilities and self-injurious behaviours among youth. One of the few studies that examined this issue in a prospective longitudinal design with adolescent boys and girls (Lundh, Wångby-Lundh & Bjärehed, 2011), proposed that this relationship may be bidirectional. They also proposed that the relative absence of psychological problems is a protective factor against the continued use of self-harm in adolescents who have started to harm themselves. Interestingly, they confirmed the bidirectional hypothesis among girls but found a one way relationship among boys. Specifically, psychological problems increased the risk of self-harm among boys but there was no support for the converse direction.

More recently, a longitudinal study with Chinese adolescents (You & Leung, 2012) confirmed the association between depressive symptoms and behavioural impulsivity at year 1 assessment and the occurrence of self-injurious behaviours at year 2 assessment. The temporal (and potentially complex link) between psychological distress and SIB is a fertile ground for future research.

The findings of the study contribute to the understanding of self-injurious behaviour, both non-suicidal and suicidal, as associated with psychological distress; broadly defined and not confined to specific diagnostic labels. Although the directionality of the relationship could not be assessed, it seems that the occurrence of self-injurious behaviours could serve as a warning signal for associated mental health vulnerabilities among adolescents and young adults.

The YSR and ASR are recognised comprehensive measures of internalising and externalising difficulties among youth; however, certain areas like disordered eating, linked with SIB in previous research, may not have been adequately assessed.

Recognition of the significant rates of non-suicidal self-injurious behaviour among adolescents and young adults, the need to delink SIB from a diagnosis of borderline personality disorder, and change perceptions of these as simply manipulative, attention-getting attempts, led clinician-researchers (Plener & Fegert, 2012) to propose SIB/NSSI as a separate diagnostic category in future diagnostic systems. Clearly, comprehensive effective evaluation, prevention and intervention approaches to addressing self-injurious behaviours would need to encompass the broader domains of mental health vulnerabilities.

#### *10.4.0 Self Injurious Behaviours and Associated Suicidal Intent among Adolescents and Young Adults in Bangalore*

The research literature is replete with conceptual uncertainties and confusion about the nomenclature of self-injury, with non-suicidal self-injury (NSSI) often conflated with non-fatal suicide attempts. The field is moving towards the recognition that although the two behaviours may differ in intent, form and function, they may co-occur as well (Andover, Morris, Wren & Bruzzese, 2012; Zetterquist, Lundh & Svedin, 2013). NSSI has been viewed as a precursor to suicidal ideation and attempts; functioning as a 'gateway' (Brausch, & Gutierrez, 2010; Stanley, Winchell, Molcho, Simeon, & Stanley, 1992). Another theory proposes that NSSI and suicidal behaviours have shared vulnerabilities, such as psychological distress, psychiatric disorder/s, or shared biochemical dysfunctions (Hamza, Stewart & Willoughby,

2012). Joiner's theory proposes a desensitisation to pain and fear through repeated NSSI attempts and an 'acquired capability' for suicidal behaviours (Joiner, 2005).

The field is moving away from clubbing all self-harm behaviours under a single umbrella term and differentiating non-suicidal behaviours and self-injurious behaviours without suicidal intent. This would reduce the likelihood of inflated estimates of these behaviours, allow for an understanding of the complex relationships between the two and for the development of appropriate assessment, preventive and intervention approaches.

In the present study a subset of self-injurers (16.7%) reported a suicidal intent associated with one or more of the acts of self-injury. Overall, 33.9% of youth engaged in non-suicidal self injury of varying severity, while 6.8% of youth reported suicidal intent associated with self-injurious act/s. The percentage of self-injurers reporting aspects of suicidal behaviour has varied across studies, with Whitlock & Knox (2007) indicating that 40.3% of university students reporting SIB also indicating suicidality, 36% in the study by Klonsky (2011) and 7% in the study by Lloyd-Richardson et al (2007).

There was a unique pattern of the form and functions of self-injurious behaviour that differentiated individuals with suicidal behaviours. They tended to be an older group and were more likely to be female, reported using a wider array of methods, tended to use more methods of a higher severity level and were less likely to use minor methods of self-injury alone. They tended to have higher rates of cutting, self-tattooing, scraping skin, hitting self, hair-pulling and picking skin to draw blood. There was a longer period of contemplation prior to self-injury indicating a more planned and relatively less impulsive process and the perception of higher levels of associated pain. Although absolute levels of associated substance use were low among all self-injurers, this pattern was more likely among those who reported suicidal intent.

