REVIEW

Increased adverse health outcomes in sexual- and gender-minority populations exposed to stressful childhood experiences: a meta-analysis

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Abstract

Within sexual- and gender-minority (SGM) populations, stressful childhood experiences (SCEs) impact health outcomes in adulthood. We conducted a meta-analysis of the impact of SCEs on health outcomes among SGM populations. A systematic review and meta-analysis of 64 independent studies from 2013-2022 was conducted. Seven health outcomes were identified: psychological health (k = 26), suicide and related behaviors (k=23), substance use (k=14), sexual health (k=13), physical health (k=5), housing instability (k=3), and adulthood abuse/victimization (k=2) with meta-analyses for each health outcome finding increased odds (31-132%) for developing an adverse health outcome in adulthood following SCEs among SGM individuals. These increased odds highlight the need to assess for SCEs in research and clinical practice. Beyond research and clinical practice, these findings yield critical policy implications for creating environments to mitigate the impact of SCEs on health outcomes for SGM individuals.

Introduction

Childhood adversity, which encompasses a broad range of adversities such as abuse, neglect, and household dysfunction that occur to individuals under the age of eighteen years, exert profound and enduring effects on health outcomes across the lifespan (Hughes et al., 2017). Within sexual- and gender-diverse populations, including individuals identifying as lesbian, gay, bisexual, transgender, queer (LGBTQ+), or non-binary, the prevalence of childhood adversity far surpasses that of their heterosexual and cisgender counterparts, shaping their health trajectories in significant ways (Schnarrs et al., 2019). These adversities intertwine with mental and physical health disparities in LGBTQ+ communities, contributing to elevated rates of psychiatric disorders, substance use disorders, and chronic health conditions (Giano et al., 2020).

For instance, research indicates that LGBTQ+ individuals often endure heightened rates of childhood sexual abuse (CSA). This traumatic experience has been consistently linked to increased risks of developing mental health disorders in adulthood, including depression, anxiety, and post-traumatic stress disorder (Giano et al., 2020). The enduring impact of such trauma underscores the critical need for tailored interventions and support systems within LGBTQ+ communities to address the complex interplay between early adversity and mental health outcomes.

Traditionally, examining childhood adversity has been limited to Adverse Childhood Experiences (ACEs) that do not always capture experiences unique to LGTBQ+ communities. For example, transgender and gender-diverse individuals frequently encounter unique stressors such as pervasive gender-based discrimination, lack of family support, and societal stigma associated with their gender identity, all of which contribute to heightened levels of psychological distress and an elevated risk of suicidal ideation (Valentine & Shipherd, 2018).

These stressors can manifest in profound ways, including internalized stigma, minority stress, and a sense of social alienation, further exacerbating mental health disparities among transgender and gender-diverse individuals (Frost & Meyer, 2023). For example, anti-LGBTQ+ structural and societal policies as SCEs were recently highlighted for their impact on health outcomes for LGBTQ+ communities (Eschliman et al., 2023), underscoring the importance of better understanding the determinants of health in this population.

Stressful childhood experiences (SCEs) encompass a wide range of events, circumstances, or situations a child encounters during their developmental years, causing significant emotional, psychological or physiological strain. These experiences can range from acute, short-term stressors to chronic, ongoing sources of stress. Examples include parental divorce or separation, frequent family conflicts or domestic violence, poverty or financial instability, chronic illness or disability (of the child or a family member), frequent moves or changes in living circumstances, academic pressures or bullying at school, natural disasters or traumatic events, and exposure to community violence or crime. It is important to note that SCEs are more inclusive and broader in scope than adverse childhood experiences (ACEs; (Felitti et al., 1998). While ACEs refer specifically to severe forms of abuse, neglect, and household dysfunction, such as physical, emotional, or sexual abuse, physical or emotional neglect, parental substance abuse, parental mental illness, parental separation or divorce involving domestic violence, and having a household member incarcerated, SCEs encompass a wider range of potentially stressful or challenging experiences.

Expanding on the foundational work of Schneeberger et al. (2014) on SCEs among lesbian, gay, bisexual and transgender populations, this updated review with a meta-analysis seeks to deepen our understanding of this intricate relationship. While the initial analysis

predominantly focused on lesbian, gay and bisexual individuals in the limited literature available at the time, there has been tremendous increases in research published in the LGBTQ+ health field, necessitating an updated and more nuanced exploration of their experiences and their impact on health outcomes.

This systematic review and meta-analysis aims to analyze the impact of SCEs on the health of sexual- and gender-minority groups, including transgender and queer populations. It will explore the types of stressful childhood experiences encountered by LGBTQ+ individuals and examine their mental and physical health outcomes. Specifically, the review will investigate health outcomes among LGBTQ+ individuals with a history of SCEs. By synthesizing literature published from 2013 to 2022, this updated review seeks to provide insights into the health implications of SCEs across diverse LGBTQ+ populations. By advancing our comprehension of the intricate links between SCEs and health within LGBTQ+ communities, this review endeavors to inform evidence-based practices and policies tailored to address the unique needs of diverse LGBTQ+ populations and mitigate the lifelong impacts of early adversity.

Transparency and Openness

The current systematic review was preregistered at PROSPERO, registration number CRD42022363590 (Schneeberger et al., 2022). No ethical approval was required for the review and analysis. Data were extracted from published literature. For reproducibility, code for the meta-analyses is available via GitHub (https://github.com/trbellucsd/SCE_meta).

Methods

Search Strategy, Study Selection Criteria, and Study Selection Process

Based on Schneeberger et al. (2014), an updated systematic review was conducted to examine stressful childhood experiences (SCEs) and health outcomes in gender and sexual minority populations. Search strategies included phrasing related to sexual orientation, gender identity, and SCEs (see PROSPERO preregistration report for specific search terms). Search engines MEDLINE (Ovid), PubMed, PsycNet (includes PsycINFO, PsycBOOKS, PsycARTICLES, PsycTESTS), Google Scholar, and Web of Science were accessed to find literature available between December 13, 2013, to October 1, 2022. All database searches were performed on December 15th, 2022, and resulted in an initial 3,067 studies (see **Figure 1** for PRISMA diagram). Rayyan systematic review software (Ouzzani et al., 2016) was used to screen titles/abstracts and full-text documents.

Studies were included if they listed the SCE occurring during childhood even if age was not explicitly stated (e.g., "middle school," "school aged," etc.) and health outcomes were reported after age 18. Studies were excluded if they did not report quantitative values of SCEs or health outcomes, did not include an LGBTQ+ sample separate from cisgender and heterosexual groups, the sample was 17 years old and younger, had a pharmaceutical-based intervention, were qualitative studies, were case reports, were bio-genetic studies, included non-human participants, included suicidal ideation as SCEs, and/or included problematic language regarding the LGBTQ+ community (e.g., pejorative or stigmatizing language, statements based upon outdated and debunked assumptions). Grey literature (e.g., dissertations) was not excluded from this review. If a peer-reviewed version of the dissertation was available, it was included in the review in place of the dissertation. Following Cochrane guidelines, the included studies were screened in two stages (J. Higgins et al., 2023). Before stage one, the research team met and discussed relevant content knowledge and processes for conducting a systematic review. At both stages,

two independent reviewers (DP, HP, TB, AA, LB, VC, DS) screened each study and any disagreements were mediated by at least one other reviewer on the research team. Before stage one, 396 references were removed due to duplication, as identified by Endnote. In the first stage, two independent reviewers assessed each study's title and abstract for potential relevance to systematic review criteria, excluding 2,295 studies. During the second stage, at full-text screening, 284 studies were excluded for failing to meet inclusion criteria (see **Figure 1** for specific exclusion reasons), leaving a final sample of 64 studies. Following stage two, data extraction from each study was conducted by one reviewer.

Study Quality Assessment. Two independent reviewers conducted quality assessments for each of the 92 studies. The Appraisal tool for Cross-Sectional Studies (AXIS), a critical appraisal aid to inform decisions about the quality of cross-sectional studies, was used for bias assessment for all studies (Downes et al., 2016). Each item on the AXIS tool was scored on a binary (0, 1), and two studies with a score below 11 were excluded for substantial bias. See **Supplemental Materials Section 1** and **Supplemental Table 1** for details regarding specifics.

Meta-Analytic Plan

Outcome measures from each study were synthesized by categories chosen by consensus of the authors: psychological health (outcomes related to depression, anxiety, and stress; k = 25), suicide-related outcomes (k = 19), substance use (k = 12), sexual health (k = 12), physical health (k = 6), housing stability (k = 3), adulthood abuse/victimization (k = 2). From each analysis, the effect size extracted were odds ratios (ORs) representing the association of SCEs and the outcome of interest. Most studies reported ORs, but OR were estimated for other reported estimates, per established methods (J. P. Higgins et al., 2019). For standardized regression estimates, ORs were estimated as the exponent of the standardized beta, which produced similar

results as estimated OR from Cohen's d effect sizes. For unstandardized beta estimates, we used calculations of t-values (unstandardized beta/reported SE), converted these to Cohen's d effect sizes, and then converted to comparable ORs. This was done using the conversion formula whereby OR = $\exp(d^2/4)$*[probability of event in the control group]. Since probability of the event occurring in the control group was often not reported, this was assumed to be .10 to be conservative. Effect sizes were put in the positive direction for expected, i.e., SCEs relate to negative adult health outcomes, which required taking the inverse from a few reported associations (i.e., HIV testing, posttraumatic growth). For the meta-analysis, we used conservative SEs estimated by 3.94 divided by the square root of the study sample size. For studies with multiple outcomes related to a chosen category, a weighted OR composite was calculated using the following equation:

$$OR_{weighted\ average} = \frac{w_1 * ln(OR_1) + w_2 * ln(OR_2)}{w_2 + w_1}$$

In this equation, w_1 and w_2 represent the inverse variable of the natural log of each OR ($\frac{1}{variance(ln(OR))}$).

