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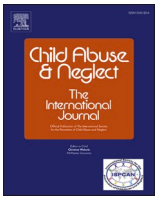

Links between image-based sexual abuse and mental health in childhood among young adult social media users

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ABSTRACT

Background: Image-based sexual abuse (IBSA) involves harm inflicted upon children through the creation, distribution, and misuse of explicit images. IBSA includes scenarios where explicit images are produced, shared, and misused by both adults and other youth.
Objective: To examine the impact of IBSA, independent of child sexual abuse and adversity, on drug overdoses, suicide attempts and self-injuries before the age of 18 with a focus on sexual and gender minority youth.
Participants and setting: Young adult social media users, aged 18 to 28 ($n = 2630$) from across the United States.
Methods: Participants were recruited through social media and completed an online survey. Data is cross-sectional - asking young adults to reflect back on experiences prior to age 18. Data was collected between February 27, 2024 and April 1, 2024.
Results: IBSA was associated with elevated odds of mental health impact, independent of in-person sexual abuse and adversity. Gender minority participants were more likely than cisgender participants to report IBSA; sexual minority youth more likely than those identifying exclusively as heterosexual to report IBSA. Gender minority youth with IBSA had increased odds of drug overdoses (aOR 3.0, $p = .053$) and suicide attempts (aOR 3.1, $p < .001$), controlling for other factors. Among sexual minority youth, IBSA was associated with increased odds of drug overdoses (aOR 3.9, $p = .002$), suicide attempts (aOR 2.4, $p < .001$) and non-suicidal self-injury (aOR 2.9, $p = .001$).
Conclusions: Youth serving professionals should be aware that IBSA is associated with increased public health problems. Vulnerability to IBSA should be included among the concerns that clinicians and educators screen for, particularly among vulnerable populations.

Abbreviations: IBSA, image-based sexual abuse; SGM, sexual and gender minority; CSA, child sexual abuse; aOR, adjusted odds ratio; CSAM, child sexual abuse material.

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1. Introduction

Image-based sexual abuse (IBSA) encompasses harm inflicted upon children through the creation, distribution, and misuse of explicit images (Finkelhor et al., 2023). IBSA includes scenarios where explicit images are produced, shared, and misused by both adults and other youth, including romantic partners and malicious peer acquaintances. Youth-produced images that are shared and misused by peers and adults have been estimated to comprise 88 % of IBSA (Finkelhor et al., 2023; Scott et al., 2022). The term IBSA recognizes the evolving nature of child sexual abuse material, which extends beyond the dynamics of hands-on child sexual abuse in which images are created by offenders. This framework provides a more inclusive and evolving terminology to capture the diverse forms of IBSA experienced by children in contemporary digital environments.

A significant challenge is distinguishing the unique emotional impacts of IBSA from the other aspects of child adversity. Studies show that IBSA is associated with previous experiences of in-person sexual abuse (Turner et al., 2023), but some aspects of the IBSA experience may be particularly harmful. Survivors of IBSA report feeling ongoing fear over the circulation or resurfacing of their images online, as well as worry about being recognized in public (Gewirtz-Meydan et al., 2018). The sharing of images and the public accessibility of the images is one of the most difficult aspects of the crime to overcome (Binford et al., 2015; Finkelhor et al., 2024; Gewirtz-Meydan et al., 2018) and contribute to feelings of guilt and embarrassment (Gewirtz-Meydan et al., 2019), ongoing vulnerability (Gewirtz-Meydan et al., 2018), helplessness (Von Weiler et al., 2010), and powerlessness by victims (Canadian Centre for Child Protection, 2017). IBSA survivors also report experiencing post-traumatic stress disorder (Gewirtz-Meydan et al., 2018), anxiety and depression, sleeping problems, hypervigilance, low body image, suicidal ideation and attempts, relationship and sexual difficulties, self-harm and paranoia (i.e., persistent feelings of distrust and suspicion) (Canadian Centre for Child Protection, 2017). However, research has yet to disentangle whether the IBSA itself has unique impact on symptomatology over that of exposure to in-person sexual abuse and adversity experienced by youth.

Sexual and gender minority (SGM) youth are an important population to include in studies of IBSA given that they already face a number of elevated risks for suicidal behavior (Birkett et al., 2009), depression (Marshal et al., 2008; Veale et al., 2017), substance use (Coulter et al., 2018; Johns et al., 2018; Johns et al., 2019; Marshal et al., 2008), and abuse (Button et al., 2012; Sterzing et al., 2019). There is little literature on IBSA impact specifically among SGM victims, although studies show higher rates of sexual abuse in this population (Messinger & Koon-Magnin, 2019; Xu & Zheng, 2015). Sexual images may also result in being "outed" to others if their sexual or gender identity was previously undisclosed; possibly resulting in added traumatic impact. There is a significant need for more information on the challenges for this population.

