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Review

Empirically supported affirmative psychological interventions for transgender and non-binary youth and adults: A systematic review

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ABSTRACT

Research suggests that transgender and non-binary (TGNB) individuals experience lower levels of psychological well-being than the general population. Although practice recommendations and guidelines exist, there is a paucity of studies evaluating the effects of psychological interventions on this group. This systematic review aimed to synthesize and analyze existing empirical affirmative psychological interventions for TGNB individuals to assess their efficacy. Eight databases (PubMed, Web of Science, PsycINFO, Scopus, LILACS, Cochrane, ProQuest, Google Scholar) were searched from January 2010 to June 2022 to identify relevant studies. Included studies needed to be randomized controlled trials, quasi-experimental, or uncontrolled pre-post. Twenty-two articles were included, of which eight had TGNB participants only, two had mixed samples with separated outcome data for TGNB participants, and 12 had mixed samples with no disaggregated data. Experimental designs, participant samples, assessed variables, and type of interventions varied widely across studies, thus preventing comparisons. Overall results suggest improvements in psychological distress, depression, anxiety, suicidality, substance-related risk behaviors, coping skills/emotion regulation, stress appraisal, self-esteem, self-acceptance, social support, minority stress, resilience, hope, positive identity, and identity acceptance, although conclusions are limited by moderate-to-high risk of bias. Future research should implement more consistent and rigorous methodological designs to assess and compare intervention efficacy.

1. Introduction

Transgender is an umbrella term that comprises a wide spectrum of individuals whose subjective experience of their own gender (commonly referred to as *gender identity*) does not match their birth sex. This concept includes individuals with gender identities that fall within the male/female gender binary (i.e., transgender man, transgender woman), as well as individuals who understand their gender identities outside of this

Abbreviations: TGNB, transgender and non-binary; RCT, randomized controlled trial; GMS, gender minority stress; GI, gender incongruence; ICD-11, International Classification of Diseases 11th version; WHO, World Health Organization; GD, gender dysphoria; APA, American Psychiatric Association/American Psychological Association; WPATH, World Professional Association for Transgender Health; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; PROSPERO, International Prospective Register of Systematic Reviews; LILACS, Latin American and Caribbean Health Sciences Literature; MeSH, Medical Subject Headings; HIV, human immunodeficiency virus; STI, sexually transmitted infection; NIH, National Institute of Health; RSE, Rosenberg Self-Esteem Scale; FS, Flourishing Scale; T-PIM, Transgender Positive Identity Measure; COVID-19, Coronavirus Disease 2019; SPARX, Smart, Positive, Active, Realistic, X-factor thoughts; TExT, Transgender Empowerment by Text; TA-CBT, Transgender Affirmative Cognitive Behavioral Therapy; TA, Transgender Affirmative Psychotherapy; BAMS, Building Awareness of Minority-Related Stressors; RISE, Releasing Internalized Stigma for Empowerment; iTEAM, My Treatment Empowerment for Adolescents on the Move; MHSE, Mental Health Systems Ecological model; LGBT, Lesbian, Gay, Bisexual, and Transgender; BDI-II, Beck Depression Inventory-II; LGBIS, Lesbian, Gay, and Bisexual Identity Scale; PHQ-9, Patient Health Questionnaire-9; GAD-7, Generalized Anxiety Disorder-7; SBQ-R, Suicidal Behaviors Questionnaire-Revised; CSE, Coping Self-Efficacy Scale; CES-D, Center for Epidemiological Studies-Depression Scale; BSI, Brief Symptom Inventory; SIDAS, Suicidal Ideation Attributes Scale; PCI-A, Proactive Coping Scale for Adolescents; SAMA, Stress Appraisal Measure for Adolescents; HS, Hope Scale; SMASI, Sexual Minority Adolescents Stress Inventory; BAI, Beck Anxiety Inventory; EQuIP, Empowering Queer Identities in Psychotherapy; P&E, Proud & Empowered; PRIDE, Pride in All Who Served; ABFT, Attachment-Based Family Therapy; ASSET, Affirmative Supportive Safe and Empowering Talk.

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binary, also known as *non-binary*. Despite being grouped under the same label (which inadvertently conveys a sense of coherence in their experiences), emerging research is starting to show important social and psychological differences between binary and non-binary transgender individuals (e.g., Bradford & Catalpa, 2019; Catalpa et al., 2019). In this review paper, we use the term transgender and non-binary (TGNB) for the sake of simplicity and methodological coherence; however, we recognize the heterogeneous nature of this category.

A 2020 systematic review with quality data from 19 studies conducted in 6 countries across Europe, North America, Asia, and Oceania estimated the proportion of individuals with a TGNB identity to be 0.3–0.5% among adults and 1.2–2.7% among children and adolescents (Zhang et al., 2020). However, these figures escalate up to 0.5–4.5% for adults and 2.5–8.4% for children and adolescents when broader manifestations of gender diversity (such as gender incongruence or gender ambivalence) are included (Zhang et al., 2020). Despite the methodological difficulties inherent to ascertaining a realistic estimation of the percentage of TGNB individuals worldwide (e.g., Collin, Reisner, Tangpricha, & Goodman, 2016; Goodman et al., 2019), this collective seems to constitute a noticeable proportion of the general population. In fact, existing epidemiological reports (Arcelus et al., 2015; Collin et al., 2016; Goodman et al., 2019; Zhang et al., 2020; Zucker, 2017) coincide in indicating a significant increase in prevalence over time, as well as an upward trend in the proportion of TGNB people in younger age groups.

A growing body of research suggests that TGNB individuals show lower levels of psychological well-being when compared to their non-TGNB counterparts. This involves an elevated prevalence of mental health problems, as well as a reduction in their overall quality of life. A systematic review of 15 studies published between 2011 and 2016 by Connolly, Zervos, Barone II, Johnson, and Joseph (2016) found that transgender youth (< 18) display increased rates of depression and depressive symptoms, suicidality, self-harm, and eating disorders in comparison to their peers from the general population. Several studies published since then have lent support to these findings (e.g., Becerra-Culqui et al., 2018; de Graaf et al., 2022; Newcomb et al., 2020; Veale, Watson, Peter, & Saewyc, 2017), which have also been replicated in adult TGNB populations (e.g., Beckwith et al., 2019; Bretherton et al., 2021). Wanta, Niforatos, Durbak, Viguera, and Altinay (2019), for instance, utilized electronic health records to retrospectively examine a cohort of 10,270 TGNB adult patients (>18) across 26 health systems in the United States. Of these, 58% had at least one mental health diagnosis, compared to 13% among non-TGNB patients, with major depressive disorder and generalized anxiety disorder being the most common.

Importantly, the presence of mental health issues exerts a significant impact on the quality of life of TGNB individuals. The findings from a systematic review and meta-analysis of 29 studies by Nobili, Glazebrook, and Arcelus (2018) suggest that the mental health-related quality of life of transgender adults is significantly poorer than that of the general population. More recent studies specific to non-binary populations have reached similar conclusions (e.g., Jones, Bouman, Haycraft, & Arcelus, 2019). These health disparities remain even when TGNB individuals are compared to their non-TGNB sexual minority (i.e., non-heterosexual) counterparts (e.g., Price-Feeney, Green, & Dorison, 2020; Warren, Smalley, & Barefoot, 2016), for whom past research has consistently shown a significant elevation of mental health problems (Plöderl & Tremblay, 2015). Although most of these studies have been conducted with convenience samples [1] and, therefore, might be subject to risk of bias, it seems increasingly clear that TGNB people present a higher burden of mental health issues, concerns, and risks when compared to their peers from the general population.

These findings have increasingly begun to be understood from a *gender minority stress* (GMS) framework (Hendricks & Testa, 2012; Testa, Habarth, Peta, Balsam, & Bockting, 2015), built upon Meyer (2003) minority stress theory, which posits that gender minority individuals face unique stressors that put them at an elevated risk of developing adverse health-related outcomes. These stressors can be classified as distal or proximal (Meyer, 2003). Distal stressors "reside" in the environment and are objective in the sense that they do not depend on the person's perception or self-identification, i.e., they operate beyond one's control. From a GMS perspective (Testa et al., 2015), this includes events of prejudice such as rejection, discrimination, victimization, and non-affirmation vis-à-vis an individual's TGNB identity. Proximal stressors, on the contrary, are subjective and result from the internalization of negative societal attitudes, attributions, and experiences of prejudice (Meyer, 2003; Meyer, 2015). From a GMS point of view, this includes anticipated stigma, internalized transphobia, and gender identity concealment (Testa et al., 2015).

The relationship between minority stressors and mental health conditions appears to be mediated by the individual's cognitive, interpersonal, and emotional psychological processes, a framework originally advanced by Hatzenbuehler (2009) (commonly referred to as the *psychological mediation framework*) that has started to receive empirical support in the TGNB literature (e.g., Sarno, Newcomb, & Mustanski, 2020; Scandurra et al., 2018; Staples, Neilson, Bryan, & George, 2018; Timmins, Rimes, & Rahman, 2017; Tucker et al., 2019). The GMS explanatory model has become predominant in the literature around mental health in TGNB individuals (see, e.g., Valentine & Shipherd, 2018), although not without its challenges. Zucker, Lawrence, and Kreukels (2016) and then Bailey (2020), for example, have suggested that, since in the GMS theory a direction of effect cannot be reliably determined, there is also a possibility that TGNB individuals with mental health issues are more likely to receive or perceive events of prejudice and discrimination from others.

While the debate remains open, much of the literature concerned with the mental health of TGNB individuals has been devoted to medical ways of dealing with gender incongruence (GI), which is the medical term proposed by the 11th version of the International Classification of Diseases (ICD-11; World Health Organization (WHO), 2019) to refer to the marked incongruence between an individual's birth sex and experienced gender (i.e., gender identity). GI that is accompanied by a clinically significant psychological distress is often referred to as gender dysphoria (GD) (American Psychiatric Association (APA), 2013). Generally, research articles within this category have measured the effects of different medical interventions aimed at reducing GI/GD, including hormone therapy and gender reassignment surgeries, on different mental health-related outcomes, such as levels of depression, anxiety, or quality of life (for reviews, see Baker et al., 2021; Wernick, Busa, Matouk, Nicholson, & Janssen, 2019). These interventions are now commonly referred to as "gender affirmative," since they are intended to help TGNB individuals express and live according to their gender identity.

Much less research, however, has been devoted to assessing the effects of *gender affirmative psychological interventions* on the mental health of TGNB individuals. According to the American Psychological Association (APA), these involve the "provision of care that is respectful, aware, and supportive of the identities and life experiences of [TGNB] people" (APA, 2015, p. 832–833). Catelan, Costa, and Lisboa (2017), for instance, conducted a scoping review of articles published between 1980 and 2015 on psychological interventions for TGNB individuals and found no clinical trials, quasi-experimental studies, or any other robust design that allowed for an evaluation of treatment efficacy. Budge and Moradi (2018), on their part, attempted to conduct a meta-analytic review of studies assessing the outcomes of transgender-specific affirmative psychotherapies, but the search yielded no eligible results. Moreover, none of the 10 studies included for content analysis had empirical data regarding treatment efficacy, but instead were concerned with TGNB individuals' experiences of psychotherapy or with

[1] Non-probabilistic and dependent on availability, accessibility, and easiness of recruitment.

psychotherapists' skills and attitudes towards TGNB clients.

This is surprising for three reasons. First, the burden of mental health issues experienced by TGNB individuals could be contemplated as a public health issue if one considers the sizable percentage of individuals that identify within the transgender spectrum nowadays. Second, gender-affirming medical interventions are not always indicated or desired by all TGNB individuals and they alone are unlikely to entirely resolve the mental health disparities observed in this population (Coyne, Poquiz, Janssen, & Chen, 2020). Third, several relevant associations for the health of TGNB individuals, such as the World Professional Association for Transgender Health (WPATH; Coleman et al., 2012), the Endocrine Society (Hembree et al., 2017), or the American Psychological Association (APA, 2015), have repeatedly emphasized the important role that mental health clinicians play in providing care for TGNB individuals.

The paucity of empirical studies assessing treatment efficacy and feasibility contrasts with the relative abundance of literature outlining clinical practice recommendations for psychological affirmative work with TGNB people (e.g., Chang, Singh, & Dickey, 2018; Fraser, 2009; Singh & Dickey, 2017), making theory-driven transgender-specific adaptations to existing psychological practices (e.g., Austin & Craig, 2015; Budge, 2013; Chang, 2017; Lange, 2020; Matsuno & Israel, 2018), or even putting forward new models of psychotherapy with TGNB individuals (e.g., Rider et al., 2019; Spencer et al., 2021). Although many psychotherapists and other mental health professionals might find these contributions valuable for implementation into their practice, the lack of an empirical basis is particularly concerning. On the one hand, it hampers the assessment of treatment efficacy, which is essential to detect the strengths, weaknesses, and room for improvement of any psychological intervention. On the other hand, it impedes us to "elucidate *which* [TGNB individuals] are at risk for *which* forms of distress and *why*" (Spivey & Edwards-Leeper, 2019, p. 347; italics in the original). In other words, empirical research is critical to understand what, how, and why TGNB individuals benefit from psychological interventions, as well as the way minority stress interacts with other environmental and developmental factors. Therefore, "we must prioritize advancing the field of psychological interventions in the direction of affirmative and empirically based treatment approaches" (Spivey & Edwards-Leeper, 2019, p. 343).