Analyses were run using the *metfor* package (Viechtbauer, 2010) in R version 4.2.1 (R Core Team, 2022). We expressly specified random effects estimation, which assumes that the average effect size from a study comes from many different population distributions. We additionally employed the restricted maximum likelihood method for model fitting. Furthermore, the model estimated I^2, the percent of effect size differences observed between studies. Forest plots were used to illustrate study effect sizes, ORs, and average effect size (average OR) for

each outcome category. Sensitivity analyses were conducted to examine the influence of high-effect studies (ORs >= 4.0).

Results

Across the 64 independent studies (k =64 in the meta-analysis, we found SCEs were associated with a 1.74 greater odds of a negative health outcome in adulthood (average OR = 1.74, 95%CI: 1.54 to 1.97, $p < .001$). Between-study heterogeneity was estimated at 98%, which was significant ($Q(63) = 1821.86$, $p < .001$). Given the meta-analysis aggregating across multiple adverse health outcomes was significant, for the remainder of the results, we present the results of individual meta-analyses for each category of adverse health outcome, given that some categories are disparate from one another and should not be aggregated (e.g., sexual health and housing instability).

Psychological Health

Twenty five studies assessed aspects of psychological health as outcome variables, including anxiety (Askew et al., 2022, Baams et al., 2021, Bond et al., 2021, Giano et al., 2019; McCabe et al., 2022; Schnarrs et al., 2020), depression (Baams et al., 2021, Bond et al., 2021, Cook et al., 2017, Giano et al., 2019, Hidalgo et al., 2021, Kunzweiler et al., 2019; Lehavot et al., 2018; Li et al., 2017; McCabe et al., 2022; Moody et al., 2022; Noor et al., 2020; Schnarrs et al., 2020; Siconolfi et al., 2020; Xu, Wu et al., 2022), ratings of general mental health or distress (Blosnich et al., 2015, Hart et al., 2022, Li et al., 2020; Schnarrs, Stone et al., 2022; Thingvold et al., 2022; Turban et al., 2020; Xu, Xue et al., 2022; Zhao et al., 2021), mental health diagnosis (Schilder et al., 2014), PTSD (Bond et al., 2021; Hidalgo et al., 2021; Ironson et al., 2022; Schnarrs et al., 2020), post-traumatic growth (Ratcliff et al., 2022), and loneliness (Giano et al.,

2019). Study effect sizes and average effect sizes are illustrated in **Figure 2**. Overall, the experience of SCEs was associated with an average 55% increased likelihood of psychological health problems (average OR = 1.55, 95%CI: 1.30 to 1.85, $p < .001$). Between-study heterogeneity was estimated at 96%, which was significant ($Q(25) = 233.60$, $p < .001$). Following the removal of the high-effect study from Xu, Xue et al. (2022), there remained a positive and significant association (average OR = 1.51, 95%CI: 1.27 to 1.77, $p < .001$) with minimal reduction in between-study heterogeneity (I^2 = 95%CI, $Q(23) = 185.78$, $p < .001$).

Suicide-Related Outcomes

Nineteen studies assessed aspects of suicide behavior and/or ideation as outcome variables, including suicidal thoughts (Andresen et al., 2022; Blonsnich et al., 2020, Cramer et al., 2022; Drobotenko, 2022; Hidalgo et al., 2021, Moody et al., 2022; Rimes et al., 2019; Scheer et al., 2021; Schilder et al., 2014; Wilton et al., 2019; Xue & Xu, 2022), suicide planning (Bloshnich et al., 2020), self-harm (Andresen et al., 2022), and suicide attempt(s) (Cramer et al., 2022; Flynn et al., 2016; Fontanari et al., 2018; Hidalgo et al., 2021; McCabe et al., 2022; Moody et al., 2022; Rimes et al., 2019; Smith et al., 2021; Twitch & Parish, 2018; Turban et al., 2020; Wang et al., 2021; Wilton et al., 2019; Xue & Xu, 2022). Study effect sizes and average effect sizes are illustrated in **Figure 3**. Overall, the experience of SCEs was associated with an average doubled increased likelihood of suicide-related outcomes (average OR = 2.06, 95%CI: 1.59 to 2.76, $p < .001$). Between-study heterogeneity was estimated at 99%, which was significant ($Q(18) = 2833.45$, $p < .001$). Following the removal of the high-effect studies from Andresen et al. (2022) and McCabe et al. (2022), there remained a positive and significant average effect size (average OR = 1.72, 95%CI: 1.41 to 2.08; $p < .001$) with a minute reduction in between-study heterogeneity (I^2 = 98%, $Q(16) = 280.90$, $p < .001$).

Substance Use

Twelve studies assessed aspects of substance use as outcome variables, including alcohol dependence (Fontanari et al., 2018; Schilder et al., 2014; Wang et al., 2018; Yuan et al., 2014), substance use disorder (McCabe et al., 2022; Hall et al., 2021), binge drinking (Turban et al., 2020; Yuan et al., 2014), nicotine use (Grigsby et al., 202; Siconolfi et al., 2020), drug dependence (Schilder et al., 2014), illicit drug use (Kecojevic et al., 2019; Wiss et al., 2022), and sedative and hypnotic drug use (Li et al., 2020). Study effect sizes and average effect sizes are illustrated in **Figure 4**. Overall, the experience of SCEs was associated with an average 72% increased likelihood of substance use (average OR = 1.72, 95%CI: 1.28 to 2.31, $p < .001$). Between-study heterogeneity was estimated at 99%, which was significant ($Q(11) = 605.61$, $p < .001$). Following removal of the high effect size from Fontanari et al. (2018), there remained a positive and significant association (average OR = 1.59, 95%CI: 1.21 to 2.10) with minute reduction in between-study heterogeneity ($I^2 = 98\%$, $Q(10) = 575.18$, $p < .001$).

Sexual Health

Thirteen studies assessed aspects of sexual health as outcome variables, including diagnosis of sexually transmitted infection (Bertonlino et al., 2020; Boroughs et al., 2017; Fontanari et al., 2018; Schilder et al., 2014), sexual risky behavior (Bertolino et al., 2020; Boroughs et al., 2017; Crump et al., 2019; Fontanari et al., 2018; Schilder et al., 2014; Williams et al., 2017; Xu et al., 2019; Zhu et al., 2018), HIV testing (Schnarrs et al., 2022), and erectile dysfunction (Faaborg-Andersen et al., 2021). Study effect sizes and average effect sizes are illustrated in **Figure 5**. Overall, the experience of SCEs was associated with an average 73% increased likelihood of sexual health problems (average OR = 1.73, 95%CI: 1.27 to 2.34, $p < .001$). Between-study heterogeneity was estimated at 91%, which was significant ($Q(11) =$

102.90, $p < .001$). Sensitivity analyses after removal of the high effect size from Phillips et al. (2017) yielded a positive and significant relationship (average OR = 1.58, 95%CI: 1.19 to 2.09, $p < .001$) with a small reduction in between-study heterogeneity ($I^2 = 88.70$, $Q(10) = 64.58$, $p < .001$).

Physical Health

Six studies assessed aspects of physical health as outcome variables, including self-rated health (Siconolfi et al., 2020), physical pain problems on a quality of life scale (Wang et al., 2018), obesity/overweight status (Huang et al., 2022; Wright, 2020), the number of comorbidities across 34 common health conditions (Zou, 2017), and diagnosis of SARS-COV-2 (Mason et al., 2022). Study effect sizes and average effect sizes are illustrated in **Figure 6**. Overall, the experience of SCEs was associated with an average 31% increased likelihood of physical health problems (average OR = 1.31, 95%CI: 1.12 to 1.54, $p < .001$). Between-study heterogeneity was estimated at 46%, which was not significant ($Q(5) = 4.22$, $p = .519$).

Housing Instability

Three studies assessed aspects of housing instability as outcome variables, including self-reported homelessness (Hogan et al., 2022), unstable housing (Krause et al., 2016), living outdoors (Siconolfi et al., 2020), and emergency/transitional housing (Siconolfi et al., 2020). Study effect sizes and average effect sizes are illustrated in **Figure 7**. On average, experiences of SCEs were associated with a doubled increased likelihood of housing instability (average OR = 2.33, 95%CI: 1.14 to 4.76, $p = .021$). Between-study heterogeneity was estimated at 84% which was significant ($Q(2) = 14.72$, $p = .006$). Sensitivity analysis showed that removal of the highest effect study) by Krause et al. (2016) resulted in a more conservative but significant association (OR = 1.57, 95%CI: 1.03 to 2.41, $p = .020$).

Adulthood Abuse/Revictimization

Two studies assessed aspects of adulthood abuse and revictimization as outcome variables, including adulthood sexual victimization (Bos et al., 2019; Rausch et al., 2016) and physical and psychological abuse (Rausch et al., 2016). Study effect sizes and average effect sizes are illustrated in **Figure 8**. On average, the experience of SCEs was associated with a 37% increased likelihood of adulthood abuse/revictimization (average OR = 1.37, 95%CI: 1.25 to 1.49, $p < .001$). Between study heterogeneity was estimated at 24%, which was not significant ($Q(1) = 1.31$, $p = .252$).

Discussion

We examined the impact of SCEs on health outcomes during adulthood among sexual- and gender-minority groups, an update to Schneeberger et al. (2014). According to our meta-analysis, among sexual- and gender-diverse communities, exposure to SCEs before age 18 was associated with increased odds (range: 31 - 132%) for worse psychological health, greater suicide-related outcomes, increased substance use, poorer sexual health, adverse physical health outcomes, more housing instability, and more adulthood abuse/revictimization. These results, first and foremost, illustrate the wide-ranging impact of SCEs on health outcomes among sexual- and gender-diverse communities. Furthermore, they indicate that SCEs differentially impact health outcomes, suggesting some health outcomes are a higher priority for intervention and prevention than others among these communities. For example, SCEs experienced before age 18 were associated with a 132% increase in odds of experiencing housing instability in adulthood versus only a 31% increase in adverse physical health.

