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Correlates of suicide ideation and behaviors among transgender people: A systematic review guided by ideation-to-action theory

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Abstract

Transgender people are at high risk for suicide ideation, attempts, and deaths compared to the general population. Several correlates of suicide ideation and attempts have been identified empirically to understand this increased risk. However, few attempts have been made to systematically review this literature. Further, a theory to understand and identify targetable factors for intervention has rarely been applied to this population. In the first systematic review guided by ideation-to-action frameworks of suicide, we systematically reviewed the literature from January 1991 to July 2017 regarding correlates of suicide ideation, attempts, and deaths among transgender people. To be included in the review, articles must have been reported in English, reported on empirical data, included a sample or subsample of transgender people, and reported separately on correlates of suicide ideation, attempts, or deaths. Two independent reviewers searched three major databases, references of included articles, and unpublished literature, which produced 45 articles for review. The review suggested that ideation-to-action frameworks would be worth investigating within this population, with attention to sources of psychological pain, social connectedness, and capacity/capability for suicide unique to this population. Additionally, other aspects of cultural identity were often studied (e.g., race, religion), suggesting the need to understand intersectionality of identities among transgender people and their effects on suicide risk. Finally, the review highlighted important limitations of the literature, namely measurement of suicide ideation and attempts and sampling method, which future work should seek to improve.

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Contributors

Caitlin Wolford-Clevenger conceived the idea of the review and wrote the protocol. Keri Frantell, Phillip Smith, Leticia Flores, and Gregory Stuart reviewed and edited the protocol. Caitlin Wolford-Clevenger and Keri Frantell conducted the systematic review, constructed the tables of reviewed material, and conducted the methodological quality review. Caitlin Wolford-Clevenger wrote the first draft of the manuscript and all authors contributed to and have approved the final manuscript.

Declarations of interest

None.

Conflict of interest

All other authors declare that they have no conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cpr.2018.06.009.

Keywords

Suicidal ideation; Attempts; Transgender; Gender diverse

Transgender people are an understudied population, despite evidence showing that suicide ideation, attempts, and death are disproportionately represented in samples of transgender individuals. The term *transgender* encompasses many gender identities, with the defining feature being that one's gender identity is incongruent with one's sex assigned at birth (Gagne & Tewksbury, 1999). Examples of such identities include transman (female-to-male), transwoman (male-to-female), bigender, agender, genderqueer, gender fluid, and other identities. Recently, the National Institute on Minority Health and Health Disparities designated transgender individuals as a population that experiences disproportionate negative mental and physical health outcomes (National Institute on Minority Health and Health Disparities, 2016). Of such mental health disparities, suicide ideation, attempts, and deaths significantly burden this population and require improved understanding and prevention efforts (Dhejne et al., 2011; Grant et al., 2010). Although reviews, including systematic reviews, have shown heightened rates of suicide ideation and behavior and explored related factors among the transgender population, the literature is lacking a systematic review guided by theory that delineates correlates separately for suicide ideation, attempts, and deaths (Adams, Hitomi, & Moody, 2017; Marshall, Claes, Bouman, Witcomb, & Arcelus, 2015; McNeil, Ellis, Eccles, Mizock, & Mueser, 2017). Thus, the present systematic review aims to advance our understanding of suicide risk within the transgender population by examining of correlates of suicide ideation, attempts, and deaths guided by empirically supported suicide theory.

1. Prior systematic reviews

Systematic reviews regarding suicide risk among transgender people thus far have primarily focused on prevalence rates, and none have reviewed correlates of suicide ideation and attempts separately. These reviews have revealed prevalence rates of suicide ideation and attempts that are alarmingly higher than the general population (Adams et al., 2017; Marshall et al., 2015; McNeil et al., 2017). Among transgender individuals, 55% and 29% engage in suicide ideation and attempts in their lifetime, respectively (Adams et al., 2017), which exceeds general population rates (9.2% and 2.7%, respectively; Nock et al., 2008). Similarly, 51% and 11% of transgender people report past year suicide ideation and attempts, respectively (Adams et al., 2017), which is substantially higher than general population rates (3.7% and 0.5%, respectively; Crosby, Gfroerer, Han, Ortega, & Parks, 2011). Data regarding suicide deaths among transgender people are scarce; however, transgender individuals undergoing gender affirmation surgery were 19 times more likely to die by suicide compared to the general population in Sweden (Dhejne et al., 2011). One caveat regarding these data is that prevalence rates of suicide ideation and attempts among transgender people may be high due to the frequent use of clinical samples (Marshall et al., 2015). However, prevalence rates of suicide ideation and attempts among transgender people are comparable to samples of individuals with major depressive disorder, a strong risk factor for suicide (Brown, Beck, Steer, & Grisham, 2000). For example, 63% and 14% of

individuals with major depressive disorder reported past year suicide ideation and attempts, respectively (Chartrand, Robinson, & Bolton, 2012)—rates comparable to those of transgender people (Adams et al., 2017). Additionally, representative studies (e.g., Grant et al., 2010) often employ single item measures of suicide attempts, which leads to inflated prevalence estimates (Millner, Lee, & Nock, 2015).

Despite the disparities in suicide ideation, attempts, and deaths between transgender and cisgender people, very few systematic reviews of correlates of suicide ideation and behavior exist for this population. Systematic reviews have examined correlates within lesbian, gay, bisexual, and transgender people (e.g., King et al., 2008; Matarazzo et al., 2014); however, these reviews do not evaluate correlates that may be unique to transgender individuals' experiences. Three systematic reviews have focused on suicide ideation and behavior solely among transgender people; however, only two of these reviews have explored correlates of such thoughts and behavior, with none reviewing separately correlates of thoughts and behaviors (Marshall et al., 2015; McNeil et al., 2017). Marshall et al. (2015) systematically reviewed the literature from January 1966 to April 2015 on prevalence rates of suicide ideation, attempts, and deaths among transgender people. This study appeared to review correlates of these events in an unsystematic fashion, finding that rates generally remained the same regardless of transition status (i.e., hormone therapy, gender affirming surgery) and seemed related to environmental (e.g., social support) and mental health factors. Similarly, McNeil et al. (2017) conducted a systematic review up to November 2016 and unsystematically reviewed correlates of suicide ideation and attempts. These authors identified individual (e.g., demographic, mental health) and environmental factors (e.g., social stigma) that associated with suicide ideation and attempts. Specifically, environmental factors of discrimination, social support, and access to medical care correlated with suicide ideation and attempts (McNeil et al., 2017). However, different correlates of suicide ideation and attempts were not highlighted, posing a challenge of differentiating risk for suicide ideation versus attempts.

Although these reviews have critically informed us of the status of the literature regarding suicide risk among transgender individuals, an additional, improved, systematic review will advance the literature. First, reviewing studies published since 2016 (when McNeil et al., 2017 ended their search) will update our understanding. Second, additional attention towards the unpublished studies, such as that accomplished by Adams et al. (2017) in their review of prevalence rates, will reduce publication bias regarding suicide risk among transgender people. Finally, perhaps most importantly, no systematic review has been guided by a theoretical framework that cohesively organizes correlates of suicide ideation and attempts. Distinguishing among potential risk factors for suicide ideation, attempts, and deaths is critical for identifying appropriate areas for prevention and intervention within this population.

1.1. Theoretical framework

In the last decade, the paradigm of suicide theory has shifted towards ideation-to-action frameworks (Klonsky & May, 2014) that propose that suicide ideation, attempts, and deaths have distinct but related causal pathways (Joiner Jr., 2005; Klonsky & May, 2015;

O'Connor, Cleare, Eschle, Wetherall, & Kirtley, 2016; Van Orden et al., 2010). These distinctions are critical, as very few individuals who think about suicide go on to attempt suicide, and very few of those who attempt suicide die by suicide (Klonsky & May, 2014). For example, one-third of individuals who report lifetime suicide ideation also report a lifetime suicide attempt (Nock et al., 2008). Although specific tenets of ideation-to-action theories differ, these theories share in the distinction of factors that lead to suicide ideation from those that promote such ideation towards an attempt. For example, in the most recent theory based in an ideation-to-action framework, Klonsky and May (2015) propose that first, suicide ideation develops from the combination of pain (e.g., psychological pain) and hopelessness. Second, such ideation escalates if not buffered by social connectedness. Third, ideation transitions into a suicide attempt if an individual has acquired (e.g., habituation to fear and pain involved in death), dispositional (e.g., genetic fearlessness/pain tolerance), and practical (e.g., access to means, knowledge of attempt lethality) capabilities of carrying out an attempt (termed suicide capacity). Given the empirical support and clinical implications of ideation-to-action frameworks (Klonsky & May, 2014; Klonsky & May, 2015; Ma, Batterham, Calear, & Han, 2016), correlates of suicide ideation, attempts, and deaths among transgender people should be organized by theory to best understand and prevent this substantial problem.