With this goal in mind, the current review provides a systematic synthesis of the existing empirically supported affirmative psychological interventions for TGNB individuals since 2010. More specifically, the review aims to answer the following questions: (1) Are there empirically supported affirmative psychological interventions targeted at mental health and psychological distress in the TGNB population? (2) If so, what is their efficacy and what are their key features? (3) What are the limitations of existing literature and how can this be addressed in future research? The review will be useful for mental health professionals working with TGNB individuals, as well as for other professionals interested in addressing the unique needs of this population.

2. Method

This systematic review was conducted in accordance with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021). The protocol for the review can be found on the International Prospective Register of Systematic Reviews (PROSPERO) with the code CRD42021257337.

2.1. Search strategy

A systematic search of the literature was conducted in eight different scholarly databases: PubMed, Web of Science, PsycINFO, Scopus, LILACS, Cochrane, ProQuest, and Google Scholar. For practical reasons, the search in Google Scholar (aimed at screening grey literature and identifying potential articles not captured by the other databases) was narrowed down to the first 200 records. The search was limited to research articles focusing on affirmative psychological interventions for TGNB individuals, and it was restricted to publications in Spanish or English language between January 1, 2010, and June 30, 2022. The search strategy used for this review can be found in Table 1. The selection of the search terms was informed by a preliminary search of the literature in an early stage of the review, prior to conducting the exhaustive database search. Two authors (PEC and JIPF) independently conducted the database search. The search strategy was applied to the Title, Abstract, Text words, and Medical Subject Headings (MeSH) terms fields, although it was adapted and modified according to the advanced search features of each specific database. We also conducted a hand search of references of studies assessed for eligibility with a view to detect potential records missed by the database search. This approach yielded a total of 1671 articles, of which 876 were unique records after removing duplicates (k = 795). Records were managed through the EndNote management tool.

2.2. Eligibility criteria

Included papers needed to meet the following criteria: (a) having adolescent and/or adult TGNB participants (i.e., 12 years old or older); (b) having some form of well-described psychological intervention for TGNB individuals (i.e., with an adequate level of detail about its content and structure); and (c) measuring and reporting the efficacy of the intervention with quantitative measures. Only randomized controlled trials (RCTs), quasi-experimental designs, and uncontrolled pre-post studies (including pilot studies) were included in the analysis; papers merely describing or presenting treatment models and intervention studies aimed at healthcare professionals or family members of TGNB individuals were excluded. Other exclusion criteria were studies not providing pre- and post-treatment data, studies with a focus on human immunodeficiency virus (HIV) or other sexually transmitted infections (STIs), and studies being written in languages other than English and Spanish. Observational studies (including case studies), practice recommendations, theoretical essays, editorials, letters to the editor, abstracts, and conference papers were also excluded.

Ideally, we hoped to have two additional eligibility criteria to assure more review specificity: one requiring included studies to assess psychological treatments designed specifically for work with TGNB people, and another one limiting the inclusion of studies where treatment data from TGNB individuals appeared mixed (i.e., not disaggregated) with data from non-TGNB populations (e.g., sexual minorities). However, given the anticipation that only a small number of studies would comply

Table 1
Search strategy used.

1	transgender OR non-binary OR gender diverse OR gender-nonconforming OR gender minority OR gender creative OR gender expansive OR gender fluid OR agender OR transsexual OR gender dysphoria OR gender incongruence
2	distress OR stress OR depression OR anxiety OR coping OR resilience OR trauma OR suicidal ideation OR suicidal thoughts OR suicidal behavior OR suicidality OR substance abuse OR impairment OR internalizing problems OR externalizing problems OR negative emotions OR negative health outcomes OR risk OR maladaptive behaviors OR gender-related distress OR identity-related distress OR identity-related stressors OR minority stress OR minority stressors OR internalized transphobia OR internalized transnegativity OR rejection OR non affirmation OR non-disclosure OR shame OR stigma OR empowerment OR self-esteem OR social support OR interpersonal difficulties OR quality of life OR well-being OR psychological functioning OR psychological difficulties OR psychological distress OR psychological problems OR psychopathology OR symptomatology OR emotional difficulties OR mental health problems OR mental health disorders OR mental health OR behavioral health
3	affirmative OR affirmation OR affirming
4	psychological OR psychotherapy
5	intervention OR practice OR counseling OR treatment OR therapy OR care OR training OR program OR trial
6	#1 AND #2 AND #3 AND #4 AND #5

with such criteria, we decided to broaden our scope and include *any* study assessing the efficacy of *any* kind of psychological treatment with TGNB individuals among its participants.

The eligibility of each article was decided based on the title and abstract; however, the full text was also examined when the title and abstract alone were not sufficient to determine its eligibility for the review. Each record was assessed independently by two of the authors (PEC and JIPF) and discrepancies were resolved by the third author (KS). A Cohen's Kappa index of 0.72 ($\kappa = 0.72$) was obtained for abstract inclusion. This initial screening resulted in a total of 31 reports deemed potentially eligible for inclusion in the systematic review, of which one could not be retrieved. Of the 30 full-text records assessed for eligibility, three were excluded for not having pre-post treatment data available, two for not describing the intervention content, one for presenting a case series, one for describing no relevant outcomes, and one for having a sample overlap. The final selection for this systematic review comprised 22 studies that satisfied the inclusion criteria ($n = 22$). Fig. 1 illustrates the selection process that identified studies for inclusion in this review.

2.3. Data extraction

We extracted the following information from each of the article: (a) study design; (b) sample size and characteristics; (c) assessed variables; (d) type, structure, and content of the intervention; (e) number of assessments and time to follow-ups; (f) intervention results; and (g) participant dropout rate. For articles with unclear or insufficient data regarding any of these aspects, the corresponding author was contacted for further clarification. A headed table was used to conduct the extraction of information from the full texts. Extraction was initially conducted by the first author (PEC) and then repeated by the second and third authors (JIPF and KS) to minimize the probability of errors. For studies assessing numerous variables, only those results statistically significant at a p-value of 0.05 ($\alpha = 0.95$) were reported in the tables. However, we also decided to report on any result not statistically significant at $\alpha = 0.95$ but presenting medium or large effect sizes in a narrative manner.[2] In uncontrolled pre-post studies not reporting effect sizes, but with enough data to conduct an estimation (e.g., a t-statistic and the degrees of freedom (df)), we calculated an r effect size using the formula provided by Field (2013, p. 368) for paired t-tests: $r = \sqrt{\frac{t^2}{t^2+df}}$.

After extracting this information, we organized the articles according to criteria (a) (study design) and (b) (sample characteristics), with the aim of allowing for a distinction between more and less robust study designs and between interventions specific and non-specific to TGNB populations. Thus, following criterion (a), we classified each article into three different categories: RCTs, quasi-experimental studies (i.e., with a control group but where group allocation is not randomized), and uncontrolled pre-post studies. Following criterion (b), we divided the articles into two different groups: studies with TGNB participants only and studies with a combination of TGNB and non-TGNB participants. Yet, if the data for the TGNB subsample of participants appeared disaggregated, we decided to classify the study within the first group (i.e., within studies with TGNB participants only). Microsoft Excel was the software used over the course of data extraction. This resulted in the creation of five different tables: two containing RCTs and uncontrolled pre-post studies with TGNB participants only (Table 2 and Table 3) and three containing RCTs, quasi-experimental, and uncontrolled pre-post studies with a combination of TGNB and non-TGNB individuals (Table 4, Table 5, and Table 6).

[2] Medium or large effect sizes might be associated to non-significant p-values (i.e., $p > .05$) due to sample size issues (e.g., a small sample size) (Morales Vallejo, 2008).

2.4. Quality assessment

The quality assessment tools produced by the United States National Institutes of Health (National Institute of Health (NIH), 2021) were used to assess each study's quality and level of evidence. These tools consist of a checklist (or a list of items) devised to evaluate aspects related to the study method and implementation that are considered critical for its internal validity. The NIH quality assessment tools were applied *exclusively* to the studies with TGNB participants only (or presenting separated treatment data for the TGNB subsample of participants), since they constitute the clinical population of interest that would benefit from the analyzed psychological interventions. Specifically, we used the quality assessment tool of controlled intervention studies for RCTs, which contains 14 items (Table A1), and the quality assessment tool for before-after (pre-post) studies with no control group for uncontrolled pre-post studies, which includes 12 items (Table A2). We did not use a quality assessment tool for quasi-experimental designs as there were no studies included within this category. Each item on the tools had three response options: 'Yes,' 'No,' and 'Cannot determine/Not reported/Not applicable.' The total score of each study was calculated by summing the number of 'Yes' in response to the items, with scores situated between 0 and 14 for RCTs and between 0 and 12 for uncontrolled pre-post studies. Quality ratings were 'Poor,' if the study obtained less than 50% of the total score; 'Fair,' if the study obtained between 50 and 75% of the total score; and 'Good,' if the study obtained more than 75% of the total score. Better scores indicate less risk of bias and, therefore, greater study's internal validity, and vice versa.

The methodological quality of the articles included in this review was assessed independently by two authors (PEC and KS) and discrepancies were resolved by a third author (JIPF).

2.5. Data synthesis and analysis

All studies included in the systematic review were synthesized and summarized narratively. A meta-analysis was planned but eventually not performed, as it was deemed inappropriate given that the characteristics of included studies (their sample sizes, experimental designs, intervention types, and assessed outcomes) were too diverse to yield a meaningful summary estimate of effect (McKenzie & Brennan, 2021). Besides, for RCTs and quasi-experimental studies, only those results arising from between-group comparisons were reported in the text, unless only within-group comparisons were available.

3. Results

The 22 studies analyzed are presented in Tables 2–6, which provide an overview of each study's characteristics and main findings. All studies were published in the last nine years, between 2014 and 2022. Fifteen were carried out in the United States (68.2%), four in Canada (18.2%), and one in each of the following countries: Italy, New Zealand, and the United Kingdom (4.6% each). Of the 22 studies included in the review, eight had TGNB participants only and two had a combination of TGNB and non-TGNB participants but provided disaggregated treatment data for the TGNB subsample ($n = 10$, 45.5%). Of these, three were RCTs (30%) and seven were uncontrolled pre-post studies (70%); there were no quasi-experimental studies within this category. Two of the included documents corresponded to doctoral dissertations. The remaining 12 studies (54.5%) included a combination of TGNB and non-TGNB participants and did not provide separated data for the TGNB subsample, of which four were RCTs (33.3%), two were quasi-experimental (16.7%), and six were uncontrolled pre-post studies (50%).

3.1. Studies with TGNB participants only

Among studies with TGNB participants exclusively (Amodeo, Picariello, Valerio, & Scandurra, 2018; Austin, Craig, & D'Souza, 2018;

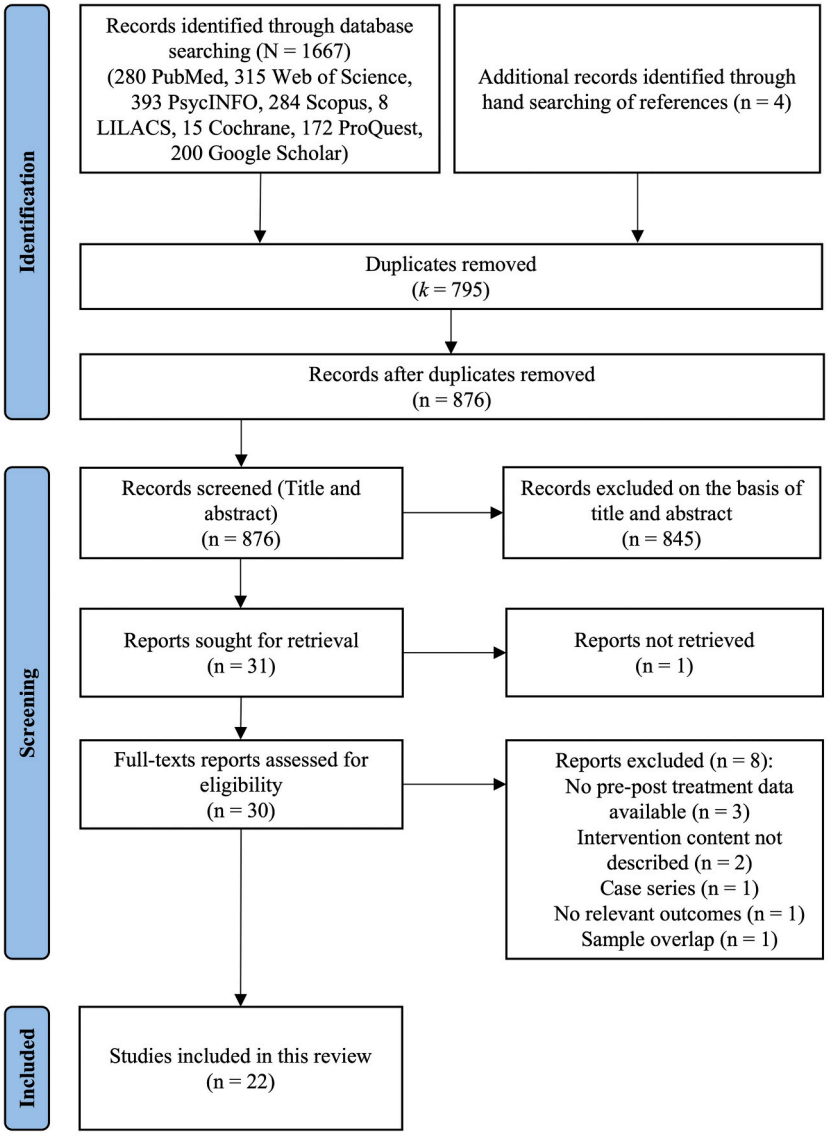

Fig. 1. PRISMA flow diagram.