Theoretical Framework

Our results can be interpreted by combining two prominent theories in the literature: the cumulative risk hypothesis (Felitti et al., 1998) and the minority stress theory (Brooks, 1981; Meyer, 2003). Our current results are also consistent with these theories. The cumulative risk hypothesis posits that more adverse childhood experiences confer a greater risk for adverse outcomes in adulthood. Minority stress theory posits that proximal and distal stress factors experienced uniquely by sexual- and gender-diverse individuals increase their risk of negative health outcomes. In the current meta-analysis, we present an accumulation of SCEs (aggregate sum scores of SCEs that include minority stress factors) before age 18 (distal), which is associated with multiple health outcomes in adulthood beyond age 18.

Health Outcomes in Adulthood

Psychological Health. Of the 26 studies within this category, all but one study found SCEs were associated with increased odds for adverse psychological health outcomes. The only study that did not find a significant association was Siconolfi et al. (2020), where homelessness among bisexual youth before age 18 (categorized as an SCE) was not associated with depression in adulthood. The most common psychological health outcomes included depression (n = 14), general mental distress (n = 9), anxiety (n = 6), or PTSD (n = 4). However, studies with a specific mental health category (i.e., depression) help establish SCEs as a risk factor for the etiology of those highly prevalent disorders. The substantial number of studies of general mental distress also assist in establishing a connection between SCEs and mental well-being in adulthood, suggesting that the effects of SCEs may be specific (i.e., one disorder) but also impair mental well-being generally. There is variation by the type of SCE, with the majority of studies reporting an aggregate adverse childhood experiences score (n = 13) and the rest examining a specific SCE type (e.g., childhood sexual abuse, n = 6; bullying, n = 3; childhood physical abuse,

n = 2, etc.). Of all studies, only three examined SCEs tied explicitly to an individual's sexual- and gender-diverse identity (e.g., bullying because of their identity, sexual orientation conversion efforts, etc.). As such, the majority of studies driving the association between SCEs and psychological health outcomes have generated an aggregate ACEs score, suggesting that the accumulation of SCEs leads to increased odds that sexual- and gender-diverse individuals will develop adverse psychological health outcomes. Given the specific disorders focused upon in studies, the generalizability of the impact of SCEs on other psychological health phenomena, such as personality or neurodevelopmental disorders, is limited.

Suicide and Related Behaviors. All 19 studies within this category indicated a significant association between SCEs and suicide and related behaviors. There were only two specific predominant outcomes across the studies: suicide attempts (n = 16) and suicidal ideation (n = 11). The types of SCEs experienced by sexual- and gender-diverse groups in this category include childhood sexual abuse (CSA) (n = 8), the aggregate score of adverse childhood experiences (n = 5), bullying (n = 3), and childhood physical abuse (n = 2). Half of the studies (n = 8) included in this category indicate CSA as a driving factor for suicide and related behaviors among sexual- and gender-diverse groups. Studies within this category focused on samples of exclusively sexual minority individuals (n = 11), transgender individuals (n = 5), and a mixture of sexual- and gender-minority-identifying individuals (n = 3). The significant meta-analytic association in this sample is mainly driven by exposure to childhood sexual abuse among sexual minority groups on suicide attempt outcomes. More research will be needed among other sexual- and gender-diverse groups exposed to other SCEs than childhood sexual abuse to determine whether they also increase the odds of suicide and related behaviors.

Substance Use. Of the 14 studies in this category, 11 identified significant positive associations between SCEs and substance use outcomes among sexual- and gender-diverse individuals. The outcomes studied included cigarette and e-cigarette use (n=4), alcohol dependence or harmful alcohol use (n=4), illicit substance use (n=3), recreational drug use (n=2), drug use in sexual contexts (n=1), and DSM-5 substance use disorder diagnoses (n=1). Within the illicit substance use category, the three studies specifically examined tranquilizer, stimulant, and opioid misuse (n=1), sedative/hypnotic use (n=1), and injection drug use (n=1). The types of SCEs reported included childhood sexual abuse (n=4), physical abuse (n=4), maltreatment (n=2), homophobia/homophobic bullying (n=2), racism (n=1), homelessness (n=1), and gender identity conversion efforts (n=1). Childhood sexual abuse was particularly influential in driving substance use, especially among cisgender bisexual women. Unique to sexual minority men, SCEs were linked to increased drug use in sexual contexts. Although most studies demonstrated significant associations between SCEs and substance use, a few reported no significant differences (n=3). In terms of population focus, half of the studies recruited sexual minority men (n=7), with the remainder assessed transgender women (n=2), sexual- and gender-diverse individuals broadly (n=2), and sexual minority women (n=1). Notably, a study by McCabe et al. (2022) utilized a large, nationally representative sample of U.S. adults and found that childhood sexual abuse was most prevalent among sexual minorities, particularly bisexual women. Nearly one-third of bisexual women reported experiencing two or more types of childhood sexual abuse, which was directly linked to the highest rates of substance use disorders in McCabe's sample. This, coupled with the broader evidence of SCEs significant associations with various substance use outcomes, highlights the need for targeted interventions, particularly for sexual- and gender-diverse individuals with histories of childhood sexual abuse.

Sexual Health. Across 13 studies, significant associations were consistently found between SCEs, particularly CSA and adverse sexual health outcomes among sexual- and gender-diverse populations, with a predominant focus on sexual minority men (n=10). Generally, CSA (n=8) was strongly associated with increased HIV risk behaviors (n=6), including condomless anal intercourse (n=3) and having multiple sexual partners in a short time span (n=3). Sexual minority men with histories of CSA were more likely to report sexually transmitted infections (STIs) (n=1), lower rates of STD/STI/HIV testing (n=2), and higher odds of HIV infection (n=1) compared to those without CSA exposure. Only one study, Bertolino et al. 2020, found that SCE exposure was associated with a greater likelihood of receiving STI testing in the last 12 months. Childhood physical abuse (n=2) and homophobic bullying (n=1) were linked to similar sexual health risks, such as unprotected anal intercourse (n=1), intercourse under the influence of drugs or alcohol (n=1), and higher rates of HIV seroconversion (n=1). These associations extended beyond sexual minority men; among transgender women (n=1) and sexual minority women (n=1), sexual abuse and childhood maltreatment were linked to sexual revictimization (n=1), engagement in sex work (n=1), decreased sexual wellbeing (n=1), and HIV diagnoses (n=1). Fontanari et al. (2018) discussed how childhood maltreatment may not directly lead to engagement in sex work, but via the minority stress model, one may theorize that cumulative stressors faced by marginalized individuals contribute to such outcomes. Fontanari and colleagues also highlighted the potential benefits of legalizing sex work to mitigate related harms. The 13 studies share several notable limitations, including reliance on self-reported data introducing recall and social desirability biases. Sampling biases due to internet-based recruitment and limited demographic diversity also hinder the generalizability of findings, particularly among racially and ethnically diverse populations.

Physical Health. Six studies in our meta-analysis examined physical health outcomes among LBGTQ+ samples. Across these studies, SCEs ranged from bullying (n = 2), general ACEs, gender identity-related discrimination, homelessness, and CSA. Homelessness before age 18 was not significantly associated with self-rated health. ACEs were not significantly associated with obesity. Bullying was associated with an increased number of physical health comorbidities. Interestingly, CSA was negatively associated with being overweight among sexual minority women. In this category, albeit the small number of studies, there was a relatively equal mix of representation from specific sexual- and gender-minority groups as 2 studies only included a sample of men who have sex with men, one sampled only transgender individuals, two studies focused on LGBQ individuals, and one study exclusively sampled of women who have sex with women. Overall, a wide variety of physical health outcomes were studied. Thus, it is challenging to draw definitive conclusions about the impact of SCEs on particular physical health outcomes. Again, the limited number of studies highlights the need to better understand the impact of SCEs on physical health outcomes.

Housing Instability. Three studies investigated homelessness and housing instability among LGBTQ+ populations as outcome variables, focusing on different subgroups and their unique challenges. Across these studies, sexual abuse, childhood neglect, and childhood abuse were identified as the contributing SCEs. CSA was significantly associated with homelessness and sex trafficking victimization, while childhood neglect and abuse were associated with unstable housing in adulthood. Siconolfi et al. (2020) uniquely explored within-group differences among LGBQ+ individuals who experienced homelessness in youth, finding that those who identified as bisexual were four times more likely to experience homelessness and less likely to utilize emergency shelter or transitional housing resources compared to their lesbian and gay

counterparts. Regarding design, one study relied on a purposive sample and the other two used probability samples. These studies contribute to a growing body of literature highlighting critical connections between individual experiences, such as SCEs, and subsequent outcomes related to social determinants of health, particularly housing stability. The association between SCEs and housing instability had the strongest effect size in this meta-analysis. However, generalizability from these studies is limited due to small sample sizes and a focus on specific LGBTQ+ subgroups.

Revictimization. Two of the three studies included in our sample examined varied SCEs, and one (Heusser & Elkonin, 2022) examined childhood sexual abuse as SCEs. All three studies examined adulthood sexual abuse as the revictimization outcome, though Rausch et al. (2016) examined adulthood physical and psychological abuse in addition to sexual abuse in adulthood. These results, though limited, are consistent with prior literature indicating that sexual- and gender-diverse communities are at greater risk for childhood and adulthood sexual abuse and highlight a critical connection between CSA and sexual abuse in adulthood among this community.