2. Purpose and aims

Thus, the purpose of the present systematic review was to advance our empirical and theoretical understanding of increased risk for suicide among transgender people. This purpose was accomplished by the following objectives: 1) To summarize correlates of (i.e., factors associated with) suicide ideation, attempts, and deaths among transgender people and 2) to describe how correlates differ among the separate outcomes of suicide ideation, attempts, and deaths, in accordance with the current ideation-to-action paradigm of suicidology. Furthermore, we aimed to improve on previous systematic reviews by reviewing studies published since 2016 and unpublished studies.

3. Method

The systematic review was conducted in line with the *Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols* (PRISMA-P; Shamseer et al., 2015). The search strategy was conducted independently by two advanced doctoral level psychology graduate students and aimed to find both published and unpublished studies. A three-step search strategy was utilized: 1) publication database review, 2) reference review of included articles, and 3) searching for unpublished studies. Following the search, results were extracted from the included studies and summarized according to the objectives of the systematic review. Assessment of methodological quality was also performed.

3.1. Inclusion criteria

3.1.1. Types of participants—The review sought studies that include transgender individuals, including those with non-binary identities (e.g., genderqueer, gender fluid, agender, bigender). Key terms used to include such identities in the review are detailed below.

3.1.2. Types of phenomena of interest—The review sought studies that investigate correlates of suicide ideation, suicide attempts, and suicide deaths. Studies defined these outcomes differently; therefore, studies were not excluded based on these differences. Rather, measurement methods were extracted from the study for qualitative comparison. Correlates were defined broadly as any variable that bears a positive or negative association (cross-sectionally or longitudinally) with suicide ideation, attempts, or deaths. Studies including variables that were tested and found not to be correlated were also included and reported on as to avoid biasing results towards statistically significant findings.

3.1.3. Types of studies—Any study that provided bivariate or multivariate associations between potential correlates and suicide ideation, attempts, and/or deaths or compared transgender/gender diverse people with non-transgender/gender diverse people in factors related to suicide ideation, attempts, and/or deaths were considered. Therefore, studies of any design and methodology were considered if they included quantitative analyses.

3.2. Exclusion criteria

3.2.1. Types of participants—Studies that included cisgender (i.e., gender identity is congruent with assigned sex at birth) participants in addition to transgender individuals were excluded if these groups are not clearly separated in analyses. Studies that focus primarily on, or that do not clearly separate, persons diagnosed with transvestic disorder (defined as dressing as the “opposite gender” for purposes of sexual arousal/gratification and experiencing related distress; APA, 2013) or intersex people (individuals born with ambiguous sex characteristics) were excluded. Transvestic disorder is currently classified as a paraphilic disorder, and intersex people are often distinct from transgender/gender diverse people. No age restrictions were imposed to reduce the amount of restrictions placed on studies that qualified for this review.

3.2.2. Types of phenomena of interest—Studies that combine one or more of the phenomena of interest (ideation, attempts, and deaths) or combine the phenomena of interest with other suicidal behavior or nonsuicidal self-injurious thoughts/behaviors (e.g., nonsuicidal self-injury, suicidal threats) were excluded. However, we noted how many studies were excluded based on combining these phenomena to highlight the state of the field’s methodology.

3.2.3. Types of studies—Qualitative papers that do not provide a quantitative analysis of the correlates of suicide ideation, attempts, and deaths were excluded. Expert opinion, conceptual, literature review, meta-analyses, and case studies/summaries were excluded. Studies written in a language other than English and that were published before 1991 (before the last 25 years) and after July 2017 were excluded.

3.3. Search strategy

First, an initial search using the designated key terms for publications between 01/01/1991 and 07/31/2017 was conducted using the following databases/search engines: Pubmed, PsycINFO, CINAHL. The following search of article keywords was used across databases: (Suicid* OR psychological autopsy) AND (Transgender* OR transsexual OR female-to-

male OR male-to-female OR gender non-conform* OR gender minority OR gender variant OR genderqueer OR gender diverse OR bigender OR agender OR two-spirit OR genderfluid OR gender neutral OR LGBT*). To cast a wider net in the search, keywords for correlates were not entered. Rather, the articles were reviewed individually for such. Following deletion of duplicates, article titles, abstracts, and keywords were reviewed to determine inclusion. If an article's inclusion status was not easily determined by this cursory review, the full article was reviewed. Discrepancies in decision-making were discussed between reviewers on a twice monthly basis.

A second search was conducted by reviewing the reference list of all included articles to identify additional studies, and titles that indicated potential for inclusion were reviewed. At least one of the transgender search terms was required to be present paired with suicide-related terms or terms related to psychiatric/mental health morbidity to warrant further review. After highlighting these titles, the reviewers (CWC and KF) determined inclusion by abstract review or full-text review (if necessary).

Finally, a third search was carried out to identify potential unpublished data. For all articles included in the review, the first author e-mailed the first and corresponding authors to request access to conference presentations, in-press manuscripts, or unpublished manuscripts or theses/dissertations. Requests for such were also sent to listservs relevant to suicide and transgender/gender diverse populations (e.g., the Society for the Psychology of Sexual Orientation and Gender Diversity [Division 44] of the American Psychological Association). This was done to reduce publication bias. These data were reviewed and documented in the same manner described above. See Fig. 1 for a summary of how many studies were discovered and excluded at each stage.

3.4. Data extraction and synthesis

Data were extracted from the full-text articles and summarized in Appendix A. The data extraction was completed independently by the two reviewers (CWC and KF) and discussed to resolve disagreements in recording. Agreement was not calculated; therefore, a kappa statistic is not available to estimate level of agreement. Findings were organized by outcome (ideation, attempt, death) and by whether the correlate is an individual or environmental characteristic and dynamic or dispositional.

Finally, the two reviewers independently assessed methodological quality of each study using the National Institutes of Health's (NIH) *Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies* (NIH, 2014). This tool was selected as it provides criteria for assessing the quality of cross-sectional, correlational studies as opposed to randomized clinical trials that most quality assessment scales are designed to appraise. Reviewers (CWC and KF) indicated yes, no, or not applicable to items assessing criteria such as clear research questions, participation rate, power analyses, reliable and valid measurement, and controlling of potential confounding variables. Scores on individual items of the scale were not summed to determine quality, as NIH (2014) instructed to use the tool as a guide to determine a study's quality of being poor, fair, or good. Therefore, reviewers used the individual items to guide their determination of risk of bias and rated studies as being of poor (0), fair (1), or good (2) quality. We assigned these numerical values to assess

interrater reliability and compute frequencies of each category of quality for descriptive purposes. To compute frequencies of quality, we averaged the reviewers' scores for each study, with 0–0.5 = poor quality, 1–1.5 = fair quality, and 2 = good quality.

4. Results

One-hundred and fifty-nine papers resulted from the search criteria conducted across databases. After removing duplicates and full-text and abstract review, 21 papers met inclusion criteria. Eighteen additional papers were included via reference review of the 21 original papers. Six studies were identified for inclusion from contacting authors and list-servs for unpublished or in press studies, resulting in 45 studies included in the final review (See Fig. 1 for reasons for papers' exclusion, Appendix A for table of extracted data, and Appendix B for reference list of included studies).

Eight (20%) of the included studies combined suicide attempt history with suicide ideation, plans, nonsuicidal self-injury, or aborted/interrupted attempts; thus, these data were not used in the systematic review. However, suicide ideation was reported separately in these same studies, allowing those variables to be included in the review. Assessment of the scaling of the measurement of suicide ideation and attempts indicated that among the 31 studies that measured suicide ideation, many (58%) measured it dichotomously (e.g., lifetime presence or absence of ideation). Similarly, among the 26 studies that measured suicide attempts separately, most (80%) measured it dichotomously (e.g., lifetime presence or absence of attempts). Notably in the measurement of suicide attempts, intent to die (a key aspect of defining attempted suicide; Silverman, Berman, Sanddal, O'Carroll, and Joiner Jr. (2007a),b) was not apparently included in any study. No studies reported correlates of suicide deaths among transgender people; therefore, the review focused solely on suicide ideation and attempts. Finally, regarding study design, only two (4.4%) of the studies included longitudinal data, and a majority (89%) used convenience, targeted, or respondent-driven sampling methods.

5. Summary of methodological quality

Interrater reliability of methodological quality was 0.78, suggesting acceptable agreement between the raters. On a scale of 0–2, the average quality of the studies was 0.67 ($SD = 76$). Assessment of methodological quality indicated that 56% of the studies were of poor quality (average rating of 0–0.5), 29% of fair quality (average rating of 1–1.5), and 15% of good quality (average rating of 2). Thus, the results of the systematic review should generally be considered tentative, given that over half of the studies were of poor methodological quality.

