



Sexual orientation differences in non-suicidal self-injury, suicidality, and psychosocial factors among an inpatient psychiatric sample of adolescents

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ABSTRACT

Within broader community samples, sexual minority adolescents (SMA, e.g., lesbian, gay, bisexual, queer) are at greater risk than their heterosexual counterparts for nonsuicidal self-injury (NSSI) and suicidal thoughts and behaviors. The present study investigated whether sexual minority orientation continues to confer additional risk for these behaviors in an already higher-risk sample of youth. Frequency and function of NSSI, suicidal behavior, and psychosocial factors were assessed in a sample of 52 adolescents (aged 12–18 years) admitted to an inpatient psychiatric unit due to suicide risk; 27 of them identified as SMA, and 25 as heterosexual (HA). Greater proportions of SMA reported engaging in lifetime NSSI, compared to HA, with a greater variety and frequency of NSSI behaviors and greater endorsement of intrapersonal NSSI functions. SMA reported higher levels of suicide ideation than HA, but not suicidal behavior. Group differences in NSSI and SI persisted when controlling for the greater prevalence of abuse and levels of peer-victimization reported by SMA. In inpatient clinical settings, SMA may be more likely than heterosexual youth to engage in NSSI, including more severe forms, and to experience suicide ideation. Providing alternative coping mechanisms may serve as treatment goals for reducing NSSI in SMA.

1. Introduction

Sexual minority adolescents (SMA) are at greater risk than their heterosexual counterparts for nonsuicidal self-injury (NSSI) and suicidal thoughts and behaviors. Specifically, meta-analyses indicate that SMA are three times more likely to endorse suicidal thoughts and behaviors (Marshall et al., 2011) and six times more likely to engage in self-harm behaviors compared to heterosexual adolescents (Batejan et al., 2015). These adolescents are additionally at greater risk of experiencing abuse, peer victimization (Friedman et al., 2011), depression, and other forms of clinical impairment (Russell and Fish, 2016), and community studies demonstrate mixed findings for these factors as potential contributors to the elevated rates of NSSI and suicidal thoughts and behavior (e.g., Baams et al., 2015; Bouris et al., 2016; Mustanski and Liu, 2012; Puckett et al., 2017; Safren and Heimberg, 1999). As these studies typically use community or epidemiological samples, it is unclear whether these differences between

SMA and heterosexual youth persist within higher risk contexts, such as inpatient clinical settings.

Understanding prevalence and correlates of NSSI in at-risk populations is particularly crucial for several reasons. A growing body of research demonstrates that engaging in NSSI, particularly in numerous types and with greater frequency, may increase risk of suicidal thoughts and behaviors (Burke et al., 2016; Hamza et al., 2012; Stewart et al., 2017). By habituating individuals to the process of inflicting harm to the self, acts of NSSI may increase acquired capacity to cause more serious and potentially lethal harm when suicidal (Joiner et al., 2012). Support for this has been demonstrated specifically among SMA: a history of NSSI was associated with a 10-fold increase in risk for suicidal thoughts and behaviors amongst SMA in a large community sample (Reisner et al., 2014). Certain functions of NSSI, in addition to the presence of the self-injurious behavior, may also reflect heightened risk for suicide. For example, in a general population sample, youth who engaged in NSSI for the purposes of self-punishment, reducing

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dissociation, and/or managing suicidal ideation, were at greatest risk for suicidal behaviors (Paul et al., 2015).

The present study sought to extend the literature on sexual orientation disparities in NSSI and suicidal thoughts and behaviors by examining these behaviors in adolescents on a psychiatric inpatient unit. Group differences observed in community samples, where these behaviors are relatively infrequent, may not generalize to high-risk settings, such as adolescents on a psychiatric inpatient unit, where rates of NSSI and suicidal behavior may be heightened across all groups. Additionally, given the relatively low occurrence of SI and NSSI in the population, most studies on community samples assess only the presence or absence of SI and NSSI; in contrast, an inpatient sample provides an opportunity to examine potential sexual orientation differences in higher severity of SI and NSSI. Determining whether sexual orientation continues to confer heightened risk for self-harm in high risk samples can help guide clinical decision-making and future intervention development and research. Therefore, the present study examined sexual orientation differences among youth in rates and characteristics of NSSI, suicidal behavior, and potentially relevant psychosocial factors, including depression, abuse or victimization, clinical severity, and life satisfaction. We hypothesized that although the sample as a whole would demonstrate elevated symptoms and rates of NSSI and suicidal behavior, SMA would demonstrate higher levels of NSSI, suicide ideation, and suicidal behavior, as well as greater psychopathology and interpersonal victimization, than their heterosexual counterparts. We also examined the forms and functions of NSSI for SMA, as this is pertinent to prevention and intervention efforts.