Engaging in self-injury served many similar functions in both groups, there were some salient differences. Those with suicidal intent more frequently endorsed reasons reflecting reduction in negative affective states (e.g. stop bad feeling, reduce numbness or emptiness) or a desire for self-punishment. Self-injury was more likely to help them to avoid situations or people, provide an outlet when alone or a sense of connectedness with a group and to draw attention or impact change in others' behaviours. Overall, those with associated suicidal ideation identified significantly greater number of functions served by their self-injurious acts. Self-injurers with associated suicidal intent formed a high risk group

for psychological distress, with levels of both internalizing and externalizing being higher than among self-injurers without suicidal intent. The logistic regression analyses identified that being a female self-injurer, being a self-injurer with internalizing problems in the borderline/clinical range, the use of greater number of self-injury methods and higher levels of pain associated with self-injury, all increased the odds of associated suicidal ideation. Those working in the field of youth mental health can be alert to the sociodemographic, mental health and self-injuring profile that could identify disturbed youth with a higher likelihood of suicidal intent.

Researchers have found a higher risk for suicidal attempts among individuals who engage in more severe forms of self-injury such as self-cutting (Favaro et al., 2008; Lloyd-Richardson et al., 2007; Tang et al., 2011; Whitlock et al., 2008). The use of multiple methods of self-injury among was also found to be associated with suicidal attempts among adolescents in a clinical setting (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006) and in a community sample (Turner, Layden, Butler & Chapman, 2012).

Research examining potential differences in the range and type of functions served by self-injury has been limited. Similar to our results, a web-based survey (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011) also reported that adolescents engaging in NSSI plus 'suicidal self-injury' described a higher number of motivations for their acts. While the two groups corresponded in terms of many reasons for self-injury, those with suicidality were more likely 'to stop negative thoughts' (an intrapersonal function) and 'to see if anyone loves me' (an interpersonal function). Brausch & Gutierrez (2010) reported that among other variables, depressive symptoms were more prominent among adolescents with a NSSI and a suicidal attempt than among those with NSSI only, while another study failed to support this distinction (Muehlenkamp & Gutierrez, 2007).

The relationship between physical pain and self-injury accompanied by suicidal intent is difficult to disentangle. The model by Joiner (2012) proposes that a habituation to pain among self-injurers, combined with other factors, would be a pathway to increased risk of suicide attempt/s. In support of this theoretical perspective, Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein (2006) found that the absence of physical pain associated with self-injury among a clinical sample of adolescents, was associated with suicidal attempts. There was an inconsistent pattern in the same study, with adolescents' report of less physical pain associated with a significantly lower number of NSSI episodes and use of fewer NSSI methods.

The present study appear to contradicts Joiner's theory and reports that moderate to severe pain perception among self-injurers is related to a threefold increase in the odds of reporting suicidal intent with SIB. A latent class analysis among adult self-injurers (Hamza & Willoughby, 2013) also unexpectedly found that self-injurers with both non-suicidal and suicidal acts reported greater pain behaviour than those with low frequency self-injury with low risk for suicidal behaviour. They speculated that self-injurers who have become inured to pain may actually increase the number and severity of methods in order to increase painful experiences. It is also possible that the reduction in pain sensitivity may become more apparent over a period of repetitive self-injury. Hamza, Stewart & Willoughby (2012) also discuss the possibility of discrepancies between self-reports of experienced pain and laboratory measures of pain sensitivity or tolerance. Clearly, the relationship between pain sensitivity, non-suicidal self-injury and suicidal intent/attempts requires further clarity through future research.

The present study explored self-injurious behaviour and did not have detailed assessments of suicidality. Future research is required to address the commonalities, distinctions and pathways between these non-suicidal and suicidal manifestations of self-damaging behaviours. Studies could explore the gamut of psychosocial risk and protective factors and psychosocial variables associated with *both* NSSI and suicidality as well as identify variables that may be differentially associated with one behavior or the other (Andover, Morris, Wren & Bruzese, 2012; Zetterqvist, Lundh, & Svedin, 2013). Recent studies also underscore the need to include other self-harming or high-risk behaviours as well (Turner, Layden, Butler & Chapman, 2012). Hamza, Stewart & Willoughby (2012) proposed an integrated model to link NSSI and suicidality with implication for testable research hypotheses that can feed back to theory development.