2. The current study

The present study seeks to investigate the relationships between various forms of IBSA experienced and key mental and behavioral health indicators (i.e. drug overdose, attempts to die by suicide, and non-suicidal self-injury) experienced before the age of 18. Importantly, analyses will contribute to our understanding of the potential unique impact of IBSA, even in the context of childhood sexual abuse and non-victimization adversity which has known connections with poor mental health (Daníelsdóttir et al., 2024; Downing et al., 2021; Pan et al., 2021). Given the known health disparities among SGM youth noted above, we explore the above relationships across youth of different sexual and gender identities.

3. Methods

Individuals aged 18–28 were recruited across the United States through Facebook and Instagram advertisements. We chose this age range to meet the minimal age requirement for consent (18 years) on the lower end and to limit recall bias on the upper end (28 years). Social media advertisements did not mention a monetary incentive or eligibility criteria. Instead, they were more general ads with colorful graphics depicting content like sports, video games, and anime, stating headers such as "have your voice heard," "make a difference," "your voice matters," and "we want to hear from you". All ads also mentioned "Tell us about your life and experiences in this research survey!". Participants who clicked on the study advertisements were brought to the online screener to determine eligibility. Primary eligibility for all participants was: 1) ages 18–28, 2) proficiency in English, and 3) currently residing in the United States). Beyond demographics, screener questions were designed to allow for an oversample of individuals with IBSA experiences to use for secondary eligibility by asking two questions which were each measured on a scale of 1 (not at all likely) to 5 (extremely likely): How likely would you be to… 1) send a sexual photo or video that was sexual, and 2) have someone ask you for a photo or video that was sexual. Throughout data collection, responses to each of these questions were examined in the context of IBSA involvement reported in the main survey. Our secondary eligible criterion was adjusted based on threshold responses for each that would maximize the likelihood of identifying participants with IBSA experience. This secondary criterion for eligibility throughout data collection was modified throughout recruitment to maximize the number of participants with IBSA involvement. As such, this is a convenience sample and the results are not meant to be representative of all 18–28 years olds across the U.S. Importantly, however, recruiting through social media is critical to reach a more diverse group of participants, especially those with known health disparities who are often not captured in large enough numbers in panel-based samples or school-based samples to conduct any meaningful analyses.

Once deemed eligible (57 % of screener completes), participants were redirected to a survey which described the study and presented them with the informed consent document. Once consent was obtained, participants were directed to the main survey. Extensive steps were taken to deter and detect any fraudulent entries; steps designed and tested by the authors across multiple studies (Colburn et al., in progress). Examples include, a) mailing incentives to a valid and confirmed physical mailing address within the US

(no PO Boxes); b) only sending one incentive per address, c) not sharing the direct survey link to people who request it; d) utilizing several Qualitrics settings to limit multiple responses and detect duplicate and fraudulent entries, for example allowing one submission per IP address, tracking time zone, RECAPTCHA Score (<0.5 means respondent is likely a bot), RelevantID Duplicate Score (≥ 75 means respondent is likely a duplicate), and RelevantID Fraud Score (≥ 30 means respondent is a scammer (scores falling in those ranges were automatically redirected out of the survey). We also utilized and reviewed more traditional e) attention check items, f) time to completion, g) conflicting response patterns, and h) straight lining. All procedures were conducted under the approval of the University of New Hampshire Institution Review Board.

Recruitment occurred in two launches with the second launch including additional survey items central to the overall study aims, including CSA victimization, discrimination, and social and structural determinants of health. The current paper focuses on the launch 2 data given the inclusion of CSA victimization in the analyses. The launch 2 survey took an average of 34.6 min to complete. Those who completed the survey and provided a valid U.S. non-P.O. box mailing address were sent a $15 Amazon gift card as a thank-you. Requiring a physical U.S. mailing address for the gift card successfully deterred fraudulent entries from outside of the U.S., a common challenge with online recruitment strategies which offer an email incentive (Pratt-Chapman et al., 2021).

A total of 3610 participants completed the Launch 2 survey between February 27, 2024 and April 1, 2024 (Launch 2). During data cleaning, cases were dropped due to declined consent ($n = 88$), duplicates or suspected fraud ($n = 65$), incomplete responses ($n = 803$), or had no matching screener data ($n = 24$). The final sample after cleaning was 2630 participants.

3.1. Measures

3.1.1. Image-based Sexual Abuse (IBSA)

Participants were asked questions about their experiences with various types of IBSA before age 18. Items were designed as part of another national study on technology-facilitated abuse (Finkelhor et al., 2023).

3.1.1.1. Non-consensual taking, making and sharing. Respondents were asked, "Before age 18, did someone ever take, make, or share a sexual picture or video of you without your permission?" This measured both the taking and making (e.g., photoshop) of sexual images without consent. Follow-up questions asked whether the incident involved taking, making, or sharing; two variables were created: 1) taking or making, and 2) sharing.

3.1.1.2. Forced or pressured production. "Before age 18, did someone ever threaten, try to force, or strongly pressure you to provide sexual pictures or videos online or through a cell phone?"

