

Perceived Parenting Style and Suicidal/Non-Suicidal Self-Injury in University Students: A Cross-Sectional South African Study

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Research Article

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Abstract

Background:

Low- and middle-income countries like South Africa carry the greatest suicide burden, with local general population suicide attempt rates of 2.9–22.7%, in comparison to 0.7–9% in international literature. Non-suicidal self-injury (NSSI) commonly co-occurs with suicidal behaviours and estimates range from 5.5% internationally to 19.4% in South Africa. As a subgroup of the general population, university students are at higher risk for both suicidal behaviours and NSSI (S/NSSI). Risk factors for S/NSSI include parenting style; however, very little is known about the relationship between parenting styles and S/NSSI in university students in the South African context. This study aimed to describe the rates of S/NSSI behaviours and to explore the relationship between the Baumrind parenting style typography and S/NSSI in university students. The study hypothesised that authoritative parenting would negatively correlate with S/NSSI. No *a priori* hypotheses were made about the other parenting styles investigated.

Methods:

Students from all faculties at the University of Cape Town were invited to complete an anonymous, online electronic survey. Data collection included a socio-demographic questionnaire, Parenting Styles and Dimensions Questionnaire and Self-Harming Behaviours Questionnaire. Descriptive statistics quantified parenting styles, suicidal behaviours and NSSI. Spearman's correlation coefficients examined the association between parenting style and S/NSSI.

Results:

In 1136 students, the rate of suicidal attempts was 6.3% and of NSSI was 22.7%. Suicide threats, suicidal thoughts, and thoughts of dying were reported by 5.9%, 35.7% and 50.7% respectively. No significant differences were seen between male and female students. We observed no significant association between authoritative parenting and suicidal behaviours, but authoritative mothers and fathers were significantly associated with a history of NSSI. Both permissive mothers and fathers were associated with suicide attempts, threats, and thoughts, whereas only permissive mothers were associated with NSSI.

Conclusions:

This study replicates previously reported high rates of S/NSSI in South African university students in comparison to general population and international data. Contrary to our hypothesis, authoritative parenting style was positively correlated with NSSI, but not with suicidal behaviours. Further studies are warranted to examine parenting style, and permissive parenting, in particular, in relation to S/NSSI.

Background

Suicide is the second leading cause of death in the 15- to 29-year age group globally, accounting for 8.5% of deaths [1, 2]. An estimated 75% of worldwide deaths by suicide occur in low- and middle-income countries (LMIC) [1, 3]. The years between 2000 and 2012 saw a 38% increase in suicide rates in Africa [1]. The highest rates of suicide in Africa are seen in adolescents and young adults aged 15–30 years [4]. South African data mirror other African findings, with local data showing a gradual increase in suicide rates over the last number of years. Current estimates attribute 11% of South African deaths in all age groups to suicide [5]. A study in Durban, South Africa, showed suicide rates to be highest amongst 25- to 34-year-olds, followed by 15- to 24-year-olds [5], while the population-wide South African Stress and Health (SASH) study found the highest rates of suicidal behaviours in the 18- to 34-year age group [6]. Rates of suicide attempts in South Africa have been reported as 2.9% for all adults [6] and 22.7% for adolescents [7].

In contrast to suicidal behaviour, non-suicidal self-injury (NSSI) is a term used to describe behaviours involving deliberate, self-directed bodily harm or mutilation without the intent to die [8–10]. The international literature reports rates for NSSI of 5.5% in adolescents and between 3.3% one-year prevalence [11] and 14.3–43.9% lifetime prevalence in young adults [12, 13].

Suicidal behaviours and NSSI frequently co-occur, with a clear relationship between NSSI and future suicide attempts [8–10] as well as future completed suicide [10]. Suicidal behaviours and NSSI also share common risk factors, including the presence of mental disorders, a history of previous suicide attempts, unemployment, social isolation, family conflict or dysfunction, and the presence of physical illness [8, 14, 15].

It is of interest that suicide attempts typically occur at higher rates among university students than in the general population [16], placing this population at particular risk for suicide. For example, the literature reports prevalence rates of 2% for suicide attempts in university students [17], and at the higher end of the global prevalence range of 0.4–5.8% in all individuals aged 18 years old and older [1]. Suicidal ideation was estimated at 9.2–10% among students [17, 18], in contrast to 14.3% in the general population [11]. In South Africa, rates of NSSI in the student population were previously estimated at 19.4% [19].