There are myriad clinical implications that arise from the intersections between NSSI and suicidality. The presence of self-injurious behaviours should trigger an assessment of suicidality as well and research results caution against underestimating risk in this group. Similarly, practitioners need to explore the occurrence of the range of self-injuring behaviours of varying severity levels among youth with suicidal ideation and/or attempts. The present study adds to the information of possible higher risk profiles within self-injuring youth and future research may offer more definitive guidelines for mental health practitioners working with troubled youth.

## 11. Conclusions summarizing the achievements and indication of scope for future work.

### SUMMARY OF KEY FINDINGS

#### *Prevalence of Self-Injurious Behaviours among Adolescents & Young Adults in Bangalore, India*

- The rate of any self-injurious behaviour among 1571 youth in the past year was 40.7%.
- Moderate/severe methods of self-injury were reported by 19.4%; the most common pattern was a combination of moderate/severe and minor methods (14.9%).
- 21.3% engaged in self-injury using only minor methods.
- Among moderate/severe methods, the most commonly reported were cutting or carving skin (8.2%) and burning skin (7.7%). The most frequently reported minor methods were biting self (19.6%) and self-hitting (17.2%).
- A majority endorsed multiple methods of self-injury ( $M=2.3$  methods;  $sd=1.6$ ).

#### *Characteristics of Self-Injurious Behaviours among Adolescents & Young Adults in Bangalore, India*

- The mean age of onset of SIB was 14.8 years ( $sd = 2.9$ ; median = 15.0).
- There was a relatively impulsive pattern of engaging in SIB with little (few minutes) or no contemplation (82.5%) before the act.
- 80.4% of self-injurers reported little or no associated pain. The experience of more physical pain during SIB was associated with a longer period of contemplation.
- A relatively small proportion of self-injurers (3.6%) reported concurrent substance use.
- 16.7% of the self-injurers (6.8% of the total sample) reported that suicidal intent accompanied one or more of their behaviours. Thus, the overall rate of *non-suicidal self-injury* was 33.9%.
- In comparison with youth employing only minor methods of self injury, youth with moderate/severe self-injury patterns tended to employ more methods of injury, had a greater likelihood of associated substance use, associated suicidal intent, higher levels of associated pain and a longer duration of premeditation or forethought.
- There were several distinctions between youth with a non-suicidal pattern of self-injury and those with associated suicidal intent. Individuals with suicidal intent tended to be an older group, more likely to be female, reported using a wider array of methods, used more methods of a higher severity level and were less likely to use minor methods of self-injury alone. They had higher rates of cutting, self-tattooing, scraping, hitting self, hair-pulling and picking skin to draw blood. There was a longer period of contemplation prior to self-injury indicating a relatively less impulsive process accompanied by higher levels of associated pain. Although concurrent substance use was relatively uncommon among all self-injurers, this pattern was more likely among those who reported suicidal intent.

### ***Self-reported Reasons for of Self-Injurious Behaviours***

- A majority of self-injurers reported multiple reasons for their acts ( $M = 5.5$  reasons;  $sd = 4.75$ )
- SIB functioned to reduce negative affective states or generate feelings (automatic reinforcement) as well as to modify or regulate the social environment (social reinforcement).
- The most commonly endorsed reasons indicating an emotion regulation function were ‘to feel relaxed’ (37.3%) and ‘to stop bad feelings’ (31.1%). The two most frequently reported reasons that served to modify or regulate the social environment were “‘To receive more attention from your parents or friends’ (39.4%), ‘get parents to understand and notice you’ (37.5%).
- The use of SIB to escape interpersonal demands was least frequently endorsed.
- There were many similarities (but also notable variations) in the self-reported reasons endorsed by individuals who reported using moderate/severe methods and those who used minor methods alone. Both commonalities and distinctive patterns emerged in the self-reported reasons reported by self-injurers with suicidal intent and those with non-suicidal self-injury. Self-injury served a greater number of functions for the moderate/severe group when compared with those who endorsed minor methods alone. This was also noted for self-injuring individuals in comparison to those reporting non-suicidal self-injury.