3.1.1.3. Threatened sharing. "Before age 18, did someone ever threaten to share a sexual picture or video of you to make you do something – like send more sexual pictures, have a sexual relationship, pay them money, or something else?"

3.1.1.4. Self-produced image sharing with someone older. This measured a sexual relationship with a partner 5 or more years older than the youth. Respondents were asked, "Before age 18, did you ever share sexual pictures or videos, even if you wanted to, with someone 5 or more years older?"

3.1.1.5. Commercial sexual exploitation. "Before age 18, did you ever make, send, or post sexual pictures or videos in exchange for money, drugs, or other valuable items?"

3.1.2. Childhood Sexual Abuse (CSA)

CSA was measured with two items from the Juvenile Victimization Questionnaire: (Finkelhor et al., 2005): "Before age 18, did a grown-up… 1) you knew or 2) didn't know… touch your private parts when they shouldn't have, or make you touch theirs? Or did they force you to have sex?" A "yes" response to either was coded as experiencing CSA.

3.1.3. Lifetime non-victimization adversity

Non-violent traumatic events and chronic stressors were measured using 10 yes/no items (e.g., serious illness, family homelessness). Items were summed for a total adversity count (Turner & Butler, 2003).

3.1.4. Mental health indicators

3.1.4.1. Attempt to die by suicide. Respondents were asked about lifetime and recent suicidal ideation and attempts (American Psychological Association, 2024), with responses of "No," "Yes," or "Prefer not to answer (n=2)," later conservatively recoded as yes/no due to the small amount of missing data.

3.1.4.2. Non-suicidal self-injury (NSSI). Five items measured NSSI, including "Have you ever… 1) cut your skin? 2) hit yourself? 3) pulled your hair? 4) burned your skin? 5) done another type of self-injury?"(National Data Archive, 2025). A positive response to any was coded as NSSI.

Table 1
Characteristics of participants by image-based sexual abuse.

Characteristic	All participants ($N = 2630$) n	Unweighted percent	Weighted percent	No IBSA ($n = 1299$) n (weighted %)	Any IBSA ($n = 1331$) n (weighted %)	*P* value
Sex assigned at birth						<0.001
Male	676	25.7	38.5	453 (72.0)	223 (28.0)	
Female	1911	72.7	61.2	826 (41.9)	1085 (58.1)	
Intersex	14	0.5	0.1	1 (6.2)	13 (93.8)	
Missing	29	1.1	0.3	19 (60.9)	10 (39.1)	
Current age						0.639
18–19	686	26.1	16.4	328 (55.6)	358 (44.4)	.
20–22	697	26.5	27.3	346 (52.5)	351 (47.5)	
23–25	720	27.4	30.4	355 (55.7)	365 (44.3)	
26–28	527	20.0	25.8	270 (50.7)	257 (49.3)	
Sexual identity prior to age 18 [a]						
Exclusively heterosexual	1124	42.7	77.3	658 (58.0)	466 (42.0)	<0.001
Gay / lesbian	318	12.1	4.2	137 (39.6)	181 (60.4)	0.001
Bisexual / queer / polysexual / demisexual	1133	43.1	16.6	462 (33.6)	671 (66.4)	<0.001
Asexual / no sexuality	91	3.5	1.3	49 (50.1)	42 (49.9)	0.688
Questioning / no labels	67	2.5	1.1	37 (59.5)	30 (40.5)	0.595
Missing	68	2.6	1.9	37 (58.9)	31 (41.1)	0.609
Any sexual minority identity						<0.001
No	1184	45.0	79.1	691 (58.0)	493 (42.0)	
Yes	1446	55.0	20.9	608 (36.5)	838 (63.5)	
Gender identity prior to age 18 [a]						
Exclusively cisgender	2070	78.7	93.6	1057 (53.8)	1013 (46.2)	0.299
Transgender	109	4.1	1.4	49 (42.9)	60 (57.1)	0.193
Nonbinary / genderqueer / genderfluid / pangender/ indigenous	419		3.7	166 (39.7)	253 (60.3)	<0.001
Agender	64	2.4	0.6	29 (44.5)	35 (55.5)	0.300
Questioning / gender variant	117	4.5	1.7	55 (50.9)	62 (49.1)	0.729
Missing	114	4.3	2.3	52 (56.1)	62 (43.9)	0.799
Any gender minority identity						0.011
No	2113	80.3	95.2	1079 (54.0)	1034 (46.0)	.
Yes	517	19.7	4.8	220 (44.4)	297 (55.6)	
Race and ethnicity [a]						
White	2036	77.4	69.1	996 (53.3)	1040 (46.7)	0.862
Black	170	6.5	9.5	66 (39.4)	104 (60.6)	0.018
Asian	234	8.9	9.7	138 (69.1)	96 (30.9)	0.001
Hawaiian or Pacific Islander	18	0.7	0.7	6 (45.5)	12 (54.5)	0.680
American Indian or Alaska Native	108	4.1	1.4	42 (43.0)	66 (57.0)	0.214
Other non-white race	157	6.0	5.3	74 (63.1)	83 (36.9)	0.164
Not sure	54	2.1	0.9	21 (41.7)	33 (58.3)	0.279
Missing	31	1.2	2.0	15 (55.6)	16 (44.4)	0.881
Ethnicity						0.999
Not Hispanic or Latino	2037	77.5	73.7	1018 (53.5)	1019 (46.5)	
Hispanic or Latino	423	16.1	19.1	192 (53.7)	231 (46.3)	
Missing	170	6.5	7.2	89 (53.4)	81 (46.6)	
Household income						0.001
Lower than the average family	1003	38.1	35.1	446 (52.7)	557 (47.3)	
Average	1057	40.2	42.9	526 (48.9)	531 (51.1)	
Higher than the average family	361	13.7	13.8	216 (68.7)	145 (31.3)	
Missing	209	7.9	8.1	111 (56.1)	98 (43.9)	
Type of community						0.143
Small town or rural area	700	26.6	28.0	316 (48.3)	384 (51.7)	
Suburban area next to a city	1020	38.8	38.7	511 (53.6)	509 (46.4)	
Urban or city area	751	28.6	26.9	385 (58.9)	366 (41.1)	
Missing	159	6.1	6.4	87 (53.4)	72 (46.6)	
Highest level of education						0.067
Less than high school	137	5.2	4.2	50 (47.5)	87 (52.5)	
High school diploma, GED, or trade school	647	24.6	33.3	260 (47.5)	387 (52.5)	
Some college	749	28.5	20.1	393 (60.4)	356 (39.6)	
Bachelor's degree	483	18.4	23.4	260 (57.5)	223 (42.5)	
Graduate school or degree	459	17.5	12.8	255 (54.7)	204 (45.3)	
Missing	155	5.9	6.3	81 (50.5)	74 (49.5)	