Implications for Future Research and Clinical Practice

Findings from our study present significant implications for research and clinical practice concerning health disparities among LGBTQ+ adults who have experienced SCEs. Future researchers should prioritize inclusive study designs that ensure a diverse representation of sexual orientations and gender identities, moving beyond binary frameworks of gender and sexuality. This is essential for accurately capturing the nuanced experiences of LGBTQ+ individuals. Using validated measures to assess minority stress and discrimination is also essential for reflecting the living experiences of these populations. Adopting and implementing

an intersectional lens is also necessary for researchers to consider how overlapping identities such as race, ethnicity, socioeconomic status, and disability interact to affect health outcomes. Differentiating among LGBTQ+ subgroups in analysis and results, rather than reporting in the aggregate, is also imperative because the health needs of transgender individuals, for example, may differ from those of cisgender sexual minorities. It is essential to recognize that LGBTQ+ communities are not monolithic, and recognizing this diversity ensures that research findings are representative and accurate.

Methodologically, researchers must move away from approaches that may inadvertently reinforce stigma, pathologize LGBTQ+ identities or frame personal identities as causal in their connections to adverse health outcomes. Another important methodological concern is mediation analysis on cross-sectional data, which can lead to misleading conclusions about causality. Additionally, the directionality of analyses should be firmly grounded in evidence-based theories that reflect the complexities of LGBTQ+ lives, rather than simplistic or stereotypical assumptions. It is the responsibility of researchers to carefully consider and justify which factor(s) are assumed to influence the outcome(s) of interest to avoid implying a unidirectional cause-and-effect. Veldhuis et al. (2024) provide invaluable guidance on addressing LGBTQ+ topics in research and manuscript writing responsibly, emphasizing precise language, contextually grounded analyses, and ethical considerations. By adhering to these guidelines, researchers can contribute to a body of work that is both scientifically rigorous and socially responsible. Examining health outcomes by specific SCEs is an exciting future direction for researchers interested in building on this foundational review.

In clinical practice, early assessment and integration of SCEs into treatment plans are vital for effectively addressing health disparities. Clinicians should routinely evaluate for SCEs

during assessments to ensure interventions address the direct impact of these experiences on health. Providing guidance on how to distinguish between necessary identity concealment related to safety versus lack of self-acceptance is crucial for building psychological resilience and empowerment among LGBTQ+ patients. To combat the unique challenges faced by LGBTQ+ adults with SCEs, a combination of strategies may be utilized. This approach could encompass anti-bullying strategies, de-stigmatization efforts, and evidence-based treatments created specifically for LGBTQ+ clients like those developed by Pachankis and colleagues (2015, 2022). The particularly strong association between SCEs and housing instability suggests that interventions targeting early-life adversity could be critical in preventing homelessness among LGBTQ+ populations. When SCEs are not directly related to sexual or gender identity (one example among many might be household dysfunction due to parental substance misuse), treatment should focus on transdiagnostic symptoms rather than overemphasizing the role of personal identities (e.g., sexual orientation, gender) where they are not relevant. This approach acknowledges that while SCEs impact mental and physical health, the relevance to treatment may vary based on the connections made by a client between their personal identities and experiences of SCE(s).

Systemic and policy-level interventions are essential in creating environments that mitigate the impact of SCEs on health outcomes for LGBTQ+ individuals. Policies that promote inclusivity and anti-discrimination in educational, workplace, and healthcare settings can significantly reduce the stressors associated with socially minoritized identities, which often begin in childhood and persist into adulthood. Implementing school-based anti-bullying programs that explicitly address LGBTQ+ issues can prevent the early onset of minority stress by fostering understanding and acceptance among peers. In healthcare settings, policies must

ensure that LGBTQ+ adults have access to competent and affirming care, particularly for those who have experienced SCEs. Training healthcare providers to recognize how SCEs may influence current health issues can enhance the quality of care. On a broader scale, legislative measures that protect LGBTQ+ rights and combat systemic discrimination are essential for improving health outcomes. For example, policies that facilitate gender marker changes on official documents without excessive barriers can significantly impact the mental health and well-being of transgender adults, especially those who have faced identity-related adversities in their youth (Scheim et al., 2020; Tan et al., 2022). Supporting LGBTQ+ community organizations that provide resources, support, and advocacy can also buffer the adverse effects of SCEs and promote resilience. By implementing systemic and policy-level changes, clinicians and researchers can work together toward reducing health disparities and improving outcomes for LGBTQ+ individuals.

Strengths and Limitations

Our meta-analysis presents several strengths. First, to our knowledge, it is the largest meta-analysis examining the impact of SCEs on adult health outcomes among sexual- and gender-diverse communities. Second, rather than examine a single adult health outcome as is typical in systematic reviews and meta-analyses (Saldanha et al., 2020), we examined outcomes across multiple domains to obtain a more holistic representation of the impacts of SCEs among sexual- and gender-diverse communities. Third, we go beyond the traditional definition of adverse childhood experiences to include additional factors (i.e., …) following minority stress theory to better understand the substantial impact of these challenges on health outcomes amongst these communities. Fourth, we included grey literature in our meta-analysis to obtain a comprehensive representation of the data, unencumbered by publication bias, especially relating

to the historical lack of representation in research findings related to sexual- and gender-diverse populations.

We acknowledge that the results of the current meta-analysis should be interpreted in light of the following limitations. First, most available effects were cross-sectional (n = 59), and thus analyzed retrospectively self-reported SCEs in relation to current adult health outcomes. This methodology creates difficulty in determining the temporal ordering of SCEs to the onset of health outcomes. To address this issue, we limited SCEs to being experienced before age 18 and health outcomes after age 18 to create an imposed temporal ordering. However, this approach does not replace prospective studies that should be conducted to examine the longitudinal associations between SCEs and adult health outcomes among sexual- and gender-diverse communities. Such studies are challenging and costly to implement. Second, we did not conduct meta-analyses stratifying by type of SCE as there was insufficient power. However, the literature has burgeoned since the initial meta-analysis's publication (Schneeberger et al., 2014). With the increase in publications on SCEs and health outcomes among sexual- and gender-diverse communities in recent years, we hope to update this meta-analysis again to examine the impact of SCE type on health outcomes and add more detail to this complex set of relationships. Third, we did not conduct meta-analyses for separate sexual- and gender-diverse identities as most studies aggregated individual identities such as gay, lesbian, and transgender into one large LGBTQ+ group for their analyses. Thus, exploring specific mechanisms of action for SCEs impacting health outcomes by specific identity was not possible due to limited information from included studies and also small sample sizes when available. Once more research is published on the impact of SCEs on health outcomes for individuals of specific identities, a replication of this meta-analysis will be necessary to explore differences in the mechanisms of action for

individuals of specific identities rather than grouping them into a general sexual- and gender-diverse group, which was done in the current meta-analysis to preserve power.

Conclusion

SCEs experienced by sexual- and gender-diverse groups confer greater odds that individuals will develop adverse health outcomes in adulthood. Across 64 independent studies spanning seven categories, with 183,506 individuals from sexual- and gender-diverse groups, this is one of the largest or the largest known to examine the impacts of SCEs on health outcomes among LGBTQ+ populations. The findings of this meta-analysis underscore the critical importance of assessing SCEs in research and clinical practice, given the heightened impact on adverse health outcomes in LGBTQ+ communities experiencing these early adversities. Beyond research and the clinic, these findings have critical policy implications for creating environments that mitigate the impact of SCEs on health outcomes for LGBTQ+ individuals.

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Table 1

Study information of included studies in meta-analysis

Citation	Health Outcome	Study Design	Sample Size	SCE Result
(Andresen et al., 2022)	Suicide	Cross-sectional	1452	SCEs were associated with self-harm, suicidal thoughts and attempts (OR = 10.89)
(Askew, 2022)	Psychological Health	Cross-sectional	105	SCEs were associated with anxiety (OR = 1.54)
(Baams et al., 2021)	Psychological Health	Cross-sectional	162	SCEs were associated with depression and anxiety (OR = 1.03)
(Bertolino et al., 2020)	Sexual Health	Cross-sectional	2590	SCEs were associated with risky sexual behavior and STD diagnosis (OR = 1.06)
(Blosnich & Andersen, 2015)	Psychological Health	Cross-sectional	445	SCEs were associated with mental distress (OR = 1.29)
(Blosnich et al., 2020)	Suicide	Cross-sectional	1518	SCEs were associated with suicidal ideation, planning, and attempts (OR = 1.28)
(Bond et al., 2021)	Psychological Health	Cross-sectional	1014	SCEs were associated with PTSD, anxiety, and depression (OR = 1.77)
(Boroughs et al., 2015)	Sexual Health	Cross-sectional	162	SCEs were associated with risky sexual behavior and STD diagnosis (OR = 2.70)
(Bos et al., 2019)	Abuse and Revictimization	Cross-sectional	2352	SCEs were associated with adulthood sexual victimization (OR = 1.39)
(Cook et al., 2016)	Psychological Health	Cross-sectional	228	SCEs were associated with depressive symptoms (OR = 1.26)
(Cramer et al., 2022)	Suicide	Cross-sectional	27658	SCEs were associated with suicidal ideation and attempts (OR = 1.39)
(Crump & Byers, 2017)	Sexual Health	Cross-sectional	299	SCEs were associated with sexual behavior (OR = 1.78)
(Drobotenko, 2022)	Suicide	Longitudinal	182	SCEs were associated with suicidal ideation (OR = 1.01)
(Faaborg-Andersen, 2023)	Sexual Health	Longitudinal	365	SCEs were associated with erectile dysfunction (OR = 1.11)
(Flynn et al., 2016)	Suicide	Cross-sectional	577	SCEs were associated with suicide attempts (OR = 3.67)
(Fontanari et al., 2018)	Substance Use; Suicide; Sexual Health	Cross-sectional	289	SCEs were associated with alcohol and drug dependence (OR = 4.22); suicide attempts (OR = 1.23); and risky sexual behavior and STD diagnosis (OR = 1.96)
(Giano & Hubach, 2019)	Psychological Health	Cross-sectional	156	SCEs were associated with anxiety, depressive symptoms, and loneliness (OR = 1.26)
(Grigsby et al., 2021)	Substance Use	Cross-sectional	1597	SCEs were associsted with cigarette and e-cigarette use (OR = 1.27)
(Hall et al., 2020)	Substance Use	Cross-sectional	1129	SCEs were associated with alcohol, cannabis, and stimulant use (OR = 3.07)
(Hart et al., 2018)	Psychological Health	Cross-sectional	304	SCEs were associated with psychological distress (OR = 1.80)
(Hidalgo et al., 2015)	Suicide; Psychological Health	Longitudinal	450	SCEs were associated with suicidal ideation and attempts (OR = 1.66); and PTSD and major depresive disorder (OR = 1.88)
(Hogan, 2022)	Housing Instability	Cross-sectional	147	SCEs were associated with experiences of homelessness and sex trafficking (OR = 1.98)
(Huang et al., 2022)	Physical Health	Longitudinal	731	SCEs were associated with obesity (OR = 1.07)
(Ironson et al., 2019)	Psychological Health	Cross-sectional	290	SCEs were associated with PTSD symptoms (OR = 1.19)
(Kecojevic et al., 2015)	Substance use	Cross-sectional	191	SCEs were associated with illicit drug use (OR = 1.33)