5.1. Summary of correlates of suicide ideation

The following details the correlates of suicide ideation and attempts found into major categories (e.g., external minority stressors, internal minority stressors). See Table 1 for a more succinct summary of these results.

5.2. Dynamic factors

5.2.1. External minority stress—External minority stress, defined as violence, discrimination, harassment, and rejection experienced related to one's minority identity (Meyer, 2003), was consistently positively associated with suicide ideation, at least at the bivariate level. This finding was demonstrated consistently across studies, regardless of methodological quality, lending strong support towards this association. External minority stress experiences such as nonaffirmation, discrimination, and stigma positively associated with suicide ideation (Bauer, Scheim, Pyne, Travers, & Hammond, 2015; Lehavot, Simpson, & Shipherd, 2016; Testa, Michaels, Bliss, Rogers, Balsam, & Joiner, 2017; c.f., Peta, Rincon, Gotelli, Testa, Sciacca, & Balsam, 2013). Violence victimization, including school-based victimization (i.e., physical and/or sexual violence occurring on school property; Perez-Brumer, Day, Russell, & Hatzenbuehler, 2017), physical violence, and sexual violence, were positively associated with lifetime odds of suicide ideation (Kuper, 2015; Rood, Puckett, Pantalone, & Bradford, 2015; Testa et al., 2017). One study suggested potential differences across gender identity. Physical violence positively associated with lifetime suicide ideation for transgender women but not transgender men, whereas sexual violence was positively associated with lifetime suicide ideation for transgender men but not transgender women (Testa et al., 2012). Finally, homelessness was positively associated with suicide ideation (Lehavot et al., 2016), which could be a result of external minority stress experiences such as rejection, housing discrimination, and violent victimization in prior residences (National Health Care for the Homeless Council, 2014).

5.2.2. Social support—Social support was also consistently found to be negatively associated with suicide ideation across studies, regardless of methodological quality, lending strong support towards this finding. The positive relations of external minority stress experiences, such as harassment and rejection, with suicide ideation were weakened by social support from significant others and friends, but not from family (Trujillo, Perrin, Sutter, Tabaac, & Benotsch, 2017). Social support (e.g., friends, family, transgender-inclusive provider) was negatively associated with current, past two weeks, and past year suicide ideation across numerous studies (Bauer et al., 2015; S.K. Kattari, Walls, Speer, & L. Kattari, 2016; Kuper, 2015; Moody & N. G. Smith, 2003; Trujillo et al., 2017; Yüksel, Ertekin, Öztürk, Bikmaz, & Oğlağu, 2017; cf. Yadegarfard, Meinhold-Bergmann, & Ho, 2014). Similarly, social isolation and loneliness (Yadegarfard et al., 2014), as well as family strain positively associated with suicide ideation (D. M. Y. Smith, Fox, Wang, & Hooley, 2018). Finally, social support constructs such as perceptions of burdensomeness and thwarted belongingness were positively correlated with suicide ideation (Grossman, Park, & Russell, 2016; Testa et al., 2017). In contrast, one study of transgender veterans indicated that social support, connectedness to the sexual and gender minority community, and connectedness to the veteran community were not associated with suicide ideation in multivariate analyses; however, veteran community connectedness was negatively associated with suicide ideation in univariate analyses (Lehavot et al., 2016).

5.2.3. Internal minority stress—Internal minority stress, defined as internalized minority stressors (e.g., concealment of identity, internalized stigma/transphobia, expectations of rejection; Meyer, 2003), was also positively associated with suicide ideation.

This finding was consistently demonstrated across better quality studies, lending more support towards this association. Internal minority stress experiences of internalized transphobia, negative expectations (e.g., of rejection), and nondisclosure of identity positively associated with suicide ideation (Testa et al., 2017). Similarly, opposites of internal minority stress such as the ability to express one's gender, positive self-concept, and clarity about one's gender identity were negatively associated with suicide ideation (Kuper, 2015; Moody & N. G. Smith, 2003).

Examining internal and external minority stress together indicated that internalized transphobia may mediate the relations of rejection and identity nonaffirmation, but not discrimination, with suicide ideation (Testa et al., 2017). Specifically, internal minority stress of negative expectations mediated the relations of rejection, victimization, and nonaffirmation, but not discrimination, with suicide ideation. Nondisclosure of gender identity, however, did not mediate any relations of discrimination, rejection, victimization, and nonaffirmation with suicide ideation (Testa et al., 2017).

Additional studies suggested that after accounting for depression and demographic factors of age and gender identity, external minority stress only positively related to past year suicide ideation through internal minority stress (e.g., internalized transphobia; Tucker et al., under review). Similarly, military-specific external minority stress positively associated with past year suicide ideation through increased internal minority stress, but not when depressive symptoms were accounted for. Finally, thwarted belongingness and perceived burdensomeness mediated the relation between internalized transphobia and negative expectations, but not nondisclosure, with suicide ideation (Testa et al., 2017).

5.2.4. Psychiatric comorbidity—Psychiatric comorbidity was positively associated with suicide ideation among transgender men but not among transgender women (Hoshiai et al., 2010). Yet, one study of better methodological quality found that emotional stability associated with decreased suicide ideation among both transgender men and women (Moody & N. G. Smith, 2003). Other studies have more specifically identified that depressive symptoms (Kuper, 2015; Perez-Brumer et al., 2017; Lehavot et al., 2016; D. M. Y. Smith et al., 2018; Trujillo et al., 2017) and posttraumatic stress disorder symptoms (Lehavot et al., 2016) positively correlated with suicide ideation. Depressive symptoms appear to be a robust correlate of suicide ideation among transgender people, as studies with good methodological quality consistently reported this finding, and social support does not appear to weaken this relationship (Trujillo et al., 2017). Furthermore, depression mediated the relation between external minority stress experiences of harassment and rejection and suicide ideation (Trujillo et al., 2017). Symptoms of anxiety and alcohol, drug, food, gambling, sex, work, and spending problems were not associated with suicide ideation (Lehavot et al., 2016; Mathy, 2003; Trujillo et al., 2017); however, these studies ranged from poor to fair methodological quality. Finally, nonsuicidal self-injury positively associated with suicide ideation in a study of high methodological quality (D. M. Y. Smith et al., 2018).

5.2.5. Transition and healthcare-related factors—Findings regarding transition status were equivocal. Studies that examined these factors in relation to suicide ideation ranged from poor to fair in methodological quality, which reduces the strength of the

conclusions drawn from these findings. Some work demonstrated that individuals who desired to or who had already begun to transition reported greater odds of suicide ideation than those who did not plan to transition (Rood et al., 2015; Terada et al., 2011). In contrast, one study found that transition steps of hormone therapy and having one or more identity-congruent documents was negatively associated with suicide ideation (Bauer et al., 2015). However, social transition status (e.g., living part- or full-time as identified gender identity) was not associated with suicide ideation (Bauer et al., 2015).

Individuals with a history of surgery on both genitalia and chest reported lower past year suicide ideation when compared to individuals with surgery on either genitalia or chest and individuals with hormone therapy only. However, past year suicide ideation was not lower among individuals with chest and genitalia surgery compared to those with no surgery or hormone therapy. Further, individuals with varying transition statuses did not differ in past year suicide ideation frequency, and depressive symptoms did not change these relations (Tucker et al., in preparation). One study demonstrated that healthcare coverage was not associated with suicide ideation (Kattari et al., 2016). History of psychotherapy/psychiatric medication and current psychiatric medication were positively associated with suicide ideation (Mathy, 2003). Similarly, a clinical sample of transgender individuals reported greater suicide ideation than a nonclinical sample (Effrig, Bieschke, & Locke, 2011).

5.2.6. Religiosity, other reasons for living and coping skills—Findings regarding religiosity were also equivocal, with studies supporting (Grossman et al., 2016) and failing to support religiosity as a potential protective factor against suicide ideation (Bauer et al., 2015), although the Grossman et al., (2016) study was of better quality. Family attitudes towards religion were not associated with present or lifetime history of suicide ideation (Yüksel et al., 2017). One study with good methodological quality demonstrated that other reasons for living including optimism, survival coping beliefs (e.g., problem-solving), and concerns about effect of suicide on children were negatively associated with suicide ideation, whereas fear of suicide, fear of social disapproval, and moral objections to suicide were not associated with suicide ideation (Moody & N. G. Smith, 2003). Finally, functional coping (i.e., self-efficacy and social support) and dysfunctional coping (substance use and negative self-directed thoughts) were negatively and positively associated with suicide ideation respectively, depending on transition status (Freese, Ott, Rood, Reisner, & Pantalone, 2018).