Missing responses dropped for significance testing.
Note. Weighted percentage, unweighted n. Row percentages. [a] Multiple responses possible.
IBSA = image based sexual abuse.

3.1.4.3. Drug overdose. Participants were asked if, before age 18, they overdosed on medication or drugs and required hospitalization. This question was modified from (Turner & Butler, 2003) to reflect personal overdose instead of knowledge of someone else's overdose. The response options were yes, no, or prefer not to answer ($n = 3$) which was conservatively coded as "no" due to the small amount of missing data.

3.1.5. Social identity

To measure sexual identity, participants were asked how they identified prior to the age of 18; multiple responses were possible. Each of these responses were reported separately and combined into the following categories due to small cell sizes for some in consultation with experts in the field of sexual and gender identity: 1) exclusively heterosexual, 2) gay or lesbian, 3) bisexual, queer, polysexual, demisexual, 4) asexual or no sexuality, and 5) questioning or do not use labels. Gender identity was categorized as: 1) exclusively cisgender, 2) transgender, 3) nonbinary, genderqueer, genderfluid, pangender, two-spirit, 4) agender, and 5) questioning

Table 2
Image-based sexual abuse, child sexual abuse, and mental health indicators by sexual identity (N = 2630).

	All participants (N = 2630) n (%)	Exclusively heterosexual ($n = 1184$) n (%)	Any sexual minority identity ($n = 1446$) n (%)	Unadjusted Odds ratio (95 % CI)	Gay / lesbian ($n = 318$) n (%)	Bisexual / queer / polysexual / demisexual ($n = 1133$) n (%)	Asexual / no sexuality ($n = 91$) n (%)	Questioning / no labels ($n = 67$) n (%)
Any IBSA	1331 (46.5)	493 (42.0)	838 (63.5)	2.40 (1.85, 3.11)***	181 (60.4)	671 (66.4)	42 (49.9)	30 (40.5)
Someone took or made sexual material of you without permission	203 (6.7)	72 (6.2)	131 (8.2)	1.34 (0.81, 2.22)	23 (5.2)	107 (8.9)	9 (6.5)	8 (8.5)
Someone shared sexual material of you without permission	260 (8.9)	88 (7.5)	172 (14.5)	2.10 (1.33, 3.30)**	34 (11.3)	138 (15.4)	4 (7.3)	6 (5.1)
Someone threatened, tried to force, or strongly pressured you to provide sexual material through technology	1039 (33.9)	379 (29.6)	660 (50.1)	2.39 (1.83, 3.12)***	127 (40.4)	543 (54.0)	38 (47.9)	26 (37.3)
Someone threatened to share sexual material to get you to do something	344 (12.2)	137 (11.7)	207 (14.2)	1.26 (0.87, 1.81)	36 (12.9)	176 (15.2)	5 (9.5)	7 (5.4)
You shared sexual material with person 5+ years older	617 (20.9)	189 (18.0)	428 (31.9)	2.14 (1.57, 2.92)***	93 (31.9)	348 (33.4)	9 (9.8)	14 (11.3)
You made, sent or posted sexual material through technology for money or something of monetary value	112 (3.7)	26 (2.3)	86 (9.1)	4.28 (2.06, 8.90)***	20 (5.2)	71 (10.8)	0	3 (3.5)
Child sexual abuse	421 (12.6)	118 (10.0)	303 (22.6)	2.64 (1.81, 3.83)***	62 (19.4)	244 (23.3)	19 (20.1)	9 (8.7)
Non-victimization adversity (M)	2.82 (2.1)	2.57 (2.1)	3.78 (2.2)	3.48 (2.35, 5.15)***	3.76 (2.3)	3.88 (2.2)	3.54 (2.2)	3.05 (1.8)
Mental health indicators before age 18								
Drug overdose	135 (3.4)	38 (2.8)	97 (5.4)	1.94 (1.06, 3.52)*	24 (6.2)	78 (5.9)	5 (4.4)	3 (7.6)
Suicide attempt	658 (18.4)	175 (14.7)	483 (32.6)	2.81 (2.04, 3.88)***	102 (28.0)	392 (34.2)	30 (35.5)	18 (37.8)
NSSI	2020 (66.4)	775 (61.4)	1245 (85.0)	3.56 (2.56, 4.96)***	269 (79.2)	983 (86.6)	79 (85.8)	57 (92.9)