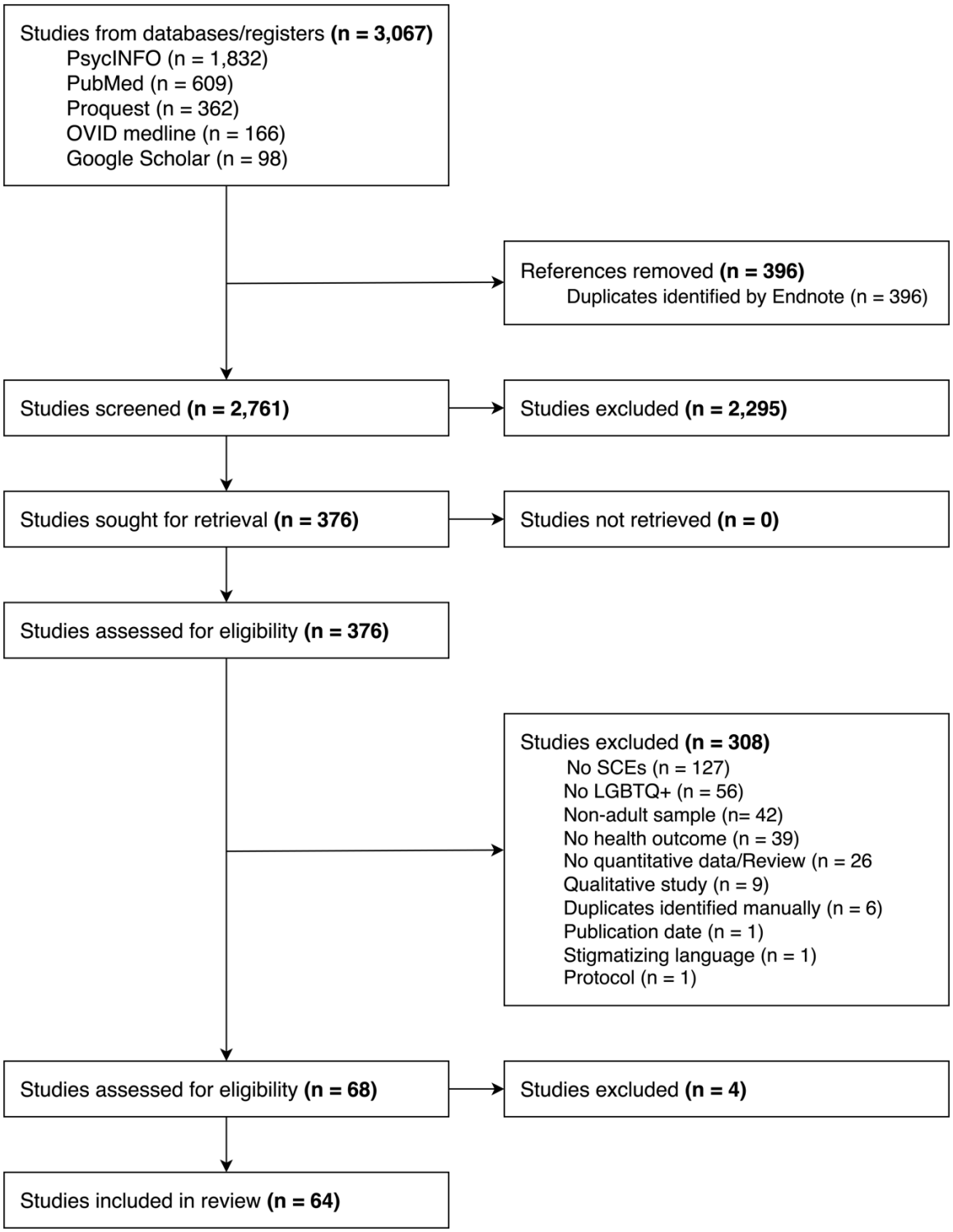
(Krause et al., 2016)	Housing Instability	Cross-sectional	598	SCEs were associated with housing status (OR = 4.31)
(Kunzweiler et al., 2018)	Psychological Health	Cross-sectional	711	SCEs were associated with depressive symptoms (OR = 3.50)
(Lehavot et al., 2014)	Psychological Health	Cross-sectional	699	SCEs were associated with PTSD and depression (OR = 1.72)
(D.-J. Li et al., 2020)	Psychological Health; Substance Use	Cross-sectional	500	SCEs were associated with sedative and hypnotic drug use (OR = 1.08); and emotional symptoms (OR = 1.34)
(M. J. Li et al., 2014)	Psychological Health; Sexual Health	Cross-sectional	545	SCEs were associated with depressive symptoms (OR = 1.68); and risky sexual behavior (OR = 1.01)
(Mason et al., 2022)	Physical Health	Cross-sectional	342	SCEs were associated with COVID (OR = 1.45)
(McCabe et al., 2022)	Psychological Health; Substance Use; Suicide	Cross-sectional	36309	SCEs were associated with depression and anxiety (OR = 1.82); substance use disorder diagnosis (OR = 1.46); and suicide attempts (OR = 5.05)
(Moody et al., 2023)	Psychological Health; Suicide	Cross-sectional	6303	SCEs were associated with depressive symptoms (OR = 1.25); and suicidal ideation and attempts (OR = 1.10)
(Noor et al., 2020)	Psychological Health	Cross-sectional	470	SCEs were associated with depressive symptoms (OR = 1.08)
(Phillips et al., 2014)	Sexual Health	Cross-sectional	451	SCEs were associated with HIV diagnosis (OR = 4.19)
(Ratcliff et al., 2022)	Psychological Health	Cross-sectional	437	SCEs were associated with posttraumatic growth (OR = 1.58)
(Rausch, 2016)	Abuse and Revictimization	Cross-sectional	91	SCEs were associated with physical and psychological abusive behavior (OR = 1.23)
(Rimes et al., 2019)	Suicide	Cross-sectional	3275	SCEs were associated with suicidal ideation and attempts (OR = 3.01)
(Scheer et al., 2021)	Suicide	Longitudinal	6305	SCEs were associated with suicidal thoughts and behaviors (OR = 1.59)
(Schilder et al., 2014)	Substance Use; Suicide; Sexual Health	Longitudinal	287	SCEs were associated with alcohol and drug dependence (OR = 2.52); suicidal ideation (OR = 2.57); and risky sexual behavior and HIV diagnosis (OR = 3.67)
(Schnarrs et al., 2020)	Psychological Health	Cross-sectional	463	SCEs were associated with mental health quality (OR = 1.16)
(Schnarrs, Bond, et al., 2022)	Sexual Health	Cross-sectional	464	SCEs were associated with HIV testing (OR = 1.09)
(Schnarrs, Stone, et al., 2022)	Psychological Health	Cross-sectional	1725	SCEs were associated with depression, anxiety, and PTSD (OR = 1.69)
(Siconolfi et al., 2020)	Physical Health; Psychological Health; Substance Use; Housing Instability	Cross-sectional	183	SCEs were associated with self-rated overall health (OR = 1.77); probable depression (OR = 0.54); cigarette and other nicotine product use (OR = 1.55); and sleeping outdoors and using emergency/transitional housing (OR = 1.32)
(Smith & Reidy, 2021)	Suicide	Cross-sectional	4271	SCEs were associtated with suicide attempts (OR = 1.26)
(Teich, 2018)	Suicide	Cross-sectional	6467	SCEs were associated with suicide attempts (OR = 2.08)
(Thingvold, 2022)	Psychological Health	Cross-sectional	274	SCEs were associated with psychological distress (OR = 6.11)
(Turban et al., 2020)	Psychological Health; Substance Use; Suicide	Cross-sectional	27715	SCEs were associated with psychological distress (OR = 1.47); binge drinking (OR = .76); and suicide attempts (OR = 1.64)
(C.-C. Wang et al., 2018)	Physical Health	Cross-sectional	500	SCEs were associated with physical pain (OR = 1.32)