Budge, Sinnard, & Hoyt, 2021; Clements, Rostosky, McCurry, & Riggle, 2021; Israel et al., 2020; Knutson et al., 2020; Martin, 2019; Riach, 2021) or with treatment data disaggregated for the subsample of TGNB participants (Lucassen et al., 2020; Stevens, Haverly, & Powell, 2020) (see Tables 2 and 3), sample sizes ranged between eight (Amodeo et al., 2018; Austin et al., 2018) and 639 (Israel et al., 2020) at baseline. Only three out of the 10 studies had a sample size larger than 100 (Israel et al., 2020; Lucassen et al., 2020; Martin, 2019), while the remaining studies had samples of between eight and 45 TGNB participants. The total number of participants at baseline across the studies was 1041 (M = 104.1; Mdn = 17.5). However, attrition was often significant: dropout rates based on missing data at post-intervention, i.e., from baseline to either post-intervention or follow-up, ranged from 0% to 92.4% (M = 27.7%; Mdn = 10.5%).

Data on the mean age of participants were retrievable in nine out of 10 studies (Amodeo et al., 2018; Austin et al., 2018; Budge et al., 2021; Clements et al., 2021; Israel et al., 2020; Knutson et al., 2020; Lucassen et al., 2020; Martin, 2019; Riach, 2021), with numbers ranging between 15.05 and 47.93 years (M = 27.3; Mdn = 28.5). Information about the birth sex of TGNB participants was retrievable only in six studies (Amodeo et al., 2018; Budge et al., 2021; Israel et al., 2020; Knutson et al., 2020; Martin, 2019; Riach, 2021), and all but one study (Lucassen et al., 2020) reported on the specific gender identity of their participants. In this regard, determining the number of participants associated with each gender identity was difficult, as two of the studies (Austin et al., 2018; Israel et al., 2020) gave their participants the option of choosing various gender identity categories simultaneously (i.e., response options were not mutually exclusive). All studies drew on gender minority stress as their main theoretical and conceptual framework.

The number of quantitative outcome variables assessed before and after intervention ranged considerably between studies, with two studies assessing just one variable (resilience, Amodeo et al., 2018; depressive symptoms, Lucassen et al., 2020), one study assessing two variables (depression and coping skills, Austin et al., 2018), one study assessing three variables (shame, pride, and affect; Israel et al., 2020), and the rest of studies assessing between four and nine variables (M = 4; Mdn = 4). Additionally, one study collected qualitative thematic data by means of a focus group (Amodeo et al., 2018) and five studies assessed the feasibility, acceptability, and/or satisfaction with the intervention with quantitative and/or qualitative measures, including Likert-type and open-ended survey questions (Austin et al., 2018; Budge et al., 2021; Knutson et al., 2020; Martin, 2019; Riach, 2021).

Assessed variables presented an important heterogeneity, and

Table 2
RCTs with TGNB participants only.

Author, year, country	Randomized participants (IG-CG)	Dropout rate	Assessed variables	Intervention type, content, and structure (IG-CG)	N° of assessments and time to follow-up	Results
Budge et al. (2021) United States	$N = 20$ IG ($n = 10$) M age = 31.11 7 FAB, 3 MAB CG ($n = 10$) M age = 27.5 7 FAB, 2 MAB, 1 missing	IG: 10% ($n = 1$) at follow-up CG: 10% ($n = 1$) at post and 20% ($n = 2$) at follow-up	Minority stress and resilience (GMSR: non-affirmation, internalized transphobia, pride, community connectedness) Overall distress (OQ-45) Working Alliance (WAI-C) Feasibility and change interviews	IG: Transgender Affirmative Psychotherapy (TA) + Building Awareness of Minority-Related Stressors (BAMS): (a) psychoeducation on minority stress; (b) prompts to recall and discuss recent minority stress experiences (10–12 weekly individual sessions) CG: Transgender Affirmative Psychotherapy (TA): e.g., asking about pronouns, discussing gender identity, basic transgender health (7–12 weekly individual sessions)	Pre, post, 6 months follow-up	Within-IG differences: overall distress decreased pre-post ($d = -0.90$, $p = .02$), but not from pre to follow-up ($d = -0.95$, $p = .09$). Non-affirmation improved pre-post ($d = -1.07$, $p = .02$) and from pre to follow-up ($d = -1.00$, $p = .05$) Within-CG differences: overall distress decreased pre-post ($d = -0.87$, $p = .01$), but not from pre to follow-up. Non-affirmation did not change pre-post, but it did from pre to follow-up ($d = -0.97$, $p = .04$) Effect sizes were not significantly different between IG and CG ($p > .05$). Working alliance increased over time for both groups ($B = 0.72$, $p = .003$). All participants were satisfied and had a positive experience in the study
Israel et al. (2020) United States	$N = 639$ M age = 28.74 332 FAB, 287 MAB, 10 intersex IG ($n = 294$) CG ($n = 345$)	IG: 11% ($n = 31$) CG: 8% ($n = 29$)	Pre (covariates): Identity concealment (NOS-C) and self-esteem (RSE) Post (outcomes): internalized transphobia (TIS, Shame and Pride subscales), affect (PANAS), "At what age would the intervention have been most useful?"	IG: Online modified version of the Releasing Internalized Stigma for Empowerment (RISE) model: (a) combatting stereotypes; (b) identifying and rejecting negative messages; (c) reinforcing the rejection of negative messages; (d) enhancing identity affirmation (30–45 min, individual) CG: online stress management: (a) myths and facts about general stress; (b) messages that may contribute to stress; (c) relaxation techniques; (d) benefits of exercise and stress-relieving images/music (30–45 min, individual)	Post	Between-IG and CG differences: lower levels of shame (F (1, 606) = 27.78, $d = 0.43$, $p = .001$) and higher levels of pride (F (1, 607) = 29.01, $d = 0.43$, $p = .001$) for the IG. Higher levels of positive affect (t (625) = −2.14, $p = .03$) for the IG
Martin (2019) United Kingdom	$N = 120$ 120 FAB IG ($n = 90$) M age = 18.09 CG ($n = 30$) M age = 17.73	IG: 74.4% ($n = 67$) CG: 26.66% ($n = 8$)	Individual: transphobic events (STE), self-esteem (RSE, SSES), self-efficacy and resilience (SAMA), psychological distress (CORE-OM), well-being (FS) Community: group identity (CSES), pride (T-PIM) Sociopolitical: activism (AICS), QueerViBE evaluation survey, Empowerment	IG: QueerViBE, 6 interactive online video tutorials: (a) introduction to gender and power; (b) masculinities and stereotypes; (c) queer goggles & gender categories; (d) dealing with intrusive questions; (e) breaking the rules: being misgendered; (f) breaking the rules: doing it your way (6–12 min each, individual) CG: waitlist	Pre, post, 1 month follow-up	Between-IG and CG differences: lower psychological distress (t (43) = −2.12, $d = 0.63$, $p = .04$), better positive trans identity (t (43) = 2.39, $d = 0.71$, $p = .02$) and lower stress appraisal (t (43) = 2.25, $d = 0.67$, $p = .03$) pre-post for the IG Within-IG differences: psychological distress improved pre-post (M diff = 13.83, $p = .004$) and between pre and follow-up (M diff = 10.35, $p = .004$). Self-esteem improved pre-post (M diff = −4.22, $p = .001$) and between pre and follow-up (M diff = −2.65, $p = .001$). Positive trans identity (M diff = −10.00, $p = .001$) and stress appraisal (M diff = −3.30, $p = .02$) improved only pre-post. State self-esteem improved after each tutorial ($p < .05$)

Notes. FAB: female at birth; MAB; male at birth; GMSR: Gender Minority Stress and Resilience Measure; OQ-45: Outcome Questionnaire; WAI-C: Working Alliance Inventory–Short Form C; NOS-C: Nebraska Outness Scale-Concealment; RSE: Rosenberg Self-Esteem Scale; TIS: Transgender Identity Survey; PANAS: Positive and Negative Affect Schedule; STE: Schedule of Transphobic Events; Scale; SSES: State Self-Esteem Scale; SAMA: Stress Appraisal Measure for Adolescents; CORE-OM: Clinical Outcomes in Routine Evaluation Outcome Measure; FS: Flourishing Scale; CSES: Collective Self-Esteem Scale; T-PIM: Transgender Positive Identity Measure; AICS: Activist Identity and Commitment Scale.

Table 3
Uncontrolled pre-post studies with TGNB participants only.

Author, year, country	Participants*	Dropout rate	Assessed variables	Intervention type, content, and structure	N° of assessments, time to follow-up	Results
Amodeo et al. (2018) Italy	$N = 8$ M age = 28.5 7 MAB, 1 FAB	0%	Resilience (RS-14) Focus group	Group training. Positive action—Promoting change program: (a) roulette of identities; (b) sharing of transphobic experiences; (c) social dreaming matrix	Pre, post, 3 months follow-up	Increase in resilience from pre (M = 5.7) to follow-up (M = 6.62) (p = .026), but not pre-post Themes: identity affirmation (gender identity recognized and supported by others), self-recognition and acceptance (internal confidence in feeling transgender), group as support (trans group support as a source of resilience)
Austin et al. (2018) United States	$N = 8$ Age range 16–18 M age = 17.62 Birth sex not reported	25% (n = 2) at follow-up	Depression (BDI-II) Reflexive coping (PCI-A) AFFIRM Satisfaction Survey	Group transgender affirmative cognitive-behavioral therapy. AFFIRM, 8 modules: (a) introduction to CBT and understanding minority stress; (b) understanding the impact of homophobic and transphobic attitudes and behaviors on stress; (c) understanding how thoughts affect feelings; (d) using thoughts to change feelings; (e) exploring how activities affect feelings; (f) planning to overcome counterproductive thoughts and negative feelings; (g) understanding the impact of minority stress and homo/transphobia on social relationships; (h) developing safe, supportive, and identity affirming social networks (2-days retreat)	Pre, post, 3 months follow-up	Decrease in depression pre-post (t (7) = 5.16, r = 0.89, p = .001) and from pre to follow-up (t (5) = 3.44, r = 0.84, p = .018). However, mean scores at post and follow-up remained in the BDI-II Severe range (29–63) Participants showed high levels of satisfaction with the intervention
Clements et al. (2021) Unites States	$N = 11$ M age = 27 Birth sex not reported	0%	Positive Identity (T-PIM) Happiness (OHQ) Life satisfaction (SWLS) Well-being (FS)	Group therapy. Focus group discussion about positive transgender identity (90 min duration) + creation of a video of personal narratives highlighting positive aspects of their identities (1–2 min)	Pre, post	Participants reported high pre-intervention scores. No statistically significant differences reported
Knutson et al. (2020) United States	$N = 15$ M age = 31.64 9 FAB, 5 MAB, 1 missing	6.7% (n = 1) at post	Credibility/expectancy (CEQ) Anxiety and depression weekly check-in (1–10 scale) Anxiety (PROMIS-Anxiety-8a) Depression (PROMIS-Depression-8b) Social support (MSPSS) Treatment acceptability (TAQ)	Online text-based cognitive-behavioral intervention through SMS services. Transgender Empowerment by Texting (TExT): (a) goals and expectations; (b) behavioral activation; (c) identifying negative thoughts; (d) challenging negative thoughts; (e) exposure; and (f) social support (6-weeks, 24-days; individual)	Pre, post, 3 months follow-up	Anxiety decreased pre-post (t (13) = 2.95, d = 0.40, p = .01) and from pre to follow-up (t (13) = 3.26, d = 0.65, p = .01). Depression decreased only pre-post (t (13) = 2.76, η^2 = 0.73, p = .05). Social support increased only between pre and follow-up (t (13) = −2.45, d = 0.29, p = .05) Participants showed high levels of satisfaction with the intervention
Lucassen et al. (2020) New Zealand	$N = 185$ Age range = 12–19 M age = 15.05 Birth sex not reported	92.4% (n = 171) at post	Depressive symptoms (PHQ-A)	Online cognitive behavioral therapy. Smart, Positive, Active, Realistic, X-factor thoughts (SPARX): Computerized self-help program through a fantasy world with 7 modules. Each module teaches one core CBT skill: relaxation training, behavioral activation, social skills training, recognizing or naming cognitive distortions, problem-solving, and cognitive restructuring (30 min per module, individual)	Pre, post (module 4 or module 7)	No improvements in depressive symptoms (M diff = −0.43, CI 95% [−6.83, 5.97]). Very low engagement for users (< 10%)
Riach (2021) United States	$N = 14$ Age range = 30–67 M age = 47.93 14 MAB	57.1% (n = 8) at booster	Screening: depression (PHQ-9), traumatic events (THQ) Outcomes: somatization-anxiety-depression (PHQ-SAD), generalized anxiety disorder (GAD-7), alcohol use (AUDIT-C), drug use (DAST-10), satisfaction (GSS)	Group transgender affirmative cognitive-behavioral therapy. TA-CBT: (1) introduction to CBT model and minority stress; (2) risk factors and their impact on stress and depressive symptomatology; thoughts, feelings, reactions and behaviors interact and can perpetuate depressive symptomatology; (3) effects of minority stress, antitransgender and transphobic attitudes and behaviors; discuss coming out experiences and	Pre, post (5th session), 1 month booster (6th session)	Reduction in depressive symptoms (t (5) = 3.27, r = 0.82, p = .022) from pre to booster, but severity of depression remained on the moderate range