5.3. Static/demographic factors

5.3.1. Sex assigned at birth, gender identity, and gender dysphoria onset—Relations between these variables and suicide ideation were also equivocal and difficult to interpret given that many studies examining these variables were of poor methodological quality. Regarding lifetime suicide ideation, some studies showed that individuals assigned female sex at birth reported greater ideation than individuals assigned male at birth (Grossman et al., 2016; Rood et al., 2015), whereas others indicated no differences (Heylens, Elaut, et al., 2014; Reisner et al., 2015; Terada et al., 2011; Veale, Watson, Peter, & Saewyc, 2017; Yuksel et al., 2017). However, the latter studies were of poor methodological quality. Regarding past year suicide ideation, studies found no differences

across gender identities or assigned sex at birth (Kuper, 2015; Veale et al., 2017). One study demonstrated that among transgender and gender diverse individuals, women who did not identify with the transgender label reported the least past year suicide ideation when compared to self-identified transgender women, transgender men, men who did not use the transgender label, and agender/genderqueer people (Kattari et al., 2016). Finally, transgender men and women did not differ in past month or current suicide ideation (Heylens, Elaut, et al., 2014; Yuksel et al., 2017); however, individuals assigned male sex at birth reported greater odds of suicide ideation over the past two weeks than individuals assigned female sex at birth (Couch et al., 2007). Finally, individuals with early- versus late-onset gender dysphoria did not differ in past month suicide ideation (Heylens, Elaut, et al., 2014).

5.3.2. Sexual orientation and sexual history—Sexual minority status (poor methodological quality; Lytle, Blosnich, & Kamen, 2016), including unsure sexual orientation (good methodological quality; Perez-Brumer et al., 2017), was positively associated with past year suicide ideation. However, Mathy (2003; fair methodological quality) found a null relation between sexual minority status and past year suicide ideation. Lytle et al., (2016) found that number of sex partners was related to suicide ideation among heterosexual and sexual minority participants; however, the direction of the relation was not reported.

5.3.3. Racial/ethnic identity—Regarding racial/ethnic identity, very few studies (6.8%) examined racial/ethnic differences in suicide ideation. Furthermore, no clear pattern of findings was demonstrated by studies of better methodological quality. Some studies found that White individuals reported greater lifetime suicide ideation (Grossman et al., 2016; Kenagy & Botswick, 2005), whereas others found that racial minority status was associated with greater odds of past year suicide ideation (Lytle et al., 2016). One study found that Asian ethnicity was associated with higher suicide ideation compared to all other racial/ethnic identities (Perez-Brumer et al., 2017).

5.3.4. Age—Age was negatively associated with past year suicide ideation (Kuper, 2015; Tucker et al., under review) and past two-week suicide ideation (Yadegarfard, Ho, & Bahramabadian, 2013). Other studies reported a null relation between age and past year suicide ideation (Kattari et al., 2016; Lytle et al., 2016; Moody & N. G. Smith, 2003). No clear pattern of findings was demonstrated by studies of better methodological quality.

5.3.5. Education—Individuals with bachelor's degrees were at twice the odds of past year suicide ideation compared to individuals with lower levels of education (Kattari et al., 2016). Another study, however, found that level of education was not associated with past two-week suicide ideation (Yadegarfard et al., 2013) or lifetime suicide ideation (Terada et al., 2011). No clear pattern of findings was demonstrated by studies of better methodological quality.

5.4. Summary of correlates of suicide attempts

5.4.1. Dynamic factors

5.4.1.1. External minority stress.: Physical, sexual, and verbal aggression victimization were positively associated with suicide attempt history across many studies ranging from poor to good methodological quality (Bauer et al., 2015; Clements-Nolle & Katz, 2006; Goldblum et al., 2012; Grossman, & D'Augelli, 2007; Haas, Rodgers, & Herman, 2014; Maguen & Shipherd, 2010; Reisner, Bailey, & Sevelius, 2014; Sciacca, 2014; Seelman, 2016; Testa et al., 2012). Relations of specific types of external minority stress with suicide attempt history differed across some studies, which differences in methodological quality did not clearly explain. Harassment/discrimination by teachers, specifically, was positively associated with suicide attempt history (Haas et al., 2014). However, in another study, victimization by staff and teachers was not associated with suicide attempt history (Seelman, 2016). Physical and sexual violence, but not verbal aggression, were positively associated with number of suicide attempts after controlling for age, sex assigned at birth, history of psychiatric hospitalization, and gendered violence (i.e., violence motivated by transphobia; Maguen & Shipherd, 2010). Using a retrospective design, one study found that past sexual violence, but not physical violence, positively related to subsequent suicide attempts across sex assigned at birth and transition status (Sciacca, 2014).

Regarding other forms of external minority stress, discrimination positively associated with suicide attempt history in some studies (Clements-Nolle & Katz, 2006; Peta et al., 2013) but not in others (Lytle et al., 2016). Related to discrimination, an anti-transgender environment at the societal level, termed structural stigma, was positively associated with lifetime suicide attempt history but not past year suicide attempt history (Perez-Brumer, Hatzenbuehler, Oldenburg, & Bockting, 2015). Regarding events on the individual level, lack of stable housing (often a result of discrimination; Marshall et al., 2016) but not discrimination by healthcare workers, positively associated with suicide attempt history (Marshall et al., 2016; Reisner et al., 2014). Being denied access to gender-appropriate bathrooms or housing (Seelman, 2016) positively associated with suicide attempt history. Correlates differed by gender identity in one study (Peta et al., 2013). Frequency of discrimination experiences, discrimination by a doctor, and hiring discrimination, but not *ever* having been discriminated against, positively associated with suicide attempt history among transgender women. Among transgender men, hiring discrimination, but not history or frequency of discrimination, or discrimination by a doctor, positively associated with suicide attempt history (Peta et al., 2013).

5.4.1.2. Social support.: Social support was found to be positively associated with suicide attempt history across studies of both poor and good methodological quality. In one study, family rejection positively associated with suicide attempt history (Klein & Golub, 2016). Social support-related constructs of perceived burdensomeness, thwarted belongingness, but not the interaction between the two, positively related to suicide attempt history (Grossman et al., 2016). In contrast, in a study of fair methodological quality, social support from authorities such as supervisors and educators was associated with *increased* odds of suicide attempt history among individuals with current suicide ideation, and parental support was not associated with suicide attempt history (Bauer et al., 2015).

5.4.1.3. Internal minority stress.: Internal minority stress was also less frequently studied as a correlate of suicide attempt history than suicide ideation; however, studies of varying methodological quality generally suggested that negative feelings towards the self were associated with suicide attempt history. Studies found that low self-esteem (Clements-Nolle & Katz, 2006), specifically regarding body weight and beliefs about how others view one's body, but not appearance, positively associated with suicide attempt history (Grossman & D'Augelli, 2007). Internalized stigma positively associated with lifetime suicide attempt history (Marshall et al., 2016; Perez-Brumer et al., 2015) but not past year suicide attempt history (Perez-Brumer et al., 2015).

5.4.1.4. Psychiatric comorbidity.: Depressive symptoms, including suicide ideation (Grossman et al., 2016), positively associated with suicide attempt history (Boza & Nicholson Perry, 2014; Clements-Nolle & Katz, 2006). Addictive problems with food, gambling, sex, and spending were not related to suicide attempt history (Mathy, 2003), while history of alcohol and drug abuse positively associated with suicide attempt history (Mathy, 2003). However, in a study of better methodological quality, history of drug abuse, but not alcohol abuse, positively associated with suicide attempt history, regardless of gender identity or transition status (Sciacca, 2014). Finally, individuals with physical and mental disabilities, but not learning disabilities, were at increased odds of a suicide attempt history (Seelman, 2016).

5.4.1.5. Transition and healthcare-related factors.: Findings regarding transition-related correlates of suicide attempt history were mixed. Receiving hormone replacement therapy (Colton Meier, Fitzgerald, Pardo, & Babcock, 2011) or gender affirmation surgery (Heylens, Verroken, De Cock, T'sjoen, & De Cuypere, 2014) was not associated with suicide attempt history in some studies. However, Bauer et al., (2015) demonstrated that individuals in the process of medical transition had increased odds of suicide attempt history compared to those who planned to transition but had not started. However, completing medical transitioning was not associated with increased odds of suicide attempt history (Bauer et al., 2015). Each of these studies was of fair quality. Finally, a cross-sectional study of good methodological quality demonstrated that suicide attempt reporting decreased following gender-affirming surgery and that all suicide attempts made post-surgery were made by transgender women (Dhejne et al., 2011).

Related to medical transitioning, seeking therapy regarding gender identity was not associated with suicide attempt history after controlling for age, sex assigned at birth, other psychiatric care, and intravenous drug use (Maguen & Shipherd, 2010). Regarding social transitioning, living part-time as one's gender identity reported low suicide attempt histories (Haas et al., 2014). In contrast, Bauer et al. (2015) found that having one or more gender-congruent identity documents negatively associated with suicide attempt history. Finally, regarding health-related factors, self-reported HIV status was not associated with suicide attempt history (Marshall et al., 2016).