(K. Wang et al., 2017)	Substance Use	Cross-sectional	19451	SCEs were associated with problematic alcohol use (OR = 1.30)
(P.-W. Wang et al., 2019)	Suicide	Cross-sectional	500	SCEs were associated with suicidal ideation and attempts (OR = 3.58)
(Y. Wang et al., 2021)	Suicide	Cross-sectional	8313	SCEs were associated with suicide attempts (OR = 1.61)
(Williams et al., 2015)	Sexual Health	Cross-sectional	1522	SCEs were associated with risky sexual behaviors (OR = 1.06)
(Wilton et al., 2018)	Suicide	Cross-sectional	161	SCEs were associated with suicidal ideation and atttempts (OR = 1.91)
(Wiss, 2022)	Substance Use	Cross-sectional	297	SCEs were associated with illicit drug use (OR = 1.99)
(Wright, 2018)	Physical Health	Cross-sectional	85	SCEs were associated with overweight status (OR = 1.97)
(Xu, Wu, et al., 2022)	Psychological Health	Cross-sectional	496	SCEs were associated with depressive symptoms (OR = 1.38)
(Xu, Xue, et al., 2022)	Psychological Health	Cross-sectional	630	SCEs were associated with mental distress (OR = 4.23)
(Xu et al., 2018)	Sexual Health	Cross-sectional	999	SCEs were associated with risky sexual behaviors (OR = 1.42)
(Xue & Xu, 2023)	Suicide	Cross-sectional	570	SCEs were associated with suicidal ideation and attempts (OR = 1.03)
(Yuan et al., 2014)	Substance Use	Cross-sectional	447	SCEs were associated with alcohol use, dependence, and binge drinking (OR = 3.16)
(Zhao et al., 2021)	Psychological Health	Cross-sectional	1360	SCEs were associated with psychological distress and self-destructive behavior (OR = 1.06)
(Zhu et al., 2018)	Sexual Health	Cross-sectional	342	SCEs were associated with risky sexual behaviors (OR = 3.28)
(Zou et al., 2013)	Physical Health	Cross-sectional	463	SCEs were associated with general physical health (OR = 1.38)

Note. Table shows the included studies for the systematic review and meta-analysis. Health Outcome was assigned by reviewers to synthesize findings. Sample Size represents the number of participants identifying as a sexual- and/or gender-minority. SCE Result represents the odds ratio (OR), either extracted or calculated, of the impact of experiencing a stressful childhood experience (SCE) on the health outcome using data from the included studies.

Figure 1

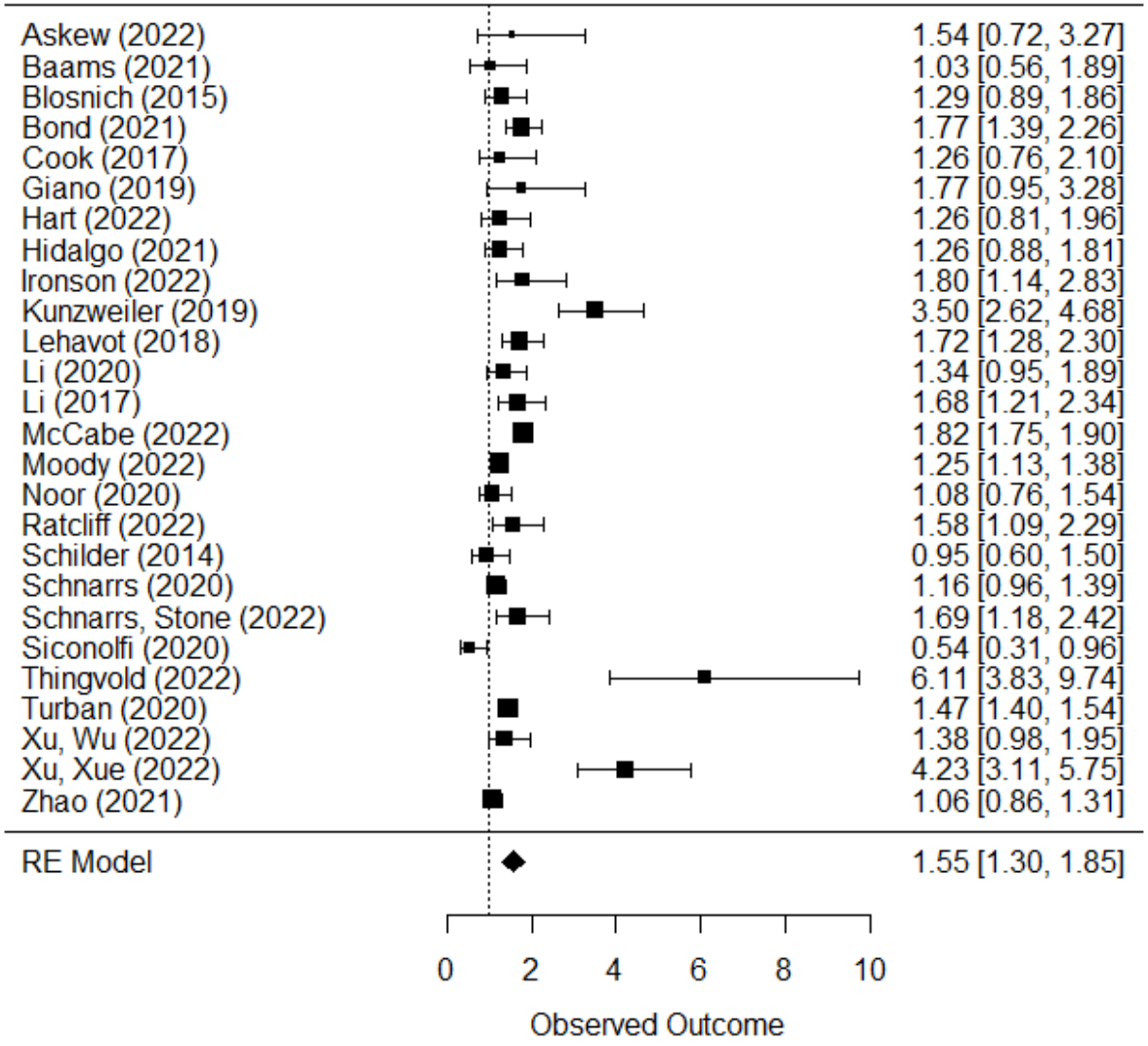
PRISMA diagram for the systematic review of included studies.



Note. Starting from the literature search to final studies included in review, this diagram shows how many studies were excluded at each step of the review.

Figure 2.

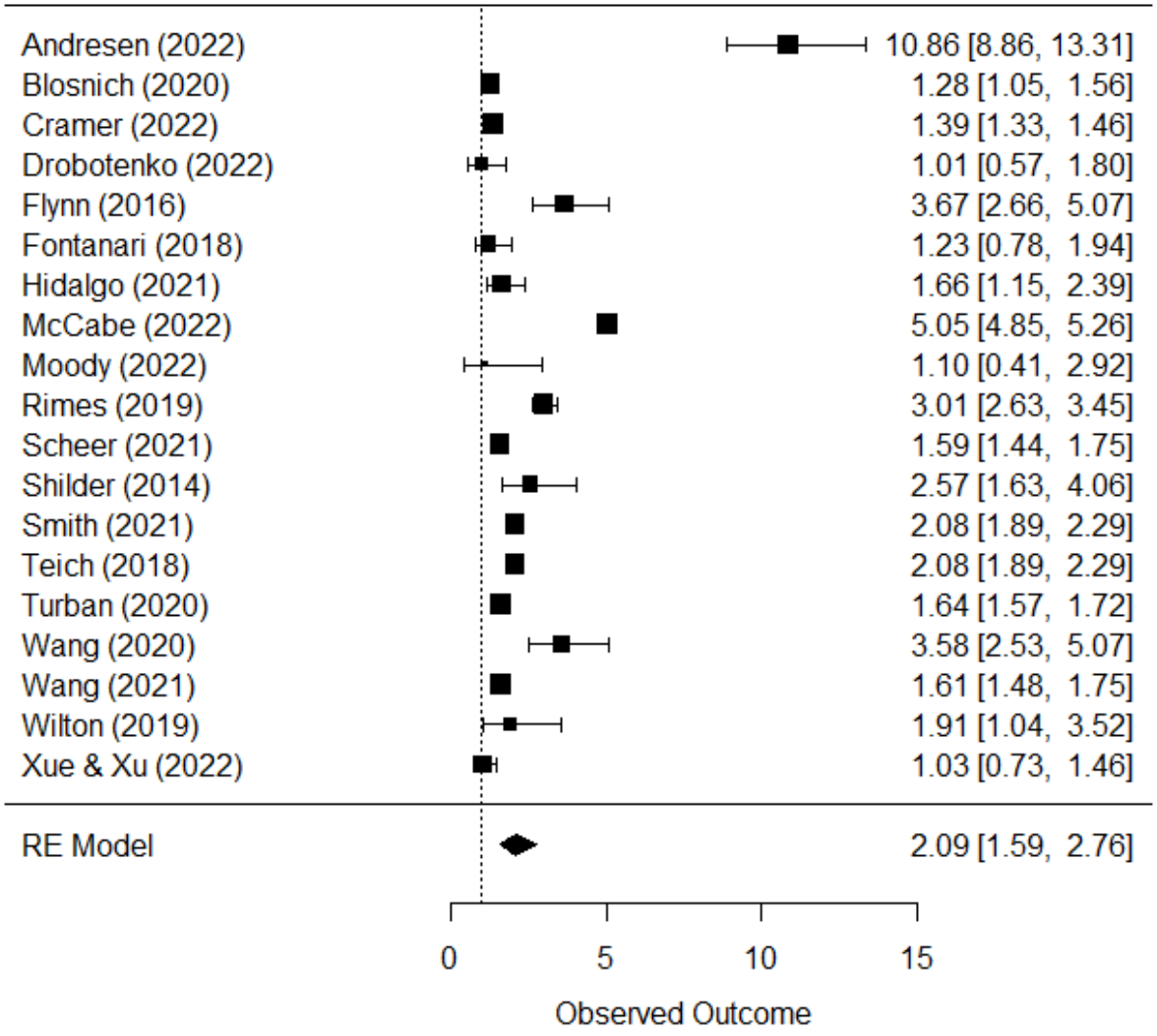
Forrest plot of the association (ORs) of SCE with psychological health outcomes in adulthood (k = 26).



