COMPREHENSIVE REVIEW

WILEY

Therapeutic alliance in psychological therapy for posttraumatic stress disorder: A systematic review and meta-analysis

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Abstract

Background: Therapeutic alliance is a key element of successful therapy. Despite being particularly relevant in people with posttraumatic stress disorder (PTSD), due to fear, mistrust and avoidance, there has not yet been a comprehensive systematic review of therapeutic alliance in this population. This review explored (a) variables which may predict alliance and (b) whether alliance predicts PTSD outcomes.

Method: Following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines, the review identified 34 eligible studies. Studies were subjected to a quality assessment. Predictors of alliance were considered in a narrative synthesis. Twelve studies were entered into a meta-analysis of the association between therapeutic alliance and PTSD outcomes.

Results: There was some evidence for individual variables including attachment, coping styles and psychophysiological variables predicting the alliance. Therapy variables did not predict alliance. The therapeutic alliance was found to significantly predict PTSD outcomes, with an aggregated effect size of $r = -.34$, across both in-person and remote therapies.

Limitations: Included studies were restricted to peer-reviewed, English language studies. Quality of included studies was mostly rated weak to moderate, primarily reflecting issues with selection bias in this area of research.

Conclusions: This is the first review to demonstrate that therapeutic alliance is a consistent predictor of PTSD outcomes, in both in-person and remote therapies, and the effect appears at least as strong as in other populations. This is of relevance to clinicians working with traumatized populations. The review identified a need for further research to determine variables predicting alliance in therapy for PTSD.

KEYWORDS
psychological therapy, PTSD, therapeutic alliance, videoconferencing therapy

1 | INTRODUCTION

The therapeutic alliance is conceptualized in many ways but generally includes three key elements: mutual agreement on the goals of therapy, mutual agreement on the tasks of therapy and the bond between client and therapist (Bordin, 1979). It is considered an essential component of successful therapy, independent of therapeutic modality, and is known to predict better therapy outcomes (Ardito & Rabellino, 2011). A recent meta-analysis of the alliance–outcome effect found significant, consistent and moderate-large effect sizes, across 295 studies, encompassing a range of populations, therapies and outcomes (Flückiger et al., 2018). As part of this broader meta-analysis, they calculated the alliance–outcome effect across seven included posttraumatic stress disorder (PTSD) samples. However, this did not fully represent the extent of the alliance–outcome literature within PTSD populations and did not include any narrative exploration of findings or a quality assessment.

Posttraumatic psychological sequelae such as avoidance, mistrust of others and emotion regulation problems have often been considered to pose potential barriers to forming a strong alliance in therapy (Cloitre et al., 2004; Keller et al., 2010). Additional concerns have been raised that therapies which encouraged exposure to traumatic memories may further damage the alliance, increase client dropout or even cause iatrogenic harm (Chen et al., 2020). There have therefore been concerns that traumatized populations or those in trauma-focussed therapy may not form strong therapeutic alliances.

Disrupted interpersonal bonds are often central to the experience of PTSD. Direct disruption of interpersonal bonds is evident in cases of interpersonal trauma, but PTSD can also indirectly disrupt social bonds, for example, through responses of an individual's social network or lack of available support (Charuvastra & Cloitre, 2008). The creation of a healthy therapeutic alliance, a reflection of these social bonds, is therefore particularly important among people with PTSD and forms part of their recovery. It is therefore important to understand the factors which may enable or hinder alliance development in this population, in psychological therapy. There is growing evidence that people with PTSD can build strong alliances in therapy, and some studies have found alliances to be stronger in trauma-focussed therapies than nontrauma-focussed therapies or pharmacotherapies (Chen et al., 2020; Keller et al., 2010). Studies have found higher alliance to be associated with improved PTSD outcomes posttherapy, and the Flückiger et al. (2018) meta-analysis of alliance–outcome effects found the effect for the seven included PTSD samples was slightly stronger than the overall aggregated effect, across several mental health populations.

Despite this awareness of the importance of alliance in this population, and the evidence indicating their ability to develop strong alliances, a systematic review of the therapeutic alliance in psychological therapy for PTSD has not yet been undertaken. Ellis et al. (2018) included therapeutic alliance as one of several elements from the evidence-based therapy relationships literature (EBR;

> **Key Practitioner Message**
> - Therapeutic alliance was consistently rated highly by clients in therapy for PTSD.
> - Potential predictors of alliance include attachment patterns, coping styles, psychophysiological variables and therapist competency.
> - The alliance strength was not predicted by therapy type and was not significantly different for in-person versus remote therapies.
> - Client-rated therapeutic alliance was moderately associated with PTSD outcomes.
> - The alliance–outcome effect was similar across in-person and remote therapies.

Norcross & Wampold, 2011), in their review of the role of EBR elements in outcomes in therapy for PTSD. They found therapeutic alliance to be frequently associated with a reduction in symptom outcomes. However, the breadth of this review, covering many therapy variables and populations, prevented substantial conclusions being drawn specifically about therapeutic alliance in the PTSD population. Ellis et al. (2018) used loose participant inclusion criteria (including abuse perpetrators along with abuse survivors and case-management as well as therapy), included several outcome measures (rather than specifically PTSD) and did not systematically explore and synthesize variables which may predict the alliance. The quality of included studies was not assessed, and no quantitative synthesis was completed.

In contrast, the current review focuses solely on those who have experienced trauma and posttraumatic symptoms and their therapeutic alliance in psychological therapy. It considers both the predictors of alliance, and the predictive ability of alliance in PTSD outcomes, as well as the average quality of alliance across included PTSD samples, which has not been calculated in previous reviews. Furthermore, the current review also gives consideration to quality of included studies and includes a meta-analysis to quantitatively synthesize findings on the association between the therapeutic alliance and PTSD outcomes. A recent clinical development is the increasing prevalence of alternative ways of delivering therapy, including videoconferencing and internet-based delivery. This has become especially important during the COVID-19 pandemic. Whilst the Ellis et al. (2018) review included some studies which used remote therapies, the relative strength of alliance, and relative predictive ability of alliance, between remote and in-person therapies was not considered. The current review will not exclude studies based on delivery methods, to enable further exploration of this important issue.

The objectives of the current review are to gather and synthesize data relating to the therapeutic alliance in psychological therapy for PTSD. There are two main research questions.

1. Are client or therapy variables associated with the development of therapeutic alliance?
2. To what extent does the therapeutic alliance predict PTSD outcomes?

2 | METHOD

2.1 | Registration

The current review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009). It was registered on Prospero in April 2020 (record number 145572).

2.2 | Inclusion criteria

Studies were selected in line with prespecified inclusion criteria as follows:

1. Adult sample receiving psychological therapy for PTSD or related trauma symptoms.
2. Reported a validated measure of alliance between client and therapist (or alliance to therapy group where appropriate).
3. Reports on either:
    i.   Association between alliance and client or therapy variables
    ii.   Association between alliance and PTSD outcomes
4. Peer-reviewed research article.

Regarding criterion 1, adults attending therapy were not required to have PTSD diagnoses but were required to attend therapy with primary presenting problems of PTSD or posttraumatic stress symptoms associated with a specific trauma (meeting criterion A for PTSD diagnoses according to DSM or ICD classifications; American Psychiatric Association, 2013; World Health Organization, 2019). This was in line with the inclusion criteria for many studies and allowed for those who presented with dual diagnoses. Psychological therapy was defined as 'treatments which involve talking to a trained professional about your thoughts, feelings and behaviour' (Mind, 2018). Examples in the context of PTSD symptoms include, but are not limited to, cognitive behavioural therapy (CBT) and its variants including prolonged exposure (PE) therapy and cognitive processing therapy (CPT). In the case of internet-based therapy, individualized written communication relating to these topics was considered sufficient, whilst automated programmes were not eligible. This recognized the prevalence and relevance of remote therapies, given that alliance has been shown to also predict outcomes in online therapy (Probst et al., 2019).

2.3 | Search strategy

Searches were completed in April 2020 and updated in December 2020. The databases PsycINFO, PubMed, Web of Science and EMBASE were searched using Boolean operators and the following terms:

1. Therap* Alliance* OR therap* relation* OR helping relation* or helping alliance* OR work* alliance* or therap* process* AND
2. PTSD OR post*traumatic stress OR posttraumatic stress OR trauma symptoms.

There were no date restrictions, and only English language papers were included. Grey literature was excluded in the current review, to ensure included studies had been peer reviewed and of sufficient quality. This search resulted in 6308 citations, following removal of duplicates. The reference lists of relevant systematic reviews were additionally searched for eligible papers ($k = 3$). All citations were initially subjected to title and abstract screening. This was completed by the primary author, with a portion (1130; 18%) independently screened by a postgraduate student. Agreement was good (99.7%, $\kappa = .77$). Subsequently, 83 studies were screened at full text level. Again, a proportion were independently screened (35; 42%; agreement = 94%, $\kappa = .84$). Where insufficient information for decision was reported, the authors of the studies were contacted, where possible. This led to one additional study being included (Cronin et al., 2014). Finally, forward- and backward citation-searching strategies were used to identify relevant papers using the reference lists of included papers and citations of included papers. This led to one additional study being included (Zorzella et al., 2014). Discrepancies were discussed with the research team at each stage. A final sample of 34 studies was included (see Figure 1).

2.4 | Quality assessment

Methodological quality of studies was assessed using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies (Thomas, 2003). The tool can be applied to different designs and has good interrater reliability and adequate construct and content validity (Armijo-Olivo et al., 2012; Thomas et al., 2004). The studies included in this review were primarily correlational or included correlational data as part of experimental studies; therefore, some elements of the tool (i.e., those relating to study design, blinding, and intervention integrity) were not relevant as they apply to randomized controlled trial designs. Similar to other systematic reviews (e.g., Safavi et al., 2017), the tool was amended by excluding these three domains. The amended tool included five relevant rating domains: Selection Bias, Confounders, Data Collection Methods, Dropouts and Analysis. Papers were assigned an overall rating of 'strong,' 'moderate' or 'weak' using this assessment, whereby no 'weak' domains led to a global rating of 'strong,' whilst one 'weak' domain led to a global rating of 'moderate.' The lead author and a postgraduate student independently rated all papers on all domains and globally. They attained substantial agreement for global ratings (87.5%, $\kappa = .81$).
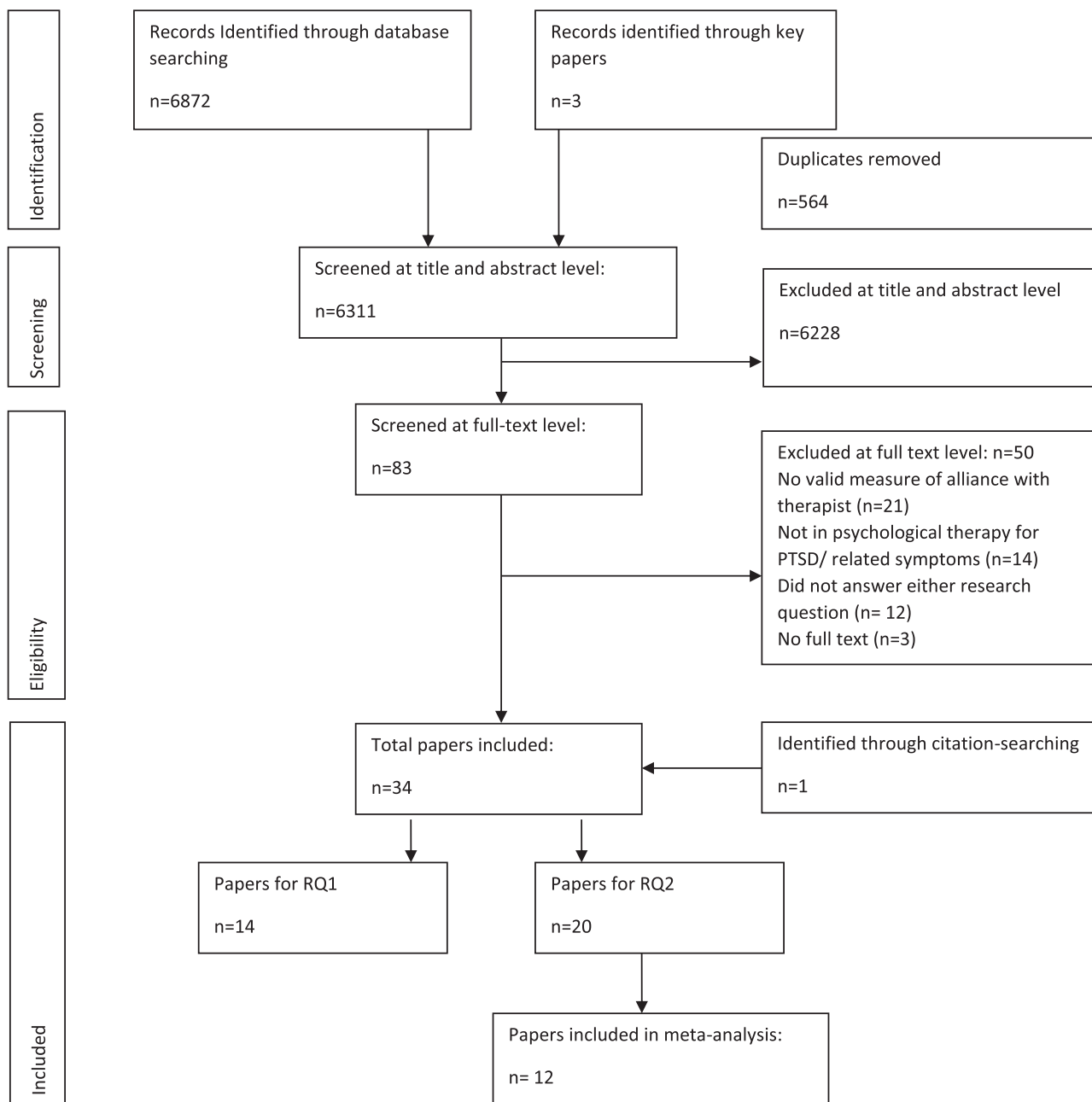
FIGURE 1 PRISMA flow diagram