Regarding psychiatric treatment, past treatment for alcohol or drug abuse (Clements-Nolle & Katz, 2006), past psychiatric hospitalization (Maguen & Shipherd, 2010), past psychotherapy, past psychiatric medication, and current psychiatric medication positively

associated with suicide attempt history (Mathy, 2003). However, one study found no differences in suicide attempt history between transgender individuals in clinical and non-clinical samples (Effrig et al., 2011). These studies ranged in quality from poor to fair, which no clear pattern of findings by quality.

5.4.1.6. Religiosity, other reasons for living and other correlates.: Religiosity was negatively associated with past suicide attempts in one study (Grossman et al., 2016) but not with past year suicide attempt history in another sample (Bauer et al., 2015). No other reasons for living were examined in studies on suicide attempts.

However, acquired capability for suicide, defined as fearlessness about death and perceived pain tolerance (related to the reason for living of fear of death; Van Orden et al., 2010), positively associated with suicide attempt frequency (Grossman et al., 2016). Finally, painful and provocative events (a construct theorized to increase acquired capability for suicide; P. N. Smith & Cukrowicz, 2010) positively associated with suicide attempt frequency, and painful and provocative events interacted with thwarted belongingness, but not perceived burdensomeness, to positively associate with suicide attempts. Specifically, thwarted belongingness only associated with suicide attempts for those with at least moderate exposure to painful and provocative events (Grossman et al., 2016). However, this construct was only examined in one study, albeit of good methodological quality.

5.4.2. Static/demographic factors

5.4.2.1. Sex assigned at birth and gender identity.: Childhood gender conformity was not associated with suicide attempt history (Grossman & D'Augelli, 2007). Many studies ranging from poor to good methodological quality found that transgender men or individuals assigned female sex were at greater odds of suicide attempt history than transgender women and those assigned male sex at birth (Goldblum et al., 2012; Grossman et al., 2016; Maguen & Shiperd, 2010; Perez-Brumer et al., 2015). One study found this relation to remain while controlling for age, psychiatric hospitalization history, and gendered violence (Maguen & Shipherd, 2010). However, other studies also ranging from poor to good methodological quality indicated no differences between transgender men and women in lifetime suicide attempt history (Clements-Nolle & Katz, 2006; Landén, Wålinder, & Lundström, 1998; Reisner et al., 2015) or past year suicide attempt history (Perez-Brumer et al., 2015). Klein and Golub (2016) found that a binary gender identity was positively associated with a suicide attempt history, and Maguen & Shipherd (2010) reported that bigender individuals were at the least risk of suicide attempt history. In contrast, a study of better methodological quality demonstrated that individuals assigned female at birth who identify as a different gender (non-binary) had the greatest odds of suicide attempt history compared to transgender men and individuals assigned male sex at birth (Grossman et al., 2016).

5.4.2.2. Sexual orientation.: The few studies that assessed the relation between sexual orientation and risk for suicide attempt consistently showed that sexual orientation was not associated with suicide attempt history (Clements-Nolle & Katz, 2006; Lytle et al., 2016; Mathy, 2003).

5.4.2.3. Racial/ethnic identity.: Findings regarding race and ethnicity were inconsistent. Studies of fair methodological quality demonstrated that racial/ethnic identity was not associated with lifetime suicide attempt history (Sciacca, 2014) or past year suicide attempt history (Perez-Brumer et al., 2015). Studies of good methodological quality found that White individuals were at greater odds of lifetime suicide attempt history than people of color and Hispanic/Latino individuals (Clements-Nolle & Katz, 2006; Grossman et al., 2016). In contrast, studies of poorer methodological quality found that people of color (including Hispanic/Latino individuals) were at greater odds of suicide attempt history than White individuals (Klein & Golub, 2016; Lytle et al., 2016; Perez-Brumer et al., 2015; Seelman, 2016), with multiracial or "other" racial/ethnic identity individuals reporting the highest attempt history odds (Goldblum et al., 2012).

5.4.2.4. Age.: Most studies found that age was negatively associated with suicide attempt history (Clements-Nolle & Katz, 2006; Klein & Golub, 2016; Goldblum et al., 2012; Maguen & Shipherd, 2010; c.f., null relations reported, Lytle et al., 2016; Perez-Brumer et al., 2015). No clear pattern of findings was evident across studies' methodological quality.

5.4.2.5. Education.: Education was negatively associated with suicide attempt history (Klein & Golub, 2016; Perez-Brumer et al., 2015).

5.4.2.6. Employment, income, socioeconomic status, and urbanicity.: Unemployment, including recent unemployment (Clements-Nolle & Katz, 2006), was positively associated with suicide attempt history (Klein & Golub, 2016). However, one study found that work problems were not associated with suicide attempt history (Mathy, 2003). Lower income was also positively associated with suicide attempt history (Goldblum et al., 2012; Klein & Golub, 2016; Seeleman, 2016); however, one study reported a null association (Perez-Brumer et al., 2015). Furthermore, individuals with low and middle socioeconomic status were at greater odds of suicide attempt history than individuals with high socioeconomic status (Goldblum et al., 2012). Finally, urbanicity was not associated with lifetime or past year suicide attempt (Perez-Brumer et al., 2015). No clear pattern of findings was evident across studies' methodological quality.

5.4.2.7. Incarceration.: In one study, history of incarceration was not associated with suicide attempt history (Reisner et al., 2014). However, in another study of better methodological study, incarceration was associated with suicide attempt history (Clements-Nolle & Katz, 2006).

6. Discussion

The purpose of this systematic review was to summarize the correlates of suicide ideation, attempts, and deaths among transgender people within an ideation-to-action framework of suicide and to assess the methodological state of the literature. We reviewed a number of dynamic and static factors related to suicide ideation and attempts. These factors suggested that an ideation-to-action framework (e.g., Joiner, 2005; Klonsky & May, 2014; Klonsky & May, 2015; Van Orden et al., 2010) may be suitable for this population. However, attention to sources of psychological pain, social connectedness, and capacity/capability for suicide

unique to this population is needed. Furthermore, numerous multicultural variables (e.g., race/ethnicity, age, religion) were studied, suggesting the need to consider other aspects of identity and their intersections with gender identity, and how theory can explain the resulting effect on suicide risk. Finally, the review also revealed important limitations of the literature, namely measurement of suicide ideation and attempts and sampling method, and a paucity of longitudinal studies, which future work should seek to improve such that stronger conclusions can be drawn from these studies.

6.1. Suitability of ideation-to-action theories to explain transgender suicide risk

Ideation-to-action theories have shown promise in the general suicide literature (Klonsky & May, 2014; Klonsky & May, 2015; Ma et al., 2016; Van Orden et al., 2010). However, the generalizability of these theories to transgender people is unknown, as few studies have tested such theories within this population. The results provide preliminary support for the suitability of these theories warrants formal, empirical tests and should utilize this review of the literature.

6.2. Potential sources of psychological pain

The literature review indicated several minority stress experiences that could conceivably contribute to psychological pain and thus suicide ideation. These findings were consistent across studies of varying methodological quality. External stressors of gender-based violence, discrimination, stigma, rejection, lack of social support, nonaffirmation (e.g., Bauer et al., 2015; Kattari et al., 2016; Lehavot, et al., 2016; Perez-Brumer et al., 2017; Rood et al., 2015; Testa et al., 2017; Yüksel et al., 2017; c.f., Peta et al., 2013), and internal stressors of internalized stigma, expectations of rejection, and concealment of identity were associated with suicide ideation (Kuper, 2015; Moody & N. G. Smith, 2003; Testa et al., 2017). Furthermore, some aspects of internal minority stress may explain the association between external minority stress and suicide ideation (Testa et al., 2017; Tucker et al., under review). That is, experiences such as rejection, violence, and discrimination may only drive suicide ideation by increasing negative/harmful feelings that are turned against oneself such as identity concealment and internalized stigma. This is consistent with suicide theorists' positions that internal psychological pain (Klonsky & May, 2015), aversive self-awareness (Baumeister, 1990), and self-hatred (Joiner, 2005) are what drive the desire to die. This is also consistent with the psychological mediation framework proposed by Hatzenbuehler (2009). This framework proposes that sexual minorities (which can conceivably be applied to gender minorities as well) develop psychopathology (such as suicide ideation) from the effects of external minority stressors through psychological pain (Hatzenbuehler, 2009). This framework may complement the ideation-to-action theories in elucidating the combined effects of external and internal minority stress on suicide risk among transgender people.