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Table 3 (*continued*)

Author, year, country	Participants*	Dropout rate	Assessed variables	Intervention type, content, and structure	N° of assessments, time to follow-up	Results
				internalized transphobia; (4) use thougts to change feelings; introduce mindfulness training; (5) overcome counterproductive thoughts and negative feelings by building hope; (6) developing social relationships and safe, supportive, and identity-affirming social networks; relapse prevention (5 + 1 weekly sessions, 2–2.5 h)		
Stevens et al. (2020) United States	$N = 21$ Age range = 15–29 Birth sex not reported	0%	Self-acceptance (SAC) Mental health/housing stability/employment status (GPRA Tool) Gender and sexual identity (iSQ)	Community-based, coordinated intervention. My Treatment Empowerment for Adolescents on the Move (iTEAM): (a) Strength-based Case Management; (b) Motivational Enhancement Therapy & Cognitive-Behavioral Therapy (MET/CBT5); (c) Street Smart, a sexual health education intervention; (d) crisis and mental health counseling; (e) education and employment services; (f) direct enrollment in local housing programs	Pre, 6 months follow-up	Improvement in overall self-acceptance scores (t (20) = −3.35, $r = 0.59$, $p = .002$), including self-confidence (t (20) = −3.51, $p = .001$), social-confidence (t (20) = −1.97, $p = .032$), and locus of control (t (20) = −2.61, $p = .009$) subscales. Improvements in employment and housing stability, but not in mental health

Notes. *N represents the number of intent-to-treat participants. MAB: male at birth; FAB; female at birth; RS-14: 14-items Resilience Scale; BDI-II: 21-Item Beck Depression Inventory; PCI-A: Adolescent Proactive Coping Inventory; T-PIM: Transgender Positive Identity Measure; OHQ: Oxford Happiness Questionnaire; SWLS: Satisfaction with Life Scale; FS: Flourishing Scale; CEQ: Credibility/Expectancy Questionnaire; PROMIS: Patient-Reported Outcomes Measurement Information System; MSPSS: Multidimensional Scale of Perceived Social Support; TAQ: Treatment Acceptability Questionnaire; PHQ-A: Patient Health Questionnaire-Adolescents; PHQ-9: Patient Health Questionnaire-9; THQ: Trauma History Questionnaire; PHQ-SAD: Patient Health Questionnaire: Somatization, Anxiety, and Depressive Symptoms; GAD-7: Generalized Anxiety Disorder-7; AUDIT-C: Alcohol Use Disorders Identification Test; DAST-10: Drug Abuse Screening Test; GSS: Group Satisfaction Scale; SAC: Self-Acceptance Scale; GPRA Tool: Substance Abuse and Mental Health Services Administration's Client Outcome Measures for Discretionary Programs Government Performance and Results Act; iSQ: iTEAM Supplemental Questionnaire.

included: depressive and anxious symptomatology, overall psychological distress, substance abuse, perceived social support, well-being, working alliance, gender minority stress and resilience, self-esteem, coping skills, and various aspects specifically related to TGNB identities, such as pride or shame. Four studies coincided in measuring depression as an outcome (Austin et al., 2018; Knutson et al., 2020; Lucassen et al., 2020; Riach, 2021), two in measuring psychological distress (Budge et al., 2021; Martin, 2019), and two in measuring well-being and positive TGNB identity (Clements et al., 2021; Martin, 2019). Measuring instruments were also diverse. Indeed, there was concordance only for three instruments across the studies: the Rosenberg Self-Esteem Scale (RSE), used by two studies (Israel et al., 2020; Martin, 2019), and the well-being Flourishing Scale (FS) and the Transgender Positive Identity Measure (T-PIM), used by another two studies (Clements et al., 2021; Martin, 2019).

Five of the interventions were provided in an individual manner (Budge et al., 2021; Israel et al., 2020; Knutson et al., 2020; Lucassen et al., 2020; Martin, 2019), three were group-based (Amodeo et al., 2018; Austin et al., 2018; Clements et al., 2021), and one was a combination of group and individual (Stevens et al., 2020). Five of the interventions were face-to-face (Amodeo et al., 2018; Austin et al., 2018; Budge et al., 2021; Clements et al., 2021; Stevens et al., 2020) and four were delivered online over the smartphone or the computer (Israel et al., 2020; Knutson et al., 2020; Lucassen et al., 2020; Martin, 2019). One study combined face-to-face group-based sessions and individual sessions by phone due to the shelter-in-place order caused by the COVID-19 pandemic (Riach, 2021).

Regarding the treatments' theoretical basis, one intervention in this category used cognitive behavioral therapy techniques and concepts (Smart, Positive, Active, Realistic, X-factor thoughts [SPARX], Lucassen et al., 2020), three used affirmative TGNB-specific adaptations of cognitive behavioral techniques and concepts (AFFIRM, Austin et al., 2018; Transgender Empowerment by Texting [TExT], Knutson et al., 2020; Transgender Affirmative Cognitive Behavioral Therapy [TA-CBT], Riach, 2021), and another used a combination of TGNB affirmative (psychodynamic and person-centered) psychotherapy and psychoeducation about gender minority stressors (Transgender Affirmative Psychotherapy + Building Awareness of Minority-Related Stressors [TA + BAMS], Budge et al., 2021). Additionally, one intervention used concepts and theories from social psychology to reduce internalized stigma (Releasing Internalized Stigma for Empowerment [RISE], Israel et al., 2020) and another used concepts from queer theory to promote empowerment (QueerViBE, Martin, 2019). Two of the interventions were more experience-based: one used different group dynamics related to the participants' identities (Positive action—Promoting change, Amodeo et al., 2018) and another used a focus group followed by the creation of a video narrating positive aspects of the participants' identity (Clements et al., 2021). Finally, one intervention used an array of community-based services, including counseling, psychoeducation, sexual health education, and employment/housing programs (My Treatment Empowerment for Adolescents on the Move [iTEAM], Stevens et al., 2020).

Among the three RCTs in this category, two had active control groups (Budge et al., 2021; Israel et al., 2020) and one used a waitlist control group that did not receive the intervention (Martin, 2019). The remaining studies lacked a control group for comparison. In total, one RCT (Budge et al., 2021) and three uncontrolled pre-post studies (Austin et al., 2018; Clements et al., 2021; Knutson et al., 2020) were categorized as pilot studies. Regarding moments of assessment, three studies had pre and post measurements only (Clements et al., 2021; Israel et al., 2020; Lucassen et al., 2020); among these, the RCT by Israel et al. (2020) used different pre- and post-intervention measures, using the former as covariates to estimate between-group differences in the latter. Six studies (Amodeo et al., 2018; Austin et al., 2018; Budge et al., 2021; Knutson et al., 2020; Martin, 2019; Stevens et al., 2020) had additional follow-up measurements; however, one lacked an immediate post-

Table 4
RCTs where TGNB participants are mixed with non-TGNB populations.

Author, year, country	Randomized participants (IG-CG)	Dropout rate	Assessed variables	Intervention type, content, and structure (IG-CG)	N° of assessments, time to follow-up	Results
Goldbach, Rhoades, Mamey, et al. (2021) United States	$N = 46$, 6 TGNB Age range 13–18 32 FAB, 12 MAB, 2 missing IG ($n = 27$) CG ($n = 19$)	IG: 3.7% ($n = 1$) at post CG: 5.5% ($n = 1$) at post	Minority stress (SMASI) Anxiety (BAI) Depression (BDI-II) Trauma (PCL-5) Suicidality (C-SSRS)	IG: School based group therapy. Proud & Empowered: (1) Introduction, meeting new people, and LGBTQ+ 101; (2) stress and coping overview; (3) coming out, disclosure and decision making; (4) families of origin and the family we create; (5) peers and friendship; (6) school-related stress and resilience; (7) spirituality, faith and religion; (8) social justice, power, oppression and status/ Intersectionality; (9) intersections of health and wellness; (10) evaluation and celebration (10 weekly sessions, 45 min) CG: school activities as usual	IG: Pre, post CG: pre, post	The SMASI internalized homonegativity subscale scores decreased for the IG and increased for the CG (F (1) = 5.28, $p = .028$) Higher levels of minority stress were associated with lower levels of PTSD in the IG and higher levels of PTSD in the CG ($b = -1.29$, $p = .032$). The intervention moderated the relationship between minority stress-depression and minority stress-suicidality: higher levels of minority stress were associated with lower levels of depression in the IG and higher levels of depression in the CG ($b = -0.79$, $p = .023$), and lower levels of suicidality in the IG and higher levels of suicidality in the CG ($b = -0.14$, $p = .012$)
Goldbach, Rhoades, Rusow, et al. (2021) United States	$N = 17$ IG ($n = 9$, 4 TGNB) M age = 16.89 CG ($n = 8$, 5 TGNB) M age = 16.88 Birth sex not reported	There was attrition in the CG, but numbers are not reported	Minority stress (SMASI) There were other behavioral health measures administered for feasibility purposes (assessing depression, anxiety, suicidality, past 30-day substance use, and sexual activity and risk behavior), but results are not reported	IG: Group therapy. Proud & Empowered: (1) Introduction, meeting new people, and LGBTQ+ 101; (2) stress and coping overview; (3) coming out, disclosure and decision making; (4) families of origin and the family we create; (5) peers and friendship; (6) school-related stress and resilience; (7) spirituality, faith and religion; (8) social justice, power, oppression and status/ Intersectionality; (9) intersections of health and wellness; (10) evaluation and celebration (10 weekly sessions, 45 min) CG: standard care practice	IG: Pre, post CG: pre, post	Improvements in overall experiences of minority stress (total SMASI score) ($t = 2.42$, $p = .023$), experiences of negative disclosure ($t = 2.97$, $p = .011$), and homonegative communication ($t = 3.19$, $p = .008$) for the IG
Pachankis, McConocha, et al. (2020) United States	$N = 60$ IG ($n = 30$, 17 TGNB) M age = 25.27 CG ($n = 30$, 9 TGNB) M age = 25.90 Birth sex not reported	IG: 16.6% ($n = 5$) at pre and follow-up CG: 3.3% ($n = 1$) at post and 13.3% ($n = 4$) at follow-up	Mental health: depression (CES-D, ODSIS), anxiety (OASIS), psychological distress (BSI), suicidality (SIDAS), alcohol use (SIP-A) Minority stress processes: sensitivity to rejection (SMW-RSS), sexual orientation concealment (SOCS), internalized stigma (LGBIS-Internalized Homonegativity Subscale, sexual orientation IAT) Universal risk processes: difficulties in emotion regulation (DERSSF), social support (MSPSS), rumination (RRS-Brooding Subscale), assertiveness (SRAS-SF) Intervention acceptability	IG: Affirmative cognitive behavioral therapy: Empowering Queer Identities in Psychotherapy (EQuIP). 3 modules with 10 individual sessions. Module 1: Introduction to minority stress framework (sessions 1–2): (1) introduction to EQuIP, (2) impact of minority stress. Module 2: Cognitive restructuring, emotional awareness & emotion regulation (sessions 3–6): (3) tracking emotional experiences, (4) mindfulness & minority stress, (5) appraisal & reappraisal, (6) emotion avoidance. Module 3: Building behavioral skills to mitigate effects of minority stress (sessions 7–10): (7) emotion-driven behaviors, (8) behavioral skills training, (9) behavioral experiment, (10) relapse prevention	IG: Pre, post, 3 months follow-up CG: 3 months pre-intervention, pre, post	Between-IG and CG differences: Mental health: reduction in depression (CES-D: $d = 0.85$, $p < .05$; ODSIS: $d = 0.84$, $p < .01$), anxiety ($d = 0.86$, $p < .05$) and psychological distress ($d = 0.60$, $p < .05$) pre-post for the IG Minority stress and universal risk processes: the increase in perceived social support was greater for the CG from 3 months pre-intervention to pre than for the IG pre-post ($d = -1.10$, $p < .01$) Within-IG and CG differences (pooled analyses): all mental health outcomes improved pre-post (M $d = 0.88$). There were reductions pre-post in emotion regulation difficulties ($d = 0.66$, $p < .05$) and rumination ($d = 0.70$, $p < .05$) Within-IG differences: from