Note. Since the sexual minority identities were not mutually exclusive, statistical comparisons between groups were not conducted.
IBSA = image based sexual abuse; NSSI = non-suicidal self-injury.
*** $p \leq .001$.
** $p \leq .01$.
* $p \leq .05$.

or gender variant. For bivariate analyses, each group represents a different variable in analyses given that many participants identified with more than one sexual minority identity (9.3 %) and more than one gender minority identity (12.1 %). For multivariate analyses, participants were combined into exclusively heterosexual and any sexual minority, and exclusively cisgender and any gender minority to maximize cell sizes. Additional characteristics included race, ethnicity, geographic location, income, age, and education as depicted in Table 1.

3.1.6. Data analysis

Missing data was <5 % and conservatively coded at "no" for dichotomous variables and replaced with the item mean for continuous variables. First, sample demographic characteristics (e.g., age, sexual and gender identity, race and ethnicity) were compared between participants who did and did not report IBSA before the age of 18 using weighted bivariate crosstabulations (Table 1). This table also provides overall sample demographic characteristics using both unweighted and weighted data. Next, we used bivariate statistics to compare responses to key study constructs (any childhood IBSA, specific forms of IBSA, CSA, and mental health indicators) across different sexual identities (Table 2) and different gender identities (Table 3) with significance testing conducted using unadjusted logistic regressions to report odds ratios with 95 % confidence intervals. A series of three logistic regressions were then conducted to explore the independent and relative effects of IBSA, CSA, and non-victimization adversity while adjusting for demographic characteristics on the mental health indicators experienced prior to age 18 (Table 4). These logistic regressions were then conducted for specific sub-groups of participants: gender minority, exclusively cisgender, sexual minority, and exclusively heterosexual (Table 5).

Table 3
Image-based sexual abuse, child sexual abuse, and mental health indicators by gender identity (N = 2630).

	Exclusively cisgender (*n* = 2113) n (%)	Any gender minority identity (*n* = 517)	Unadjusted Odds ratio (95 % CI)	Transgender (*n* = 109) n (%)	Nonbinary / genderqueer / genderfluid / pangender/ indigenous (*n* = 419) n (%)	Agender (*n* = 64) n (%)	Questioning / gender variant (*n* = 117) n (%)
Any IBSA	1034 (46.0)	297 (55.6)	1.47 (1.09, 1.98)**	60 (57.1)	253 (60.3)	35 (55.5)	62 (49.1)
Someone took or made sexual material of you without permission	150 (6.5)	53 (10.0)	1.60 (1.00, 2.57)*	13 (12.5)	45 (11.1)	10 (12.8)	11 (6.7)
Someone shared sexual material of you without permission	195 (8.8)	65 (12.1)	1.43 (0.92, 2.23)	9 (7.4)	57 (13.7)	8 (19.8)	12 (10.5)
Someone threatened, tried to force, or strongly pressured you to provide sexual material through technology	795 (33.3)	244 (46.3)	1.73 (1.28, 2.34)***	50 (48.8)	207 (49.9)	27 (46.6)	46 (38.3)
Someone threatened to share sexual material to get you to do something	2634 (12.0)	81 (15.4)	1.33 (0.90, 1.96)	17 (15.0)	68 (16.4)	10 (11.2)	19 (13.0)
You shared sexual material with person 5+ years older	464 (20.4)	153 (30.1)	1.67 (1.19, 2.36)**	32 (37.5)	131 (33.9)	17 (28.8)	31 (29.2)
You made, sent or posted sexual material through technology for money or something of monetary value	70 (3.5)	42 (7.9)	2.34 (1.34, 4.07)**	11 (8.4)	34 (8.0)	5 (5.4)	10 (5.0)
Child sexual abuse	308 (12.3)	113 (17.9)	1.55 (1.10, 2.19)**	17 (15.0)	99 (19.6)	20 (21.7)	15 (9.0)
Non-victimization adversity (M)	2.76 (2.1)	4.12 (2.2)	5.30 (2.88, 9.76)***	3.97 (2.2)	4.12 (2.2)	4.44 (1.9)	3.97 (2.2)
Mental health indicators before age 18							
Drug overdose	88 (3.1)	47 (9.0)	3.11 (1.77,5.47)***	9 (9.0)	39 (9.3)	11 (16.5)	11 (5.8)
Suicide attempt	435 (17.3)	223 (40.0)	3.17 (2.31,4.36)***	43 (38.7)	190 (41.9)	27 (34.8)	47 (33.4)
NSSI	1550 (65.1)	470 (91.8)	6.01 (4.02,8.99)***	101 (94.3)	386 (93.1)	62 (98.2)	102 (87.6)