2. Methods

Data for these analyses were drawn from baseline interviews from a study examining the feasibility of a multi-modal (in-person and text messaging) intervention (Skills to Enhance Positivity in Suicidal Adolescents; STEP) to increase positive affect and decrease suicidality in adolescents recently discharged from a psychiatric inpatient unit. A description of the STEP intervention can be found in Yen et al. (in press), which presents findings from the randomized controlled trial.

2.1. Participants

Participants were 52 patients recruited from an adolescent psychiatric inpatient unit, who were admitted due to concerns of suicide risk (e.g., attempt or ideation). Participants were between the ages of 12–18, living at home with a primary guardian, proficient in English, and with access to text-messaging. Exclusion criteria included any psychotic disorder, active psychosis, cognitive or intellectual deficits that hindered understanding of study materials, and being a ward of the state. Participants were screened using medical charts and consultation with the attending psychiatrist, and 76 patient/parent pairs were approached. Of those, 52 (68%) enrolled, signed consent/assent (consent only for 18-year-olds), and completed baseline assessments. Most common reasons patient/parent pairs approached were not subsequently enrolled including failure to complete self-report measures on unit ($n = 5$), inability to contact parents ($n = 6$), and declining to participate ($n = 9$; see Yen et al., in press, for further details about participant recruitment process).

2.2. Procedures

Each adolescent and participating parent were administered separate baseline assessments, consisting of structured clinical interviews and self-report questionnaires, and were compensated \$40 upon completion. This study protocol was approved by the institutional review boards of the hospital recruitment site and the affiliated university.

2.3. Measures

All self-report assessments have demonstrated reliability and validity and were at an appropriate reading level for adolescents.

2.3.1. Demographics

Gender, sexual orientation, and race were collected via self-report. Ethnicity, living arrangements, parents' level of education and income, and abuse history were assessed within a structured interview based off the Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997). Abuse history was obtained from parent report only due to IRB concerns on direct assessment from adolescent participants; however, given the potential for lack of parental disclosure, this was supplemented with information from medical chart review which includes the intake assessment. For the present study, an “any abuse” variable was created indicating the presence of any abuse history (inclusive of physical, sexual, or psychological abuse and neglect) from either or both of these sources.

2.3.2. Suicidal behavior

Suicidal behavior characteristics were assessed using the Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011), a semi-structured interview assessing frequency and intensity of behaviors, including suicide ideation, attempts, aborted and interrupted attempts, and preparatory acts, in the week prior and over lifetime. The C-SSRS was administered to both adolescent and parent; where there were discrepancies between child and parent ratings, consensus ratings were made by the research team based on all available data, including hospital admission notes.

2.3.3. Suicide ideation

Suicide ideation was assessed using three measures, including the C-SSRS described above. The Suicide Ideation Questionnaire (SIQ; Reynolds, 1988) is a 30-item self-report instrument designed to assess thoughts about suicide experienced by adolescents during the prior month. Internal consistency was excellent in the present sample (Cronbach's $\alpha = 0.97$). SI was also assessed with the Adolescent–Longitudinal Interval Follow-Up Evaluation (A-LIFE; Keller et al., 1987), a semi-structured interview that assesses psychopathology and functioning. Psychiatric status ratings are assigned to SI at each assessment on a 6-point scale (1 = not present, 2 = thoughts of death, 3 = SI without method, 4 = SI with method, 5 = SI with plan, 6 = SI with plan and preparations). The present manuscript utilized the single timepoint A-LIFE rating of SI severity conducted at baseline, referring to the past week.