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Table 4 (*continued*)

Author, year, country	Randomized participants (IG-CG)	Dropout rate	Assessed variables	Intervention type, content, and structure (IG-CG)	N° of assessments, time to follow-up	Results
				CG: waitlist		post to follow-up, psychological distress ($p < .001$) and rumination ($p < .01$) continued to decrease, while social support continued to increase ($p < .05$)
Pachankis, Williams, et al. (2020) United States	$N = 108$ CG ($n = 36$, 9 TGNB) *M* age = 24.14 25 FAB, 11 MAB IG-1 ($n = 36$, 8 TGNB) *M* age = 23.47 26 FAB, 10 MAB IG-2 ($n = 36$, 12 TGNB) *M* age = 23.42 26 FAB, 10 MAB	CG: 8.4% ($n = 3$) at post and 25% ($n = 9$) at follow-up IG-1: 8.4% ($n = 3$) at post and 11.11% ($n = 4$) at follow-up IG-2: 16.66% ($n = 6$) at post and 27.88% ($n = 10$) at follow-up	Outcomes: depression (CES-D), psychological distress (BSI), anxiety (BAI), suicidality (SIDAS), alcohol abuse (AUDIT), drug abuse (SIP-DU), sexual risk (HIV-Risk Behavior) Contextual moderators: discrimination (EDS), LGBTQ victimization	Online expressive writing activities (20 min per day for 3 days, individual) CG: Writing about daily activities (neutral control) IG-1: Expressive writing prompts. Writing in response to stressors and contexts frequently experienced by sexual minority individuals IG-2: Self-affirmation prompts. Giving advice to a sexual minority person experiencing distress, based on vignettes	Pre, post, 3 months follow-up	Participants were highly satisfied with the intervention Between-IG-1 and CG differences: reduction in depression ($d = 0.48$, $p < .01$) and psychological distress ($d = 0.36$, $p = .03$) from pre to follow-up in the IG-1. No significant changes pre-post Between-IG-2 and CG differences: reduction in drug abuse ($d = 0.88$, $p = .03$) pre-post in the IG-2. No significant changes from pre to follow-up

Notes. FAB: female at birth; MAB: male at birth; SMASI: Sexual Minority Adolescents Stress Inventory; BAI: Beck Anxiety Inventory; BDI-II: Beck Depression Inventory-II; PCL-5: Post Traumatic Stress Disorder Checklist for DSM-5; C-SSRS: Columbia-Suicide Severity Rating Scale; LGBTQ: Lesbian, Gay, Bisexual, Transgender, and Queer; CES-D: Center for Epidemiological Studies-Depression Scale; BSI: Brief Symptom Inventory; ODSIS: Overall Depression Severity and Impairment Scale; OASIS: Overall Anxiety Severity and Impairment Scale; SIDAS: Suicidal Ideation Attributes Scale; SIP-A: Short Inventory of Problems-Alcohol; SMW-RSS: Sexual Minority Women's Rejection Sensitivity Scale; SOCS: Sexual Orientation Concealment Scale; LGBIS: Lesbian, Gay, and Bisexual Identity Scale; IAT: Implicit Association Test; DERSSF: Difficulties in Emotion Regulation Scale-Short Form; MSPSS: Multidimensional Scale of Perceived Social Support; RRS: Ruminative Responses Scale-Brooding Subscale; SRAS-SF: Simple Rathus Assertiveness Schedule-Short Form; AUDIT: Alcohol Use Disorders Identification Test; SIP-DU: Short Inventory of Problems-Modified for Drug Use; EDS: Everyday Discrimination Scale.

intervention measurement and used the follow-up assessment for the pre-post comparisons (Stevens et al., 2020). One study used a mid-test at the end of the intervention and a post-test at a booster session conducted after one month (Riach, 2021). Follow-up times ranged between one and six months ($M = 3.7$, $Mdn = 3$).

3.1.1. Intervention outcomes

Among RCTs that compared intervention and active control conditions (Budge et al., 2021; Israel et al., 2020), one showed similar improvements in both groups (Budge et al., 2021) and the other showed better results for the intervention group (Israel et al., 2020) from pre- to post-intervention. Additionally, Budge et al. (2021) found that the significant reduction in non-affirmation experiences was sustained at follow up for the intervention group and only appeared at follow-up for the control group. Internalized transphobia also decreased from pre- to post-intervention ($d = 0.59$, $p = .07$) and this reduction was sustained at follow-up ($d = 0.72$, $p = .15$), although the effect sizes were associated to non-significant *p*-values ($p > .05$), most likely due to the small sample size. In the RCT that compared intervention and waitlist conditions (Martin, 2019), the intervention group had significantly better results than the control group at post-intervention, but not in all the assessed variables (three out of seven). Moreover, these improvements were not sustained at follow up. However, there were medium effect sizes ($d > 0.5$) for the differences in well-being and resilience levels between the intervention and control group at post-intervention, although not associated to statistically significant *p*-values ($0.05 < p < .1$). The results of this study should be interpreted with caution given the high number of participants lost to follow-up (74.4%). Overall, effect sizes were between medium and large ($d = 0.63$–0.9) for psychological distress (Budge et al., 2021; Martin, 2019), large ($d = 1.00$–1.07) for the non-affirmation aspect of gender minority stress (Budge et al., 2021), medium ($d = 0.71$) for positive TGNB identity (Martin, 2019), medium ($d = 0.67$) for stress appraisal (Martin, 2019), and small-medium ($d = 0.43$) for shame and pride (used as proxies for internalized transphobia; Israel et al., 2020). Budge et al. (2021) also reported significant improvements in participants' rates of working alliance with their therapists over time, and Israel et al. (2020) found that participants considered that the intervention would have been most useful at the mean age of 16.5 years.

Among uncontrolled pre-post studies, there were statistically significant improvements in depression (Austin et al., 2018; Knutson et al., 2020), anxiety (Knutson et al., 2020), and self-acceptance (Stevens et al., 2020) from pre- to post-intervention, although there were no further improvements for depression and anxiety at follow-up. Additionally, Amodeo et al. (2018) and Knutson et al. (2020) found significant improvements in resilience levels and social support, respectively, but only between pre-intervention and follow-up. Riach (2021) only found a statistically significant improvement in depressive symptomatology from pre-intervention to booster, although the severity of depression remained on the moderate range. Effect sizes were large for depression ($r = 0.82$–0.89; $\eta^2 = 0.73$), small-medium for anxiety ($d = 0.40$–0.65), large for self-acceptance ($r = 0.59$), and small for social support ($d = 0.29$). The remaining studies (Clements et al., 2021; Lucassen et al., 2020; Stevens et al., 2020) showed no significant improvements in mental health, positive TGNB identity, or well-being, although participants in Clements et al. (2021) study reported high pre-intervention scores in all measures. It is worth noting that Knutson et al. (2020) only reported on the statistical differences in outcomes between pre-intervention and follow-up, but not between post-intervention and

Table 5
Quasi-experimental studies where TGNB participants are mixed with non-TGNB populations.

Author, year, country	Allocated participants (IG-CG)	Dropout rate	Assessed variables	Intervention type, content, and structure (IG-CG)	N° of assessments, time to follow-up	Results
Craig, Eaton, et al. (2021) Canada	$N = 147$ IG ($n = 106$, 60 TGNB) M age = 21.08 CG ($n = 41$, 33 TGNB) M age = 23.78 Birth sex not reported	IG: 8.5% ($n = 9$) at post CG: 0%	Depression (BDI-II) Reflexive coping (PCI-A-Reflective Coping Subscale) Coping strategies (BCI: active coping, substance use, emotional support, instrumental support, behavioral disengagement, positive framing, planning, humor, and self-blame) Stress appraisal (SAMA: challenge, threat, and resources) Hope (HS: agency and pathway) AFFIRM Acceptability Survey	IG: Group affirmative cognitive behavioral therapy. AFFIRM: (a) introduction to CBT and understanding minority stress; (b) understanding the impact of homophobic and transphobic attitudes and behaviors on stress; (c) understanding how thoughts affect feelings; (d) using thoughts to change feelings; (e) exploring how activities affect feelings; (f) planning to overcome counterproductive thoughts and negative feelings; (g) understanding the impact of minority stress and homo/transphobia on social relationships; (h) developing safe, supportive, and identity affirming social networks (8 weekly, 2-h sessions) CG: waitlist	Pre, post	Between-IG and CG differences: improvements in depression ($d = 0.56$, $p = .001$), stress appraisal-challenge ($d = 0.68$, $p < .001$), stress appraisal-threat ($d = 0.56$, $p = .001$), stress appraisal-resources ($d = 0.42$, $p = .016$), emotional support ($d = 0.65$, $p < .001$), instrumental support ($d = 0.71$, $p < .001$), positive framing ($d = 0.70$, $p < .001$), planning ($d = 0.64$, $p < .001$), humor ($d = 0.43$, $p = .014$), reflective coping ($d = 0.46$, $p = .009$), hope-agency ($d = 0.61$, $p = .001$) and hope-pathway ($d = 0.59$, $p = .001$) for the IG Within-IG differences: improvements in depression ($b = -4.16$, $p < .001$) stress appraisal-threat ($b = -0.39$, $p < .001$), stress appraisal-challenge ($b = 0.80$, $p < .001$), stress appraisal-resources ($b = 0.47$, $p < .001$), emotional support ($b = 0.48$, $p < .001$), instrumental support ($b = 0.35$, $p < .001$), positive framing ($b = 0.41$, $p < .001$), planning ($b = 0.31$, $p < .001$), humor ($b = 0.23$, $p = .004$), reflective coping ($b = 0.20$, $p < .001$), hope-agency ($b = 0.80$, $p < .001$) and hope-pathway ($b = 0.64$, $p < .001$) Within-CG differences: no improvements in any outcome Participants were highly satisfied with the intervention
Craig, Leung, et al. (2021) Canada	$N = 128$ IG ($n = 78$, 37 TGNB) M age = 21.17 CG ($n = 50$, 37 TGNB) M age = 23.42 Birth sex not reported	IG: 41% ($n = 32$) at post CG: 0%	Depression (BDI-II) Reflexive coping (PCI-A-Reflective Coping Subscale) Stress appraisal (SAMA: challenge, threat, and resources) Hope (HS: agency and pathway) AFFIRM Acceptability Survey	IG: Online group affirmative cognitive behavioral therapy. AFFIRM: (a) introduction to CBT and understanding minority stress; (b) understanding the impact of homophobic and transphobic attitudes and behaviors on stress; (c) understanding how thoughts affect feelings; (d) using thoughts to change feelings; (e) exploring how activities affect feelings; (f) planning to overcome counterproductive thoughts and negative feelings; (g) understanding the impact of minority stress and homo/transphobia on social relationships; (h) developing safe, supportive, and identity affirming social networks (8 weekly sessions) CG: waitlist	Pre, post	Between-IG and CG differences: Improvements in depression ($d = 0.60$, $p = .005$), stress appraisal-challenge ($d = 0.60$, $p = .005$), active coping ($d = 0.54$, $p = .012$), emotional support ($d = 0.51$, $p = .017$), instrumental support ($d = 0.77$, $p < .001$), positive framing ($d = 0.42$, $p = .046$) and planning ($d = 0.49$, $p = .024$) for the IG Within-IG differences: improvements in depression ($b = -4.65$, $p = .001$), stress appraisal-challenge ($b = 0.69$, $p < .001$), stress appraisal-resources ($b = 0.40$, $p < .001$), active coping ($b = 0.25$, $p < .01$), emotional support ($b = 0.32$, $p < .01$), instrumental support ($b = 0.30$, $p < .01$), positive framing ($b = 0.25$, $p = .05$), planning ($b = 0.27$, $p < .05$), and self-blame ($b = -0.45$, $p < .001$) Within-CG differences: decrease in instrumental support ($b = -0.28$, $p < .05$) pre-post Participants were highly satisfied with the intervention

Notes. BDI-II: Beck Depression Inventory-II; PCI-A: Proactive Coping Inventory for Adolescents; BCI: Brief COPE inventory; SAMA: Stress Appraisal Measure for Adolescents; HS: Hope Scale.

follow-up. Interestingly, depression and social support scores worsened between post-intervention and follow-up, while anxiety scores slightly improved (yet most likely not significantly). According to the authors, this may be due to interpersonal struggles (e.g., breaking up with a partner) and/or contextual issues (e.g., moving back in with parents) experienced by some of the participants after the post-intervention assessment, despite having found the treatment protocol beneficial.

Although the results of the interventions were limited, participants' self-reported levels of satisfaction with the interventions provided were generally high, suggesting good intervention acceptability for the TGNB population.