2.5 | Data extraction and synthesis

Data extraction was completed by the lead researcher, with all meta-analysis data independently extracted in parallel by a postgraduate student (intraclass correlation = .99, $p < .001$). Average ratings of alliance were quantitatively synthesized, where a minimum of two studies reported on the same measurement tool. Due to the marked heterogeneity of predictor variables explored, including client, therapist and therapy variables, quantitative synthesis was not possible regarding potential predictors of alliance. A narrative synthesis of this literature was therefore completed to answer the first research question. Regarding the second research question, alliance–outcome effect

size data were extracted using a hierarchy of preferred data for extraction, which was developed a priori in order to ensure consistency across both reviewers (Appendix A). This accounted for studies which presented several effects, for example, using multiple time points or statistical models. Where multiple ratings were provided, the alliance rating closest to session 3–4 is reported, as is recommended in the literature on alliance as the crucial stage of alliance development, and less vulnerable to bias due to perceived improvement (Crits-Christoph et al., 2011). Effect sizes which controlled for baseline PTSD symptoms were determined to be preferable. Zero-order correlations do not control for the potential for people with less severe baseline PTSD to form better alliances, thereby potentially

TABLE 1 Study characteristics and key findings

Authors (year), country	Study type	Context	Therapy	n	% female age (SD)	Alliance measure (perspective)
Paivio and Patterson (1999), USA	Alliance–outcome	Outpatient therapy for adults with childhood abuse	EFT-AS (including imaginal confrontation)	33	79%, 39 (range 19–72)	WAI (client, s3 and s4)
Kanninen et al. (2000), Palestine	Predictor–alliance	Outpatient therapy for victims of political violence	1:1 and group trauma therapies.	36	0% 31 (7.1)	WAI (client, s3)
Paivio et al. (2001), USA	Alliance–outcome	Outpatient therapy for adults with childhood abuse	EFT-AS (including imaginal confrontation)	37	78%, 38 (11.32)	WAI (client, s4)
Cloitre et al. (2002), USA	Alliance–outcome	Therapy arm of RCT for women with PTSD relating to childhood abuse.	STAIR plus PE	31	100%, 34 (7.22)	WAI-SF (client, s3–s5 average)
van Minnen et al. (2002), Netherlands	Alliance–outcome	Outpatient therapy for chronic PTSD	PE	45	60%, 34.8 (9.8)	BLRI (client, s3)
Cloitre et al. (2004), USA	Alliance–outcome	Therapy arms of two RCTs for women with PTSD relating to childhood abuse	STAIR plus PE	49	100% 33 (7.02)	WAI-SF (client, s3–s5 average)
Knaevelsrud and Maercker (2006), Germany	Alliance–outcome	Online therapy for adults with PTSD symptoms	Internet-based written CBT programme with individualized communication	48	92%, 35 (range 18–68)	WAI-SF (client, s4)
Knaevelsrud and Maercker (2007), Germany	Alliance–outcome	Online therapy for adults with PTSD symptoms	Internet-based written CBT programme with individualized communication	49	90%, 35 (range 18–68)	WAI-SF (client and therapist, S4, S10)
Forbes et al. (2008), Australia	Alliance–outcome	Military veterans specialist PTSD programme.	Not reported	103	0%, 53.3 (7.5)	WAI-SF (client and therapist, 3 weeks)
Germain et al. (2010), Canada	Predictor–alliance	Comparison study of in-person and videoconferencing therapy for adults with PTSD	1:1 CBT (in person and videoconferencing groups)	46	58.7% 42 (NR)	WAI (client, S1, S5, pre-exposure, post-exposure, and end therapy)
Morland et al. (2011), USA	Predictor–alliance	Comparison study of in-person and videoconferencing therapy for veterans with PTSD	CPT group therapy (in-person and videoconferencing groups)	13	0% 48.6 (14.2)	GTAS (client, NR)
Applebaum et al. (2012), USA	Alliance–outcome	Telephone therapy for adults with PTSD symptoms related to illness.	Telephone-CBT	47	39% 52.33 (10.6)	WAI-SF (client, s3)
Wagner et al. (2012), Iraq	Alliance–outcome	RCT of online therapy for adults with war trauma (waitlist condition also included in analyses)	Internet-based written CBT programme with individualized communication	55	87% 27.7 (7.0)	WAI-SF (client, s4)
Hoffart et al. (2013), Norway	Alliance–outcome	RCT on IE vs. IR in residential therapy programme for adults with PTSD	Residential 10 week PTSD programme involving IE or IR	67	58% 45.2 (9.7)	WAI-SR, (client, weekly)

TABLE 1 (Continued)

Authors (year), country	Study type	Context	Therapy	n	% female age (SD)	Alliance measure (perspective)
Cronin et al. (2014), International	Alliance–outcome	Longitudinal naturalistic treatment study of adults with dissociative disorders. (89% had PTSD)	Therapists used their preferred trauma-informed 1:1 approaches.	132	96% 45.57 (range = 18–72).	CASF-P (client) and WAI-T (therapist) at Time 3 (Time 3 is 18 months into the study, Time 4 is 30 months, stage in therapy therefore varies across participant)
Doukas et al. (2014), USA	Alliance–outcome	Therapy for women with complex trauma exposure including violence	Therapists used preferred 1:1 approaches, majority used psychodynamic or CBT approaches.	27	100% 38.77 (13.44)	WAI-SF (client, s12)
Ellis et al. (2014), USA	Alliance–outcome	Inpatient therapy for active duty military with combat-related PTSD	Group inpatient programme including CPT	38	2.6% 31 (6.81)	CALPAS-G 12 item divided into 4 subscales (client, posttherapy of minimum 28 days)
McLaughlin et al. (2014), USA	Alliance–outcome	Prolonged exposure participants from an RCT of choice vs. no-choice of treatment options for PTSD.	1:1 PE, 10 weekly sessions.	116	76.1% 36.7 (11.3)	CALPAS (client, fortnightly)
Morland et al. (2014), USA	Predictor–alliance	RCT of in-person vs. videoconferencing CPT-C for male veterans with PTSD	Group CPT-C. 12 sessions (in person and videoconferencing groups)	125 (96 completed)	0% 55.3 (12.5)	Group therapy alliance scale (client, end of therapy)
Zorzella et al. (2014), Canada	Predictor–alliance	Day programme for women with experiences of childhood abuse	WRAP (including daily group therapy and weekly individual therapy).	47	100% 40 (range 24–64)	CALPAS-P therapist understanding subscale (relating to the group therapist, weekly).
Brady et al. (2015), UK	Alliance–outcome	Outpatient therapy for adults with PTSD.	1:1 CT-PTSD	58	43% 39.2 (11.4)	WAI-OS (observer-rated, first or second session)
Morland et al. (2015), USA	Predictor–alliance	RCT of in-person vs. videoconferencing CPT for women with PTSD (veterans and civilians)	1:1 CPT (in person or videoconferencing). 12 sessions.	126	100% 46.4 (11.9)	WAI-SF (client and therapist, s2)
O'Driscoll et al. (2016), Northern Ireland	Predictor–alliance	Outpatient therapy for adults with schizophrenia and PTSD	1:1 trauma-focussed CBT; 12–16 sessions.	26	42% 46 (10)	WAI-OS (observer-rated, s3 and s10)
Lawson et al. (2017), USA	Alliance–outcome	Outpatient therapy for women presenting for treatment relating to childhood abuse.	1:1 integrated relationship and trauma-based cognitive behaviour therapy, mean of 21 sessions.	76	100% 30.37 (18–60)	ITA-RS (client, s3/s4)

TABLE 1 (Continued)

Authors (year), country	Study type	Context	Therapy	n	% female age (SD)	Alliance measure (perspective)
Reynolds et al. (2017), Northern Ireland	Predictor–alliance	Outpatient therapy for complex trauma.	Individual trauma therapy (including trauma-focused CBT, phase-oriented trauma therapy, psychodynamic psychotherapy, trauma counselling and systemic therapy).	59	22% 50.91 (8.84)	WAI (client, session number varied but 55% were in the middle stages of therapy).
Flanagan et al. (2018), USA	Predictor–alliance	RCT of prolonged exposure augmented with oxytocin vs. placebo for adults with PTSD	Prolonged exposure 10 sessions (oxytocin and placebo groups)	17	17.6% 43.82 ± 14.54	HAQ-II (client, s5)
Ford et al. (2018), USA	Predictor–alliance	RCT of PE vs. TARGET among male veterans with PTSD and anger	1:1 prolonged exposure or TARGET (TARGET is an emotion regulation-focussed therapy)	31	0% 36.5 (9.8)	Brief WAI (client, s4, s7, s10)
Najavits et al. (2018), USA	Predictor–alliance	RCT of creating change vs. seeking safety therapies for veterans with PTSD and substance use disorders.	1:1 creating change (past-focussed) or seeking safety (present focussed) therapies for PTSD and SU, 17 sessions.	52	26.9%, 48.75 (10.77),	HAQ-II (client, s3)
Thompson-Hollands et al. (2018), USA	Predictor–alliance	RCT of CBT vs. present-centred therapy for male veterans with PTSD.	CBT and PCT groups, 14-session group therapy.	178	0% 56.04 (11.97)	CALPAS group (client, s2, s14)
van Minnen et al. (2018), Netherlands	Predictor–alliance	Rotating therapist team providing intensive prolonged exposure therapy.	Prolonged exposure, 12 1:1 sessions over 4 days	73 (43 in analyses)	NR NR	WAI-SF (client, s12)
Chen et al. (2020), USA	Predictor–alliance	Outpatient therapy for veterans with PTSD. Data taken from RCT	Individual CPT and non-trauma-focussed psychotherapy groups.	117	17.1% 48.72 (14.25)	HAQ-II (client, 6 months)
Engel et al. (2020), Germany	Alliance–outcome	Online CBT for male soldiers seeking treatment for PTSD.	Internet-based CBT programme with individualized written communication, 10 sessions.	35	0% 37.91 (10.04)	SACiP (client, s4)
Lawson et al. (2020), USA	Alliance–outcome	Outpatient therapy for women presenting for treatment relating to childhood abuse.	Integrated relationship and trauma-based cognitive behaviour therapy, mean of 19 sessions.	84	100% 30.41 (13.9)	ITA-RS (client, s2–s3, s6–s8, s16–s24)
de la Rosa and Riva (2021)	Alliance–outcome	Outpatient group therapy for women sexual assault survivors.	Trauma-focussed CBT based group (16 or 24 weeks)	33	100% 29 (20–55)	WAI-S bond subscale (weeks 1, 5, 10, 25).