Understanding Risk Factors For Suicide And Non-suicidal Self-injury

With S/NSSI clearly acknowledged as important causes of morbidity and mortality among youth in LMICs, such as South Africa, it is important to identify factors associated with and mechanisms underlying this risk. Bronfenbrenner's ecological model provides a useful framework to understand some of the factors contributing to suicidal behaviours and NSSI in university students. This model posits that human development is the outcome of two broad processes: the interaction between the individual's characteristics and their immediate environment, including family and peer interactions (proximal

processes), and more distal processes involving the interaction between the individual and broader society (see Fig. 1) [20]. Behavioural outcomes, such as S/NSSI, can thus be understood to be a consequence of these interactions. Individual characteristics (e.g. age) interact with factors present in the individual's immediate environment (e.g. family environment) in the genesis of S/NSSI. Although typically considered adults as most students are usually in their late teens and early twenties when commencing their studies, students in the 18–24-year-old age group can be considered adolescents insofar as they continue to experience biological (brain) growth and navigate role transitions typically attributed to the adolescent experience [21]. Many remain psychologically and materially dependent on their families as they pursue higher education. Exploring these individual/family associations begins with understanding the individual characteristics predisposing students to S/NSSI and how these interact with family factors in the genesis of S/NSSI behaviours.

There is a well-documented sex difference in suicidal behaviours, with women more likely to attempt suicide and engage in NSSI than men, and men more likely to succeed in their attempts than women [9, 14, 22].

Various behavioural outcomes in adolescents and youth, including suicidal behaviours and NSSI are associated with the family environment. Family dysfunction often precedes suicidal behaviours and NSSI [23]. Conflicts in the family, physical abuse, and invalidating family environments, characterised by emotional or physical neglect, poor relationship quality and disrupted attachments, can be triggers for NSSI in adolescent females [24]. Poor family structure and relationships, unstable parental employment, and poor parenting techniques have all been associated with suicidal ideation in this population [24–26]. In the South African context, poor family relations are associated both with suicidal behaviours and NSSI [27], with a negative feeling towards the family being a potential antecedent to suicide attempts [5, 7].

Specific parental characteristics previously reported in association with suicidal behaviour and NSSI include parental affectionless control, low maternal warmth, the presence of maternal anxiety or depression, feelings of alienation in the parent-child relationship, failed protection or overprotection, and poor communication [25, 26, 28].

As noted above, there is a lack of consistency in the way parent-child relationships have been defined and measured in the literature, with several terms and typologies used to define parental behaviours. One such typology was outlined by Baumrind [29]. She classified parenting styles as permissive, authoritative, neglectful, or authoritarian, although later removed neglectful parenting from her typology. These parenting styles describe the specific practices favoured by parents to influence their children's behaviour and their attitudes towards their children [29, 30]. Parenting styles differ along two dimensions, namely warmth (or responsiveness) and demandingness (or control) [29, 30]. Permissive parents are nonpunitive and use a high warmth/responsiveness, low demandingness/control style in their interaction with their children [30]. Authoritative parents are controlling and demanding [31], but also display high warmth/responsiveness [32]. Authoritarian parents are controlling, while simultaneously displaying low warmth/responsiveness [29, 32]. Neglectful parents employ a style of low warmth/responsiveness and

low demandingness/control [32]. Authoritative parenting has been found to be protective against S/NSSI in adolescents and youth [22, 33], likely due to the presence of positive behaviours such as emotional responsiveness and the use of appropriate boundaries. Local data have supported this finding, with Roman et al. [34] finding that authoritative parenting was associated with positive psychological outcomes in South African adolescents.

In this study, we set out to examine two related questions: first, to determine the rates of S/NSSI in a representative population of university students; second, to explore the association between parenting styles and S/NSSI in the sample using Bronfenbrenner's ecological model as a framework. We predicted that we would be observing rates of S/NSSI that would be higher than reported in the international literature, and hypothesised that authoritative parenting style (deemed the most adaptive parenting style) would be associated with reduced rates of S/NSSI. We did not make any *a priori* predictions for the other parenting styles.

Methods

Study design

The study was an anonymous online electronic survey of undergraduate students at the University of Cape Town, South Africa. The study was cross-sectional in design.