2.3.4. NSSI

Lifetime presence of any NSSI behaviors was assessed using the C-SSRS (see above). Lifetime presence of specific NSSI behaviors, NSSI frequency, and functions of NSSI were also assessed on the Inventory of Statements About Self-injury (ISAS; Klonsky and Glenn, 2008). The ISAS assesses 13 functions of NSSI, as well as the frequency of 12 NSSI behaviors (e.g., banging/hitting self, biting, burning, cutting, wound picking, etc.). Participants who endorse one or more of the 12 NSSI behaviors complete the second section assessing 13 potential functions of NSSI, that have been empirically grouped into two factors (Klonsky and Glenn, 2008; Klonsky et al., 2015). Intrapersonal functions include affect-regulation, feeling generation (anti-dissociation), anti-suicide, self-care, self-punishment, and marking distress. Interpersonal functions include autonomy, interpersonal boundaries, interpersonal influence, peer-bonding, revenge, sensation seeking, and toughness. Each function is assessed by three items, rated on a 3-point Likert-style scale (0 “not relevant,” to 2 “very relevant” to the individual's experience of NSSI), and function scores are then summed to create the two factor scores.

2.3.5. Peer victimization

Peer victimization over the last month was assessed using a 4-item peer victimization scale assessing verbal, relational, and physical victimization (Poteat et al., 2014). The scale was designed to assess general victimization, and items reflect common themes in self-report and peer nomination measures of peer victimization. Response options were zero times, 1 or 2 times, 3 or 4 times, 5 or 6 times, and 7 or more times (scaled 0–4). Internal consistency for the total scale was good in the present sample (Cronbach's $\alpha = 0.83$).

2.3.6. Depression

The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) assessed self-reported depression symptoms over the past two weeks. Scores over 20 represent clinically elevated levels of depression. Internal consistency was excellent in the present sample (Cronbach's $\alpha = 0.90$).

2.3.7. Clinical impairment

The Columbia Impairment Scale (CIS; Bird et al., 1993) is a 13-item scale that assesses functioning in children and adolescents over “the past week or two” in four areas: interpersonal, psychopathology, school/work, and leisure. Internal consistency was adequate in the present sample (Cronbach's $\alpha = 0.74$).

2.3.8. Life satisfaction

The 5-item Satisfaction with Life Scale (SLS; Diener et al., 1985) was administered as a measure of global life satisfaction rather than a measure of any specific life domains. Content included items such as, “The conditions of my life are excellent” and was in reference to the past month. Internal consistency was good in the present sample (Cronbach's $\alpha = 0.86$).

3. Results

3.1. Demographics

The mean age of our sample was 15.6 years ($SD = 1.47$), and 32 (62%) identified as female, 19 (37%) as male, and 1 (1.9%) as other. Gender identity was not further assessed, so we cannot determine gender minority status across the sample. Our sample was mostly White (77%), with 5.8% Black or African American, 3.8% Asian, 3.8% American Indian/Alaskan Native, and 9.6% Other. Of the full sample, 25% identified as Hispanic/Latinx. For household income, 47% of the sample reported under \$50,000.

When asked about sexual orientation, 25 (48%) of the adolescents identified as straight (heterosexual adolescents referred to as the HA group). Of the remaining 27 (52%), 2 (3.8% of the full sample) identified as Lesbian or Gay; 16 (31%) as Bisexual; 3 (5.8%) as Other (e.g., pansexual); 2 (3.8%) endorsed “Don't know/Not sure”; and 4 (7.7%) endorsed “Rather not say.” A sensitivity analyses excluding the participants endorsing “Don't know” or “Rather not say” produced results consistent with results including these participants; accordingly, the decision was made to include these youth in the SMA category.¹

T-tests and chi-square tests were conducted to compare SMA and HA on variables of interest. The SMA and HA did not differ on age, gender,

¹ Youth who are questioning their orientation or who have conflict around it have been shown to demonstrate even higher levels of risk than those self-identified as sexual minorities, including depression (Birkett, Espelage, & Koenig, 2009), difficulties with adjustment in response to bullying and victimization (Poteat, Aragon, Espelage, & Koenig, 2009), and suicidal ideation (Batejan et al., 2015). Less extant work examines risk of individuals who select not to report; however, prior research has demonstrated non-disclosure to be a form of stigma management among sexual minority individuals (Schrimshaw, Downing, & Cohn, 2018). This suggests that the youth choosing not to disclose may also be at elevated risk for minority stress and at-risk behaviors, and thus of particular relevance to the research question.

or race; however, significantly more SMA were of Hispanic ethnicity (see Table 1). Race was collapsed into White compared to Non-White, given low rates of non-White participants; no significant differences between SMA and HA were found for this analysis nor when examining race as individual categories.