### ***Socio-demographic and Mental Health Correlates of Self-Injurious Behaviours among Adolescents & Young Adults in Bangalore, India***

#### *Association between Sociodemographic Variables and Self-injurious Behaviours*

- There were higher rates of SIB among the younger age-group (13 years to under 18 years)
- The prevalence of self-injurious behaviours was highest among youth in pre-university colleges, followed by school-going youth and lowest among young adults in undergraduate colleges.
- Gender differences indicated higher rates of self-injurious behaviours among males.
- Adolescent males under 18 years had a higher rate of moderate/severe self-injury than adolescent girls, with the difference manifested only in the higher rate of self-tattooing attempts. The overall rates of minor methods of self-injury did not differ between adolescent boys and girls.
- Conversely, among youth aged 18 years and above, there were no significant gender differences in rates of moderate/severe self-injury. More males engaged in minor forms of self injury than females, with significantly higher rates of wound picking and inserting objects under the skin.
- Gender was significantly associated with presence of suicidal intent among self-injurers; there was a higher proportion of females than males in this group.
- Males were more likely to report substance use concurrent with self-injury than were females.

- Females were more likely to report a longer period of contemplation ranging from more than a day to more than a week prior to self-injury.
- There was no significant relationship between SIB and these socio-demographic variables; educational sector (government, private and aided institutions), family system, family structure, presence or absence of siblings and current residential arrangements.
- Comparison of self-injuring youth using moderate/severe methods and those reporting only minor methods did not indicate any difference with respect to socio-demographic variables.

*Association between Mental Health vulnerabilities and Self-injurious Behaviours*

- Self-injuring adolescents and young adults had significantly higher levels of internalizing problems, externalizing problems and total problems on the YSR and ASR.
- Self-injuring adolescents and young adults with suicidal intent had significantly higher levels of internalizing, externalizing and total problems than youth with non-suicidal self-injury.
- Self-injurers with associated suicidal intent formed a high risk group for psychological distress, with levels of internalizing, externalizing and total problems being higher than those among youth with non-suicidal self-injury.

*Logistic regression analyses: Sociodemographic & mental health predictors of SIB*

- Males were 1.7 times more likely than females to report self-injurious behaviour.
- The younger age-group, aged 13 to below 18 years, largely from high school and pre-university college, were 1.4 times as likely to report SIB, than young adults, aged 18 years and above.
- Youth with internalizing problems in the borderline/clinical range were 3.8 times more likely to report SIB than those below that range. While externalizing behaviours in borderline/clinical range also predicted a higher likelihood of SIB, the odds were lower (Odds ratio=2.5).

*Logistic regression analyses: Predictors of SIB with Suicidal Intent*

- The logistic regression analyses identified that being a female self-injurer (OR=2.4), being a self-injurer with internalizing problems in the borderline/clinical range (OR=3.1), the use of greater number of self-injury methods (OR=1.5) and higher levels of pain associated with self-injury (OR=3.2), all increased the odds of associated suicidal ideation.

The findings of the present study contribute to the understanding of the phenomenon of self-injury and associated mental health vulnerabilities among youth; a relatively understudied but important domain in our country. There are implications for clinical practice and for taking a public health approach to youth mental health. The results can catalyse future research initiatives in the areas of non-suicidal self-injury and suicidality.

### ***Strengths and Implications of the Study:***

The research work represents an important contribution in the relatively unexplored domain of self-injurious behaviours among youth in the community in the Indian setting.

The strengths of the study include the large sample size, spanning across the developmental period from high school students to those in undergraduate colleges from English and Kannada medium government, aided and private educational institutions.

There was a fairly comprehensive assessment of self-injurious behaviours, including severity levels and characteristics like associated pain, substance use and degree of contemplation.

The findings highlighted that adolescent boys and young adult males are also vulnerable to expressions of self-injurious behaviour and must not be neglected in provision of care and support.

The detailed evaluation of the functional significance of SIB provides a deeper understanding of the perceived reasons for engaging in these damaging behaviours. The profile of reasons had some salient variations among subgroups of self-injurers based on the severity level of self-injury and presence or absence of suicidal intent.