More directly related to ideation-to-action theories, thwarted belongingness and perceived burdensomeness, but not the interaction between the two, positively associated with suicide ideation (Grossman et al., 2016; Testa et al., 2017). This supports the notion that perceived burdensomeness may be a key source of psychological pain that drives suicide ideation (Joiner, 2005; Ma et al., 2016) and that social connectedness may buffer the effects of such pain on the desire to die (Klonsky & May, 2005). Finally, depressive symptoms and

substance abuse were associated with suicide ideation in the studies reviewed (Freese et al., 2018; Kuper, 2015; Perez-Brumer et al., 2017, Lehavot et al., 2016; Trujillo et al., 2017). The general suicide literature has shown these diagnoses to relate to thwarted belongingness and/or perceived burdensomeness (Silva, Ribeiro, & Joiner, 2015). Psychiatric morbidity may be a source of psychological pain among transgender people which places them at risk for suicide ideation.

6.3. Potential factors related to capacity for suicide

According to ideation-to-action theories, suicide ideation does not transition into a suicide attempt unless someone has the capability (acquired, practical, or dispositional) to overcome the fear, pain, and other difficulties involved in suicide (Joiner, 2005; Klonsky & May, 2015; O'Connor et al., 2016; Van Orden et al., 2010). Like the studies reviewed on suicide ideation, most studies did not directly examine capability for suicide. However, one may hypothesize that constructs related to capability for suicide would be associated with suicide attempt history.

Specific painful and fearsome events studied in the general suicide literature were also found to associate with suicide attempt history in the systematic review. First, physical, sexual, and verbal aggression victimization were consistently associated with suicide attempt history across many studies of varying methodological quality (Bauer et al., 2015; Clements-Nolle & Katz, 2006; Goldblum et al., 2012; Grossman, & D'Augelli, 2007; Haas et al., 2014; Maguen & Shipherd, 2010; Reisner et al., 2014; Sciacca, 2014; Seelman, 2016; Testa et al., 2012). When controlling for other covariates, physical and sexual violence related to suicide attempt history (Maguen & Shipherd, 2010; Sciacca, 2014). Additional potentially painful and fearsome experiences, such as non-suicidal self-injury and substance misuse, positively associated with suicide attempt history (Mathy, 2003; Sciacca, 2014; D. M. Y. Smith et al., 2018). These findings parallel the literature on majority cisgender samples that physical and sexual violence victimization (Joiner et al., 2007), nonsuicidal self-injury (Franklin et al., 2017), and substance misuse (Kessler, Borges, & Walters, 1999) are linked to suicide attempt risk. Furthermore, these findings tentatively support the theoretical position and empirical findings that violent traumas, nonsuicidal self-injury, and substance misuse may increase one's capability for suicide (Khazem, Jahn, Cukrowicz, & Anestis, 2015; P. N. Smith & Cukrowicz, 2010; P. N. Smith et al., 2016; Willoughby, Heffer, & Hamza, 2015; Wolford-Clevenger et al., 2015). Finally, in a direct test of theory, a study of good methodological quality showed that capability for suicide was associated with suicide attempts, and painful and fearsome events were positively associated with suicide attempt frequency at moderate-to-high levels of thwarted belongingness (Grossman et al., 2016). This finding suggests that social connectedness protects against suicide attempts, as posited by Klonsky and May (2015).

However, in contrast to the notion that only fearsome and physically painful events are associated with such capability, internal minority stress was generally positively related to suicide attempt history (Clements-Nolle & Katz, 2006; Haas et al., 2014; Lytle et al., 2016; Marshall et al., 2016; Perez-Brumer et al., 2015; Peta et al., 2013; Reisner et al., 2014; Seelman, 2016). In line with ideation-to-action theories, these relations may be mediated by

the effects of internalized stigma on psychological pain (Klonsky & May, 2015; Shneidman, 1985) or aversive self-awareness (Baumeister, 2005). However, future work should test the sequential effects of internal minority stress on suicide attempts through psychological pain and suicide ideation.

Although some of the findings from the review lend preliminary support towards ideation-to-action, one finding raised questions about its generalizability to the transgender population. For example, prison inmates are thought to have high capability for suicide given their significant histories of fearsome and painful events (e.g., violence; P. N. Smith et al., 2016). However, incarceration history was associated with suicide attempt history in one study (Clements-Nolle & Katz, 2006) but not another (Reisner et al., 2014). Clements-Nolle and Katz's (2006) study was of better methodological quality, lending more support towards the notion that incarceration may be associated with greater capability for suicide and suicide attempt history. However, future work investigating which events may promote transgender individuals' capability for suicide will help clarify these mixed findings.

Finally, acute factors specific to suicide ideation that appear to predict the transition from suicide ideation to suicide attempts need further investigation in transgender samples. For example, in a retrospective study of a large sample of service members, recent onset of suicide ideation, presence and recent onset of a suicidal plan, difficulty controlling suicide ideation, and difficulty answering questions about suicidal ideation predicted suicide attempts (Nock et al., 2018). Future work, particularly qualitative studies, could shine light what acute factors advance suicide ideation towards action among transgender people.

6.4. Consideration of intersecting identities

Numerous aspects of identity were studied. Unfortunately, the lack of clear findings and limited methodological quality of most studies weakened conclusions to be drawn from these findings. This suggests a strong need for better quality studies to consider intersecting identities and their relation to suicide ideation and attempts so that they can be integrated within a comprehensive theory of suicide. Sex assigned at birth is one such aspect of identity. Regarding suicide ideation, findings were inconsistent. Studies revealed significant findings in both directions and null results (e.g., Couch et al., 2007; Kattari et al., 2016; Kuper, 2015; Veale et al., 2017; Yuksel et al., 2017); this contrasts with the pattern in the general suicide literature that women are greater risk for suicide ideation than men (Huang, Ribeiro, Musacchio, & Franklin, 2017). Sex at birth may cease to bear a relationship with suicide ideation among transgender individuals given their varied experiences with gender and biological sex. Studies on suicide attempt history revealed a more consistent pattern, with transgender men or individuals assigned female sex at birth being at greater odds of suicide attempt history than transgender women and those assigned male sex at birth (Goldblum et al., 2012; Grossman et al., 2016; Maguen & Shiperd, 2010; Perez-Brumer et al., 2015; c.f., null results: Clements-Nolle & Katz, 2006; Landén et al., 1998; Reisner et al., 2015). These findings parallel the general suicide literature that cisgender individuals assigned female at birth are at higher risk for suicide attempts (Huang et al., 2016). The relation between sex assigned at birth on suicide ideation and attempts among transgender people is likely complex and warrants further study.

The decision to carry out social and medical transition is very individualized and often dependent on financial means for transgender people (Beckwith, Reisner, Zaslow, Mayer, & Keuroghlian, 2017). Furthermore, various gender affirmation procedures exist beyond hormone therapy, “top” surgery (i.e., breast augmentation, mastectomy), and “bottom” surgery (e.g., vaginoplasty, metoidioplasty), such as facial feminization/masculinization surgeries. The range in procedures available as well as the range in satisfaction regarding such procedures are important to consider regarding how medical transition may relate to suicide risk. This individualized nature of medical transitioning was not likely captured in the studies reviewed, as many did not study all available procedures or the individual’s satisfaction with the outcomes. In the present review, gender-affirming medical procedures demonstrated inconsistent associations with suicide ideation—including null, negative, and positive associations across studies (Bauer et al., 2015; Kuper, 2015; Rood et al., 2015; Tucker et al., in preparation), and social transition status was not associated with suicide ideation (Bauer et al., 2015). Findings regarding suicide attempts were similar, with some studies finding null (Bauer et al., 2015; Colton Meier et al., 2011; Heylens, Verroken, et al., 2014), negative (Dhejne, 2017), and positive correlations (Terada et al., 2011) between medical procedures and suicide attempt history. Additionally, social transitory steps were both positively (Haas et al., 2014) and negatively associated with suicide attempt history (Bauer et al., 2015). The individualized nature of desire for, means to obtain, and satisfaction with medical and social transitioning may play a role in these unclear findings. Additionally, these inconsistent findings may be due to the lack of temporal data. It is possible that individuals with a history of suicide attempts are more likely to seek to transition as an attempt to resolve significant dysphoria or external minority stress, which would cause some of the positive associations demonstrated here between transitioning, suicide ideation, and suicide attempt history.

Findings regarding racial/ethnic differences in suicide ideation and attempts were also inconsistent. Some studies found White individuals were at greater risk for suicide ideation (Grossman et al., 2016; Kenagy & Botswick, 2005), whereas others found that racial minority status was associated with greater risk for ideation (Lytle et al., 2016; Perez-Brumer et al., 2017). These unclear findings are consistent with the general suicide literature (Huang et al., 2017; Perez-Rodriguez, Baca-Garcia, Oquendo, & Blanco, 2008). Similar inconsistencies were found in the suicide attempt studies, with some studies finding White individuals at greater odds of suicide attempt history than people of color (Clements-Nolle & Katz, 2006; Grossman et al., 2016) and others finding the opposite (Klein & Golub, 2016; Lytle et al., 2016; Perez-Brumer et al., 2015; Seelman, 2016). This is not consistent with the finding in the general suicide literature that Whites are at a greater risk for suicide attempt history than racial/ethnic minorities (Huang et al., 2016). Nonetheless, the negative effects of discrimination and other sources of minority stress may be amplified for transgender people of color (Grant et al., 2010); thus, examining the potential moderating effects of race/ethnicity on correlates of suicide ideation and attempts may be informative.