Participants

Students across all faculties at the University of Cape Town were invited to participate if they were willing to provide informed consent and were aged between 18 and 24 years of age. Participants who did not indicate their age were excluded. The 18- to 24-year age range was selected given that 18 is the legal age of consent in South Africa and given that young adults (aged 15 to 24) were identified as a group at particular high risk for suicide and NSSI. Participants were contacted via an invitation email sent out by the University Administrative System to all undergraduate students. After providing electronic consent, participants were invited to complete a range of questionnaires anonymously via SurveyMonkey. Automatic reminders were sent after one and two weeks, then two weeks later, followed by a final reminder one month later. After this date, the electronic data collection was concluded.

Measures

Participants completed the following questionnaires as part of the anonymous survey:

Social/demographic questionnaire

The demographic questionnaire asked participants to indicate their age, sex, field of study and year of study.

The Parenting Styles and Dimensions Questionnaire (PSDQ) [35, 36]

The PSDQ is a 32-item self-reporting questionnaire that measures adolescents' perceived parenting styles, viz. authoritative, authoritarian, and permissive parenting for both maternal and paternal parental figures. This instrument does not assess for neglectful parenting. The questionnaire asks participants to rate their parents' behaviour on a 4-point Likert scale from 1 (not at all like him/her) to 4 (a lot like him/her) [35, 36], with higher scores associated with strong agreement with each parental style. Reported scores are then aggregated to determine the mean score for the sample. This instrument has previously been used in the South African context [34, 37].

Self-Harming Behaviours Questionnaire (SHBQ) [38]

The SHBQ is a self-reporting questionnaire designed to measure suicidal/self-harming behaviours using multiple choice and open-ended questions [38, 39]. The instrument was initially validated in a sample of college students and was later validated for use in adolescents in the United States [39]. To our knowledge this instrument has not previously been used in the South African context. Questions are divided into four subscales measuring self-harm (non-suicidal), suicide attempt, suicide threat and suicidal ideation [38]. Each subscale is anchored by an introductory question, e.g. 'Have you ever hurt yourself on purpose? / attempted suicide? / threatened to commit suicide? / talked or thought about wanting to die? / talked or thought about committing suicide?' A positive response to any of the anchoring questions would then prompt the participant to answer further clarifying questions regarding each endorsed behaviour. Participant responses were scored and coded using the scoring manual provided by the authors of the instrument. This coding was then used for statistical analysis.

Statistical analysis

All data were collected anonymously. To ensure anonymity, SurveyMonkey parameters were set not to collect any electronic identifiable information about participants. Electronic records were password protected. No qualitative data were used in this study. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 23.0. Descriptive statistics were presented as frequencies or means with standard deviations. Given that participants were allowed not to answer all questions on the SHBQ, the denominator of results differed and was considered in frequency analysis. Data were not normally distributed, and Spearman's correlation was therefore used to examine the association between parenting style and S/NSSI variables. The chi-squared test was used to test for the significance of differences in reported S/NSSI behaviours between male and female students. A p -value of ≤ 0.05 was used as the cut-off for statistical significance.

Research ethics

Ethical approval was obtained from the University of Cape Town Human Research Ethics Committee (HREC) prior to commencing the survey (Reference Number 420/2016 and 556/2016), and additional permission for access to students was obtained from the Department of Student Affairs in the University Administration.

Given the potentially distressing nature of the questions, the HREC insisted that participants should be able to *opt out* of answering any or all of the questions in the SHBQ. In the event that participants experience distress in the course of completing the survey, the online survey form included the contact details for both the National Student Helpline and National Suicide Crisis Line. In addition, email contact details for the study investigators were included in the participant information sheets. Participants experiencing distress were directed to make use of these resources, with study investigators facilitating access to mental health resources in the community if the need arose.

From an 'evidence-based' perspective, the study was expected to carry a minimal risk to participants. In their review, Dazzi and colleagues [40] found no evidence that enquiring about suicidal and related behaviours in adolescents and adults increased suicidal ideation. Instead, acknowledging and discussing suicidal ideation may reduce distress. Similarly, other studies have shown that asking about NSSI does not increase distress [41].

Results

Demographic characteristics

A total of 1136 students were included in the study. Most respondents were female (75.3%, n = 855/1136) and were in the first three years of their studies (76.2%, n = 866/1136). The demographic characteristics of study participants are summarised in Table 1.