Note. Since the gender minority identities were not mutually exclusive, statistical comparisons between groups were not conducted.
IBSA = image based sexual abuse; NSSI = non-suicidal self-injury.
*** $p \leq .001$.
** $p \leq .01$.
* $p \leq .05$.

Table 4
Relative impact of image-based sexual abuse and child sexual abuse on health indicators before the age of 18 ($n = 2630$).

	Model 1: IBSA only		Model 2: Plus CSA		Model 3: Plus Adversity	
	aOR (95 % CI)	*P* value	aOR (95 % CI)	P value	aOR (95 % CI)	P value
Any IBSA – drug overdose						
IBSA	2.5 (1.0, 6.2)	0.051	2.1 (0.7, 5.7)	0.154	1.8 (0.7, 4.8)	0.231
CSA	–	–	2.9 (1.2, 7.3)	0.022	2.4 (0.9, 6.4)	0.084
Adversity	–	–	–	–	1.2 (1.0, 1.4)	0.013
Any IBSA – suicide attempt						
IBSA	2.1 (1.5, 3.1)	<0.001	2.0 (1.3, 2.9)	0.001	1.7 (1.2, 2.6)	0.007
CSA	–	–	2.1 (1.3, 3.4)	0.002	1.7 (1.0, 2.8)	0.050
Adversity	–	–	–	–	1.2 (1.1, 1.3)	<0.001
Any IBSA - NSSI						
IBSA	1.7 (1.2, 2.4)	0.002	1.6 (1.1, 2.2)	0.009	1.4 (1.0, 2.0)	0.043
CSA	–	–	2.6 (1.4, 4.7)	0.002	2.0 (1.1, 3.7)	0.024
Adversity	–	–	–	–	1.3 (1.2, 1.4)	<0.001

Note. All models adjust for sex at birth, gender identity, sexual identity, race and ethnicity, income, education, and urbanicity.
IBSA = image based sexual abuse; CSA = child sexual abuse; NSSI = non-suicidal self-injury.

Table 5
Relative impact of image-based sexual abuse, child sexual abuse, and health indicators by sexual and gender identity.

	Drug overdose		Suicide attempt		NSSI	
	aOR (95 % CI)	P value	aOR (95 % CI)	P value	aOR (95 % CI)	P value
Any gender minority ($n = 517$)						
IBSA	3.0 (1.0, 9.1)	0.053	3.1 (1.8, 5.3)	<0.001	1.8 (0.8, 4.1)	0.151
CSA	1.5 (0.6, 3.9)	0.356	3.4 (1.8, 6.3)	<0.001	3.6 (0.7, 18.2)	0.125
Adversity	1.2 (1.0, 1.4)	0.040	1.1 (1.0, 1.3)	0.039	1.2 (0.9, 1.5)	0.137
Exclusively cisgender ($n = 2070$)						
IBSA	1.7 (0.6, 4.9)	0.331	1.7 (1.1, 2.6)	0.018	1.4 (1.0, 2.0)	0.066
CSA	2.5 (0.8, 7.6)	0.117	1.5 (0.9, 2.7)	0.142	1.9 (1.0, 3.7)	0.036
Adversity	1.2 (1.0, 1.4)	0.034	1.2 (1.1, 1.3)	<0.001	1.3 (1.2, 1.4)	<0.001
Any sexual minority (n = 1446)						
IBSA	3.9 (1.7, 9.2)	0.002	2.4 (1.5, 3.7)	<0.001	2.9 (1.6, 5.4)	0.001
CSA	1.9 (1.0, 3.6)	0.060	2.0 (1.1, 3.4)	0.014	1.3 (0.6, 2.7)	0.439
Adversity	1.2 (1.0, 1.3)	0.017	1.1 (1.0, 1.3)	0.024	1.3 (1.2, 1.5)	<0.001
Exclusively heterosexual ($n = 1124$)						
IBSA	1.6 (0.4, 5.9)	0.464	1.6 (0.9, 2.7)	0.076	1.3 (0.9, 1.9)	0.165
CSA	2.9 (0.6, 13.5)	0.169	1.6 (0.7, 3.5)	0.255	2.0 (1.0, 4.2)	0.060
Adversity	1.2 (1.0, 1.5)	0.040	1.3 (1.1, 1.4)	<0.001	1.3 (1.1, 1.4)	<0.001

Note. All models adjust for sex at birth, gender identity, sexual identity, race and ethnicity, income, education, and urbanicity.
IBSA = image based sexual abuse; CSA = child sexual abuse; NSSI = non-suicidal self-injury.