The study contextualized the occurrence of self –injurious behaviour among youth by elucidating links between self-injurious behaviours and mental health vulnerabilities.

In tune with international trends in research on self-injurious behaviours, the study distinguished two groups of self-injurers – those with and without associated suicidal intent.

The use of statistical techniques like logistic regression analyses aided in the identification of socio-demographic and mental health variables which served to increase the likelihood of self-injury among youth.

The findings have relevance for suggesting a public health approach to address the problem of self-injurious behaviours and associated mental health vulnerabilities among young people in schools and colleges. Self-injuring behaviours tend to begin in the early to mid adolescence period and early interventions and preventive approaches to enhance coping, emotional well-being and resilience are advocated.

Self-injury is often a hidden or relatively neglected behaviour and the findings underscore the need to look at constellations of distress among youth which may also include self-damaging behaviours. Adolescent and young adults may not access the limited counseling/mental health services in our country and the need for outreach programmes is critical. The qualitative responses at the end of the YSR and ASR questionnaires revealed that many youth described their emotions (e.g. depression, loneliness, emptiness, anger), stressful experiences (e.g. death of a significant other, 'unpleasant memories', difficulties 'drawing lines of personal space', problems at home; relationship difficulties). Others summarized positive aspects of themselves and their environment. Many respondents felt that the questionnaires helped them to understand themselves and express 'secrets' or difficult emotions.

Concerted awareness initiatives situated within educational institutions and the community and informed policies on recognizing and addressing self-injurious behaviours as a marker of distress among students are required. This should include all stakeholders for youth mental health including teachers, parents and others in the community.

Campaigns to reduce barriers towards helpseeking, training of teachers as 'gatekeepers' and the provision of resources like telephone helplines or online resources are some directions for the future.

Efforts to facilitate a climate conducive to disclosure and the creation of a culture of 'acceptance, tolerance and support (McAllister, 2003) for self-injuring youth are vital.

The findings of the study also advocate for an individualized approach for therapeutic interventions with self-injuring youth; one that includes an understanding of the types of methods used, the associated characteristics of self-injury, diverse perceived reasons for the acts and the presence of any associated mental health vulnerabilities.

The study is also strengthened by the critical evaluation of its limitations and the implications for future research

### ***Limitations:***

1. The study has some limitations that are related to difficulties in conducting research with youth and in educational/community settings. These include refusal of consent for participation in the research from educational institutions, the large rates of non-return of parental consent forms/refusal of parental consent (for youth aged 13-18 years) and the lack of information about those who did not provide consent/assent. This would impact on the representativeness of the sample and overall generalisability of the findings. These concerns are not unique to the present study and may reflect the difficulties of community-based studies with youth. International research on self-harm behaviours has indicated higher response rates with passive parental consent procedures when compared with active parental consent methods.

2. There are certain limitations with respect to the measures used in the present study. The FASM which measures self-injurious behaviours has not been used extensively with Indian samples previously, except with college youth aged 17-22 studying in colleges with English as the medium of instruction (Kharsati, 2013). The psychometric properties – reliability and validity of the tool have not been established with Indian samples. The tool is brief and provides a comprehensive screening of relevant characteristics of self-injurious behaviour. However, Walsh (2012) points out that some of the behaviours are very mild and others could be misinterpreted (e.g. bite self). In the present study, the respondents' interpretation of the item referring to 'gave yourself a tattoo' could have varied. While, some tattooing behaviour might be aimed at self-injury, it may also be a culturally sanctioned form of self-expression. In addition, some behaviours, e.g. hairpulling, may not exemplify the current definitions of self-injury (Walsh, 2012). This may have resulted in inflated estimates of self-injurious behaviours among youth in the present study.

While the YSR (11-18 years) has been used in many Indian studies and is available in many Indian languages, there is a lack of normative data from India and therefore no established cutoffs to identify youth in the borderline or clinical range of functioning. There has been limited research using the Adult Self Report (18-59 years) in India (Balla, 2013) and a dearth of information on its psychometric properties.

In order to address the limitation related to cutoff scores, the 90<sup>th</sup> percentile cutoffs were computed to identify individuals with potential problems in the present study, similar to other studies in international contexts (Şimşek, Erol, Öztop & Özer Özcan, 2008).