3.2. Suicide ideation and behavior

Rates of suicide ideation and attempts were examined across the full sample and by SMA status (see Table 2A; effect sizes for group comparisons also reported in table). When assessed with the SIQ, no group differences were found for suicide ideation in the past month; however, SMA reported significantly higher severity ratings of suicide ideation in the past week based on the LIFE interview, with a large effect size. These results converged with the C-SSRS SI severity ratings, which were higher in the SMA for the week prior to hospitalization, but not significantly different between groups for most severe rating over lifetime. Approximately half of the sample had a lifetime suicide attempt history and one quarter had a suicide attempt in the week prior to hospitalization; this did not significantly differ by SMA status.

3.3. Nonsuicidal self-injurious behavior

All of the SMA reported lifetime NSSI, in contrast to 68% of the HA, in the C-SSRS interview (a moderate-to-large effect size); however, when NSSI was assessed with the ISAS self-report measure, which specifically asks about numerous forms of possible NSSI behaviors, the rate of HA endorsing NSSI increased to 88%, and the difference between groups became non-significant ($p = .064$; see Table 2B). This may be driven in part by the extent to which the ISAS also asks about numerous less severe forms of self-injury (e.g., hair-pulling, pinching, and sticking self with pins). When these less severe NSSI forms were excluded, the difference between groups slightly widened to significant levels ($\chi^2 = 4.68$; $p = .031$), with 100% of SMA and 84% of HA endorsing NSSI ($\phi = 0.30$; moderate effect size). In contrast, group differences on less severe forms of NSSI were not significant ($\chi^2 = 0.07$; $p = .797$), with 56% of SMA and 52% of HA endorsing these forms of NSSI. Of the youth endorsing lifetime NSSI on the ISAS, SMA reported engaging in significantly greater frequency of NSSI (moderate effect size) and more types of NSSI (large effect size) compared to the HA.² Self-reported functions of NSSI were examined for the adolescents reporting a history of NSSI on the ISAS. SMA endorsed intrapersonal functions to a significantly greater extent than the HA (large effect size); however, no significant differences between the groups were found on the interpersonal functions (see Table 2B).

3.4. Life history and psychosocial variables

Groups were compared on life history and psychosocial variables (see Table 2C). For the full sample, 19 participants had positive abuse history from parent report on the KSADS and 17 on medical chart review, with 29 (56%) with a positive history from at least one source. SMA reported higher rates of lifetime history of any abuse (70%) than the heterosexual group (40%), with a moderate effect size. SMA reported higher levels of peer victimization than HA, also with a moderate effect size. There were no significant differences in depression, clinical impairment, and life satisfaction ratings between SMA and HA.

Exploratory post-hoc hierarchical regression analyses were conducted to determine if the associations between SMA status and LIFE SI

² For youth reporting NSSI, frequency scores ranged from 1 to 1323 and reflected a highly positively skewed count variable. Accordingly, a Mann Whitney U non-parametric test was utilized and median values, in addition to means, are provided in the table. Significant results were also achieved with an alternate approach of t-tests using log-transformed variables.

Table 1
Sample demographics, for total sample and by sexual orientation.

	Overall (<i>n</i> = 52) <i>N</i> (%) / <i>M</i> (<i>SD</i>)	SMA (<i>n</i> = 27) <i>N</i> (%) / <i>M</i> (<i>SD</i>)	HA (<i>n</i> = 25) <i>N</i> (%) / <i>M</i> (<i>SD</i>)	<i>t</i> / χ^2
Age	15.6 (1.47)	15.3 (1.51)	16 (1.35)	-1.76
Gender: female	32 (62%)	17 (63%)	15 (60%)	5.06
Male	16 (31%)	6 (22%)	10 (40%)	
Transgender/non-binary	4 (8%)	4 (15%)	0 (0%)	
Race: white	40 (77%)	20 (74%)	20 (80%)	2.40
Black	3 (6%)	2 (7%)	1 (4%)	
Asian	2 (4%)	1 (4%)	1 (4%)	
American Indian/ Alaskan	2 (4%)	1 (4%)	1 (4%)	
Other	5 (10%)	3 (11%)	2 (8%)	
Hispanic ethnicity	13 (25%)	10 (37%)	3 (12%)	4.34*

Notes: SMA = sexual minority adolescents; HA = heterosexual adolescents. χ^2 value for race is presented for White vs Non-White given the low frequencies of other races and thus low power to test across all categories; results remained non-significant if tested across all groups.

* = $p < 0.05$.