3.2. Studies with a combination of TGNB and non-TGNB participants

Among the 12 studies with a combination of TGNB and non-TGNB participants and with no separated outcome data for the TGNB subsample (Craig, Austin, & McInroy, 2014; Craig, Austin, & Huang, 2018; Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, & Karys, 2021; Hilgeman, Lange, Bishop, & Cramer, 2022; Lange, Hilgeman, Portz, Intoccia, & Cramer, 2020; Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020; Riggle, Gonzalez, Rostosky, & Black, 2014; Russon, Morrissey, Dellinger, Jin, & Diamond, 2021; see Tables 4, 5, and 6), sample sizes ranged between 30 (Craig et al., 2018) and 263 (Craig et al., 2014) at baseline. Four of these studies had sample sizes larger than 100 (Craig et al., 2014; Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Pachankis, Williams, et al., 2020). The total number of participants at baseline across the studies was 948 ($M = 79$; $Mdn = 56$), and roughly a third of them (30.9%; $n = 293$) were identified as TGNB. Yet, determining the exact number of TGNB participants was challenging, as some of the studies (Craig et al., 2018; Pachankis, Williams, et al., 2020) did not use mutually exclusive categories to collect demographic data on gender identity. Like among studies with TGNB participants only, attrition was also significant: dropout rates based on missing data at post-intervention, i.e., from baseline to either post-intervention or follow-up, ranged between 0% and 38.5% ($M = 16\%$; $Mdn = 13.8\%$). However, given that available data were based on the whole sample, the attrition rates of TGNB participants specifically were not possible to determine, nor was their mean age. All studies but one (Russon et al., 2021, who used the Mental Health Systems Ecological [MHSE] model) drew on minority stress as their main theoretical and conceptual framework.

The number of quantitative outcome variables assessed before and after intervention ranged from just one (coping skills, Craig et al., 2018) to 12 grouped in three areas (mental health, minority stress processes, and universal risk processes, Pachankis, McConocha, et al., 2020) ($M = 5$; $Mdn = 4.5$). In addition, one study collected qualitative thematic data using an expressive writing exercise (Riggle et al., 2014) and seven studies assessed the acceptability, engagement, or satisfaction with the intervention through quantitative and/or qualitative measures, including Likert-type and open-ended survey questions (Craig et al., 2014; Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020; Pachankis, McConocha, et al., 2020; Russon et al., 2021).

Assessed variables were numerous, and included: overall psychological distress, depressive and anxious symptomatology, trauma, suicidality, substance abuse, risk behaviors, social support, minority stress processes, coping skills, self-esteem, hope, stress appraisal, emotion regulation, identity acceptance, and positive aspects of lesbian, gay, bisexual, and transgender (LGBT) identities. Eight studies coincided in measuring depression as an outcome (Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Goldbach, Rhoades, Mamey, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020; Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020; Russon et al., 2021), six in measuring coping skills (Craig et al., 2014; Craig et al., 2018; Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020) and suicidality (Goldbach, Rhoades, Mamey, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020; Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020; Russon et al., 2021); five in measuring anxiety (Goldbach, Rhoades, Mamey, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020; Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020); four in measuring minority stress (Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021; Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020); three in measuring positive LGBT identity (Hilgeman et al., 2022; Lange et al., 2020; Riggle et al., 2014); and two in measuring psychological distress and substance abuse (Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020), stress appraisal and hope (Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021), identity acceptance (Hilgeman et al., 2022; Lange et al., 2020), and self-esteem (Craig et al., 2014; Riggle et al., 2014), respectively.

In this regard, there was concordance for 15 instruments across the studies: the Beck Depression Inventory-II (BDI-II), used by four studies (Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Goldbach, Rhoades, Mamey, et al., 2021; Russon et al., 2021); the Lesbian, Gay, and Bisexual Identity Scale (LGBIS), used by three studies (Hilgeman et al., 2022; Lange et al., 2020; Pachankis, McConocha, et al., 2020); the Patient Health Questionnaire-9 (PHQ-9), the Generalized Anxiety Disorder-7 (GAD-7), the Suicidal Behaviors Questionnaire-Revised (SBQ-R), and the Coping Self-Efficacy Scale (CSE), used by two studies conducted by the same research team (Hilgeman et al., 2022; Lange et al., 2020); the Center for Epidemiological Studies-Depression Scale (CES-D), the Brief Symptom Inventory (BSI), and the Suicidal Ideation Attributes Scale (SIDAS), used by two studies conducted by the same research team (Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020); the Proactive Coping Scale for Adolescents (PCI-A), the Stress Appraisal Measure for Adolescents (SAMA), and the Hope Scale (HS), used by two studies conducted by the same research team (Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021); the Sexual Minority Adolescents Stress Inventory (SMASI), used by two studies conducted by the same research team (Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021); the Beck Anxiety Inventory (BAI), used by two studies (Goldbach, Rhoades, Mamey, et al., 2021; Pachankis, Williams, et al., 2020); and the Rosenberg Self-Esteem Scale (RSE), also used by two studies (Craig et al., 2014; Riggle et al., 2014).

Two of the interventions were individual (Pachankis, McConocha, et al., 2020; Pachankis, Williams, et al., 2020), eight were group-based (Craig et al., 2014; Craig et al., 2018; Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020), and two were a combination of group and individual (Riggle et al., 2014; Russon et al., 2021). Of these, 10 were face-to-face (Craig et al., 2014; Craig et al., 2018; Craig, Eaton, et al., 2021; Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020; Pachankis, McConocha, et al., 2020; Riggle et al., 2014; Russon et al., 2021) and the remaining two were delivered online (Craig, Leung, et al., 2021; Pachankis, Williams, et al., 2020).

Regarding the treatments' theoretical basis, four interventions in this category used affirmative sexual and gender minority-specific adaptations of cognitive-behavioral techniques and concepts (AFFIRM, Craig et al., 2018; AFFIRM, Craig, Eaton, et al., 2021; AFFIRM online, Craig, Leung, et al., 2021; Empowering Queer Identities in Psychotherapy [EQuIP], Pachankis, McConocha, et al., 2020), two relied on the 10 conceptual domains of minority stress (Proud & Empowered [P&E], Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow,

Table 6
Uncontrolled pre-post studies where TGNB participants are mixed with non-TGNB populations.

Author, year, country	Participants*	Dropout rate	Assessed variables	Intervention type, content, and structure	N° of assessments, time to follow-up	Results
Craig et al. (2014) Canada	$N = 263$, 3 TGNB Age range 13–20 M age = 16.7 Birth sex not reported	11% ($n = 29$) at post	Self-esteem (RSE) Proactive coping (PCI) Social connectedness (SCS) Program Acceptability and Satisfaction	School-based counseling program. Group Affirmative Supportive Safe and Empowering Talk (ASSET). Each session consists of: (a) warm up; (b) exploring "hot topics" or time-sensitive issues in the students' lives; (c) exploring thematic and relevant topics; (d) exploring and practicing healthy decision making; (e) group reflection and facilitator summary. Topics included: identity development, coming out, assertiveness, stereotypes and discrimination, stress management, sexual health, family relationships, and dating (8–10 weekly sessions, 45 min each)	Pre, post	There were increases in proactive coping (Wilks' $\lambda = 0.964$, F (2.216) = 8.16, $\eta^2 = 0.04$, $p = .005$) and self-esteem (Wilks' $\lambda = 0.955$, F (2.221) = 10.46, $\eta^2 = 0.051$, $p = .001$). Participants perceived the treatment as helpful and were satisfied (item scores (Range 1–4) ranged from $M = 3.4$ to $M = 3.8$)
Craig et al. (2018) Canada	$N = 30$, 8 TGNB Age range 15–18 M age = 17.07 Birth sex not reported	0%	Coping strategies (A-COPE: ventilating feelings, seeking diversions, developing self-reliance and optimism, developing social support, solving family problems, avoiding problems, seeking spiritual support, investing in close friends, seeking professional support, engaging in demanding activity, being humorous, and relaxing)	Group affirmative cognitive behavioral therapy. AFFIRM: (a) introduction to CBT and understanding minority stress; (b) understanding the impact of homophobic and transphobic attitudes and behaviors on stress; (c) understanding how thoughts affect feelings; (d) using thoughts to change feelings; (e) exploring how activities affect feelings; (f) planning to overcome counterproductive thoughts and negative feelings; (g) understanding the impact of minority stress and homo/transphobia on social relationships; (h) developing safe, supportive, and identity affirming social networks (8 weekly sessions)	Pre, post	Increase in total coping scores (t (29) = 2.26, $r = 0.38$, $p < .001$). Specifically, there were increases in solving family problems (t (29) = 2.70, $p < .01$), seeking diversion (t (29) = 4.18, $p < .001$), engaging in demanding activities (t (29) = 2.51, $p < .05$), being humorous (t (29) = 2.51, $p < .05$) and seeking spiritual support (t (29) = 2.09, $p < .05$)
Hilgeman et al. (2022) United States	$N = 65$, 19 TGNB M age = 48.64 38 MAB, 26 FAB, 1 missing	32.3% ($n = 21$) at post	Experience: satisfaction and feedback (questionnaire, open-ended feedback) Internal resources: identity-related acceptance (LGBIS: acceptance, concealment, uncertainty, internalized transphobia, and affirmation), resilience and coping (CSE: problem-focused coping and getting social support), positive identity (LGBT-PIM: authenticity, self-awareness, and community involvement) Mental health outcomes: symptoms of distress (PHQ-9, GAD-7, SBQ-R)	Health education group intervention. PRIDE in All Who Served: (1) continuums of identity; (2) coming out process; (3) identity models; (4) military culture – then and now; (5) Veteran Administration culture – the changes ahead; (6) affirmative care; whole health; (7) sexual health; (8) healthy intimate relationships; safety in relationships; (9) LGBT families; (10) community resources and engagement (10 weekly sessions)	Pre, post	Patient experience themes: social support and connectedness (45%), improved self-understanding and identity (16%), better with communication and openness (16%), positive impacts on well-being and confidence (11%), and improved understanding of LGBTQ+ healthcare (2%) Reductions in acceptance concerns (t (43) = −2.79, $d = -0.41$, $p = .008$) and identity uncertainty (t (43) = −2.13, $d = -0.3$, $p = .04$), and increases in community involvement (t (43) = 1.98, $d = 0.31$, $p = .05$). Suicide attempt likelihood decreased (t (31) = −2.35, $d = -0.31$, $p = .03$), changing from 72.7% of participants at elevated suicide risk at pre to 56.8% at post. Depression and anxiety scores reduced non-significantly but did not reflect a meaningful clinical change Participants showed a positive response to the program and high levels of satisfaction, but no changes in perceived access or satisfaction were observed
Lange et al. (2020)	$N = 22$, 8 TGNB		Mental health-related symptoms: depression, anxiety, and	Health education group intervention. PRIDE in All Who	Pre, post	Reductions in depression (t (12) = −2.08, $d = -0.58$, $p = .06$),

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Table 6 (*continued*)

Author, year, country	Participants*	Dropout rate	Assessed variables	Intervention type, content, and structure	N° of assessments, time to follow-up	Results
United States	*M* age = 46.77 12 MAB, 8 FAB, 2 missing	18.18% (*n* = 4) at post	suicidality (PHQ-9, GAD-7, SBQ-R) Identity: LGBIS (acceptance, concealment, uncertainty, internalized homonegativity, difficult process, superiority, affirmation, and centrality) Resilience: coping (CSE: problem-focused coping, stopping unpleasant thoughts and emotions, and getting social support), positive identity (LGB-PIM: self-awareness, authenticity, community involvement, intimacy, and social justice beliefs) Engagement and feedback: questionnaire, open-ended feedback	Served: (1) continuums of identity; (2) coming out process; (3) identity models; (4) military culture – then and now; (5) Veteran Administration culture – the changes ahead; (6) affirmative care; whole health; (7) sexual health; (8) healthy intimate relationships; safety in relationships; (9) LGBT families; (10) community resources and engagement (10 weekly sessions)		anxiety (t (12) = −3.06, d = −0.85, p = .01), and suicide attempt likelihood (t (17) = −3.56, d = −0.84, p = .003). Depression and anxiety changed from moderate to mild Improvements in identity uncertainty (t (16) = −2.78, d = −0.67, p = .01), internalized homonegativity (t (16) = −1.66, d = −0.40, p = .12), identity affirmation (t (16) = 2.98, d = 0.73, p = .009), identity centrality (t (16) = 2.34, d = 0.57, p = .03), self-awareness (t (17) = 1.88, d = 0.44, p = .08), authenticity (t (17) = 2.52, d = 0.59, p = .02), community involvement (t (17) = 4.83, d = 1.14, p < .001), intimacy (t (17) = 2.39, d = 0.56, p = .03), problem-focused coping (t (17) = 2.96, d = 0.7, p = .009), stopping unpleasant thoughts (t (17) = 1.92, d = 0.45, p = .07), and getting social support (t (17) = 1.95, d = 0.46, p = .07) Improvements in participants' perceptions of staff cultural competence (t (17) = 6.73, d = 1.59, p < .001) and overall satisfaction (t (17) = 3.74, d = 0.88, p = .002)
Riggle et al. (2014) United States	*N* = 52, 10 TGNB Age range = 18–32 Birth sex not reported	38.5% (*n* = 20) at follow-up	Writing exercise Positive LGBTQA identity (LGBTQA Positive Identity Scale) Collective self-esteem (CSES) Individual self-esteem (RSE)	(a) 30-min group presentation focused on positive LGBTQA identities and themes; (b) selection of a theme or experience linked to participants' positive identity; (c) writing of a brief story (individually for 10 min) explaining the experience and its impact on their identity; (d) answering to a set of four value affirmation questions: "This experience has influenced my life in positive ways," "In general, I try to learn positive lessons from experiences like these," "My experiences are an important part of who I am," "I care about finding positive values through my experiences" (on a Likert-type scale)	Pre, post, 1 month follow-up	Increases in positive identity (t (51) = −2.42, r = 0.32, p = .01), collective self-esteem (t (51) = −1.90, r = 0.25, p = .032) and individual self-esteem (t (51) = −2.91, r = 0.38, p = .003) pre-post. Decreases in positive identity (F = 7.89, p = .009) and individual self-esteem (F = 12.57, p = .001) from pre to follow-up, indicating regression to pre levels Themes: belonging to an LGBTQA community (26.4%); self-awareness, insights, and growth (17.0%); authenticity (13.2%); mentoring, role model, and activism (11.3%); stronger emotional connections with others (11.3%); compassion for others (9.4%); freedom to explore relationships and sexuality (7.5%); flexible rules for gender expression (3.8%)
Russon et al. (2021) United States	*N* = 10, 8 TGNB Age range 15–25 *M* age = 18.2 Birth sex not reported	0%	Treatment acceptability and credibility (WAI, OAT) Suicidality (SIQ-JR) Depression (BDI-II)	Family therapy. Modified version of the Attachment-Bassed Family Therapy (ABFT) for SGM youth: (1) Relational Reframe: strengthening relationships between youth and their parents; (2) Adolescent Alliance Task: building a strong therapeutic alliance with the youth, processing emotions associated with the parents' rejection, and communicating unmet attachment and identity needs; (3) Parent Alliance Task: building strong therapeutic alliance with each	Pre, mid-1 (week 4), mid-2 (week 8), post (week 16)	Participants showed high alliance at mid-1 (M = 61.88) and the scores were maintained at post (M = 66.66). OAT scores were adequate at mid-1 (M = 18.77) and were maintained at post (M = 20.55) 55% of participants no longer endorsed severe suicidal ideation at post, and one reported full clinical recovery. Only one participant moved from a clinical to a nonclinical range of