Table 1
Demographic characteristics of participants

		n (%)
Total sample		1136 (100)
Sex	Male	279 (24.6)
	Female	855 (75.3)
	Not specified	1 (0.1)
Year of study	1st	309 (27.2)
	2nd	309 (27.2)
	3rd	248 (21.8)
	4th	139 (12.2)
	5th	75 (6.6)
	6th	16 (1.4)
	Other	37 (3.3)
	Unspecified	3 (0.3)
Age	Mean (SD)	20.50 (1.7)

Suicidal and NSSI behaviours

Given that students had the option to opt out of any of the S/NSSI questions, each rate was calculated using data from the answered questions only. The rate of past suicide attempts was 6.3% ($n = 47/746$); 9.2% ($n = 67/728$) have threatened to commit suicide, 35.7% ($n = 248/695$) have thought or talked about committing suicide and 50.7% ($n = 356/702$) have thought or talked about being dead. A total of 22.7% ($n = 168/740$) reported having ever hurt themselves on purpose with no suicidal intent.

There were no statistically significant differences in rates of any of the S/NSSI variables between male and female students: suicide attempts (females 6.7% vs males 5.4%; $\chi^2 = 0.346$, $p = 0.556$), suicide threats (females 9.6% vs males 8.2%; $\chi^2 = 0.333$, $p = 0.564$), thinking or talking about committing suicide (females 36.6% vs males 32.7%; $\chi^2 = 0.829$, $p = 0.363$), thinking or talking about being dead (females 52.4% vs males 45.4%; $\chi^2 = 5.370$, $p = 0.068$) and hurting self on purpose (females 24.1% vs males 18.0%; $\chi^2 = 2.861$, $p = 0.091$).

Given that we predicted higher rates of S/NSSI in comparison to those from other international and South African studies of university students, we were keen to base our interpretation on a comparison with

similar populations. Table 2 shows a synthesis of findings from university students in international and other South African studies, in relation to our observations.

Table 2

S/NSSI in university students: comparison of international and South African findings to this study

S/NSSI behaviour	International general population literature (range)	South African general population literature (range)	International university students (range)	This study
Suicidal attempt	0.4–5.8% [1,11,21]	2.9–22.7% [7,19]	0.7–6.9% [17,40,41]	6.3%
Suicidal threats		3.8% [6]	1.1% [41]	9.2%
Suicidal thoughts	14.3–39.4% [11,21]	9.1% [6]	3.7–32.3% [17,18,40,41]	35.7%
Thoughts about being dead				50.7%
NSSI	3.3–5.5% [42]	19.4% [19]	3.3–43.9% [13,42,43,44]	22.7%

Parenting style

Given the absence of sex differences in S/NSSI, male and female participants were combined for exploration of parenting styles in relation to S/NSSI. As shown in Table 3, maternal and paternal authoritative parenting dimensions received the highest mean scores across the sample. Scores in the dimensions of permissive mothers and authoritarian fathers had the lowest means (see Table 3).

Table 3
Mean (Standard Deviation) scores on the Parenting Styles Questionnaire¹ (n = 1136)

	Mean	Standard Deviation
Mother: Authoritative	3.49	0.65
Mother: Authoritarian	2.74	0.66
Mother: Permissive	2.65	0.62
Father: Authoritative	3.15	0.80
Father: Authoritarian	2.52	0.73
Father: Permissive	2.57	0.70
¹ Participants responded on a 4-point Likert Scale: 1 = Not at all like him/her and 4 = A lot like him/her.		

As shown in Table 4, we did not observe a statistically significant negative correlation between the dimension of authoritative parenting (mothers and fathers) and any of the S/NSSI variables. However, authoritative mothering and fathering showed significant positive associations with NSSI (authoritative mothers: $\rho = 0.098$, $p = 0.015$; authoritative fathers: $\rho = 0.102$, $p = 0.017$). Authoritarian parenting showed no significant association with any S/NSSI variables (see Table 4). The dimensional scores on permissive fathering showed significant associations with past suicide attempt ($\rho = 0.101$, $p = 0.017$), past suicide threats ($\rho = 0.101$, $p = 0.018$) and suicidal ideation ($\rho = 0.092$, $p = 0.035$). Permissive mothering showed significant positive associations with past suicide attempt ($\rho = 0.085$, $p = 0.033$), past suicide threats ($\rho = 0.083$, $p = 0.040$) suicidal ideation ($\rho = 0.082$, $p = 0.047$), and with the presence of NSSI ($\rho = 0.101$, $p = 0.011$). The S/NSSI variable about talking or thinking about wanting to die did not show significant associations with any of the parenting style dimensions.