Like the general suicide literature (Huang et al., 2016), age was inconsistently associated with suicide ideation (i.e., negative associations: Kuper, 2015; Tucker et al., under review; Yadegarfard et al., 2013; null associations: Kattari et al., 2016; Lytle et al., 2016; N. G. Moody & Smith, 2003). Also consistent with the general suicide literature, age was

negatively associated with suicide attempt history among the studies reviewed (Clements-Nolle & Katz, 2006; Klein & Golub, 2016; Goldblum et al., 2012; Maguen & Shipherd, 2010; c.f., null relations reported, Lytle et al., 2016; Perez-Brumer et al., 2015). These findings suggest that age may have a similar relationship to suicide ideation and attempts between cisgender and transgender people, with younger individuals being at higher risk for ideation—perhaps due to developmental factors such as impaired decision-making (Jollant, Lawrence, Olié, Guillaume, & Courtet, 2011).

Socioeconomic status variables were also studied in relation to suicide ideation and attempts. Education was generally not associated with suicide ideation (Terada et al., 2011; Yadegarfard et al., 2013). However, unemployment (Clements-Nolle & Katz, 2006; Klein & Golub, 2016) and low income were positively associated with suicide attempt history (Goldblum et al., 2012; Klein & Golub, 2016; Seeleman, 2016). Future work should seek to explicate the effects of the socioeconomic status and related variables on suicide ideation and attempts within the context of the unique experiences of transgender people.

Individuals with sexual minority status were at greater risk for suicide ideation (Lytle et al., 2016; Perez-Brumer et al., 2017) but not attempts (Clements-Nolle & Katz, 2006; Lytle et al., 2016; Mathy, 2003), than heterosexual individuals. This is consistent with the cisgender literature concerning suicide ideation but not suicide attempts (King et al., 2008). According to ideation-to-action theories, sexual minority status may add to one's psychological pain through additional internalized stigma and other experiences of distress (Hatzenbuehler, 2009), which may affect one's suicide ideation but not capacity to attempt.

Veteran status is another identity that warrants further attention as it relates to transgender individuals' suicide risk. Veterans generally present with an increased risk for suicide compared with the general population (Kuehn, 2009). Transgender veterans may be at even greater risk for suicide given unique stressors they face in service (Matarazzo et al., 2014). For example, the two studies on veterans that qualified for the present review found that minority stress, including stigma perceived in the military (Lehavot et al., 2016), was associated with suicide ideation (Tucker et al., under review). Future work is needed that focuses on veteran status, as well as intersections with other marginalized identities such as racial/ethnic identity (Brown & Jones, 2014).

Finally, other aspects of identity that were less frequently studied included religious status and physical disability status. Identifying as religious was found to be both related and unrelated to suicide ideation and attempts (Bauer et al., 2015; Grossman et al., 2016; Yüksel et al., 2017). This is partially consistent with the suicide literature, which suggests a null relation between religiosity and suicide ideation, but a negative association between religiosity and suicide attempts (Huang et al., 2016). Religiosity and religious coping have a varied relationship with lesbian, gay, and bisexual individuals as well, with some forms of religious coping correlating with emotional suffering and others having no relationship (Bourn, Frantell, & Miles, 2018). Religion may lose its protective nature against suicide risk for transgender people depending on the level of acceptance they experience in their religious identity and religious community, or the type of religious coping they utilize. Finally, only one study examined physical disabilities, demonstrating a positive association

with suicide attempt history (Seelman, 2016). This is consistent with the general suicide literature (Meltzer et al., 2012). Although physical disabilities may contribute to psychological pain that would promote suicide ideation, it is unclear how such disabilities may relate to capability of suicide, given that individuals may face greater practical challenges of carrying out an attempt depending on the severity of their disability.

6.5. Quality of the literature

Finally, the review also indicated important limitations of the literature, namely measurement of suicide ideation and attempts, sampling method, and design, which future work should seek to improve. Indeed, over half of the studies reviewed were considered of poor quality. First, measurement of suicide ideation and attempts was greatly compromised. Six (5.5%) of the excluded studies were excluded because they combined suicide ideation and attempts into one outcome. Further, 20% of the included studies combined suicide attempt history with other suicidal behaviors, making it impossible to look at separate correlates of suicide attempts. Second, in many cases the scaling of suicide ideation and attempt measures was not ideal. That is, most studies examining suicide ideation and attempts measured these constructs dichotomously rather than continuously. Continuous measurement would more accurately represent the nuanced nature of these constructs and provide more power for statistical analyses (MacCallum, Zhang, Preacher, & Rucker, 2002).

Third, intent to die (a key aspect of defining attempted suicide; Silverman et al., 2007a, 2007b) was not specified in any reported measurements of suicide. Intent to die is crucial to measure in relation to suicide attempts, as fewer individuals may report suicide attempts when inquired about their intent to die. Fourth, similar to other reviews (McNeil et al., 2016), no studies reported correlates of suicide deaths among transgender people, resulting in the necessity to focus solely on suicide ideation and attempts. This lack of data highlights the need for gender identity data to be included in suicide and other violent death reports (Haas et al., 2015) as well as psychological autopsies to identify specific risk factors for suicide deaths among transgender people. Fifth, regarding study design, only two (4.4%) of the studies included longitudinal data, and a majority (89%) used convenience, targeted, or respondent-driven sampling methods. Sixth, 33% of studies were excluded because they combined transgender participants with sexual minority (e.g., lesbian, gay, or bisexual) participants. Finally, 33% of the studies reviewed included individuals of non-binary gender identities, which is an important area of growth for this literature. In summary, there is a clear need to allocate additional resources to more sophisticated study designs (e.g., psychological autopsy, longitudinal studies, case-controls) that target representative samples of transgender (particularly non-binary) people that are not conflated with sexual orientation. This will vastly improve the strength of conclusions and thus the practical applications to be drawn from these studies.

6.6. Policy and clinical implications

These findings emphasize and expand upon policy and clinical recommendations made by previous authors (Haas et al., 2010; McNeil et al., 2016). The hardships experienced by transgender people at macro- and micro-levels of their environment suggest a clear need for policy implementation (McNeil et al., 2016). Along with these hardships are important static

factors related to suicide ideation and attempts that warrant clinical recommendations regarding assessment and treatment of transgender individuals for suicide risk.

Particularly within the United States, policy changes are needed to more adequately protect transgender people from sources of minority stress including discrimination, stigma, harassment, and aggression from employers, educators, and healthcare providers. The current review suggests that minority stress is consistently related to transgender people's suicide ideation and attempts, and such structural changes may have a global impact on transgender individuals' well-being (McNeil et al., 2016). Relatedly, mental health providers and researchers are well-suited to partner with transgender advocacy groups to inform policy-makers at local, state, and federal levels of the potential impact of this change on the well-being of transgender people (Haas et al., 2010). In addition to advocating for policy change, mental health providers and researchers should invest in educating, training, and advocating for providing transgender-affirmative care among current and up-and-coming healthcare providers across disciplines (Haas et al., 2010). Unfortunately, transgender people continue to meet barriers in accessing needed care and can experience discrimination by their healthcare providers. For example, in a transgender healthcare needs study in Virginia, 25% of participants reported needing but being unable to access some form of transgender-related healthcare in the past year (Bradford, Reisner, Honnold, & Xavier, 2013). In a national study in the United States, 20% of transgender individuals were refused treatment (Grant et al., 2010). Changes are necessary to ensure transgender people are met with greater acceptance, support, and effective care in their healthcare environments.

Although this literature is in its infancy, some tentative clinical recommendations can be made and also tested in future study. Given the parallels between this review's findings and the general suicide literature regarding ideation-to-action theory, factors related to unmet interpersonal needs or intense psychological pain should warrant careful assessment of suicide ideation (Klonsky & May, 2015; Van Orden et al., 2010). Additionally, external and internal minority stress experiences thought to contribute to emotional distress, such as discrimination or internalized stigma, should also trigger an inquiry about suicide ideation (McNeil et al., 2016). When assessing risk for suicide attempts, the current review suggests that histories of violent traumas, nonsuicidal self-injury, substance abuse, and physical disability may warrant further assessment of suicide attempt risk. The literature was generally inconsistent regarding demographic correlates of suicide ideation and attempts. Therefore, clinicians may choose to withhold judgment about certain demographic factors *protecting* against risk as to not under-estimate patients' risk, given this population's vulnerability. Additionally, clinicians may consider whether the patient identifies with multiple marginalized identities (e.g., transgender, gay, and of low socioeconomic status) and how this may heighten their risk for suicide ideation and attempts.