Table 2
Life history, psychosocial, suicide, and non-suicidal self-injury variables for the full sample and by sexual orientation.

	Overall (<i>N</i> = 52) <i>N</i> (%) / <i>M</i> (<i>SD</i>)	SMA (<i>n</i> = 27) <i>N</i> (%) / <i>M</i> (<i>SD</i>)	HA (<i>n</i> = 25) <i>N</i> (%) / <i>M</i> (<i>SD</i>)	Statistic <i>t</i> / χ^2 /Mann-Whitey U	Effect size <i>d</i> / ϕ /r
A. Suicide/NSSI Behavior					
Suicidal Ideation Question (SIQ)	103.02 (42.09)	108.07 (38.18)	97.56 (46.10)	0.90	0.25
Suicide Ideation (PSR)	4.33 (1.29)	4.81 (1.04)	3.80 (1.35)	3.05**	0.84
Suicide Ideation, lifetime (C-SSRS)	4.19 (1.27)	4.33 (1.18)	4.04 (1.37)	0.83	
Suicide ideation, past week (C-SSRS)	3.83 (1.51)	4.30 (1.14)	3.32 (1.70)	2.41*	
Suicide attempt, lifetime (C-SSRS)	27 (51.9%)	16 (59.3%)	11 (44.0%)	1.21	0.15
Suicide attempt, past week (C-SSRS)	13 (25.0%)	7 (25.9%)	6 (24.0%)	0.03	0.02
NSSI, lifetime (C-SSRS)	44 (84.6%)	27 (100%)	17 (68.0%)	10.21**	0.44
NSSI, past week (C-SSRS)	22 (42.3%)	15 (55.6%)	7 (28.0%)	4.04*	0.28
Any NSSI, lifetime (ISAS)	49 (94.2%)	27 (100%)	22 (88.0%)	3.44	0.26
B. NSSI Rates/functions					
Variety of NSSI (ISAS)	<i>N</i> = 49 3.61 (2.46)	<i>n</i> = 27 4.52 (2.17)	<i>n</i> = 22 2.50 (2.37)	3.11**	0.89
Frequency of NSSI (ISAS) median values [‡]	202.50 (322.24) 45.50	254.74 (348.40) 130.0	141.17 (283.80) 12.0	174.00**	0.38
Intrapersonal Functions	17.28 (8.47)	20.59 (5.96)	13.39 (9.41)	3.17**	0.91
Interpersonal Functions	6.94 (7.87)	8.00 (9.14)	5.70 (6.02)	1.03	0.30
C. Life History/psychosocial variables					
Any Abuse	29 (55.8%)	19 (70.4%)	10 (40.0%)	4.85*	0.31
Peer victimization	1.57 (1.28)	1.91 (1.26)	1.20 (1.22)	2.05*	0.57
Depression (BDI)	33.92 (11.57)	34.74 (12.02)	33.04 (11.23)	0.53	0.15
Impairment (CIS)	27.23 (8.99)	28.56 (8.05)	25.80 (9.88)	1.11	0.31
Satisfaction with Life (SLS)	12.62 (6.09)	11.11 (5.25)	14.24 (6.61)	1.90	0.52

Notes: SMA = sexual minority adolescents; HA = heterosexual adolescents; SIQ = Suicide Ideation Questionnaire; PSR = Psychiatric Status Rating; C-SSRS = Columbia-Suicide Severity Rating Scale; ISAS = Inventory of Statements About Self-Injury; BDI = Beck Depression Inventory; CIS = Columbia Impairment Scale; SLS = Satisfaction with Life Scale; Any Abuse = Chart report or parent endorsement of sexual, physical, psychological abuse and/or neglect.

* = $p < 0.05$.

** = $p < 0.01$.

[‡] A Mann Whitney U non-parametric test was used to compare median values for Frequency of NSSI given non-normal distribution.

scores, NSSI frequency, NSSI variety, and NSSI intrapersonal functions persisted over and above shared variance with lifetime abuse and peer-victimization (see Table 3). SMA status was entered as a predictor in step 1, and abuse and peer victimization were entered in step 2. For all outcomes, step 2 did not contribute significant incremental validity to the model ($p > .472$), and SMA status remained a significant predictor with similar effect sizes, while neither abuse nor victimization were significant in any model ($p > .256$). These findings suggest that while SMA have higher rates of abuse and peer victimization than their heterosexual peers, the association between SMA status and SI and NSSI variables were not attributable to shared variance with abuse history and peer victimization.