Note. Forrest plot represents the odds ratios (ORs) for each study and an overall OR from the meta-analysis for the category. The x-axis represents the odds ratio (OR) and the 95% confidence interval in brackets. RE = random effect.

Figure 3.

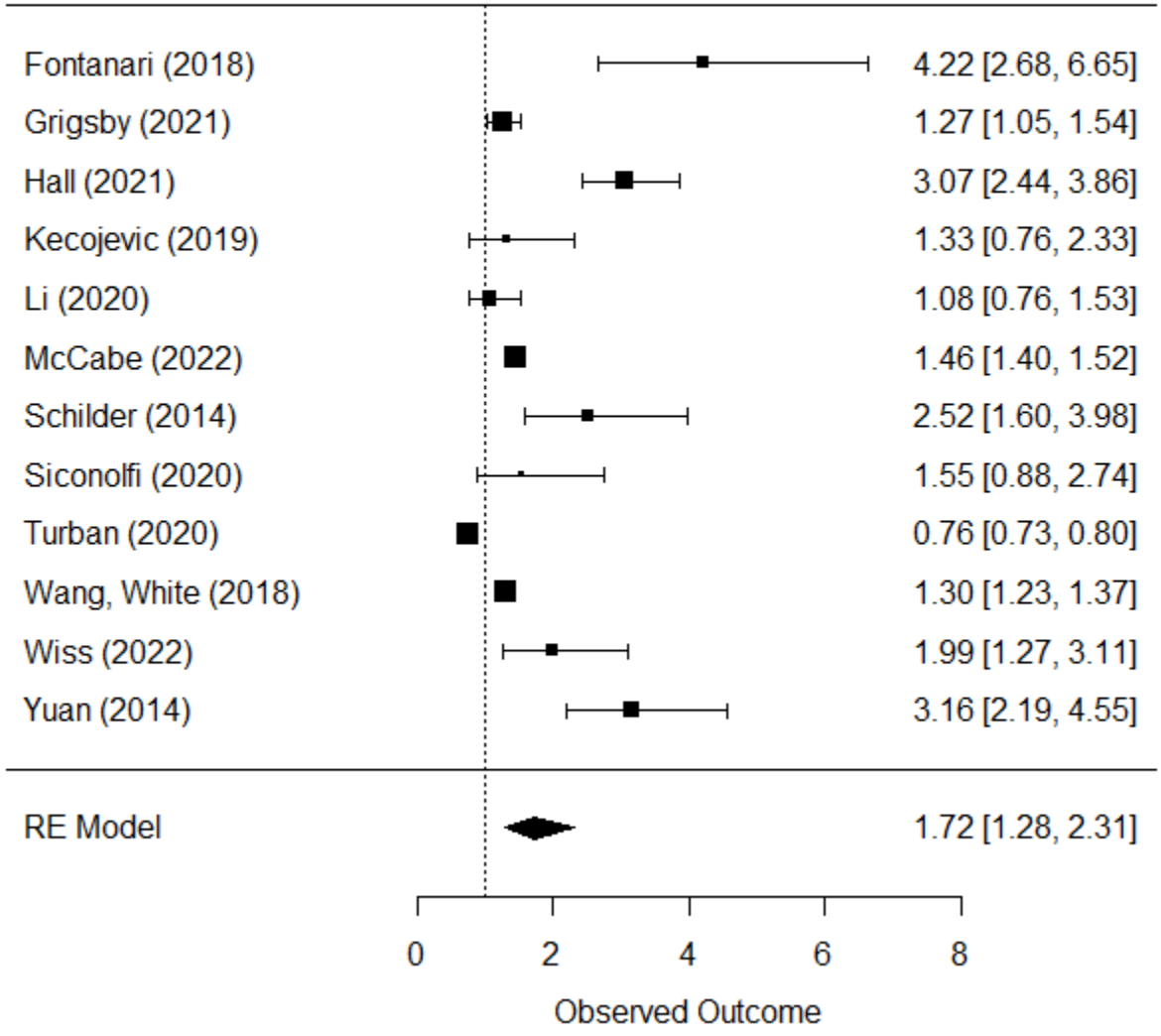
Forrest plot of the association (ORs) of SCE with suicide-related outcomes in adulthood (k = 19).



Note. Forrest plot represents the odds ratios (ORs) for each study and an overall OR from the meta-analysis for the category. The x-axis represents the odds ratio (OR) and the 95% confidence interval in brackets. RE = random effect.

Figure 4.

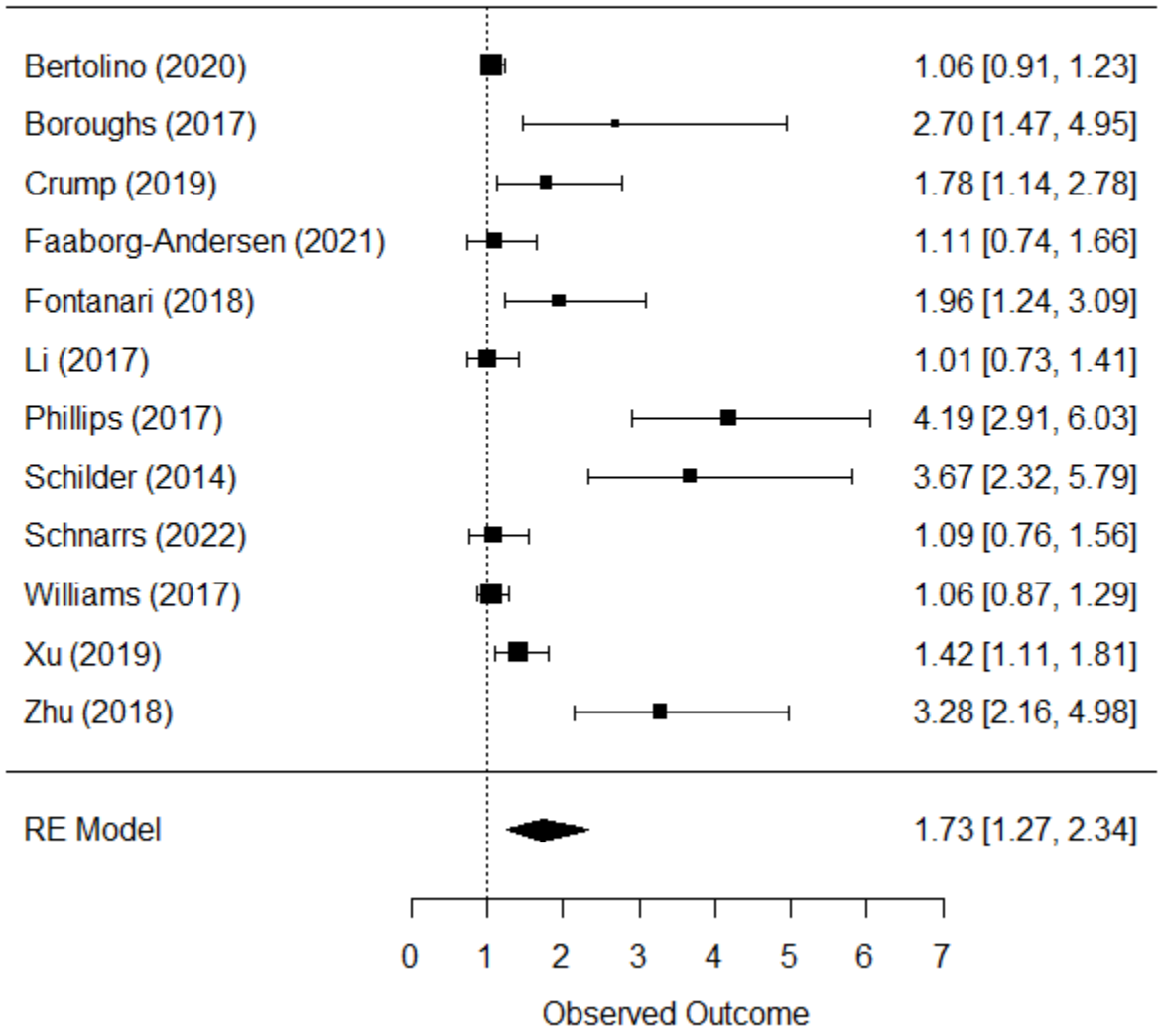
Forrest plot of the association (ORs) of SCE with substance use outcomes in adulthood (k = 12).



Note. Forrest plot represents the odds ratios (ORs) for each study and an overall OR from the meta-analysis for the category. The x-axis represents the odds ratio (OR) and the 95% confidence interval in brackets. RE = random effect.

Figure 5.