Table 4

Spearman correlation coefficients of the relationship between parenting style and suicidal/non-suicidal self-injury

	Have you ever attempted suicide? <i>Spearman's ρ</i> (<i>p</i> -value) (denominator)	Have you ever threatened to commit suicide? <i>Spearman's ρ</i> (<i>p</i> -value) (denominator)	Have you ever talked or thought about committing suicide? <i>Spearman's ρ</i> (<i>p</i> -value) (denominator)	Have you ever talked or thought about wanting to die? <i>Spearman's ρ</i> (<i>p</i> -value) (denominator)	Have you ever hurt yourself on purpose? <i>Spearman's ρ</i> (<i>p</i> -value) (denominator)
Authoritative parenting style					
Mother Authoritative	0.024 (0.554) (610)	-0.038 (0.359) (599)	0.044 (0.291) (571)	0.066 (0.113) (577)	0.098* (0.015) (610)
Father Authoritative	-0.029 (0.501) (545)	0.043 (0.323) (537)	-0.002 (0.961) (510)	-0.004 (0.936) (516)	0.102* (0.017) (545)
Authoritarian parenting style					
Mother Authoritarian	0.044 (0.279) (619)	0.073 (0.074) (607)	0.031 (0.454) (580)	0.022 (0.600) (586)	0.008 (0.837) (619)
Father Authoritarian	-0.022 (0.611) (551)	-0.003 (0.949) (542)	0.052 (0.241) (513)	0.054 (0.220) (519)	-0.067 (0.114) (551)
Permissive parenting style					
Mother Permissive	0.085* (0.033) (628)	0.083* (0.040) (616)	0.082* (0.047) (588)	0.064 (0.117) (594)	0.101* (0.011) (628)
Father Permissive	0.101* (0.017) (559)	0.101* (0.018) (550)	0.092* (0.035) (520)	0.036 (0.416) (526)	0.044 (0.301) (559)
*Sig. (2-tailed) ≤ 0.05					

Discussion

This study aimed to explore the rates of suicidal behaviours and NSSI, and the association between parenting style and S/NSSI in undergraduate students at a South African university. We identified suicidal attempts in 6.3%, suicidal threats in 9.2%, suicidal thoughts in 35.7%, thoughts of wanting to die in 50.7%, and NSSI in 22.7% of the participants. Interestingly we saw no significant differences in these rates between male and female students. In terms of parenting styles, authoritative parenting was the most highly endorsed by participants. In contrast to our hypothesis, we did not observe a negative correlation between authoritative parenting style and S/NSSI. Instead, perceived authoritative mothering and fathering showed positive associations with NSSI. Authoritarian parenting styles did not show significant associations with any S/NSSI behaviours, but permissive parenting (mothers and fathers) showed many associations with S/NSSI.

The results of our study showed rates of most S/NSSI behaviours to be either higher than the national average for adults, adolescents and young adults in South Africa, or towards the high end of previously reported rates [6, 7, 19, 42]. These findings are in keeping with the literature where a youthful preponderance in suicidal behaviours is well described both locally and internationally [1, 5, 6].

The rate of suicide attempts in this study was slightly lower than those seen in South African adults over the age of 18 and adolescents [6, 43], with the exception of a study of South African adolescents by Shilubane et al. [7] that reported rates of suicide attempts almost four times the rates found in the current study at 22.7%. Nevertheless, the results of this study revealed higher rates of suicide attempts than those seen in students internationally [17, 44, 45] and Korean adolescents [11]. We found that the rates of suicide threats in this study were consistently higher than reported international, local and student-related rates of suicidal threats [6, 17, 44], and more than double the rate of suicide threats seen in South African adults [6].

Similarly, suicidal thoughts were reported at much higher rates than found in local and international literature [6, 7, 11, 17, 18, 22, 44]. The exception was a South African study of suicidal behaviours in adolescents that reported marginally lower rates of suicidal thoughts (32.3% vs 35.7%) [7]. Unlike the current study, the South African study on adolescent suicidal behaviours reported on a much smaller sample size, making any direct comparison difficult.

Comparison of rates of NSSI behaviours showed mixed results. One Canadian study of undergraduate students showed a rate double that of our study [46], but other studies of NSSI in students reported much lower rates than reported in this study (1.4–14.3%) [13, 45, 47]. Notably, a study of South African students reported slightly lower rates of NSSI (19.4% vs 22.7%) [19].