Abbreviations: BLRI, Barrett–Leonard relationship inventory; CALPAS, California Psychotherapy Alliance Scales; CALPAS-G, CALPAS for group psychotherapy; CAPS, clinician-administered PTSD scale; CBT, cognitive behavioural therapy; CPT, cognitive processing therapy; EFT-AS, emotion-focussed therapy for adult survivors of childhood abuse; GTAS, Group Therapy Alliance Scale; HAQ-II, Helping Alliance Questionnaire revised; IE, imaginal exposure; IES, Impact of Events Scale; IR, imaginal reliving; PE, prolonged exposure; ITA-RS, Integrative Therapeutic Alliance Scale revised short form; MDD, major depressive disorder; MPSS-SR, Modified PTSD Symptom Scale; PDS, Posttraumatic Diagnostic Scale; PSS-SR, PTSD symptom scale self-report; PCL, posttraumatic checklist; RSA, respiratory sinus arrhythmia; SACiP, scales for the multiperspective assessment of general change mechanisms in psychotherapy; SCL, skin conductance level; STAIR, skills training in affective and interpersonal regulation; TSC-40, trauma symptoms checklist; WAI, working alliance inventory; WAI-OS, WAI observer short form; WAI-SF, WAI short form; WAI-SR, WAI short form revised; WRAP, women recovering from abuse programme.

TABLE 1 (Continued)

Authors (year), country	PTSD outcome measure	Predictors of alliance	Quality rating	Key findings RQ1	Key findings RQ2
Paivio and Patterson (1999), USA	IES	Childhood trauma exposure; axis-II diagnosis; interpersonal problems	Weak	Alliance was significantly predicted by presence of emotional/physical abuse, emotional and physical neglect but not by total childhood abuse.	Early alliance was significantly associated with reduced PTSD symptoms ($r = -.37$, $p < .05$) at posttreatment.
Kanninen et al. (2000), Palestine	Harvard trauma questionnaire	Adult attachment interview	Moderate	Interaction between attachment patterns and alliance over time. The dismissing group pattern was significantly different to the autonomous group $F(1,22) = 5.31$, $p = .031$ and to the preoccupied group $F(1,13) = 6.26$, $p = .026$.	
Paivio et al. (2001), USA	IES	Childhood trauma exposure; pretherapy PTSD; level of engagement	Weak	Non-significant association between early alliance and childhood trauma ($r = .27$ ns) and pre-PTSD symptoms ($r = -.14$ ns).	Early alliance predicts PTSD outcome controlling for pre-PTSD ($r = -.30$, $p > .05$)
Cloitre et al. (2002), USA	MPSS-PR	NA	Weak	NA	Early alliance predicted post PTSD controlling for mid PTSD ($r = -.62$, $p < .03$)
van Minnen et al. (2002), Netherlands	PSS-SR	NA	Weak	NA	Early alliance did not significantly predict PTSD outcome ($r = -.19$, $p > .1$).
Cloitre et al. (2004), USA	MPSS-SR	Negative mood regulation	Weak	NA	Early alliance significantly predicted PTSD outcome ($r = -.46$ $p < .01$).
Knaevelsrud and Maercker (2006), Germany	IES-R	Anxiety, depression, PTSD.	Moderate	Bond subscale predicted by lower pretherapy symptoms anxiety $r = -.34$, $p < .05$; avoidance PTSD subscale $r = -.35$, $p < .05$.	Early alliance not significantly associated with any posttherapy PTSD symptoms (Intrusion .16, avoidance .13, hyperarousal .15)
Knaevelsrud and Maercker (2007), Germany	IES-R	NA	Moderate	NA	End-therapy alliance significantly associated with PTSD outcomes ($r = .50$, $p < .05$).
Forbes et al. (2008), Australia	PCL	Anger, alcohol use, anxiety, depression, PTSD	Moderate	No baseline variable was significantly associated with client-rated alliance.	Early alliance not significantly associated with PTSD at 9 months ($r = -.19$, $p > .05$).
Germain et al. (2010), Canada	NA	Therapy modality	Moderate	No significant main effect of condition (remote and in-person therapy) or interaction effect with time.	NA

TABLE 1 (Continued)

Authors (year), country	PTSD outcome measure	Predictors of alliance	Quality rating	Key findings RQ1	Key findings RQ2
Morland et al. (2011), USA	NA	Therapy modality	Weak	No difference in alliance between remote and in-person therapy conditions ($U = .64$, $p > .05$).	NA
Applebaum et al. (2012), USA	PCL	NA	Weak	NA	Significant interactions between alliance (good/poor) and time on PTSD subscale outcomes, task and Reexperiencing ($F = 3.31$, $p = .020$); task and avoidance ($F = 3.39$, $p = .018$); bond and reexperiencing ($F = 4.18$, $p = .002$).
Wagner et al. (2012), Iraq	PDS	Trauma exposure	Moderate	NA	Higher early alliance associated with better PTSD outcomes at posttreatment controlling for pre PTSD ($\beta = .37$, $t = 2.81$, $p = .007$)
Hoffart et al. (2013), Norway	PSS-SR or PSS-I	Therapeutic approach	Strong	No within-person effect of PSS-SR scores on subsequent task, goal or bond scores (alliance measured 4 days later; all absolute t values < 1).	Higher initial task and bond (but not goal) predicted a steeper negative slope of PTSD symptoms. Task: $B = 0.272$, $SE = 0.136$, $t(55.5) = 2.00$, $p = .025$; bond: $B = 0.337$, $SE = 0.125$, $t(55.6) = 2.71$ $p < .01$.
Cronin et al. (2014), International	PCL-C	NA	Weak	NA	Client-rated and therapist-rated alliance at time 3 both significantly associated with PTSD at time 4 ($r = -.045$, $p < .01$; $r = -.28$, $p < .01$).
Doukas et al. (2014), USA	PCL	Trauma exposure, symptoms, sensitivity, dissociation, RSA, SCL.	Moderate	Alliance was not predicted by pretherapy PTSD symptoms severity ($r = .09$, $p = .690$), age of first trauma exposure ($r = .23$, $p = .126$) or number of types ($r = -.16$, $p = .212$). Higher RSA at baseline ($r = .47$, $p = .026$) and during the positive slides ($r = .43$, $p = .044$), predicted higher alliance. Lower SCL during ($r = -.41$, $p = .049$) and after (recovery, $r = -.44$, $p = .047$), trauma slides predicted higher alliance.	No statistically significant relationship between PTSD symptom change and end-therapy alliance ($r = .06$, $p = .800$).

TABLE 1 (Continued)

Authors (year), country	PTSD outcome measure	Predictors of alliance	Quality rating	Key findings RQ1	Key findings RQ2
Ellis et al. (2014), USA	PCL-M	Trauma exposure, personality	Moderate	NA	End-therapy patient working capacity subscale of alliance to the group associated with PTSD $r = -.58$, $p < .01$. No association for the other 3 subscales of group alliance, including member understanding subscale.
McLaughlin et al. (2014), USA	PSS-I and PSS-SR	PTSD, trauma exposure, depression diagnosis	Weak	Early alliance was not predicted by pretreatment PTSD ($r = .09$, $p = .93$), childhood abuse $t(98) = -0.92$, $p = .36$ or MDD $t(99) = 0.05$, $p = .96$.	Presence of repaired and unrepaired rupture in alliance significantly associated with PTSD outcome $B = 10.88$, $p < .05$. No rupture group had the lowest PTSD outcomes ($M = 10.04$, $SD = 8.20$), followed by the repaired rupture group ($M = 12.45$, $SD = 9.84$). Unrepaired rupture group had highest PTSD at posttreatment ($M = 19.06$, $SD = 11.48$).
Morland et al. (2014), USA	CAPS	Therapy modality	Weak	No difference in alliance between remote and in-person therapy conditions $d = .08$, $t(df) = 0.2$ (284.9), $p = .84$.	NA
Zorzella et al. (2014), Canada	NA	Adult attachment projective	Weak	Attachment pattern predicted therapist understanding and involvement subscale $F(1,218) = 13.21$, $p = .000$, generalized eta-squared $= .024$, such that unresolved clients rated therapists more positively ($M = 5.46$; $SD = .88$) than dismissing clients ($M = 4.98$, $SD = .82$).	NA
Brady et al. (2015), UK	PDS. Groups of 'good' and 'poor' responders to treatment based on PDS change scores	Patient perseveration and emotional expression, therapist competence and efficiency.	Strong	Alliance predicted by therapist competency ($r = .49-.55$, $p < .001$).	'Good' responders to treatment scored significantly higher on early observer-rated agreement ($F(1,51) = 4.05$, $p = .05$) but not relationship: ($F(1,51) = 0.88$).

TABLE 1 (Continued)

Authors (year), country	PTSD outcome measure	Predictors of alliance	Quality rating	Key findings RQ1	Key findings RQ2
Morland et al. (2015), USA	CAPS and PCL	Therapy modality	Moderate	Session 2 alliance was rated higher by clients in the in-person than the videoconferencing group ($D = .07$), but there was no difference at session 6 or 12. Civilians reported a slightly stronger working alliance than veterans ($p < .05$).	NA
O'Driscoll et al. (2016), Northern Ireland	CAPS and PCL	Emotional processing Emotional arousal	Weak	Session 3 observer-rated alliance significantly associated with emotional processing (modal $r = .76, p < .01$; peak $r = .59, p < .01$) but not emotional arousal ($r = .21, p > .05$). Session 10 alliance was significantly associated with modal emotional processing ($r = .64, p < .01$).	NA
Lawson et al. (2017), USA	TSC-40	Trauma exposure, dissociation	Weak	Pretherapy dissociation symptoms significantly predicted task, goals, and bond subscales ($r = -.22$ to $-.27, p < .05$). Pretherapy trauma symptoms predicted all 4 subscales ($r = -.26$ to $-.40, p < .05$).	Early alliance predicted lower posttherapy trauma symptoms (task $r = -.36, p < .01$, goal $r = -.26, p < .05$, bond $r = -.36, p < .01$)
Reynolds et al. (2017), Northern Ireland	NA	Attachment style, alexithymia, coping skills, trauma exposure	Weak	Alliance was significantly predicted by coping styles: acceptance ($r = .37, p = .004$), emotional support ($r = .46, p < .0005$), instrumental support ($r = .5, p < .0005$), planning ($r = .27, p = .003$), positive reframing ($r = .27, p = .037$) and venting ($r = .38, p = .003$). Established psychological and traumatogenic factors (e.g., attachment, alexithymia, number of traumatic events) did not significantly predict alliance.	NA

TABLE 1 (Continued)

Authors (year), country	PTSD outcome measure	Predictors of alliance	Quality rating	Key findings RQ1	Key findings RQ2
Flanagan et al. (2018), USA	CAPS and PCL	Oxytocin	Moderate	The oxytocin group had higher working alliance scores than placebo, although these differences did not reach statistical significance.	NA
Ford et al. (2018), USA	CAPS	Therapy modality	Weak	Therapeutic alliance was slightly higher in TARGET than PE at s4, s7 and s10, but there were no significant differences ($t = 0.29$-1.76, $df = -14$-15, $p = .10$-$.78$).	NA
Najavits et al. (2018), USA	PCL	Therapy modality	Weak	No significant difference in early alliance between therapy groups ($t = -.55$, $df = 32$, $p = .59$).	NA
Thompson-Hollands et al. (2018), USA	CAPS-5	Trauma exposure, therapy modality	Weak	An interpersonal index event, compared to non-interpersonal, did not significantly impact initial levels of alliance or change in alliance over time ($b = 1.01$, $SE = 3.98$, $p = .799$). Treatment condition did not impact early alliance levels ($b = 3.41$, $SE = 2.79$, $p = .223$), but the CBT condition had a significantly greater rate of alliance growth over time.	NA
van Minnen et al. (2018), Netherlands	NA	Attachment style	Weak	No significant difference in end-therapy alliance between secure (15) and insecure (28) attachment groups ($t(41) = .416$, $p = .68$)	NA
Chen et al. (2020), USA	PDS	Therapy modality	Weak	Mean difference in alliance ratings between groups did not reach inferiority margin ($M = 0.24$, 95% CI [0.00; 0.47])	NA
Engel et al. (2020), Germany	CAPS	Oxytocin blood concentration	Weak	Oxytocin blood concentration did not significantly predict alliance: emotional bond ($\beta = .14$, $t = 0.61$, $p = 0.55$) or collaboration ($\beta = .23$, $t = 0.99$, $p = .34$).	Early alliance associated with PTSD outcomes, controlling for pretherapy PTSD: Emotional bond: $r = -.25$, $p = .31$; agreement on collaboration: $r = -.48$, $p = .04$.