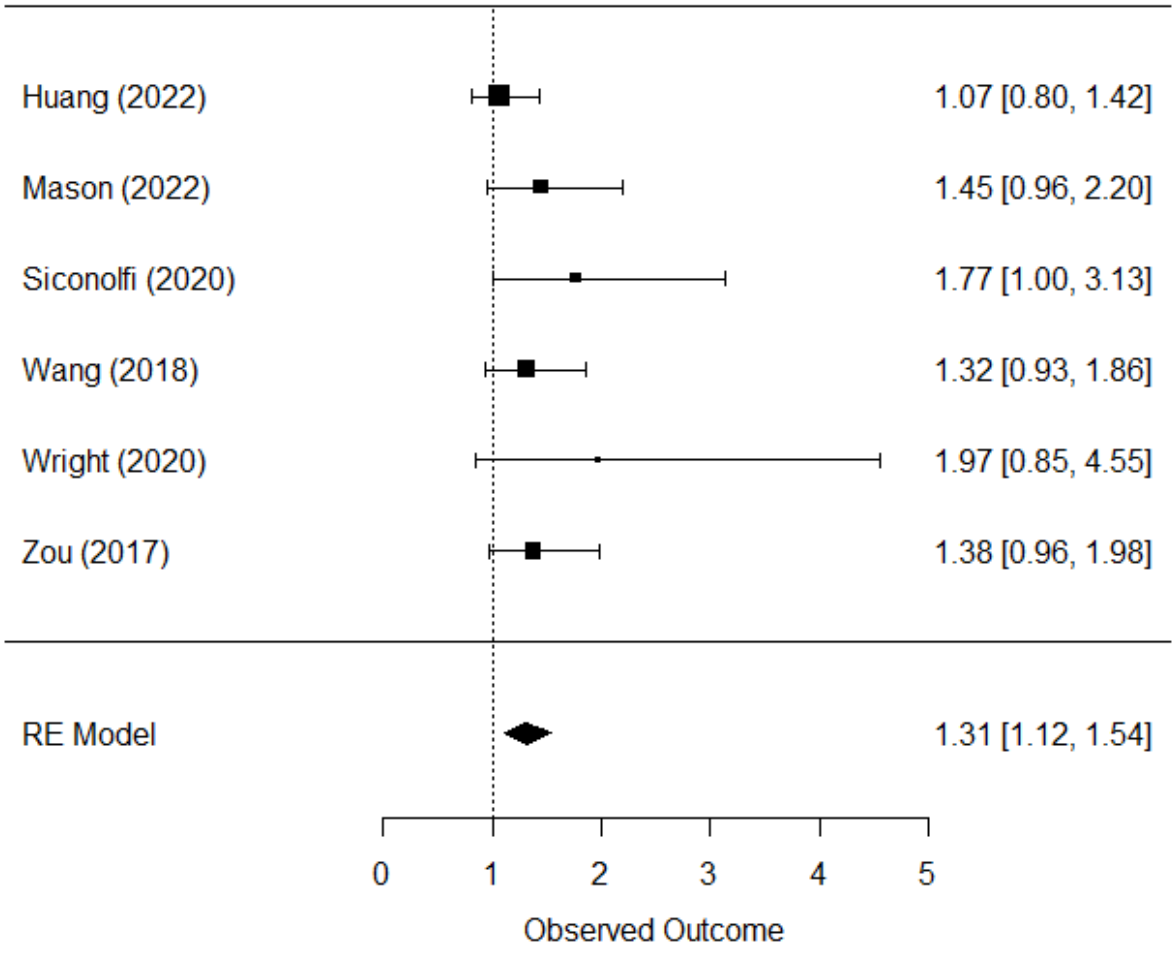
Forrest plot of the association (ORs) of SCE with sexual health outcomes in adulthood (k = 12).



Note. Forrest plot represents the odds ratios (ORs) for each study and an overall OR from the meta-analysis for the category. The x-axis represents the odds ratio (OR) and the 95% confidence interval in brackets. RE = random effect.

Figure 6.

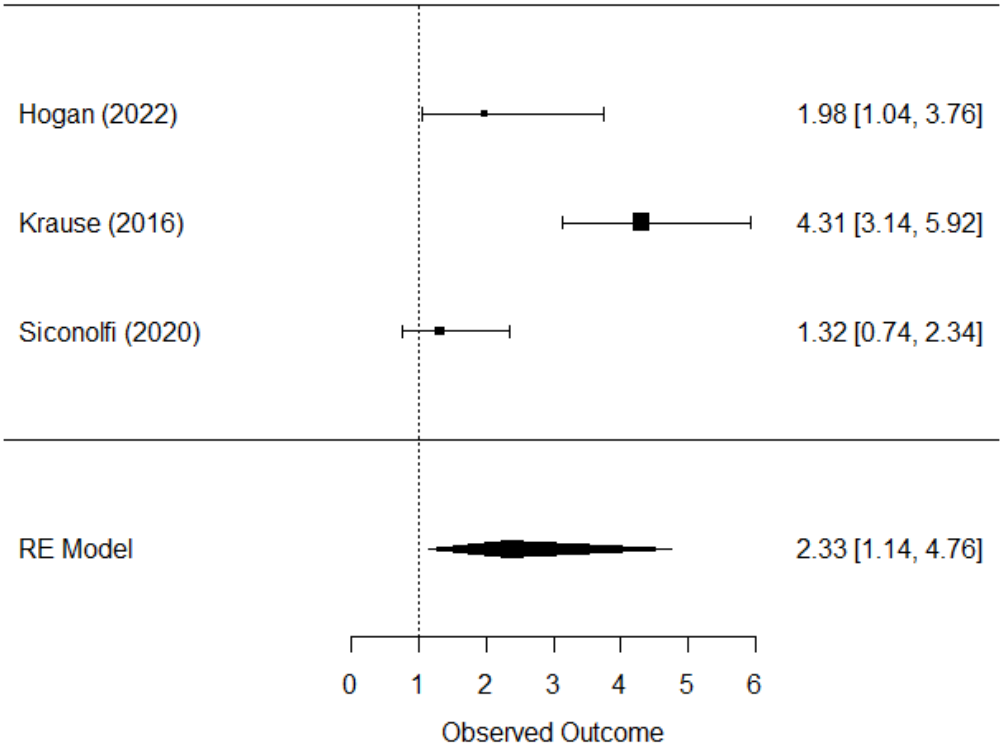
Forrest plot of the association (ORs) of SCE with psychological health outcomes in adulthood (k = 6).



Note. Forrest plot represents the odds ratios (ORs) for each study and an overall OR from the meta-analysis for the category. The x-axis represents the odds ratio (OR) and the 95% confidence interval in brackets. RE = random effect.

Figure 7.

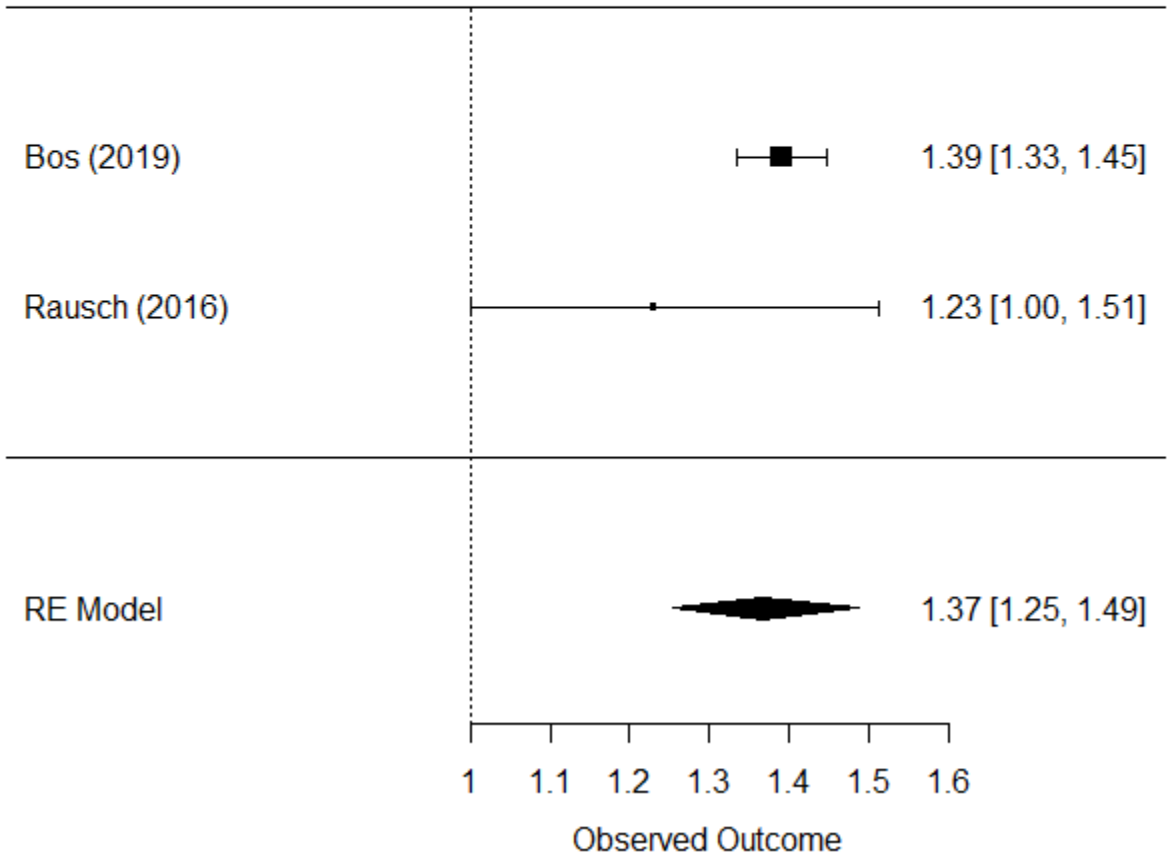
Forrest plot of the association (ORs) of SCE with housing instability outcomes in adulthood (k = 3).



Note. Forrest plot represents the odds ratios (ORs) for each study and an overall OR from the meta-analysis for the category. The x-axis represents the odds ratio (OR) and the 95% confidence interval in brackets. RE = random effect.

Figure 8.

Forrest plot of the association (ORs) of SCE with adult abuse outcomes in adulthood (k = 2).



Note. Forrest plot represents the odds ratios (ORs) for each study and an overall OR from the meta-analysis for the category. The x-axis represents the odds ratio (OR) and the 95% confidence interval in brackets. RE = random effect.