We were not able to identify any previous studies that had measured the presence of thoughts of dying. However, the very high rate observed in our study (50.2%) suggests that thoughts of dying (even if not accompanied by thoughts of wanting to harm or kill oneself) are very common in university students.

Even though the S/NSSI rates reported here were all towards the higher end or more than previously reported rates, we remain mindful that students in this study were able to opt out of answering any or all questions about suicide. It is therefore possible that the true rate of S/NSSI behaviours in the study population might have been higher if participants affected by these behaviours avoided answering the questions, or lower if unaffected students opted out of answering these questions if they felt questions were not relevant to them. We also acknowledge that there was no consistency in the way S/NSSI behaviours were measured across studies, with no other study using the SHBQ to assess S/NSSI behaviours. Studies in similar populations of South African students had smaller sample sizes and used different measures to assess S/NSSI behaviours [7, 19, 43], thus making direct comparison difficult.

In the international literature, there is a clear female preponderance of suicide attempts [4, 6] and it was therefore surprising not to find significant differences in our study. The pattern of rates for suicidal attempts and other S/NSSI behaviours did show higher rates in women for most items, even if there were not statistically significant differences. Interestingly, there have been suggestions from international studies of university students, that the rate of NSSI may be higher among males, suggesting that perhaps not all S/NSSI behaviours are predominant among women. We are also mindful that the relatively low participation rate for men and the possibility of opting out of questions may have influenced our findings. Nevertheless, our observations suggest, if nothing else, that all undergraduate students (male and female) may present with a range of S/NSSI behaviours that may require support or intervention.

In a study conducted at the University of Cape Town around the same time as our investigations, Van der Walt et al. [48] showed that 25% of medical students were diagnosed with depressive disorder, 20.5% with an anxiety disorder, and that 28.1% of students were receiving psychotropic medications. In their study, female sex was significantly associated with both diagnoses [48]. Unfortunately, their study did not investigate any S/NSSI variables.

On the PSDQ, the dimensions of authoritative parenting showed the highest mean scores, and permissive parenting the lowest mean scores. These findings are in keeping with other South African data, suggesting that the parenting style dimensions measured in this study were representative of the South African population [37]. The associations between parenting style and S/NSSI, however, yielded some unexpected results. A positive correlation between maternal and paternal authoritative parenting and NSSI in our study contrasted with other studies reporting a negative correlation between authoritative parenting and S/NSSI [22, 33], and contrasted with findings that demonstrated a positive correlation between authoritative parenting and positive psychological outcomes in adolescents in the form of the pursuit of intrinsic over extrinsic goals [34]. It is difficult to make a definitive interpretation of these findings, except perhaps to acknowledge that the correlation coefficients in our study (Spearman rho values, ρ) were modest ($\rho = 0.098$ for authoritative mothers; $\rho = 0.1$ for authoritative fathers), suggesting that, even though statistically significant, the association should not be over-interpreted. If nothing else, our results suggest that, even with authoritative parents, university students may engage in S/NSSI behaviours and thoughts.

Permissive parenting in both mother and father was associated with higher rates of reported S/NSSI behaviours in our study, albeit also with modest Spearman rho correlation coefficient values. We had not made any *a priori* hypotheses about permissive parenting, given unclear evidence in the scientific literature.

We acknowledge that several parental behaviours have been associated with both positive and negative behavioural outcomes in the international literature. Maternal neglect has, for instance, been associated with younger age of onset of substance use [49], while overall parental neglect or hostility was associated with greater suicidal intent and increased risk of delinquent behaviour in adolescents [50, 51]. Individuals who had experienced more fear and alienation, and less communication and trust in their relationship with their parents were more likely to engage in NSSI behaviour [28]. Conversely, high parental care had been associated with lowered risk of S/NSSI behaviours [24]. The dimension of 'permissiveness' as defined by Baumrind combines 'parental warmth' with a relative lack of boundary-setting. Most of the parental characteristics outlined in the literature above were related to a lack of emotional warmth, which was not the case in our participants with permissive parents.

Given the very modest Spearman rho values observed in our study, we are very cautious not to over-interpret our findings in any definitive way. Instead, we will make a few tentative suggestions that could be explored further in future research.