TABLE 1 (Continued)

Authors (year), country	PTSD outcome measure	Predictors of alliance	Quality rating	Key findings RQ1	Key findings RQ2
Lawson et al. (2020), USA	TSC-40	Trauma exposure (DAPS subscale), dissociation, interpersonal problems	Weak	Early alliance was significantly predicted by interpersonal problems ($\gamma = -.28, p < .01$) but not by dissociation ($\gamma = -.16, p = .24$) or retraumatization ($\gamma = .04, p = .68$). Mid-therapy alliance was predicted by baseline trauma symptoms ($r = -.20; -.28; -.27$) but end-therapy alliance was not ($r = -.18; -.09; -.16$).	Early alliance predicted lower trauma symptoms posttherapy (task $r = -.33, p < .01$, goal $r = -.25, p < .05$, bond $r = -.40, p < .01$)
de la Rosa and Riva (2021)	PCL-5	Baseline PTSD	Weak	Pre-PTSD scores were not found to be significant in the prediction of initial bond scores ($p = .596$) or the growth of bond over time ($p = .669$).	Changes in bond scores were not significant in the change of PTSD scores over time ($p = .193$).

inflating the alliance–outcome effect, as they are likely to also have lower PTSD scores at end therapy. These were therefore extracted where no controlled correlations were available. Where included papers did not present data suitable for aggregation, authors were contacted to provide this. This led to one additional study's inclusion in the meta-analysis (Hoffart et al., 2013).

A meta-analysis was conducted on the association between client-rated therapeutic alliance and PTSD outcomes across all eligible effect sizes. Studies reporting the relevant alliance–outcome effect size were entered into a meta-analysis, using R (R Core Team, 2020) and the Meta package (Balduzzi et al., 2019). The random-effects model was used, as is appropriate where heterogeneity is expected across studies. Pearson's r was chosen as the primary effect-size metric. Subgroup analysis was conducted regarding in-person therapies and remote-delivered therapies, to explore any potential differences in the alliance–outcome effect. Further, subgroup analysis was conducted regarding zero-order correlations and correlations controlling for baseline PTSD symptoms, to assess the validity of including both types of data. Heterogeneity statistics (Cochran's Q test and I^2) were used to examine the degree of inconsistency across the reported effect sizes (I^2 values: 25% = low, 50% = moderate, 75% = high heterogeneity; Higgins et al., 2003). Publication bias was assessed using Egger's test for funnel plot asymmetry and visual inspection of plots (Egger et al., 1997). The 'Trim-and-Fill' method (Duval & Tweedie, 2000) was used to correct the results for the potential influence of publication bias or other selection bias. Finally, any unduly influential outlying studies were detected using the 'find outliers' command in R.

3 | RESULTS

3.1 | Study characteristics

Thirty-four studies were included in the systematic review, and their characteristics are presented in Table 1. Thirty-two were longitudinal, whilst two were cross-sectional. Fourteen studies, including the two cross-sectional studies, were classed as predictor–alliance studies, as they measured alliance during therapy, and its association with baseline or mid-therapy variables, providing data relevant to the first research question. Twenty studies were classed as alliance–outcome studies, as they explored the association between alliance during therapy, and PTSD outcomes, providing data relevant for the second research question. Where alliance–outcome studies additionally report on potential predictor variables, this is included in Table 1 and in the narrative synthesis.

As four pairs of studies used participants drawn from the same sample, there are 30 independent samples to which the following information relates. The larger and later-dated sample is referenced in each case. In total, 1921 participants were included. Samples were drawn from a variety of settings including specialist trauma clinics, inpatient services, specialist veteran's programmes and non-clinical samples self-referring for support relating to trauma. Nine of the studies used solely military samples, seven of these were veteran samples,

whilst two were active duty. Therapy was conducted in a variety of modalities including individual ($k = 18$), group ($k = 6$), inpatient ($k = 2$) internet-based ($k = 3$) and remote videoconferencing ($k = 4$) or telephone therapy ($k = 1$). Some studies used multiple modalities, for example, remote and face-to-face therapies. Therapists used a variety of approaches with CBT ($k = 10$), PE ($k = 6$) and CPT ($k = 5$) used most frequently in this set of studies.

3.2 | Quality of studies

Quality assessment using the EPHPP identified that quality of studies was weak–moderate, with only two studies rated 'strong' (Appendix B for subscale ratings). However, these ratings must be considered within the context of psychotherapy research, which is by nature often weak on selection bias and attrition of participants. Additionally, studies often reported on alliance as a supplementary research question rather than the primary aim. They therefore may score lower when being assessed from this perspective than their intended research question, for example, studies of intervention efficacy.

Selection bias was rated 'weak' for 31 studies, given the prevalence of self-referred participants, additional selection criteria impacting on generalizability and lack of detail provided on recruitment procedures. Twelve studies were rated 'weak' on dropouts, nine of which were due to a failure to report detail on dropouts. Regarding confounders, 23 studies were rated 'weak' or 'moderate.' A moderate rating was given where studies controlled for baseline PTSD symptoms in the association between alliance and PTSD outcomes (13 studies) or where the variable of interest was randomly assigned, such as in randomized controlled trials where group allocation was the variable of interest (seven studies).

Eleven studies controlled for one or more additional variables such as demographic variables and were rated as strong. In many cases, the lack of potential confounds controlled for appeared to be due to the focus of the paper differing from the research questions presented in the current review, as discussed previously. Data collection methods were good, with 25 studies rated 'strong' as the measures used were either established, or reported to be reliable and valid. Analyses were generally appropriate but lack of management of missing data and multiple comparisons was frequent, leading to 28 studies being rated 'weak' or 'moderate.'

3.3 | Average alliance

Thirteen measures of alliance were used. The Working Alliance Inventory short form was the most frequently used (WAI-SF; Tracey & Kokotovic, 1989; $k = 8$). Client-rated alliance was reported in 28 samples, whilst observer-rated alliance was reported in two samples. Therapist-rated alliance was reported in addition to client-rated in four samples. In most cases, alliance was measured early in therapy, that is, by session five ($k = 25$). In 16 of these, it was additionally

measured later in therapy, with some studies measuring weekly. Five studies only measured at end therapy, whilst three studies measured alliance at a varying or unknown time point in therapy.

Average alliance during therapy was reported by 27 studies. The weighted average alliance was calculated across samples where at least two independent studies reported on the same measure (Table 2). Average ratings were weighted by sample size to provide a more representative estimate. Where studies were drawn from the same sample, only the data from the later study were used. Where authors reported a combination of total and scaled scores, total scores were converted to their scaled score. For example, the WAI-SF is sometimes reported out of a cumulative total of 84 points and sometimes on a scale of 1–7. Whilst these measures do not have cut-off points, higher ratings indicate better alliance. The average alliance data should be interpreted with caution, given that this review does not encompass every study of alliance in therapy for PTSD. Other measures used are presented in Table 1; however, there was insufficient data to report a weighted average.

Eleven studies reported an increase in client alliance ratings over therapy, five of which were reported to be statistically significant increases (Cloitre et al., 2004; de la Rosa & Riva, 2021; Engel et al., 2020; Germain et al., 2010; Knaevelsrud & Maercker, 2007; Lawson et al., 2020; McLaughlin et al., 2014; Paivio & Patterson, 1999; Thompson-Hollands et al., 2018; Wagner et al., 2012; Zorzella et al., 2014). One study recorded a decrease, but the significance of this effect was not reported (Morland et al., 2015). It must be noted that most studies did not report on alliance over time, and firm conclusions cannot be drawn from this descriptive data. Cronin et al. (2014) reported therapist-rated alliance at two time points; these scores remained consistent. Therapist-rated alliance was consistently lower than client-rated alliance within studies. Two studies reported significant correlations between client and therapist ratings ($r = .37–.39$, $p < .05$), whilst one did not report on this effect.

3.4 | Predictors of alliance

3.4.1 | Demographic variables

No study reported on correlations between age or gender and the therapeutic alliance. One study reported on chi-square analyses between alliance rupture groups (no rupture, repaired rupture and unrepaired rupture) and education, income and minority status and found no significant associations (McLaughlin et al., 2014). This

study was rated weak quality and used a self-referred sample which may not be representative across demographic factors. One moderate quality study reported on military status, finding that civilians reported slightly higher early working alliance than veterans, within a sample of 126 women (Morland et al., 2015).

3.4.2 | Trauma variables

Six studies reported on the associations between alliance and trauma exposure variables. Five studies reported no significant associations with alliance, specifically regarding the age of trauma onset and number of trauma types (Doukas et al., 2014), the presence of childhood trauma (McLaughlin et al., 2014), the number of traumas (Reynolds et al., 2017), the presence of retraumatization (Lawson et al., 2020) and the presence of an interpersonal trauma (versus a non-interpersonal trauma; Thompson-Hollands et al., 2018). However, Paivio and Patterson (1999), a low quality study among 33 participants with childhood sexual trauma, found significant negative associations between childhood trauma, specifically emotional/physical abuse, emotional neglect and physical neglect and early alliance. They found no association with childhood sexual abuse or with total childhood maltreatment. Their findings may have differed from the other studies due to a focus on specific types of childhood traumatic experiences, rather than broader lifetime exposure.

Given the relatively small sample sizes and different constructs measured, these results do not permit conclusions to be drawn about the impact of trauma exposure on alliance development. It is possible that specific trauma types, such as those measured by Paivio and Patterson (1999) predict the alliance, rather than trauma exposure more broadly.

3.4.3 | Symptom variables

Ten studies reported on associations between client-rated alliance and client symptoms and/or diagnoses. Eight studies found no significant association between PTSD symptoms and subsequent alliance ratings. Most studies measured symptoms at baseline (de la Rosa & Riva, 2021; Doukas et al., 2014; Forbes et al., 2008; Knaevelsrud & Maercker, 2006; McLaughlin et al., 2014; Paivio et al., 2001; Wagner et al., 2012), whilst one measured symptoms weekly, 3 days prior to alliance ratings (Hoffart et al., 2013). However, Knaevelsrud and Maercker (2006) found baseline avoidance subscale of PTSD

TABLE 2 Average alliance ratings

Alliance measure	Therapy delivery	Number of studies	Weighted average	Range	Scale
HAQ-II (client-rated)	In-person	3	5.16	5.13–5.20	1–6
WAI-SF (client-rated)	Remote and in-person	9	5.81	3.99–6.30	1–7
WAI-SF (therapist-rated)	Remote and in-person	3	5.38	4.94–5.65	1–7
WAI 36-item (client-rated)	Remote and in-person	3	6.04	5.93–6.14	1–7

significantly predicted the bond subscale of alliance. Only one study found baseline trauma symptoms, as measured by the Trauma Symptoms Checklist (TSC-40), were significantly negatively associated with all four subscales of their alliance measure, Integrative Therapeutic Alliance Scale (ITAS-RS; Lawson et al., 2017). Neither of the measures used in the Lawson studies were used within other samples, so it is possible they are measuring slightly different constructs.

Four studies reported on several non-significant findings regarding other baseline symptoms, including anxiety and depression (Forbes et al., 2008; Knaevelsrud & Maercker, 2006), anger (Forbes et al., 2008), alexithymia (Reynolds et al., 2017) and global distress, interpersonal sensitivity and dissociation (Doukas et al., 2014). However, Lawson et al. (2017) did report significant associations between baseline dissociation and all ITAS-RS subscales. Again, this discrepancy may relate to the choice of measures in this study. Forbes et al. (2008) explored the associations with Affective Control, reporting a negative significant association between 'fear of anxiety' and therapist-rated, but not client-rated, alliance and no significant associations for fear of depression, anger or happiness. However, Forbes et al. (2008) reported a correlation matrix for 12 intake variables without controlling for multiple comparisons and were therefore likely to find some significant results due to chance.