Data were weighted to general population targets from the Current Population Survey (United States Census Bureau, 2023) for 18–28 year olds on age, gender, education, race and Hispanic ethnicity and from Pew Research on gender identity and sexual identity (Brown, 2022, 2023).

4. Results

4.1. Characteristics of participants by IBSA

For participants in this national sample, who were purposively screened for a higher likelihood of IBSA, 46.5 % reported this victimization experience ($n = 1331$). IBSA was significantly more likely for participants who were female assigned at birth or intersex at birth compared with male at birth (Table 1). Participants who identified as a gender minority and/or sexual minority also were significantly more likely to report IBSA. Differences were also noted by race with Black participants more likely to report IBSA than non-Black and Asian participants less likely to report IBSA compared to non-Asian.

4.2. IBSA, CSA and health indicators by sexual identity

As seen in Table 2, participants who reported any sexual minority identity prior to the age of 18 had an (unadjusted) 2.40-fold

increased odds of any IBSA. Odds of specific types of IBSA for any sexual minority identity are also provided. Endorsement of any IBSA was highest among participants who identified as bisexual, queer, polysexual, and demisexual (66.4 %); followed by those who identified as gay or lesbian; asexual or having no sexuality; questioning or no labels, and least likely among participants who identified as exclusively heterosexual (42.0 %). The most commonly endorsed type of IBSA was having someone threaten, try to force, or strongly pressure you to provide sexual material through technology.

CSA was reported by 12.6 % of all participants with percentages ranging from 8.7 % for youth who were questioning their sexual identity / used no labels to 23.3 % of youth who identified as bisexual, queer, polysexual, or demisexual. The average number of non-victimization adversities experienced during childhood was also higher among each sexual minority group (over 3.0) with exclusively heterosexual participants experiencing, on average, 2.1 types. NSSI was reported by 66.4 % of this sample, 18.4 % had tried to die by suicide and 3.4 % had a drug overdose - all prior to the age of 18. Each of these health indicators were more commonly reported by sexual minority than those who identified exclusively as heterosexual.

4.3. IBSA, CSA and health indicators by gender identity

As shown in Table 3, identifying with a gender minority identity prior to the age of 18 was related to an (unadjusted) 1.47-fold increased odds of any IBSA. Of gender minority individuals, 55.6 % reported any IBSA before the age of 18; 46.0 % of participants who identified as exclusively cisgender reported this experience. Odds of specific types of IBSA for any gender minority identity and differences by sub-groups of gender identity are also presented in Table 3.

Eighteen percent of gender minority participants reported CSA and experienced, on average, 4.12 different non-victimization adversities during childhood. In comparison, 12.3 % of exclusively cisgender participants experienced CSA and reported 2.76 adversities. Each health indicator was more common among gender minority participants compared with exclusively cisgender participants.

4.4. Relative impact of IBSA and CSA on health indicators before the age of 18

As seen in Table 4, IBSA was significantly related to all three health indicators while controlling social demographic characteristics, including sexual and gender identity (Model 1): drug overdose (aOR = 2.5, $p = .051$), suicide attempt (aOR = 2.1, $p < .001$), and NSSI (aOR = 1.7, $p = .002$). The addition of CSA in Model 2 eliminated the relationship with drug overdose while IBSA was still significantly related to suicide attempt (aOR = 2.0, $p = .001$) and NSSI (aOR = 1.6, $p = .009$). In these models, CSA was significantly related to each health indicator. Further adjusting for non-victimization adversity in Model 3 slightly attenuated the relationships between IBSA and suicide attempt and NSSI, but they remained significant. Non-victimization adversity was significantly related to each health indicator.

4.5. Relative impact of IBSA, CSA and Adversity on health indicators before the age of 18 by sexual and gender identity

The relative impact of IBSA on each health indicator while controlling for CSA and adversity varied by sexual and gender identity (Table 5). Specifically, IBSA was significantly related to drug overdose for sexual minority (aOR = 3.9, p = .002) and gender minority (aOR = 3.0, $p = .053$) participants – even when taking into account CSA and adversity. IBSA was significantly related to suicide attempt for gender minority (aOR = 3.1, $p < .001$), cisgender (aOR = 1.7, $p = .018$) and sexual minority (aOR = 2.4, $p < .001$) participants, but not those who identified as exclusively heterosexual. IBSA was only significantly related to NSSI in the context of CSA and adversity for sexual minority participants (aOR = 2.9, p = .001).