First, the absence of a negative association between authoritative parenting style and suicidal behaviours (attempts, threats, thoughts, and thoughts of death) may suggest that, at least in university students, the contribution of this parenting style is becoming a lesser contributor to positive behavioural outcomes in the broader ecological context of these young adults. This may reflect the fact that students straddle aspects of adolescence and adulthood, and may be best understood to be emerging into adulthood. Their needs for parental affirmation, and the impact of parenting style may be diminishing. Given the novelty of this observation, the finding may be particular to the South African context where many students are the first generation in their families to enter tertiary education. This may lead to immense pressure to succeed, become financially independent and lift their extended families out of poverty. The authoritative parent that was able to support the adolescent in secondary school, may not have the repertoire and insight into the pressures and constraints under which the emerging adult student is expected to perform, in turn leading to inadequate or inappropriate support and loss of the 'protectiveness' of their authoritative parenting style.

Second, the association observed between authoritative parenting styles and NSSI may suggest differential psychological and ecological pathways to NSSI as opposed to suicidal behaviours. However, this finding contradicts the established literature showing a clear correlation between suicidal and NSSI behaviours. Third, the higher 'signal' of S/NSSI associations seen here with permissive parenting may suggest the importance not only of parental warmth, but also of clear and appropriate expectations and boundary-setting by parents, as a contributor to the psychological well-being of university students. For example, during the student phase of emerging adulthood, high levels of parental warmth may be

welcomed and appreciated by the student, and experienced as comforting. However, individuation and development of independence and self-efficacy are crucial developmental tasks during this phase. A permissive parent may not set clear expectations or boundaries on their 'emerging adult' student, which in turn may prevent the student from developing the necessary repertoire to prioritise the use of time to achieve academic goals and delay gratification in the form of social and other pleasures. The lack of adequate preparation for the inevitable and necessary constraints of university life may thus undermine the benefits of high levels of warmth.

Limitations and Future Recommendations

We acknowledge a range of potential limitations to our study. First, we had already raised the fact that, at the request of our ethics committee, answering any or all questions in the SHBQ was optional and only a portion of participants in the larger study completed any of the items in the questionnaire. While we agreed with the ethical principle in doing so, this may have led to an under-reporting of S/NSSI in our study. However, the sample size was still relatively large in comparison to similar studies. Second, the study had a cross-sectional design and was correlational in nature. We were therefore not able to make any causal inferences. Instead, we tried to be cautious in our language not to imply any causal associations between S/NSSI and parenting styles, but rather tried to examine these as potential risks or protective markers. Third, we acknowledge that the study did not account for other potential confounding variables such as co-morbid mental illness or psychosocial variables that could have influenced our findings. However, a highly multivariate study would have required a very large sample size and was outside the scope of our work. Fourth, we acknowledge that we did not examine parenting styles in relation to South Africa's racial and ethnic groups, where clear differential profiles may have existed [37, 52]. This would be an important next step in future research. Similarly, we acknowledge that the psychometric properties of the SHBQ has not been examined in a South African context, and this will also be an important next step for research.

Despite these limitations, the study showed students to remain developmentally vulnerable as they face the transition from childhood dependence into adulthood and independence and showed an association between permissive parenting style and S/NSSI behaviours. However, further work is required to determine the relative contribution parenting and other factors associated with developmental outcomes in adolescents and young adults (e.g. childhood adversity) make towards S/NSSI behavioural outcomes in students. Such data could assist in developing interventions in earlier schooling years to improve outcomes in university students. This data could also inform the design of university-based interventions that may include families and parents, as a significant proportion of students remain relatively dependent on their families for the duration of their student years.

The differential correlations between permissive parenting and S/NSSI behaviours versus authoritative parenting and NSSI behaviours suggests the possibility that different developmental mechanisms underly the genesis of suicidal and NSSI behaviours. Further research exploring these possible differential

pathways could be helpful in designing parenting interventions for at-risk adolescents and emerging adults.

Conclusions

Suicidal attempts, threats and thoughts, and NSSI were identified in a significant proportion of university students in the study, and rates that were higher or towards the high end of previous national and international comparable studies, underlining the importance to consider S/NSSI phenomena in university students in South Africa and in other LMIC. In spite of the limitations of the study, parenting style characteristics may represent a component of the ecological model that could be strengthened in childhood years through parent training and parent-child interaction therapy. Such support and intervention may represent one component that could help to prepare students for the complex demands of university life.