4. Discussion

The current study examined differences by sexual orientation in suicidal and self-harming behaviors, as well as a range of potentially related psychosocial variables, in a sample of adolescents recruited on an inpatient psychiatric hospital. In this high-risk sample, SMA did not differ from heterosexual adolescents on rates of prior suicide attempts, but findings for suicide ideation differed for the two measures used. SMA reported higher levels of SI than the heterosexual group on the A-LIFE (a clinician rated measure based on interview report of suicidal ideation severity over the past week) but not the SIQ (a self-report measure based on frequency of thoughts over preceding month). These findings converged with SI severity ratings on the C-SSRS. In that interview, SMA reported experiencing higher levels of SI than the heterosexual group in the week prior to hospitalization, but the group difference on lifetime SI severity was nonsignificant. While all of the inpatient youth report similar lifetime histories of SI, SMA are reporting more intense acute SI at hospitalization, perhaps reflecting a more severe state of crisis. This could be driven by greater experiences of adverse and stigma-specific events precipitating hospitalization, a ten-

dency not to ask for help or disclose SI until more severe, and/or other factors not assessed in the present study. Further investigation is needed to better understand implications of these differences in acute SI prior to hospitalization. SMA also endorsed higher rates of NSSI than heterosexual adolescents, particularly more severe forms of NSSI, as well as higher levels of engaging in NSSI for the intrapersonal functions.

Engaging in NSSI to for intrapersonal functions, such as to achieve management of suicidal urges, as self-punishment, or in order to generate feelings, has been particularly strongly linked to suicide attempts in prior studies of college students (Paul et al., 2015), suggesting that these functions may reflect elevated risk for suicidal thoughts and behaviors. While recently hospitalized adolescents are generally at elevated risk for suicidal behavior regardless of sexual orientation, the

Table 3

Post-hoc hierarchical regression analyses predicting suicidal ideation, NSSI frequency, NSSI variety, and NSSI intrapersonal function from sexual orientation (step 1) and past month peer-victimization and lifetime abuse (step 2).

Dependent variable	Predictors	Adjusted R^2	ΔR^2	Step 1 β	Step 2 β
Suicide ideation (PSR score)	1. Sexual minority	0.14**		0.40**	0.36*
	2. Any abuse	0.13*	0.02		−0.02
	Peer victimization				0.15
Past Week Suicide Ideation (C-SSRS)	1. Sexual minority	0.09*		0.33*	0.34*
	2. Any abuse	0.07	0.02		−0.11
	Peer victimization				0.09
NSSI variety (ISAS)	1. Sexual minority	0.15**		0.39**	0.47**
	2. Any abuse	0.18*	0.03		−0.11
	Peer victimization				−0.13
NSSI frequency (ISAS)	1. Sexual minority	0.10*		0.34*	0.39**
	2. Any abuse	0.09	0.03		0.00
	Peer victimization				−0.18
NSSI intrapersonal Function (ISAS)	1. Sexual minority	0.18**		0.43**	0.37*
	2. Any abuse	0.20*	0.02		0.07
	Peer victimization				0.12

Notes: NSSI = Nonsuicidal Self-Injury; PSR = Psychiatric Status Rating; C-SSRS = Columbia-Suicide Severity Rating Scale; ISAS = Inventory of Statements About Self-Injury.

* = $p < 0.05$.

** = $p < 0.01$.

differences in motivation for NSSI among SMA (versus heterosexual adolescents) suggests that SMA may be at higher risk of engaging in self-harming behavior to manage their distress. The elevated prevalence of NSSI among SMA, as well as the different reasons for SMA in this group, may heighten risk for and severity of future suicide attempts, through increasing acquired capability for and desensitization to self-destructive behavior (Whitlock et al., 2013). The greater number of methods of NSSI utilized by the SMA may also reflect elevated risk for suicide attempts (Stewart et al., 2017). Future work should examine these associations longitudinally in high-risk youth to understand whether NSSI may contribute to the elevated suicide rates found in SMA over time.