5. Discussion

This study was designed to look at the IBSA problem and its impact independent of CSA and non-victimization adversity among a sample of young adult social media users. Notably, the risk for suicide attempt and NSSI during childhood was evident even controlling for in-person CSA and other childhood adversities (Table 4). These findings suggest that there are elements unique to IBSA that make this type of victimization particularly harmful to psychological well-being. Many victims of IBSA face the continued threat of their images re-surfacing online and thus re-victimization (McGlynn et al., 2021). These situations, in which the victim may have no control over the future or continued distribution of the sexual material, likely lead to continued and lasting mental and emotional distress.

Another key focus of this paper was to examine differential impacts of IBSA on SGM youth, a population that experiences significant health disparities (Rogers & Taliaferro, 2020). Our study revealed that SGM youth are indeed more vulnerable to IBSA, with such experiences associated with worsened health outcomes (Table 5). The increased vulnerability to IBSA applied to a variety of SGM statuses with the exception of the asexual, agender and questioning youth who may be in a more passive or risk avoidant mode with regard to online exploration (McInroy et al., 2022). Alternately, the smaller sample size for these groups could have lowered the power to find significant findings. More research is necessary to better understand the experiences of these youth. The association with increased health impacts was also quite broad. SGM youth had higher levels of suicide attempts and NSSI and substance use disparities, which is consistent with the existing literature (Rogers & Taliaferro, 2020)'(Fernandez et al., 2021; Mereish, 2019; Watson et al., 2018).

The pathways contributing to heightened health vulnerability among these groups remain unclear, though multiple factors likely play a role (Choukas-Bradley et al., 2022). SGM youth are often stigmatized and targeted for bullying, some of which could involve image abuse (Zaza et al., 2016). Their search for information and community support online may expose them to exploiters posing as

allies (Hatchel et al., 2021). Additionally, alienation from parents, due to rejection or the need to conceal their identity, can result in a lack of supervision, reducing protective factors (Ryan et al., 2009).

Elevated health problems among abused SGM youth may be linked to marginalization and stigma, which negatively impact emotion regulation and resilience (Hatzenbuehler et al., 2009). Their distance from trusted adults and even peers may mean they are forced to deal with abuse on their own. In some cases, seeking help could risk outing them to people they do not trust, compounding their distress. Moreover, SGM youth may struggle with issues of self-efficacy related to their sexual and gender identities, making them particularly vulnerable to self-blame and discouragement following an IBSA episode (Button, 2015).

5.1. Limitations

This study provides data from a large and diverse population of young adult social media users, including a large sample of SGM respondents, but it also has some limitations that need to be considered. The use of opt-in recruitment may introduce sampling biases, although this was less likely given ads did not reveal study aims. Participants were young adults recalling earlier experiences, which could lead to recall bias. Some variables, like sexual abuse and drug overdoses, may be confounded within the IBSA episodes such that the IBSA was created as part of the sexual abuse, for example. Since health outcomes and abuse exposure were measured simultaneously (prior to the age of 18), causal relationships cannot be determined.

5.2. Implications

Exploring the connections between IBSA and CSA and health indicators reveals critical insights for public health and therapeutic interventions. The significant relationship between suicide attempt, NSSI and IBSA, even alongside CSA and adversity, calls for targeted public health strategies focusing on mental health and IBSA education, particularly tailored to SGM youth. A comprehensive approach is needed that addresses the unique and combined impacts of IBSA and CSA, with a specific emphasis on suicide prevention, self-harm and substance use.

Clinicians and educators should be trained and cognizant about the vulnerability of SGM youth both to IBSA and mental health difficulties. They should be able to point SGM youth to healthy and safe sources of information. In communities where SGM-specific safety programs are not feasible, primary care providers may bear more responsibility, offering confidential and sensitive discussions. Online communities can also serve as a critical resource for reaching SGM youth (Higa et al., 2014; McInroy et al., 2019), who may rely more on these spaces for health and medical information or sexuality and sexual attraction questions (Palmer et al., 2013). Safety and prevention programming in online spaces would likely be beneficial for those SGM youth who are otherwise not able to access in-person services or face unique barriers to these resources.

6. Conclusion

This study highlights the significant impact of IBSA on mental health, even after accounting for exposure to CSA and non-victimization adversity. IBSA uniquely increases risks for suicide attempts and non-suicidal self-injury, with SGM youth facing heightened vulnerability. Future research is needed to better understand the unique contributions of IBSA on mental health in both adolescent samples, as well as using longitudinal designs. Qualitative research is needed to add context to these experiences, particularly among vulnerable subgroups like SGM youth who likely require different approaches to prevention and intervention given the stigma and discrimination they often face in society (Meyer, 2003).

CRediT authorship contribution statement

Kimberly J. Mitchell: Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Deirdre Colburn:** Writing – review & editing, Methodology, Investigation, Data curation. **David Finkelhor:** Writing – review & editing, Conceptualization. **Ateret Gewirtz-Meydan:** Writing – original draft. **Heather A. Turner:** Writing – review & editing, Investigation. **Lisa M. Jones:** Writing – review & editing, Investigation.

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Declaration of competing interest

No conflicts of interest were reported by the authors of this paper.

Data availability

Data will be made available on request.

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