List Of Abbreviations

NSSI - Non-Suicidal Self-Injury

S/NSSI - Suicidal and Non-Suicidal Self Injury

LMIC - Lower-and-Middle-Income Countries

PSDQ - Parenting Styles Dimensions Questionnaire

SHBQ - Self-Harming Behaviours Questionnaire

HREC - Human Research and Ethics Committee

Declarations

Ethics approval and consent to participate

The study was approved by the Human Research Ethics Committee, Faculty of Health Sciences, University of Cape Town (HREC Reference: 420/2016 and 556/2016) and permission was granted by the institution's Department of Student Affairs.

Consent for publication

Not applicable.

Availability of data and material

The datasets used and/or analyses of the study are available from the authors on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MC conceptualised the idea, led protocol development, data analysis and interpretation, and drafting and preparation of the manuscript. ELD contributed to the conceptualisation of the idea, led data collection, contributed to protocol development, data analysis and interpretation, and drafting of the manuscript. PJdV contributed to the conceptualisation of the idea, contributed to protocol development, data analysis and interpretation, drafting and revision of the manuscript. All authors read and approved the final manuscript.

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Figures

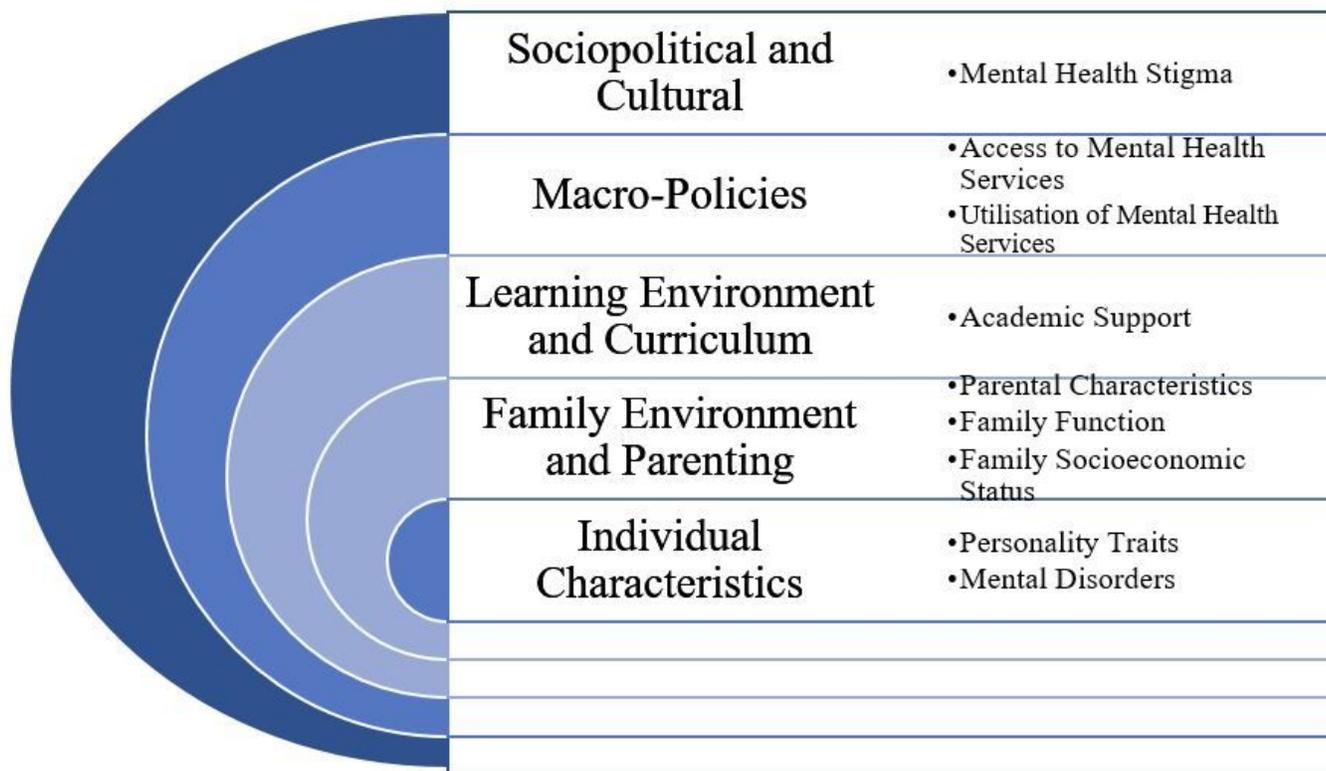


Figure 1

A diagrammatic representation of the Bronfenbrenner ecological model as applied to university students