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Table 6 (*continued*)

Author, year, country	Participants*	Dropout rate	Assessed variables	Intervention type, content, and structure	N° of assessments, time to follow-up	Results
				parent, processing emotions associated with the youth's sexual orientation or gender identity, reflecting on how nonacceptance has affected the family relationship, and listening to the youth's pain and unmet needs; (4) Reattachment Task: the youth communicates the experience of feeling rejected, while the parents are helped to respond in an empathic and caring manner; (5) Helping family members work collaboratively towards future shared challenges (16 weekly sessions, 60 min)		depression. Growth curve analyses showed significant decreases in suicidality over the course of the treatment ($\beta = -12.16$, $t(10) = -3.14$, $d = 1.22$, $p < .01$), but not in depression scores

Notes. *N represents the number of intent-to-treat participants. MAB: male at birth; FAB: female at birth; RSE: Rosenberg Self-Esteem Scale; PCI: Proactive Coping Inventory; SCS: Social Connectedness Scale; A-COPE: Adolescent Coping Orientation for Problem Experiences; LGBIS: Lesbian, Gay, and Bisexual Identity Scale; CSE: Coping Self-Efficacy Scale; LGB-PIM: Lesbian, Gay, Bisexual, and Transgender Positive Identity Measure; PHQ-9: Patient Health Questionnaire-9; GAD-7: Generalized Anxiety Disorder-7 Scale; SBQ-R: Suicidal Behaviors Questionnaire-Revised; LGBT: Lesbian, Gay, Bisexual, and Transgender; LGBTQ: Lesbian, Gay, Bisexual, Transgender, and Queer; LGBTQA: Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, and Asexual/Aromantic; CSES: Collective Self-Esteem Scale; RSE: Rosenberg Self-Esteem Scale; WAI: Working Alliance Inventory; OAT: Opinions About Treatment: SIQ-JR: Suicidal Ideation Questionnaire; BDI-II: Beck Depression Inventory-II.

et al., 2021), two implemented a health education program for veterans (PRIDE in All Who Served [PRIDE], Hilgeman et al., 2022; Lange et al., 2020), one used a modified version of the Attachment-Based Family Therapy (ABFT) for sexual and gender minority adolescents (Russon et al., 2021), one used a discussion-based exploration of shared minority experiences (Affirmative Supportive Safe and Empowering Talk [ASSET], Craig et al., 2014), one used expressive writing activities about minority stressors (Pachankis, Williams, et al., 2020), and another used a presentation on positive aspects of LGBT identities followed by the creation of a brief personal story (Riggle et al., 2014).

Among the four RCTs in this category, one had an active control group (Pachankis, Williams, et al., 2020), one used a waitlist control group that received the intervention once the intervention group had completed the treatment (Pachankis, McConocha, et al., 2020), and two had control groups receiving care or engaged in school activities as usual (Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021). There were two quasi-experimental studies with a non-randomized control group (Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021) and the remaining studies lacked a control group for comparison. One RCT (Goldbach, Rhoades, Rusow, et al., 2021) and two uncontrolled pre-post studies (Craig et al., 2014; Lange et al., 2020) were categorized as pilot studies. Regarding moments of assessment, eight studies had pre and post measurements only (Craig et al., 2014; Craig et al., 2018; Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021; Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021; Hilgeman et al., 2022; Lange et al., 2020) and one study had pre, mid, and post assessments throughout the intervention (Russon et al., 2021), whilst the remaining three studies had additional follow-up measurements. Follow-up times ranged between one and three months ($M = 2.3$, $Mdn = 3$).

3.2.1. Intervention outcomes

Overall, results from RCTs in this category suggest significant reductions in depression, anxiety, psychological distress, and emotion regulation difficulties (including rumination) for participants receiving the EQuIP intervention (Pachankis, McConocha, et al., 2020); in depression, psychological distress, and drug-related risk behaviors for participants engaged in online writing activities compared to controls (Pachankis, Williams, et al., 2020); and in minority stress for participants in the P&E program as compared to controls (Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021), with overall effect sizes ranging from small ($d = 0.36$) to large ($d = 0.85$). Participants in the EQuIP program (Pachankis, McConocha, et al., 2020) generally continued to improve at follow-up, while the results for participants in the online writing intervention (Pachankis, Williams, et al., 2020) depended on the condition they were assigned to: improvements in depression and psychological distress for the expressive writing condition only appeared at 3-months follow-up, while the pre-post improvement in drug abuse for the self-affirmation condition was not sustained at follow-up. However, participants in this condition also experienced improvements in suicidality and drug abuse from pre-intervention to follow-up with medium effect sizes ($d = 0.62$ and $d = 0.59$, respectively), but these were not associated to statistically significant p-values ($p > .05$). Goldbach, Rhoades, Mamey, et al. (2021), for their part, found that the P&E intervention moderated the relationship between minority stress and mental health symptoms, i.e., P&E acted as a buffer against mental health symptoms in the face of minority stress experiences for participants in the intervention condition. Additionally, P&E participants reported decreases in anxiety (in contrast with controls), but also increases in various minority stress subscales and trauma (like controls).

The two quasi-experimental studies with a non-randomized control group (Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021) showed overall significant improvements in depression, stress appraisal, coping skills, and hope for the intervention group, with effect sizes ranging between small-medium ($d = 0.42$) and medium-large ($d = 0.77$). These findings were seemingly better for the face-to-face AFFIRM group intervention (Craig, Eaton, et al., 2021) than for the AFFIRM online adaptation (Craig, Leung, et al., 2021). Finally, among uncontrolled pre-post studies, there were significant improvements in mental health-related symptoms (Hilgeman et al., 2022; Lange et al., 2020; Russon et al., 2021), coping skills (Craig et al., 2014; Craig et al., 2018; Lange et al., 2020), self-esteem (Craig et al., 2014; Riggle et al., 2014), positive identity (Hilgeman et al., 2022; Lange et al., 2020; Riggle et al., 2014), and identity acceptance (Hilgeman et al., 2022; Lange et al., 2020) from pre- to post-intervention. Effect sizes ranged between small and large for mental health-related symptoms ($d = 0.31$–1.22), positive identity ($d = 0.31$–1.14, $r = 0.32$), and self-esteem ($r = 0.25$–0.38, $\eta^2 = 0.051$); and small and medium for coping skills ($d = 0.45$–0.7, $r = 0.38$, $\eta^2 = 0.04$) and identity acceptance ($d = 0.3$–0.73). Participants in Riggle et al. (2014) study, however, showed a significant regression to baseline levels in positive identity and self-esteem at one-month follow-up. It

should also be noted that reductions in depression and anxiety in Hilgeman et al. (2022) study were neither statistically nor clinically significant. Additionally, some of the improvements in depression and subscales of coping skills, positive identity, and identity acceptance with medium effect sizes reported by Lange et al. (2020) pilot study were not associated to statistically significant *p*-values ($p > .05$).

Like among studies with TGNB participants only, the levels of engagement and satisfaction with the intervention were high, suggesting good intervention acceptability for sexual and gender minorities. Yet, the lack of disaggregated treatment and satisfaction data for the TGNB subsample of participants makes it virtually impossible to draw any conclusion with regards to the efficacy and acceptability of these interventions for TGNB individuals specifically.

3.3. Quality appraisal

Among the studies with TGNB participants only, seven (70%) were rated as being of fair quality (i.e., they all obtained between 50 and 75% of the total score) and three (30%) were rated as being of poor quality (i.e., less than 50% of the total score) (see Tables A1 and A2 in the Appendix). This means that seven studies, including the three RCTs (Budge et al., 2021; Israel et al., 2020; Martin, 2019) and four uncontrolled pre-post studies (Amodeo et al., 2018; Austin et al., 2018; Clements et al., 2021; Knutson et al., 2020), were at moderate risk of bias, which implies the presence of some concerns but probably not enough to invalidate having at least some confidence that the results reflect true intervention effects. The remaining three uncontrolled pre-post studies (Lucassen et al., 2020; Riach, 2021; Stevens et al., 2020) were at high risk of bias, which involves low confidence that the results reflect true intervention effects.

For RCTs, the most common causes of bias were unclear allocation concealment (selection bias), lack of blinding for outcome assessment (detection bias), unclear intervention adherence and similarity in participants' background treatments, insufficient statistical power to detect differences, and not using an intent-to-treat analysis. For uncontrolled pre-post studies, the most common causes of bias were small sample sizes, lack of blinding for outcome assessment, and not using multiple outcome measures before and after the intervention. Participant dropout rates were also significant for four (Austin et al., 2018; Lucassen et al., 2020; Martin, 2019; Riach, 2021) out of the 10 studies. It should be noted, however, that the NIH quality appraisal tools used in this review were originally designed to assess medical trials, and therefore not all items were easily applicable to the studies included. This may have contributed to lowering their scores.

4. Discussion

Of the initial 876 records after removing duplicates, 22 studies were included in this systematic review on empirically supported psychological treatments for TGNB individuals. Only eight of these had samples composed of TGNB individuals exclusively, while two had samples combining TBNB and non-TGNB participants but provided disaggregated data for the TGNB subsample. The remaining 12 studies had samples with a mixture of TGNB and non-TGNB participants and did not provide separated data for the TGNB subsample. Thus, despite the increasing availability of research examining the mental health disparities experienced by TGNB people, considerably much less investigation has been devoted to assessing the efficacy of psychological treatments tailored to the needs of this population. In fact, the first studies were conducted in 2014, while the most methodologically rigorous date from 2018 onwards.

Interventions for TGNB individuals were quite heterogeneous, both from a theoretical and a formal point of view, and not very well-described in some cases. Starting with RCTs, Budge et al. (2021) compared the efficacy of a psychoeducational minority stress intervention (BAMS) plus Transgender Affirmative Psychotherapy (TA) versus TA alone. Although it is reported that the TA component was provided by four psychotherapists with psychodynamic and person-centered orientations, and that TA training included some basic education about transgender health, only the BAMS component was adequately described. The modified RISE model (Israel et al., 2020) draws on well-established theories from social psychology, such as attribution theory and attitude change, to challenge participants internalized transnegativity. It somehow resembles Martin (2019) QueerViBE intervention in that: (a) it works on gender norms and stereotypes; and (b) it is socio-politically charged. Both were delivered online and obtained favorable results in mental health and positive identity variables, although QueerViBE reported a significantly high participant dropout rate (74.4%) and did not sustain its improvements at follow-up, which may pose a threat to the validity of the treatment effect. These results might be explained by the fact that QueerViBE was not directed towards mental health per se, but towards empowerment, and that watching video tutorials may not constitute a powerful therapeutic tool if not accompanied by other techniques or resources.