Finally, although significant work needs to be done at the environmental level to decrease suicide risk among transgender people, treatment may address internal difficulties transgender people face, thus reducing their individual risk. For instance, the present review highlighted some psychiatric problems (i.e., depression, nonsuicidal self-injury, substance abuse) related to suicide ideation and attempts among this population. Additionally, internal minority stress experiences such as internalized stigma and nondisclosure are additional

sources of psychological pain and conflict that may be worth exploring in individual therapy. Individual therapy may help patients to explore, understand, and manage these internal difficulties, thereby potentially reducing suicide risk. Testing and refining evidence-based treatments for suicide risk are critical to meet the needs of transgender people (Haas et al., 2010; Marshall, 2016).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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HIGHLIGHTS

- Transgender people are at high risk for suicide ideation, attempts, and deaths.
- No theory-guided, systematic reviews of transgender suicide risk correlates exist.
- We systematically reviewed the literature from January 1991 to July 2017.
- Ideation-to-action suicide theories may explain suicide risk in this population.

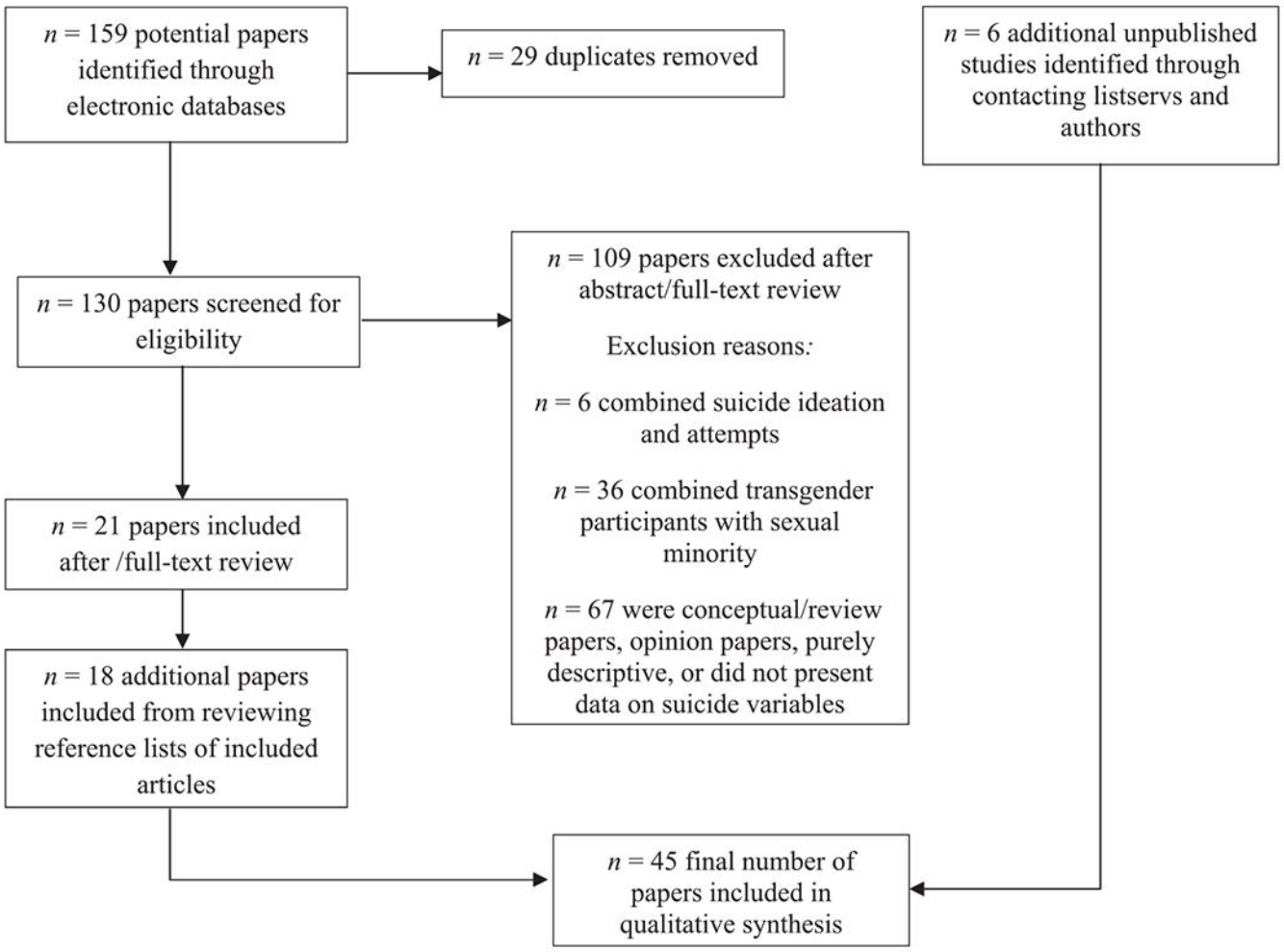

Fig. 1.
Summary of papers identified, excluded, and included in systematic review search.

Table 1

Summary of studied correlates of suicide ideation and attempts among transgender and gender diverse people.

Dynamic factors					Static/demographic factors	
External minority stress	**Internal minority stress**	**Psychiatric morbidity**	**Transition and healthcare**	**Reasons for living**	**Sex assigned at birth/gender identity**	**Demographic/other factors**
Suicide ideation						
Physical violence[ac]	Internalized stigma/ transphobia[a]	Psychiatric comorbidity[c]	No desire to transition[b]	Religiosity[bd]	Assigned female sex[abd]	Age[bd]
Sexual violence[ac]	Concealment of identity/ nondisclosure[a]	Depression[a]	Desire or begun to transition[a]	Family attitudes towards religion[d]	Self-identified women[b]	Racial/ethnic minority[ab]
Harassment[a]	Expectations of rejection[a]	Emotional stability[a]	Completing hormone therapy[b]	Optimism[b]		Education[b]
Discrimination[ad]	Ability to express gender[b]	Anxiety[d]	Top or bottom surgery[d]	Survival coping beliefs[b]		Sexual orientation minority[ad]
Stigma[a]	Positive self-concept[b]	PTSD[a]	Top and bottom surgery[b]	Concerns about suicide effects on children[b]		Unsure sexual orienation[a]
Nonaffirmation[a]	Gender identity clarity[b]	Alcohol abuse[d]	Social transition[d]	Fear of suicide[d]		
Social support[bd]		Compulsive behavior[d]	One or more identity documents[b]	Fear of social disapproval[d]		
Perceived burdensome ness (PB)[a]		Psychiatric care history[a]	Healthcare coverage[d]	Moral objections to suicide[d]		
Thwarted belongingness (TB)[ad]				Functional coping[b]		
Interaction between TB and PB[d]				Dysfunctional coping[a]		
Dynamic factors					**Static/demographic factors**	
External minority stress	**Internal minority stress**	**Psychiatric morbidity**	**Transition and healthcare**	**Reasons for living**	**Sex assigned at birth/gender identity**	**Demographic/other factors**
Suicide attempt						
Physical violence[ad]	Internalized stigma/ transphobia[a]	Depression[a]	Receiving hormone therapy[ab]	Religiosity[bd]	Assigned female sex[ad]	Racial/ethnic minority[abd]

Dynamic factors					Static/demographic factors	
External minority stress	**Internal minority stress**	**Psychiatric morbidity**	**Transition and healthcare**	**Reasons for living**	**Sex assigned at birth/gender identity**	**Demographic/other factors**
Sexual violence[ad]	Low self-esteem[ad]	Suicide ideation[a]	Medical and surgical tranisition[abd]	Acquired capability for suicide[a]	Assigned female sex with non-binary gender identity[a]	Age[bd]
Harassment[ad]		Physical and mental disabilities[a]	Gender dysphoria psychotherapy[d]	Bigender[b]	Education[b]	
Discrimination[acd]		Learning disabilities[d]	Visual nonconformity[a]		Binary gender identity[a]	Income[b]
Social support[ab]		Alcohol abuse[ad]	Disclosure of identity[a]		Childhood gender non-conformity[d]	Employment[b]
Perceived burdensome ness (PB)[a]		Drug abuse[a]	Having some but not all identity documents[a]			Socioeconomic status[b]
Thwarted belongingness (TB)[a]		Compulsive behavior[d]	One or more identity documents[b]			Sexual orientation minority[d]
Interaction between TB and PB[d]		Psychiatric care history[ad]	Self-reported HIV status[d]			Incarceration[ad]
Painful and provocative events[a]						
Interaction between TB and painful and provocative events[a]						
Interaction between PB and painful and provocative events[d]						

Note:

[a]positive correlation,

[b]negative correlation,

[c]potential gender differences,

[d]null correlation.