3. The measures of psychopathology among school, pre-university and undergraduate college youth were self-reports and this may be viewed as a limitation. Although multi-informant data from parents/teachers have been advocated, the perspective of the adolescent or young adult may be most important when trying to understand their internal lives and perceived problems. The use of retrospective self-report to identify self-injurious behaviours can introduce problems related to accuracy of recall.

4. The cross-sectional design assessed self-injurious behaviours in the past year in youth in schools, pre-university and undergraduate college of the study did not permit the understanding of the course of self-injurious behaviours across the developmental span.

### *Directions for Future research*

Self-injurious behaviours among youth in India warrant further research. A range of planned studies could frame relevant research questions to explore this further.

1. Future studies examining self-injurious behaviours need to include other putative psychosocial factors, for example, history of abuse or trauma (physical, sexual and emotional), history of self-harm or suicidality among family members, exposure to peers with self-harming behaviours, emotion regulation, attachment styles, self-esteem. The present study indicated that one of the most commonly cited functions of self-injurious behaviours was ‘to get parents to understand or notice you’ and ‘to receive attention from parents or friends’. This suggests the importance of incorporating family related variables in future research; e.g. parental marital discord, parental psychopathology, domestic violence, parent-youth relationship/attachment. Unlike studies in Western contexts, a majority of the youth came from intact families with both biological parents. Therefore, indicators like parental divorce/single-parent families may not be as relevant as measures of family functioning and relationships.

2. Future research could also incorporate potential protective factors; for example, perceived support or presence of a confiding stable relationship. Together the identification of psychosocial risk and protective factors could help define a range of potential targets for therapeutic intervention at promotive, preventive and therapeutic levels.

3. A large scale nation-wide epidemiological study could assess self-injurious behaviours, mental health concerns and related relevant variables. In fact, Muehlenkamp, Claes, Havertape & Plener (2012) advocated for cross-national studies that can inform international policies for youth that are culturally and contextually relevant. A second level of structured diagnostic assessment after first level screening with tools like the Youth Self-Report or Strengths and Difficulties Questionnaire could identify individuals with mental health concerns with greater accuracy.

4. The present study has indicated that self-injurious behaviours, although often hidden, undetected or inadequately addressed, occur in a significant proportion of youth. Literature in other countries suggests that these self-harming behaviours are expected to be higher in special populations like juvenile correctional homes or prisons. Studies in these contexts could be conducted in the Indian setting.

5. Future research could explore the prevalence of salient self-injurious behaviours, e.g. cutting, among clinical populations. Clinicians may connect the occurrence of self-injurious behaviours with certain diagnostic groups (e.g. borderline personality disorder) and these behaviours may be missed in other groups. Research findings in general hospital and mental health settings in India could add to the limited information about the rate and characteristics of self-injurious behaviours in various clinical groups. This in turn would inform appropriate therapeutic interventions.

6. Future studies on the functions of self-injury need to correlate distinct functions with a range of risk factors (e.g. trauma/abuse, parenting variables), individual vulnerabilities (e.g. impulsivity, self-directed criticism, emotion-regulation, attachment styles) and characteristics of self-injury (e.g. severity, occasional vs. repetitive patterns, disclosure). This would be critical in the planning of targeted, idiographic, intervention approaches.

7. Theoretical perspectives have discussed the links between direct self-injurious behaviours and other indirect forms like substance abuse, eating disordered behaviour, physical risk-taking and sexual risk-taking. Future studies could examine this spectrum of self-destructive behaviours.

8. The complex intersections and differences between self-injurious behaviours and suicidal attempts warrant sustained examination. Most Indian studies looking at self-harm have unclear distinctions between these two. The present study has illuminated some patterns that distinguish self-injurers with suicidal intent associated with any one or more acts from those who do not report suicidal intent. However, this was not a defined objective of the study and there was limited information available about the timing, frequency and other aspects of suicidal ideation or attempts among youth in the sample. Research design would need to reflect potential differences in methods, frequency of the act, the expressed reasons or motivations etc.

Future studies need to explore if early patterns of self-injurious behaviour serve as a gateway or a risk indicator for future suicide attempts. A cross-sectional study tapping retrospective data on both non-suicidal self injury and suicidality can explicate the relationship between the two.