Several possibilities may explain the lack of observed differences in suicide attempts between SMA and HA in the present sample, despite the elevated SI and NSSI in the SMA group. Given that this is a high severity sample recruited based on suicidal behavior, it is possible that the sample approaches a ceiling effect for attempts, typically a relatively rare behavior, whereas there is more variability to capture for SI and NSSI. There also may be only a small effect on attempts in this more severe sample that the present sample is underpowered to detect. Additionally, one of the specific functions of NSSI endorsed to a greater extent by the SMA is using NSSI to manage suicide-related thoughts, suggesting that for these SMA experiencing SI, these high rates of NSSI may reflect emotion regulation strategies that function to prevent suicide attempts, at least in the short-term. If so, engaging in NSSI may then paradoxically increase risk over time as described above (Whitlock et al., 2013) or have other maladaptive effects; longitudinal research would be needed to examine that possibility, as well as any other potential developmental or age-related effects on differences suicide attempts between these groups.

Although SMA reported higher incidence of physical abuse and peer-victimization than heterosexual participants — confirming others' findings that this group is at particular risk for abuse from family and peers (see Friedman et al., 2011 for a meta-analysis) — the presence of abuse and victimization was not, surprisingly, associated with NSSI or SI after adjustment for SMA status, and the magnitude and significance of the relations between SMA status and both NSSI and SI were unchanged by controlling for abuse and victimization. Other studies have implicated these elevated rates of abuse and the associated experiences of minority stress as risk factors for suicide and self-harming behavior in SMA among general populations (Baams et al., 2015; Bouris et al., 2016; Mustanski and Liu, 2012; Puckett et al., 2017); however, in our study on inpatient participants, the link between sexual orientation and

NSSI and SI appeared unrelated to abuse and peer-victimization. However, the present study is underpowered for mediation or moderation analyses, so further research with larger samples powered for mediational and moderation analyses is needed to determine whether trauma history and peer victimization may directly contribute to the elevated rates of NSSI used to manage distress in SMA or affect which SMA engage in NSSI or SI. Future research should also incorporate a measure of lifetime peer victimization, as well as recent victimization, given that important experiences shaping current behavior may have occurred prior to the previous month's assessment period of the measure utilized in the present study. More nuanced assessment of forms of victimization, including sexual minority-specific victimization and types and intensity of behaviors involved, would also be informative. Clinically, careful assessment of interpersonal victimization and stressors may be particularly important for SMA to determine whether these factors may be present and contributing to distress.

While SMA demonstrated a trend toward lower levels of satisfaction with life, SMA and heterosexual adolescents did not differ in their levels of symptoms of depression and clinical impairment. These findings likely reflect the high severity of symptoms present across most adolescents warranting inpatient levels of care. These results are also consistent with prior findings demonstrating that suicide risk differences between SMA and heterosexual adolescents may persist even when differences in depression are accounted for (Safren and Heimberg, 1999). Furthermore, while understanding how sexual minority status may confer risk within the high-risk population of recently hospitalized adolescents is important for clinicians in these settings, restriction of range in some variables due to the heightened severity may obscure some associations that would be observed in broader samples across ranges of clinical severity.

Future, larger studies should examine additional constructs as potential factors in elevated self-harm and SI, such as those that have been found to promote resilience in community SMA samples, including family support and connectedness (Reisner et al., 2014; Taliaferro and Muehlenkamp, 2017). Further work could also include a priori assessment of gender identity, as well as measures beyond self-report, such as task-based assessments of suicide and self-harm biases. Additionally, the SMA in this sample were primarily bisexual-identified girls, so these findings may not generalize to youth of other sexual minority identities or genders; further research is needed with broader samples. Similarly, our sample was predominately White; as such, additional research is warranted to understand the experiences of SMA who are racial and ethnic minorities. We were unable to record information from patient

and parent pairs who were approached for the study but declined to participate, so we cannot determine whether self-selection bias may have occurred and further affected demographic representation or other aspects of the study.

These findings suggest that sexual minority orientation may exacerbate self-harm risk, perhaps through increased need to regulate distress, in addition to the underlying psychopathology common across all youth in these settings. Interventions such as Dialectical Behavior Therapy (Linehan, 2014; Rathus and Miller, 2014) that specifically target difficulties with emotion regulation and distress tolerance, challenge self-punitive cognitions, and provide alternative coping skills to NSSI, might be particularly useful for increasing skills for managing stressors. However, evidence of differential efficacy of these types of interventions across sexual minorities suggest they may also need to be adapted specifically to meet SMA needs and address relevant concerns (Beard et al., 2017).

Declaration of Competing Interest

None.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.psychres.2019.112664](https://doi.org/10.1016/j.psychres.2019.112664).

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