Two studies reported on associations with mental health diagnoses. One found clinician-determined axis-II disturbance was significantly negatively associated with client-rated alliance (Paivio & Patterson, 1999). However, given that diagnoses were determined by the treating therapist, this variable may be confounded by the therapeutic alliance. McLaughlin et al. (2014) found no association between a diagnosis of Major Depressive Disorder and early or late alliance.

One study reported on therapist-rated alliance and symptoms, finding that PTSD, dissociation and global severity of symptoms at Time 3 were significantly negatively associated with therapist-rated alliance at Time 4 (Cronin et al., 2014). However, Time 3 was a variable time point which could be several years into a participant's therapy.

These results do not present a coherent picture regarding the relationship between pretherapy or in-therapy mental health symptoms and alliance in therapy, with discrepancies in constructs measured and time points utilized. Hoffart et al. (2013) was rated strong quality, and measured alliance and PTSD weekly, whilst Forbes et al. (2008) reported on a large sample. These studies may therefore provide more reliable findings and neither found a significant association with baseline PTSD symptoms. Lawson et al. (2017) did find a significant negative association with baseline trauma symptoms; however, their measure is much broader than the standard PTSD criteria and may be incorporating some other aspects of distress which may potentially hinder the alliance.

3.4.4 | Psychosocial variables

Eight studies reported on associations between client-rated alliance and baseline psychosocial variables. Four studies investigated associations between attachment and client-rated alliance, using differing methods of measurement. Kanninen et al. (2000), using the Adult Attachment Interview, found significant difference in trajectories of alliance over therapy for the dismissing group compared to pre-occupied or autonomous attachment patterns, such that the dismissing group alliance decreased over time. Zorzella et al. (2014) found perception of therapist's understanding (TUI subscale of CALPAS) to be significantly higher in the unresolved group than the dismissing group, as classified according to the Adult Attachment Projective. However, van Minnen et al. (2018) found no difference in alliance ratings between securely attached and insecurely attached groups, classified using the Relationship Questionnaire. Additionally, Reynolds et al. (2017) found alliance did not correlate with any attachment dimension according to the Attachment Style Questionnaire. Each of these studies used different classification systems of attachment and so it is difficult to integrate findings. However, both Kanninen et al. (2000) and Zorzella et al. (2014) found significantly weaker alliances among people with dismissing attachment patterns, despite small sample sizes. The Kanninen study was rated moderate quality, whilst the others were rated weak, and so may present the most reliable findings.

Four studies explored associations with other psychosocial variables. Interpersonal problems were significantly associated with early alliance in one study (Lawson et al., 2020), whilst no significant association was found in Paivio and Patterson (1999), using similar measures. However, the latter study used a small sample and may have been underpowered to detect an effect. Six coping styles were found to be significantly positively associated with client-rated alliance: acceptance, emotional support, instrumental support, planning, positive reframing and venting, whilst no association was found regarding the remaining eight coping styles on the COPE measure (Reynolds et al., 2017). This study was rated weak quality and reported a large correlation matrix without controlling for multiple comparisons. No significant association with alliance was found regarding positive or negative social support, within a moderate quality study (Forbes et al., 2008).

Overall, it appears that psychosocial factors merit further investigation as they show some potential as predictors of alliance in this population, but variation in constructs measured impacts the coherence of findings. The dismissing attachment style appears to be associated with lower alliance, as this was demonstrated across two studies.

3.4.5 | Psychophysiological variables

Four studies reported on psychophysiological factors. Two small-sample studies reported non-significant positive associations between oxytocin and alliance: Engel et al. (2020) measured baseline oxytocin levels, whilst Flanagan et al. (2018) experimentally manipulated oxytocin levels using a nasal spray. Forbes et al. (2008) found no significant association between baseline alcohol intake and early alliance, despite reporting a moderate–strong positive correlation ($r = .31$) as part of

their large correlation matrix. Doukas et al. (2014), a moderate quality study, measured two physiological variables relevant to emotion regulation. Respiratory sinus arrhythmia (RSA; a breathing rate rhythm) at baseline significantly predicted higher alliance at end therapy, whilst higher skin conductance level (SCL; a skin stress response) when viewing trauma slides significantly predicted lower alliance.

It appears alliance may be influenced by physiological factors, and these require further investigation. Apart from Engel et al. (2020), which was rated weak, these studies were rated moderate quality and may present reliable findings. Flanagan et al. (2018) was a pilot study with only 13 participants completing measures and therefore unable to detect a potential true effect regarding the positive impact of oxytocin on alliance.

3.4.6 | Therapy variables

Thirteen studies reported on associations between therapeutic alliance and therapy variables. Five studies explored therapeutic processes. Brady et al. (2015), which was rated strong quality, measured observer-rated alliance and observer-rated expression of thoughts and feelings, and perseveration, during initial sessions. Significant positive associations were found between client expression and both agreement and relationship domains of alliance, and a significant negative association was found between perseveration and agreement. Similarly, O'Driscoll et al. (2016) found early observer-rated alliance was significantly associated with observer-rated emotional processing, but not emotional arousal, despite a small sample size. Paivio et al. (2001) found early alliance to be significantly positively associated with level of engagement in imaginal confrontation procedures during the same session. Cronin et al. (2014) found therapist-rated Progress in Treatment Questionnaire (PITQ; a measure of clients' progress in adaptive management of their symptoms) at Time 3 correlated significantly with both client- and therapist-rated alliance at Time 4. The number of sessions attended (median = 27) was not significantly associated with client-rated alliance (Reynolds et al., 2017). Regarding therapist factors, Brady et al. (2015) found that observer-rated therapist competency was significantly associated with higher alliance, whilst therapist efficiency was not. Eight studies investigated the impact of therapy type on alliance. Four studies, of low–moderate quality, found no significant difference in client-rated alliance between face-to-face and videoconferencing modes of therapy delivery; Germain et al. (2010) found no difference when delivering CBT, whilst Morland et al. (2011, 2014, 2015) found no difference when delivering CPT. Four studies, all rated low quality due to issues with selection and attrition biases, found no significant differences in alliance across therapeutic approaches. The therapy models compared included: PE and TARGET (an emotion regulation-focussed intervention), whereby alliance was slightly higher in TARGET; a present-focussed group therapy (Seeking Safety) and a past-focussed group therapy (Creating Change; Najavits et al., 2018); CPT and nontrauma-focused supportive psychotherapy, whereby alliance was

slightly higher in CPT (Chen et al., 2020); and group person-centred therapy and group CBT (Thompson-Hollands et al., 2018).

In-therapy variables including expression, perseveration, engagement in trauma work and use of newly acquired skills appear to be associated with therapeutic alliance within this population. However, most of these findings are subject to the 'halo effect' as they are rated by the same person. Cronin et al.'s (2014) finding encompasses therapist-rated PITQ, and client-rated alliance so is particularly interesting as it does not have the same bias. Brady et al.'s (2015) findings regarding emotional expression, perseveration and therapist competency are likely to be reliable, as this is a high quality rated study. It does not appear that either method of delivery of therapy, or type of therapy, significantly impacts the alliance development among people with PTSD.

3.5 | Alliance predicting PTSD outcome

3.5.1 | Alliance–outcome effect sizes

Twenty studies reported on correlations between alliance and PTSD outcome and are presented in Table 3. Effect sizes were selected for extraction in line with the data extraction hierarchy (Appendix A). Effect sizes reporting on the total therapeutic alliance are prioritized. Where only subscales were reported, the 'Bond' subscale, or equivalent, was chosen, as the element representative of the interpersonal relationship between therapist and client.

3.5.2 | Meta-analysis of alliance–outcome correlations

Twelve studies were entered into a meta-analysis. As four pairs of studies used overlapping samples, only one of each pair was entered into the meta-analysis; these were selected according to the hierarchy (Appendix A), prioritizing those with the preferred correlation data and larger samples. Two studies did not provide the relevant data when requested (Applebaum et al., 2012; Brady et al., 2015). Two studies (de la Rosa & Riva, 2021; Ellis et al., 2014) were ineligible for aggregation in a meta-analysis, due to measuring alliance to the group, rather than to the therapist, which is conceptually different. The remaining 12 studies were entered into a random-effects meta-analysis (Figure 2). The aggregated correlation effect size was $r = -.339$ [CI $= -0.436; -0.234$], $p < .001$. This indicates a moderate effect size between therapeutic alliance and posttherapy PTSD outcomes, when aggregating the 12 included studies.

Heterogeneity was assessed using Q and I^2 statistics: $Q(11) = 18.12$, $p = .079$, $I^2 = 39.3\%$ [CI $= 0.0\%; 69.3\%$]; $H = 1.28$ [1.00; 1.80]. This indicates non-significant levels of heterogeneity across effect sizes. I^2 can be interpreted as the percentage of variability due to true differences among effect sizes, in this case, approximately 39% (Hedges & Olkin, 1985). The heterogeneity across effect sizes may also be related to between-study differences, such as the

TABLE 3 Correlations of alliance and PTSD outcome

Study	n	Alliance measure	Alliance time point	PTSD measure	PTSD time point	Correlation	Other relevant statistic
Paivio and Patterson (1999)	33	WAI (client)	Session 4	IES	Posttherapy (residual change score)	–.32*	
Paivio et al. (2001)	37	WAI (client)	Session 4	IES	Posttherapy (controlling for pre)	–.30	
Cloitre et al. (2002)	22	WAI-SF (client)	Session 3–5 average	MPSS-SR	Posttherapy (change score)	–.62*	
van Minnen et al. (2002)	35	Barrett–Leonard relationship inventory (client)	Session 3	PSS-SR	Posttherapy (residual gain)	–.19	
Cloitre et al. (2004)	34	WAI-SF (client)	Session 3–5 average	MPSS-SR	Posttherapy	–.46**	
Knaevelsrud and Maercker (2006)	40	WAI-SF (client)	Session 4	IES-R	Posttherapy (residual gain) by subscale: intrusions; avoidance; hyperarousal	.16; .13; .15	
Knaevelsrud and Maercker (2006)	40	WAI-SF (therapist)	Session 4	IES-R	Posttherapy (residual gain) by subscale: intrusions; avoidance; hyperarousal	.08; .08; –.04	
Knaevelsrud and Maercker (2007)	41	WAI-SF (client)	Session 10 (end therapy)	IES-R	Posttherapy (controlling for pre)	–.50*	
Knaevelsrud and Maercker (2007)	41	WAI-SF (therapist)	Session 10 (end therapy)	IES-R	Posttherapy (controlling for pre)	–.30	
Forbes et al. (2008)	103	WAI-SF (client)	Week 3	PCL	9-month follow-up (controlling for pre)	–.07	
Forbes et al. (2008)	103	WAI-SF (therapist)	Week 3	PCL	9-month follow-up (controlling for pre)	–.06	
Applebaum et al. (2012)	47	WAI-SF (client)	Session 3	IES	6-month follow-up		Bond subscale and re-experiencing subscale: $F = 2.88^*$; task subscale and avoidance subscale: $F = 3.39^*$
Wagner et al. (2012)	47	WAI-SF (client)	Session 4	PDS	Posttherapy (change score)	.40*	
Hoffart et al. (2013)	65	WAI-SR (client)	Week 3	PSS-SR	Posttherapy	–.38**	
Cronin et al. (2014)	113	CASF-P (client)	18 months	PCL-C	30 months	–.45**	
Cronin et al. (2014)	113	WAI-T (therapist)	18 months	PCL-C	30 months	–.28**	
Doukas et al. (2014)	27	WAI-SF (client)	Session 12 (end therapy)	PCL	Posttherapy (change score)	.06	
Ellis et al. (2014)	37	CALPAS-G Member Understanding Subscale (client alliance to the group)	Posttherapy	PCL-M	Posttherapy	–.09	
McLaughlin et al. (2014)	82	CALPAS (client)	Session 1–10 average	PSS-SR	Posttherapy	–.37**	
Brady et al. (2015)	58	WAI-OS subscales (observer)	Session 1–2	PDS	Posttherapy (divided into good and poor PTSD outcome groups; controlling for demographics and pre-PTSD)		ANCOVA predicting 'good responder' and 'poor responder' from alliance. Agreement subscale: $F(1,51) = 4.05$, partial eta-squared = .073, $p = .05$; relationship subscale: $F(1,51) = 0.88$, partial eta-squared = .017, ns.