The feasibility of longitudinal designs could be planned after consideration of ethical issues related to research in this area (Prinstein, 2008).

8. Qualitative research is required to increase the understanding the experiences of young people who self-injure and other related issues like disclosure, perceptions about helpseeking and reasons or barriers to stopping self-injurious behaviours.

9. Youth in both schools and colleges exhibit significant rates of self-injury and these remain high even if we eliminate the relatively minor forms of self-injury. This suggests the values of assessing teacher awareness, myths/misconceptions and responses to self-injurious behaviour among students.

10. Another important area of research would be to assess the effectiveness of targeted interventions for self-injurious behaviours both among clinical and community samples.

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## 12. S&T benefits accrued:

- I. List of research publications with complete details: N.A. Papers in preparation  
Authors, Title of paper, Name of Journal, Vol., page, year

Poornima Bhola & Manjula M. *Non-suicidal self injurious behaviors and psychopathology among school-going adolescents in India: Implications for Public Health approaches*. Paper accepted for presentation at the International Conference on Global Public Health (GPH) 2014, Negombo, Sri Lanka, July 3-4, 2014.

Manuscripts for publication in journals are in preparation.

These include one manuscript on the association between mental health problems (Internalizing/Externalizing problems) and self-injurious behaviours.

The other manuscript will discuss the similarities and differences between self-injurers with and without suicidal intent.

- II Manpower trained on the project:
  - a. Research Scientists or Research Fellows – One Senior Research Fellow  
Ms. Vanitha, R.
  - b. No. of Ph.Ds produced – n.a.
  - c. Other Technical Personnel trained – n.a.

III. Patents taken, if any: n.a.

IV Products developed, if any. Information brochure on self-injurious behaviours was prepared for administration and teachers at educational institutions; both schools and colleges.

**13. Abstract** (300 words for possible publication in ICMR Bulletin).

Self-injurious behaviours (SIB) are a growing public health issue and few troubled youth access mental health services. The study explored the occurrence, methods, characteristics and reported reasons for SIB among school, pre-university and undergraduate college students and its sociodemographic and mental health correlates.

1571 youth completed the Functional Assessment of Self Mutilation questionnaire and measures of psychopathology, the Youth Self Report or the Adult Self-Report.

Results indicated that 40.7% reported SIB in the past year, with a male preponderance and higher rates among youth between 13- below 18 years. The rate of non-suicidal self-injury was 33.9%, with 16.7% of self-injurers reporting associated suicidal intent. Moderate/severe forms of SIB were reported by 19.4%, most commonly cutting (8.2%) and burning (7.7%). 21.3% used only minor methods; most frequently biting self (19.6%) and self-hitting (17.2%). Multiple self-injury methods were most often endorsed and 14.8 years was the mean age of onset. Characteristics like duration of forethought, associated levels of pain and concurrent substance use were described. Distinctive patterns of SIB emerged based on gender; the severity of methods used; and the presence or absence of suicidal intent. SIB served both to regulate internal emotional states (automatic reinforcement) and to influence others in the environment (social reinforcement). Self-injuring youth had significantly higher levels of internalizing problems, externalizing problems and total problems .

Logistic regression analysis indicated that males (OR = 1.7), youth aged 13- below 18 years, youth with internalizing (OR=3.8), or externalizing problems (OR=2.4) in the borderline/clinical range had a higher likelihood of self-injurious behaviour. Additional logistic regression analyses identified that being a female self-injurer (OR=2.4), a self-injurer with internalizing problems in the borderline/clinical range (OR=3.1), the use of greater number of self-injury methods (OR=1.5) and higher pain levels (OR=3.2), all increased the odds of associated suicidal ideation.

Implications for awareness building and targeted prevention and intervention approaches among vulnerable school and college youth are discussed.

**KEYWORDS:** self-injurious behaviours, self-harm, suicidal intent; adolescents, youth, psychopathology, community

**14. Procurement/usage of Equipment: n.a.**

a.

S.No.	Name of Equipment	Make/Model	Cost FE/Rs	Date of Installation	Utilisation rate %	Remarks regarding maintenance/breakdown

b. Suggestions for disposal of equipment(s) n.a.

Name and signature with date

1. \_\_\_\_\_  
(Principal Investigator)

2. \_\_\_\_\_  
(Co-Investigator)