Among uncontrolled pre-post studies, both Amodeo et al. (2018) and Clements et al. (2021) used group-based approaches related to the participants' TGNB identities. Participants in Amodeo et al. (2018) program experienced improvements in self-reported resilience levels, while participants in Clements et al. (2021) study reported high pre-intervention scores in positive identity and well-being measures and did not improve with the intervention. Stevens et al. (2020) iTEAM was not a psychological treatment per se, but a comunity-based coordinated intervention that comprised a wide array of services, including mental health and counseling services. Of note, some of the TGNB participants in this study had an unstable housing situation. The intervention led to improvements in self-acceptance after six months, but not in mental health variables, results that might be explained by the sustaining of more barriers to remain engaged in counseling. The only four interventions with a common cognitive-behavioral theoretical framework were AFFIRM (Austin et al., 2018), a group-based intervention with eight TGNB participants that were part of a larger, mixed pilot study of the AFFIRM program; TExT (Knutson et al., 2020), an online text-based intervention delivered to 15 participants; SPARX (Lucassen et al., 2020), a fantasy game-based intervention with only 14 TGNB completers and more than 92% dropout rate; and TA-CBT (Riach, 2021), an originally group-based intervention disrupted by the COVID-19 pandemic with only six completers. The preliminary results for AFFIRM and TExT were favorable, although it would be adventurous to draw definite conclusions given the small sample sizes.

Taking all this into account, TA + BAMS (Budge et al., 2021), AFFIRM (Austin et al., 2018), and TExT (Knutson et al., 2020) seem to be the most promising interventions for TGNB individuals at the moment of writing. Participants in these interventions showed significant improvements in psychological distress, depression, anxiety, social support, and some aspects of gender minority stress, although further experimental testing is due, given that the improvements were not generally sustained at follow-up and only TA + BAMS (Budge et al., 2021) was a RCT.

Studies with mixed TGNB and non-TGNB samples are particularly difficult to interpret since they do not provide disaggregated data for the TGNB subsample. However, given the paucity of studies, we chose to analyze them. Starting with RCTs, Pachankis, Williams, et al. (2020) found reductions in depression, psychological distress, and risk-behaviors after delivering an online expressive writing intervention focused of minority stress and self-affirmation, although effect sizes were modest and only arose at follow-up. The EQuIP intervention (Pachankis, McConocha, et al., 2020), on its part, is based on the Effective Skills to Empower Effective Men (ESTEEM) program, a cognitive-behavioral intervention aimed at improving the well-being of young gay and bisexual men (Pachankis et al., 2019). Like ESTEEM, EQuIP has a cognitive-behavioral orientation and is delivered through 10 individual sessions. Although its results were promising, it would be

interesting to make a specific adaptation for the TGNB population and assess its efficacy, feasibility, and acceptability. Goldbach and colleagues tested P&E (Goldbach, Rhoades, Mamey, et al., 2021; Goldbach, Rhoades, Rusow, et al., 2021), an intervention addressing 10 domains of minority stress with potential to be delivered in schools and community-based settings. The results provide preliminary evidence that participating in P&E reduces anxiety, several aspects of minority stress, and their detrimental effect on mental health through the learning of coping mechanisms, although participants did not improve or worsened in depression, trauma, and some other domains of minority stress along with controls (Goldbach, Rhoades, Mamey, et al., 2021).

The research conducted by Craig and colleagues shows an interesting evolution from ASSET (Craig et al., 2014), a school-based counseling program focused on improving participants' self-esteem, coping skills, and social connections; to AFFIRM, a group-based cognitive-behavioral program that has been tested in different settings (both face-to-face and online) and has obtained promising results, leading to improvements in coping skills, depression, and stress appraisal (Craig et al., 2018; Craig, Eaton, et al., 2021; Craig, Leung, et al., 2021), though the dropout rate for the group receiving the online version of AFFIRM was high (41%) (Craig, Leung, et al., 2021). As mentioned, the efficacy of the AFFIRM program has also been assessed for a small subsample of TGNB individuals with positive results (Austin et al., 2018), so it would be convenient to test this intervention using more methodologically sound designs. The research carried out by Hilgeman et al. (2022) and Lange et al. (2020) focuses on the effects of PRIDE, a health education group intervention for LGBT veterans. Results suggest improvements in mental health-related symptoms (especially suicidality), coping skills, identity acceptance, and positive identity, albeit dropout rates were high and sample generalizability is limited. Riggle et al. (2014) intervention was aimed to increase participants' self-esteem and positive identity through expressive writing activities, with favorable results in positive identity and self-esteem, although participants regressed to baseline levels at follow-up. Finally, Russon et al. (2021) tested the effectiveness of ABFT modified for work with sexual and gender minority youth, reporting both statistically and clinically significant reductions in suicidality, but not in depression.

In general, the results of the psychological interventions analyzed are encouraging but also limited and, at times, difficult to interpret. Some interventions showed significant improvements from pre- to post-intervention that were sustained at follow-up, while others led to pre-post improvements that were not sustained (or even decreased) at follow-up. Additionally, there were interventions that produced significant improvements in outcomes, but these only arose when comparing pre-intervention and follow-up scores. In such cases, it is hard to know whether the observed improvements are due to intervention effects or the result of other processes. In one of the reviewed studies (Goldbach, Rhoades, Mamey, et al., 2021), some measures of mental health and minority stress showed significant improvements at post-intervention, while others worsened or showed no change. The absence of a pre-test measure (Israel et al., 2020) and untreated control groups (nine of the 22 studies included were uncontrolled pre-post) poses an additional hindrance to the evaluation and interpretation of changes over time.

Furthermore, besides the heterogeneity of experimental designs and the generally small sample sizes that restrict generalizability, the variety in the scope of interventions, assessed variables, and their associated measurement instruments make it challenging to draw any comparison. Essentially, this diversity shows that the field of psychological care for TGNB individuals is still underdeveloped, leading professionals to weigh intervention areas differently and, thus, to set different treatment goals for these individuals. However, it is worth noting the gap between the mental health disparities commonly discussed in the TGNB literature (e.g., depression, anxiety, suicidality, quality of life, etc.) and the outcomes assessed by some of the reviewed studies (e.g., minority stress, resilience, coping skills, identity-related acceptance and stress, etc.).

4.1. Limitations and future lines of research

As already stated, the disparate study characteristics make it difficult compare the efficacy of the analyzed psychological interventions and limits our capacity to draw conclusions in that regard. For this reason, we have deemed inappropriate to provide a grade of recommendation for each treatment program, as is common among systematic reviews of interventions. Further, various studies presented very high attrition rates and did not analyze whether dropouts differed from completers, which poses a threat to the validity of their results. Attrition was particularly elevated for at least three out of the six (50%) online interventions (Craig, Leung, et al., 2021; Lucassen et al., 2020; Martin, 2019), which is in line with previous research indicating that smartphone-delivered and Internet-based psychological treatments tend to suffer from high dropout (Linardon & Fuller-Tyszkiewicz, 2020; Melville, Casey, & Kavanagh, 2010). In addition, only 40.9% of the 22 studies included in the review had a follow-up measurement, making it difficult to ascertain if the interventions had long-lasting effects. For these reasons, future interventions should try to implement more robust, higher quality methodological designs, with a view to provide more confidence in that the results reflect true intervention effects. Moreover, given the sustained impact of minority stress, longer psychotherapeutic interventions with ongoing follow-ups would be convenient.

Besides these methodological considerations, none of the 10 studies with TGNB participants made distinctions between binary and non-binary transgender individuals, therefore precluding an examination of the differential effects that psychological treatments may have on them. As mentioned in the introduction, there are important social and psychological differences between these populations in terms of their beliefs about gender and their perception of factors influencing well-being that are likely to be reflected in the outcomes of therapy. Furthermore, the studies did not specify whether their participants experienced gender dysphoria (GD) nor the type of gender transition (social, medical, or both) they were embarked on. Only Austin et al. (2018) reported that all participants were publicly "out" as TGNB to at least some people in their lives, so one might assume that they had socially transitioned to a certain extent. As a result, it is hard to disentangle the true effects of psychotherapy from the effects of the participants' background gender transition in private and public life, and to determine to what extent the treatments may also pose an aid to ameliorating GD.

Finally, the analyzed psychotherapeutic approaches to TGNB individuals' well-being used different assessment protocols and therefore prioritized different areas of intervention, focusing either on the reduction of psychological distress, fostering different positive aspects of TGNB individuals' identities, or working on other key strengths, such as coping skills or resilience. Future interventions should try to incorporate and combine all these aspects, and efforts must be made to develop more consistent, standardized evaluation protocols that allow for comparisons of efficacy between different psychotherapeutic programs. Besides, care should be taken to describe the assessed interventions in more detail to ensure understanding and replication (two studies [McDanal, Rubin, Fox, & Schleider, 2022; Zúñiga-Salazar, Valdiviezo-Oña, Ruiz-Cordoba, Baldus-Andrade, & Paz, 2022] were excluded for this reason), as well as to investigate mechanisms of change in TGNB individuals beyond intervention efficacy and/or effectiveness.

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Contributors

PEC designed the study and wrote the protocol. PEC and JIPF

conducted the literature search. All authors extracted the data and assessed the methodological quality of studies. PEC wrote the first draft of the manuscript and all authors contributed to and have approved the final manuscript.

Declaration of Competing Interest

The authors declare that they have no conflicts of interest.

Appendix A

Table A1
Assessment of methodological quality for TGNB only RCTs.

	Budge et al. (2021)	Israel et al. (2020)	Martin (2019)
1. Was the study described as randomized, a randomized trial, a randomized clinical trial, or an RCT?	Yes	Yes	Yes
2. Was the method of randomization adequate (i.e., use of randomly generated assignment)?	Yes	Yes	Yes
3. Was the treatment allocation concealed (so that assignments could not be predicted)?	CD/NR	CD/NR	CD/NR
4. Were study participants and providers blinded to treatment group assignment?	CD/NR	Yes	Yes
5. Were the people assessing the outcomes blinded to the participants' group assignments?	No	No	No
6. Were the groups similar at baseline on important characteristics that could affect outcomes (e.g., demographics, risk factors, co-morbid conditions)?	Yes	NR	Yes
7. Was the overall drop-out rate from the study at endpoint 20% or lower of the number allocated to treatment?	Yes	Yes	No
8. Was the differential drop-out rate (between treatment groups) at endpoint 15 percentage points or lower?	Yes	Yes	No
9. Was there high adherence to the intervention protocols for each treatment group?	Yes	CD	CD
10. Were other interventions avoided or similar in the groups (e.g., similar background treatments)?	CD	CD	CD
11. Were outcomes assessed using valid and reliable measures, implemented consistently across all study participants?	Yes	Yes	Yes
12. Did the authors report that the sample size was sufficiently large to be able to detect a difference in the main outcome between groups with at least 80% power?	No	Yes	Yes
13. Were outcomes reported or subgroups analyzed prespecified (i.e., identified before analyses were conducted)?	Yes	Yes	Yes
14. Were all randomized participants analyzed in the group to which they were originally assigned, i.e., did they use an intention-to-treat analysis?	No	No	No
Total	8/14 < 75% F	8/14 < 75% F	7/14 < 75% F

Notes. CD: Cannot determine; NR: Not reported; F: Fair.

Table A2
Assessment of methodological quality for TGNB only uncontrolled pre-post studies.

	Amodeo et al. (2018)	Austin et al. (2018)	Clements et al. (2021)	Knutson et al. (2020)	Lucassen et al. (2020)	Riach (2021)	Stevens et al. (2020)
1. Was the study question or objective clearly stated?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Were eligibility/selection criteria for the study population prespecified and clearly described?	No	Yes	No	Yes	Yes	Yes	Yes
3. Were the participants in the study representative of those who would be eligible for the test/service/intervention in the general or clinical population of interest?	No	Yes	Yes	Yes	Yes	No	No
4. Were all eligible participants that met the prespecified entry criteria enrolled?	Yes	CD/NR	Yes	Yes	CD	Yes	Yes
5. Was the sample size sufficiently large to provide confidence in the findings?	No	No	No	No	No	No	No
6. Was the test/service/intervention clearly described and delivered consistently across the study population?	Yes	Yes	CD	Yes	No	Yes	CD
7. Were the outcome measures prespecified, clearly defined, valid, reliable, and assessed consistently across all study participants?	Yes	Yes	Yes	Yes	Yes	No	CD
8. Were the people assessing the outcomes blinded to the participants' exposures/interventions?	No	No	No	No	No	No	No
9. Was the loss to follow-up after baseline 20% or less? Were those lost to follow-up accounted for in the analysis?	Yes	No	Yes	Yes	No	No	Yes
10. Did the statistical methods examine changes in outcome measures from before to after the intervention? Were statistical tests done that provided *p* values for the pre-to-post changes?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11. Were outcome measures of interest taken multiple times before the intervention and multiple times after the intervention (i.e., did they use an interrupted time-series design)?	No	No	No	No	No	No	No
12. If the intervention was conducted at a group level (e.g., a whole hospital, a community, etc.) did the statistical analysis take into account the use of individual-level data to determine effects at the group level?	NA	NA	NA	NA	NA	NA	NA
Total	6/12 < 75% F	6/12 < 75% F	6/12 < 75% F	8/12 < 75% F	5/12 < 50% P	5/12 < 50% P	5/12 < 50% P

Notes. CD: Cannot determine; NR: Not reported; NA: Not applicable; F: Fair; P: Poor.

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