TABLE 3 (Continued)

Study	n	Alliance measure	Alliance time point	PTSD measure	PTSD time point	Correlation	Other relevant statistic
Lawson et al. (2017)	76	ITA–RS bond subscale (client)	Session 3–4	TSC	Posttherapy	−.36**	
Engel et al. (2020)	35	Emotional bond (client)	Session 4	CAPS	Posttherapy controlling for pre	−.25	
Lawson et al. (2020)	84	ITA–RS bond subscale (client)	Session 2–3	TSC	Late therapy	−.40**	
de la Rosa and Riva (2021)	33	WAI-SF bond subscale	Session 1, 5, 10, 25	PCL-5	Pre- and posttherapy		Using growth curve modelling, changes in bond scores over time were not significant in the change of PTSD scores over time (p = .193).

*p < .05. **p < .01.

difference in measurement methods, and measurement time points, used across different studies. However, heterogeneity was minimized by ensuring only client-rated alliance was included, and the majority of measurements occurred at similar time points (i.e., early alliance and late PTSD).

Visual inspection of the funnel plot did not present any inconsistencies, and it appeared symmetrical (Figure 3). Eggers' test was non-significant, indicating the absence of funnel plot asymmetry $t(10) = -0.177$, $p = .862$. The outlier-exclusion analysis, which identifies outlying studies based on the overlap between their confidence intervals and the pooled effect confidence intervals, was conducted. No outliers were detected. However, Forbes et al. (2008) appeared to exert a strong influence on the results. As PTSD was measured at a 9-month follow-up in this study, further exploration was required to determine the potential influence of including this conceptually different data. Sensitivity analyses were run to determine the outcome of the meta-analysis leaving out Forbes et al. (2008). Omitting this study, the aggregated correlation was slightly stronger: $r = -.391$, $p < .001$.

3.5.3 | Subgroup analyses

A subgroup analysis was conducted for therapy delivery modes (Figure 4). Whilst the effect appeared weaker for in-person therapy ($k = 8$; $r = -.323$) than remote therapy ($k = 4$; $r = -.390$), no significant difference was identified ($Q(1) = 0.41$, $p = .524$).

A subgroup analysis additionally explored the difference in effect size when using controlled and uncontrolled correlations, that is, whether pretherapy PTSD scores were controlled for (Figure 5). Whilst the effect was stronger for zero-order correlations ($k = 5$; $r = -.392$) than controlled correlations ($k = 7$; $r = -.303$), this was not a significant difference ($Q(1) = 0.81$, $p = .367$).

3.5.4 | Additional alliance–outcome findings

Twelve of the 20 studies found significant associations between client-rated therapeutic alliance and PTSD outcomes. No significant associations were found in eight samples. Of these, two studies measured alliance at the end of therapy, enabling the potential for alliance ratings to be influenced by their perceived symptom recovery following therapy (Doukas et al., 2014; Ellis et al., 2014). One measured PTSD at 9-month follow-up (Forbes et al., 2008), rather than posttherapy, by which time there is potential for relapse in symptoms. Three studies used measures of alliance not used in any other included study: van Minnen et al. (2002) used an unusual measure of therapeutic alliance, which may be more suited to dyadic family relationships (Ganley, 1989); Engel et al. (2020) used a novel measure of emotional bond; whilst Brady et al. (2015) used an observer-rated measure. These differences may help explain why these studies did not find an effect. However, it must also be noted that many studies reporting significant effects also had quality constraints as discussed.
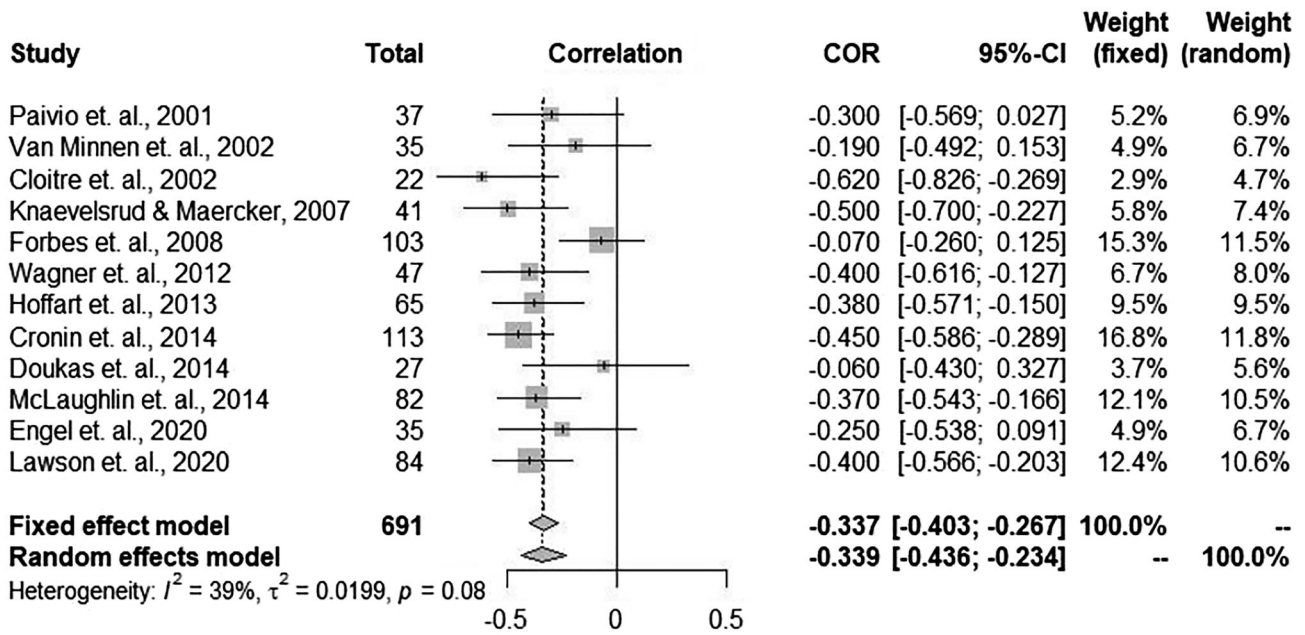
Study	Total	Correlation	COR	95%-CI	Weight (fixed)	Weight (random)
Paivio et. al., 2001	37		-0.300	[-0.569; 0.027]	5.2%	6.9%
Van Minnen et. al., 2002	35		-0.190	[-0.492; 0.153]	4.9%	6.7%
Cloitre et. al., 2002	22		-0.620	[-0.826; -0.269]	2.9%	4.7%
Knaevelsrud & Maercker, 2007	41		-0.500	[-0.700; -0.227]	5.8%	7.4%
Forbes et. al., 2008	103		-0.070	[-0.260; 0.125]	15.3%	11.5%
Wagner et. al., 2012	47		-0.400	[-0.616; -0.127]	6.7%	8.0%
Hoffart et. al., 2013	65		-0.380	[-0.571; -0.150]	9.5%	9.5%
Cronin et. al., 2014	113		-0.450	[-0.586; -0.289]	16.8%	11.8%
Doukas et. al., 2014	27		-0.060	[-0.430; 0.327]	3.7%	5.6%
McLaughlin et. al., 2014	82		-0.370	[-0.543; -0.166]	12.1%	10.5%
Engel et. al., 2020	35		-0.250	[-0.538; 0.091]	4.9%	6.7%
Lawson et. al., 2020	84		-0.400	[-0.566; -0.203]	12.4%	10.6%
Fixed effect model	**691**		**-0.337**	**[-0.403; -0.267]**	**100.0%**	**--**
Random effects model			**-0.339**	**[-0.436; -0.234]**	**--**	**100.0%**

Heterogeneity: $I^2 = 39\%$, $\tau^2 = 0.0199$, $p = 0.08$

-0.5   0   0.5
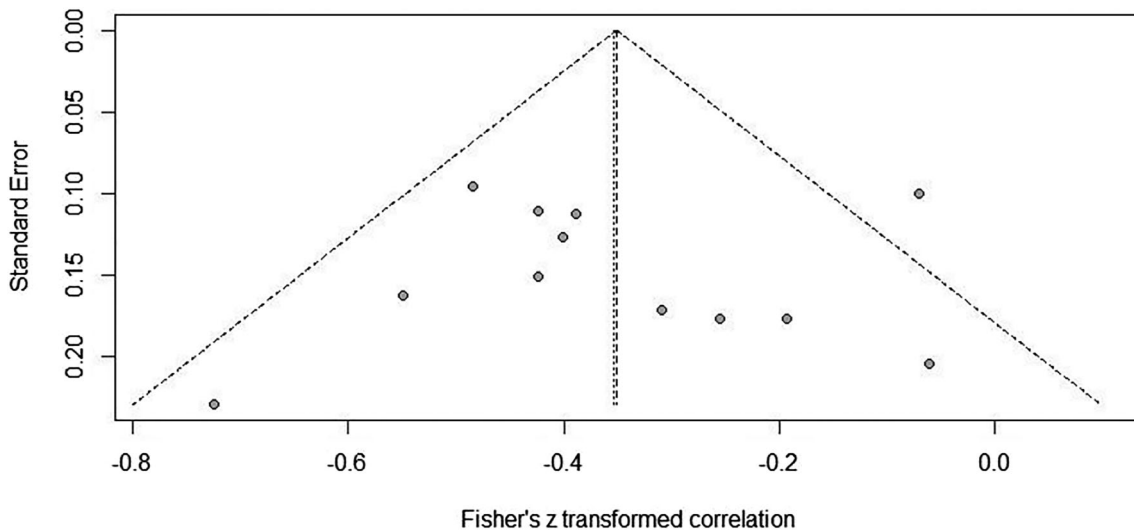
FIGURE 2 Forest plot

FIGURE 3 Funnel plot

Two studies reported on client-rated alliance to the group within group therapy. Ellis et al. (2014) did not find a significant association between alliance to the group, using the Member Understanding subscale of the CALPAS-F measure, which measures the participant's sense of being understood by the group, and PTSD outcomes ($r = -.09$). They did find a significant association with the Patient Working Capacity subscale, which assesses participant willingness to engage and disclose within the group ($r = -.58$, $p < .01$). de la Rosa and Riva (2021) did not find a significant effect of changes in Bond scores over time on changes in PTSD scores over time ($p = .193$).

McLaughlin et al. (2014) explored the differences in PTSD outcomes across three defined rupture groups. They found that those with an unrepaired rupture in the alliance ($n = 15$) had the worst PTSD outcomes, controlling for baseline PTSD, and this difference was significant. Those who experienced no rupture in their alliance had the best PTSD outcomes at end therapy ($n = 44$), whilst those with a repaired rupture ($n = 23$) had slightly worse outcomes.

Four of the studies, comprising three independent samples, additionally reported on the association between therapist-rated alliance and PTSD outcome. Of these, only one, Cronin et al. (2014), reported
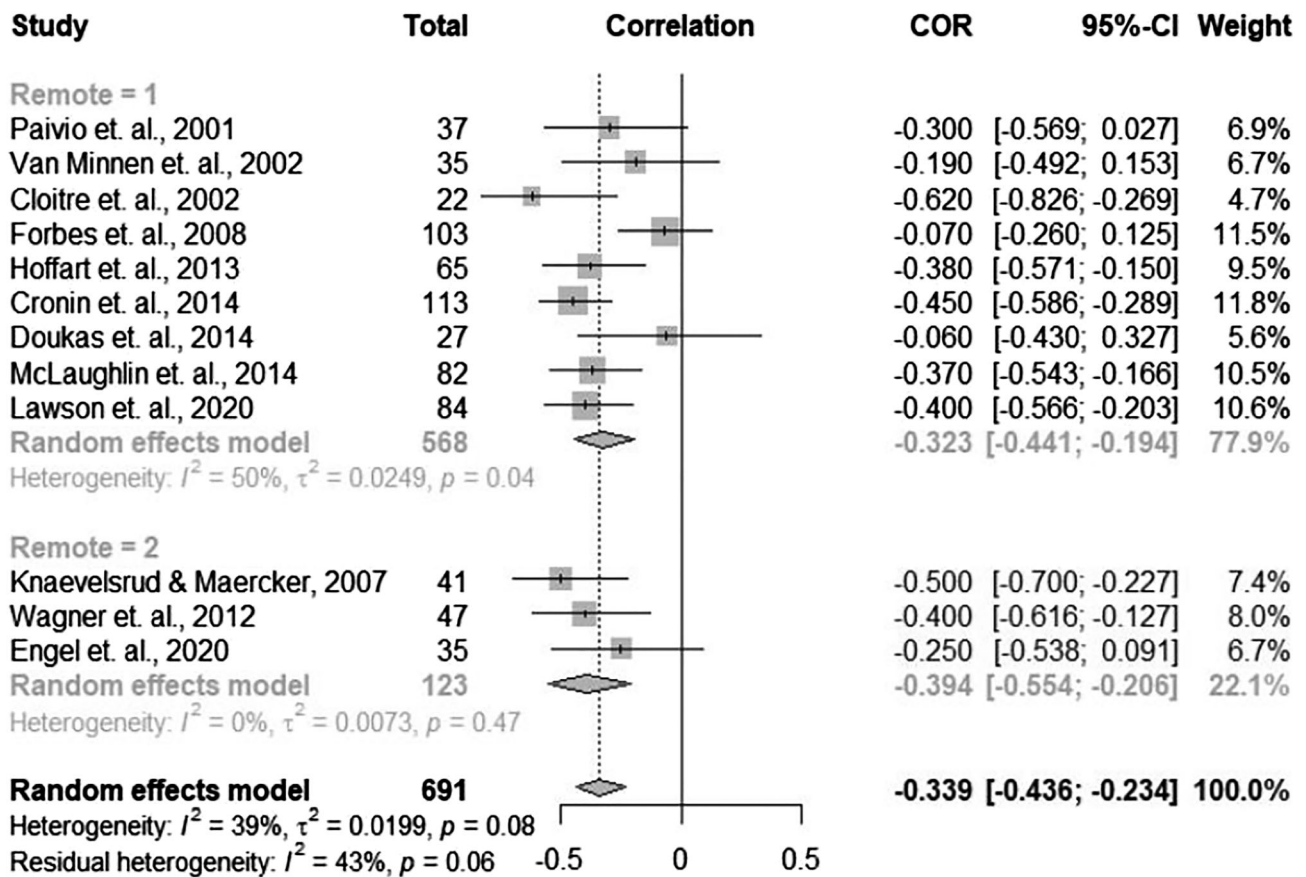
Study	Total	Correlation	COR	95%-CI	Weight
Remote = 1					
Paivio et. al., 2001	37		-0.300	[-0.569; 0.027]	6.9%
Van Minnen et. al., 2002	35		-0.190	[-0.492; 0.153]	6.7%
Cloitre et. al., 2002	22		-0.620	[-0.826; -0.269]	4.7%
Forbes et. al., 2008	103		-0.070	[-0.260; 0.125]	11.5%
Hoffart et. al., 2013	65		-0.380	[-0.571; -0.150]	9.5%
Cronin et. al., 2014	113		-0.450	[-0.586; -0.289]	11.8%
Doukas et. al., 2014	27		-0.060	[-0.430; 0.327]	5.6%
McLaughlin et. al., 2014	82		-0.370	[-0.543; -0.166]	10.5%
Lawson et. al., 2020	84		-0.400	[-0.566; -0.203]	10.6%
Random effects model	568		-0.323	[-0.441; -0.194]	77.9%
Heterogeneity: $I^2 = 50\%$, $\tau^2 = 0.0249$, $p = 0.04$					
Remote = 2					
Knaevelsrud & Maercker, 2007	41		-0.500	[-0.700; -0.227]	7.4%
Wagner et. al., 2012	47		-0.400	[-0.616; -0.127]	8.0%
Engel et. al., 2020	35		-0.250	[-0.538; 0.091]	6.7%
Random effects model	123		-0.394	[-0.554; -0.206]	22.1%
Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0.0073$, $p = 0.47$					
Random effects model	**691**		**-0.339**	**[-0.436; -0.234]**	**100.0%**
Heterogeneity: $I^2 = 39\%$, $\tau^2 = 0.0199$, $p = 0.08$					
Residual heterogeneity: $I^2 = 43\%$, $p = 0.06$		-0.5 0 0.5			

FIGURE 4 Remote and in-person subgroups

a significant association ($r = -.28$, $p < .01$). In each case, the effect was stronger for client-rated alliance than for therapist-rated alliance.

4 | DISCUSSION

4.1 | Summary of findings

This review investigated the therapeutic alliance in psychological therapy for PTSD and synthesized the findings of 34 included studies. Strong alliances were found to develop across a variety of therapies and therapy delivery methods. Several predictors of alliance were considered within the literature in this population, and several individual variables including attachment, interpersonal problems, psychophysiological variables and therapy engagement variables appear to merit further investigation as potential predictors. Alliance was found to be a significant predictor of PTSD outcomes across several studies, and this effect was confirmed using a meta-analysis aggregating effect sizes from 12 studies.

4.2 | Quality of studies

Quality was found to be weak-to-moderate in this area of the literature. Weaknesses commonly related to issues with selecting a

representative sample of PTSD and issues regarding lack of detail reported around selection, dropout and analysis. There were further weaknesses relating to the lack of confounds controlled for in analysis and the lack of rigour in statistical analysis methods; however, as discussed, this is influenced by the current review's focus on the alliance analyses and may not accurately reflect the study quality in their primary analyses.

4.3 | Average alliance

Alliance was typically measured from the client's perspective but occasionally from the therapist and observer perspective. It was often measured at several time points, with most studies capturing it in early therapy, close to the recommended crucial time point of the third or fourth session. The WAI measure was the most commonly used, with four different WAI formats used. Average client-rated alliance was 5.79 and 6.05 for the WAI-SF and the WAI, respectively, rated out of 7. These scores can be considered to represent high alliance, in comparison to those published in the literature. For example, Hersoug et al. (2001) measured WAI scores among 270 psychotherapy clients with minimal inclusion criteria and found an average of 4.94, considerably lower than the samples in the present review. Only one study (Doukas et al., 2014) recorded an average below 4. This sample was composed of women seeking treatment for interpersonal violent
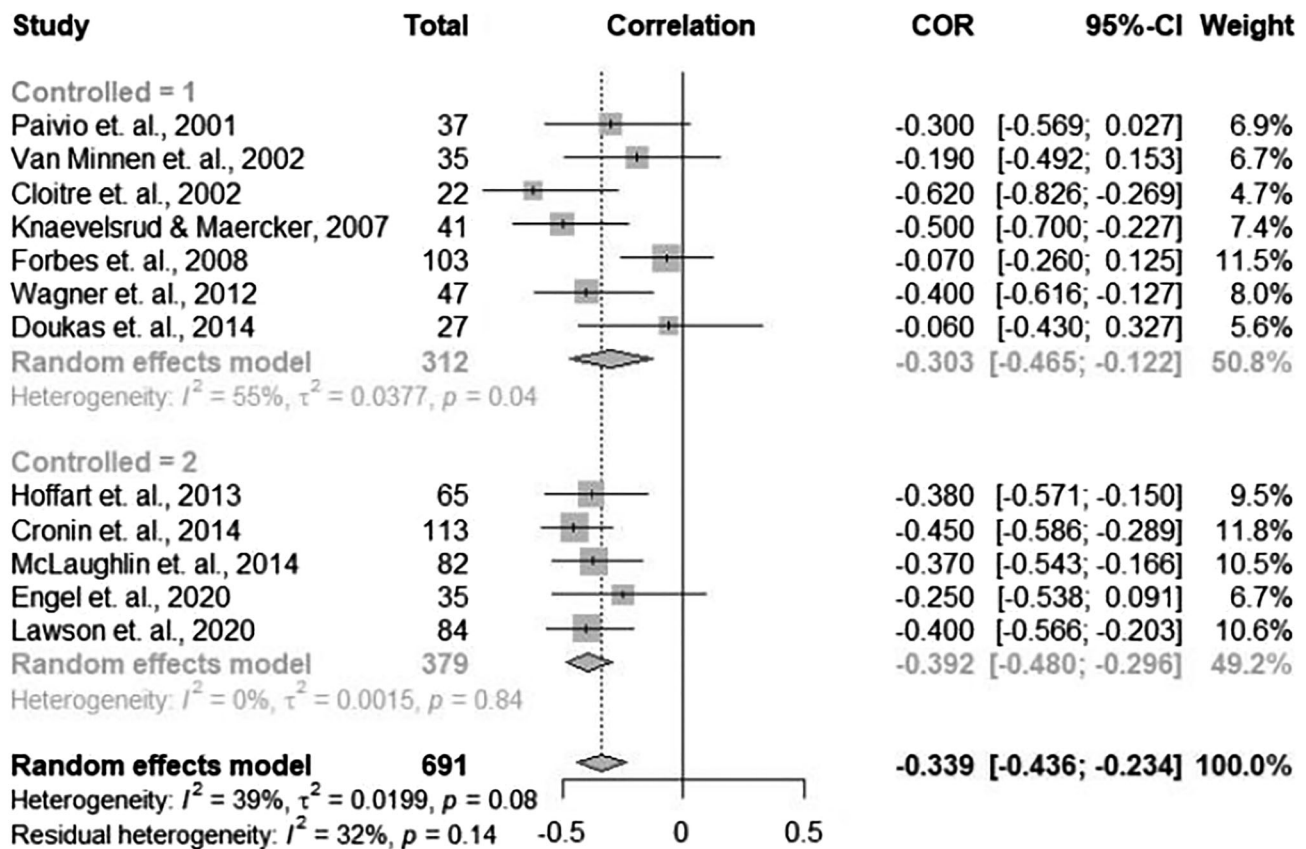
Study	Total	Correlation	COR	95%-CI	Weight
Controlled = 1					
Paivio et. al., 2001	37		-0.300	[-0.569; 0.027]	6.9%
Van Minnen et. al., 2002	35		-0.190	[-0.492; 0.153]	6.7%
Cloitre et. al., 2002	22		-0.620	[-0.826; -0.269]	4.7%
Knaevelsrud & Maercker, 2007	41		-0.500	[-0.700; -0.227]	7.4%
Forbes et. al., 2008	103		-0.070	[-0.260; 0.125]	11.5%
Wagner et. al., 2012	47		-0.400	[-0.616; -0.127]	8.0%
Doukas et. al., 2014	27		-0.060	[-0.430; 0.327]	5.6%
Random effects model	312		-0.303	[-0.465; -0.122]	50.8%
Heterogeneity: $I^2 = 55\%$, $\tau^2 = 0.0377$, $p = 0.04$					
Controlled = 2					
Hoffart et. al., 2013	65		-0.380	[-0.571; -0.150]	9.5%
Cronin et. al., 2014	113		-0.450	[-0.586; -0.289]	11.8%
McLaughlin et. al., 2014	82		-0.370	[-0.543; -0.166]	10.5%
Engel et. al., 2020	35		-0.250	[-0.538; 0.091]	6.7%
Lawson et. al., 2020	84		-0.400	[-0.566; -0.203]	10.6%
Random effects model	379		-0.392	[-0.480; -0.296]	49.2%
Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0.0015$, $p = 0.84$					
Random effects model	**691**		**-0.339**	**[-0.436; -0.234]**	**100.0%**
Heterogeneity: $I^2 = 39\%$, $\tau^2 = 0.0199$, $p = 0.08$					
Residual heterogeneity: $I^2 = 32\%$, $p = 0.14$		-0.5 0 0.5			

FIGURE 5 Controlled and zero-order correlation subgroups

trauma, so this may represent a population requiring further exploration and understanding with regards to alliance development.

Furthermore, despite studies using methods including videoconferencing, telephone and internet-based therapy, the alliance remained strong across studies. Despite 'conventional wisdom' suggesting that face-to-face therapy may enable superior alliances to form, possibly due to eye contact and body language (Norwood et al., 2018), these findings suggest that alliance development is not hindered by remote delivery methods. However, a meta-analysis of four videoconferencing therapy versus in-person therapy trials found videoconferencing alliance to be inferior to in-person alliance (Norwood et al., 2018). This area therefore requires further research to determine the factors enabling strong alliances to from online in some cases and not in others.

Therapist-rated alliance was consistently lower than client-rated alliance, but they were found to be moderately correlated. This is consistent with findings from a meta-analysis of adult psychotherapy samples (Shick Tryon et al., 2007). This may reflect that client and therapists experience their therapeutic relationship slightly differently, as studies have found client-rated and therapist-rated alliance to be differentially impacted by processes or feelings experienced within the same sessions (Nissen-Lie et al., 2015). Clients and therapists also come with different relational experiences and frames of references; the therapist can compare with other clients, whilst the client may compare with family or friends (Tryon, 2005). The McLaughlin

et al. (2014) finding that an unresolved rupture in the alliance led to significantly poorer PTSD outcomes indicates the importance of therapist attunement to the client's experience of the alliance, to enable noticing and repairing of ruptures, and therefore facilitate improved outcomes.

4.4 | Predictors of alliance

Discrepancies across studies in the constructs measured, time points and statistical methods used have resulted in incoherent findings regarding predictors of alliance, demonstrating the need for further research in this area. Regarding trauma exposure, Paivio and Patterson (1999) reported significant associations between experiencing childhood abuse/neglect types and lower alliance. However, all other included studies failed to find any significant alliance associations with various trauma exposure variables. This indicates specific forms of abuse may have differential impacts on alliance development, rather than trauma exposure more broadly. However, some findings were isolated and require further exploration; for example, Thompson-Hollands et al. (2018) found no difference in alliance between interpersonal and non-interpersonal index traumas, but the sample reported multiple traumas, and many had interpersonal traumas which were not selected as the index trauma.

PTSD symptoms at baseline were found to predict subscales of alliance in just two studies (Knaevelsrud & Maercker, 2006; Lawson et al., 2017); whilst no significant associations were found in four studies (Doukas et al., 2014; Forbes et al., 2008; McLaughlin et al., 2014; Paivio et al., 2001). Forbes et al. (2008) had the largest sample at 103 veterans yet did not find PTSD symptoms to significantly predict lower alliance. Similarly, anxiety, depression, anger and global distress were not found to predict lower alliance in this study. Considering the potential for mistrust and fear of others in PTSD, it is an important finding that severity of PTSD does not appear to hinder alliance development. This warrants further corroboration among large civilian samples.

Attachment was the only significant predictor of alliance across two studies in this review (Kanninen et al., 2000; Zorzella et al., 2014). The four studies predicting alliance from attachment each used different classification methods. However, the two significant findings indicated dismissing attachment pattern groups had different alliance trajectories to other attachment patterns. These findings may indicate that clients with a dismissing attachment style have different needs and experiences within a therapeutic relationship. This concurs with the findings of a systematic review of alliance and attachment in adult psychotherapy more generally (Smith et al., 2010).

Other client factors displaying potential to predict stronger alliance include coping styles, ability to express and process emotion within sessions and oxytocin levels (Brady et al., 2015; Engel et al., 2020; Flanagan et al., 2018; O'Driscoll et al., 2016; Reynolds et al., 2017). These factors warrant further investigation in larger samples. Regarding therapist factors, increased competency may facilitate an improved alliance (Brady et al., 2015). No therapy approaches or delivery methods appear to have a significant impact on the alliance development in this population. This should increase therapist confidence in using a wider range of approaches, including remote delivery, within traumatized populations.

4.5 | Alliance predicting outcome

In line with Ellis et al. (2018), the majority of studies investigating the alliance–outcome effect in PTSD samples found alliance to be a significant predictor. Client-rated alliance during therapy significantly predicted PTSD symptoms at the end of therapy across 12 of 20 studies, with an aggregated moderate effect size of $r = .339$. This supports the body of research on alliance as an important predictor of therapeutic outcomes. It confirms that this effect is also relevant in traumatized populations and in those undertaking trauma-focussed therapy, areas which were previously considered problematic for alliance development. This effect size is stronger than the association found in the recent meta-analysis of 295 samples with variety of mental health presentations ($r = .287$; Flückiger et al., 2018). Six of the studies in the current meta-analysis were included in the Flückiger et al. (2018) subgroup analysis for alliance–outcome effects in PTSD, which reported an effect size of $r = -.31$ for seven aggregated studies. Whilst some included studies did not demonstrate a significant

alliance–outcome effect, many were studies that may have measured a slightly different effect, as discussed. Subgroup analyses further clarified that the effect held regardless of whether the individual's baseline PTSD symptoms were controlled for. Furthermore, although it appeared slightly stronger in in-person therapies, the effect was also present in remote therapies, and there was no significant difference in effect strength. This is a key finding which contributes to current knowledge around the use of remote therapy. The findings that remote therapeutic alliances can both develop strongly, and contribute to better therapeutic outcomes, in a similar way to in-person therapies, is crucial in enabling therapists and clients to continue using this approach to delivering therapy, where desired (Simpson et al., 2020).

Only four studies predicted outcomes from therapist-rated alliance, and in all cases, the effect was weaker than for client-rated alliance. This 'halo effect' occurring when both alliance and outcome are rated by the same person was similarly noted in Horvath et al.'s (2011) meta-analysis. The strength of the alliance–outcome effect in psychotherapy may be partially attributable to the inherent bias when one rater measures both constructs. Further studies should explore the alliance–outcome effect using therapist-rated alliance.

4.6 | Limitations

Several methodological limitations must be considered. Study selection was limited to English language and published studies, which introduces bias and eliminates some potentially relevant studies. However, it was deemed necessary to exclude nonpeer-reviewed studies. The quality of the studies was examined using the EPHPP quality assessment tool, which rated the majority of studies within the weak ($n = 22$) and moderate ranges ($n = 10$). These results reflect methodological limitations across all identified studies in the area, particularly regarding selection bias, and use and reporting of statistical analyses. The EPHPP is best suited to randomized controlled trials and required adaptation for use in the current review. It may reflect overly strict judgements within the field of psychological therapy research, where selection bias is highly prevalent. The quality assessment ratings should therefore be interpreted with caution. However, future research should seek to maximize external validity by minimizing selection criteria. Studies were mainly rated high quality for data collection methods, due to use of reliable and valid measures. However, these measures are predominantly client rated and are vulnerable to biases including social desirability and the halo effect. Due to the wide variety of variables measured across studies and the variety of samples used (e.g., military and childhood sexual abuse), this review cannot draw firm conclusions regarding predictors of alliance, or mediators of the alliance–outcome association, within traumatized populations. As the literature expands, it may be possible to investigate therapeutic alliance in each of these populations individually, to draw more generalizable conclusions. Furthermore, whilst subgroup analyses indicated no significant difference between remote and in-person therapies, this did not distinguish between internet-based,

telephone and videoconferencing therapies. Further research is required to explore any differing effects across these remote therapy methods.

It was decided that studies would not be excluded based on the lack of an available PTSD diagnosis for participants, as this enabled exploration of a more clinically relevant sample, and all participants were required to be seeking therapy relating to a traumatic event and PTSD-related symptoms. However, it is acknowledged that this is a limitation which impacts ease of replicability.

Measures were administered at widely varying time points, limiting the ability to draw conclusions regarding temporal order prediction from this set of studies. It must be considered that a relationship in the opposite direction, or a complex bidirectional relationship, may also exist. Hoffart et al. (2013), de la Rosa and Riva (2021) and Lawson et al. (2020) reported on the predictive effects of PTSD symptoms on alliance over time in therapy, however, as all three used differing methodologies these could not be quantitatively synthesized. It is hoped that future research will address this question.

Finally, studies reporting on alliance–outcome effect sizes varied in how they presented these data, with some reporting zero-order correlations, some controlling for baseline PTSD symptoms and some reporting on alliance and PTSD at later time points. Despite this being a limitation in the current review and meta-analysis, the subgroup analysis found no significant difference between aggregated zero-order correlations and those controlling for baseline PTSD; therefore, this does not appear to have impeded the generalizability of this meta-analysis.

4.7 | Clinical implications

This review identified that a strong alliance, across therapeutic modalities and approaches, can be developed by people with PTSD or associated symptoms in therapy. Furthermore, the meta-analysis provides substantive evidence for a moderate alliance–outcome effect on PTSD symptoms within this population. This adds weight to the importance of clinicians developing a good therapeutic alliance, over and above the type and format of therapy they provide, as this may influence how much benefit the client obtains from therapy. There is some indication in McLaughlin et al. (2014) that ruptures in alliance can predict worse PTSD outcomes posttherapy. If this effect were replicated in further studies, it may highlight the importance of therapist attunement to any issues in the relationship, prior to the occurrence of a rupture.

Overall, despite previous concerns, there does not currently seem to be any reliable evidence to consider an individual seeking therapy for trauma any less likely to form a strong alliance due to their trauma history or baseline mental health symptoms. Further research is recommended to clarify the associations between alliance and trauma exposure, attachment and baseline PTSD symptoms, given the clinical relevance of these factors.

The non-significant associations reported between therapy delivery modality and therapeutic approach and alliance indicate that this population may be likely to form alliances equally well regardless of whether the therapy is remote, face-to-face or involves exposure work. This is in contrast to the concerns that may have been held about these types of work (Chen et al., 2020; Norwood et al., 2018). The findings are in instead in line with the view of Simpson et al. (2020), which considers the pandemic-necessitated move towards online therapy options to open up, rather than narrow, therapeutic opportunities. Whilst there are undeniable difficulties with videoconferencing therapy, there may be several benefits, including client preference, greater openness and reduced stigma (Simpson et al., 2020).

The meta-analysis replicated previous findings that alliance predicts outcomes in therapy, to a moderate degree, and is the first meta-analysis of this effect within people in therapy for PTSD. The finding that the alliance–outcome association holds in remote therapy, among people with PTSD, is important in the current context of clinical decision-making. Services are attempting to strike a critical balance between infection control and physical safety and providing effective therapy for people with significant mental health problems. Despite understandable concerns about losing the non-specific ingredients of therapy which make it effective, it appears that remote therapeutic alliances can not only be strong but can predict symptom outcomes in a similar way to in-person alliances, even among people with significant trauma exposure and PTSD symptoms.

4.8 | Research implications

The findings gathered and synthesized within this review point towards some avenues for further research. There is a need for further research into therapeutic alliance in online trauma therapy, to corroborate the tentative findings of the current review. This is particularly relevant currently, given the need to provide online therapeutic services and to provide equality of access to service users with varying presentations, including those requiring trauma therapy.

Several conceptually sound variables have been proposed as predictors of alliance in the current review. Currently, there is insufficient evidence to determine whether these are predictors or artefacts of the individual study designs and samples. Future research should attempt to replicate the findings regarding predictive ability of variables including client's coping styles, clients' ability to express and process emotion within sessions, oxytocin levels and therapist competency.

The scope of the current review did not enable exploration of mediating variables in the alliance–outcome effect. Further investigation of this would enable understanding of the mechanisms by which alliance predicts therapy outcomes in PTSD. Client, therapist or therapy variables may mediate or moderate this relationship; however, it is also possible that it is manipulated by study design and measurement. For example, the halo effect appears to be a common concern, given that most measures of both alliance and PTSD outcome are rated by the client. The literature would therefore benefit from studies controlling for this by measuring alliance and outcome from multiple perspectives.

5 | CONCLUSION

Strong therapeutic alliances can be developed among people with PTSD and PTSD symptoms in therapy, regardless of delivery method or therapeutic model. Further research is needed to determine the predictors of alliance in this population, but some plausible predictors include client's attachment style, coping styles, emotional engagement within sessions, oxytocin blood concentration and therapist competency. The alliance–outcome association found in previous meta-analyses (e.g., Flückiger et al., 2018) was confirmed in the current study within PTSD samples and was also found to hold true in remote therapies. Further research is required to explore these associations within differing therapy delivery methods and within different traumatized populations.

CONFLICT OF INTEREST

All authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

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SUPPORTING INFORMATION

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