Psychological interventions for PTSD, depression, and anxiety in child, adolescent and adult forced migrants: a systematic review and frequentist and Bayesian meta-analyses

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Psychological Interventions for PTSD, Depression, and Anxiety in Child, Adolescent and Adult Forced Migrants: A Systematic Review and Frequentist and Bayesian Meta-Analyses

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ABSTRACT

Objective: The number of forced migrants has been rising for years. Many forced migrants suffer from post-traumatic stress disorder (PTSD), depression, and/or anxiety and need treatment. Here, we evaluate the effectiveness of psychological interventions (CBT, EMDR, expressive/art, mindfulness, mixed elements, NET and psychoeducation) in reducing symptoms of PTSD, depression, and anxiety in forced migrants.

Design and Data Sources: Systematic searches in PubMed and Web of Science and searches of preprint servers and grey literature were performed (final search date: 1 September 2023). Random-effects frequentist and Bayesian meta-analyses were used for data synthesis.

Results: We included 84 studies on treatment effects in adults (pooled $N = 6302$) and 32 on children and adolescents (pooled $N = 1097$). Our data show a reduction in symptoms of PTSD, depression and anxiety symptoms in both adults and child/adolescent forced migrants. Pooled pre- to post-treatment effects (effect size Cohen's d) ranged from −1.03 to −0.26 for PTSD, from −0.91 to −0.11 for depression and from −0.91 to −0.60 for anxiety, without there being differences in outcome per study design (i.e., RCT comparison vs. non-RCT comparison vs. single arm treatment study). Treatment effects remained evident over follow-up, and not a single type of treatment stood out as being superior to other treatment types. Structural differences in populations (e.g., regarding country of origin) over studies, however, could have hampered the validity of the comparisons between study characteristics such as treatment type.

Conclusion: Our findings support the effectiveness of psychological treatment in adult and child/adolescent forced migrants.

Summary

- Psychosocial interventions are effective in reducing PTSD, depression and anxiety (pre-post treatment and at follow-up) in forced migrants of all age groups.
- Not a single specific treatment type/theoretical approach stood out as being superior to other treatment types.
- The evidence could be further advanced by the study of mechanisms underlying change.

1 | Introduction

The number of forcibly displaced people has risen sharply over the past decade (UNHCR 2022) to an astonishing 89 million people (UNHCR 2022). Unfortunately, this trend is not likely to change anytime soon. With currently already over 7 million people fleeing Ukraine as the result of the war with Russia, we are now witnessing 'Europe's largest refugee crisis this century' (Siegfried 2022, UNHCR n.d.). The current conflict between Israel and Hamas, in addition to other conflicts, have the potential to add to this crisis.

Refugees are *people who have fled war, violence, conflict or persecution and have crossed an international border to find safety in another country* (UNHCR 2022). The term is occasionally conflated with the terms *asylum seeker* and *migrant*. Although these terms all refer to people who move away from their previous place of residence, it is important to make a distinction between these groups. An asylum seeker is someone who has left their former place of residence for reasons similar to refugees but has not yet received a final decision on their request for refugee status in a host country (UNHCR 2022). The term *migrant* is often used as an umbrella term to describe people that move from one place to another, either within or outside of their country, either forced or by choice (UNHCR 2022). One could argue that refugees and asylum seekers fall under this definition. However, referring to them as *migrants* does not acknowledge that they left involuntarily and cannot go home (UNHCR 2022). For this reason, we will use the term *forced migrants* in this study to refer to both refugees and asylum seekers.

Most forced migrants are exposed to various highly stressful and traumatic events and circumstances, which may include persecution, violence, separation from loved ones, being deprived of basic needs and detention (Priebe, Giacco, and El-Nagib 2016; Verhülsdonk, Shahab, and Molendijk 2021). Exposure to such stressors increases the vulnerability to developing stress-related, mood and anxiety disorders. Indeed, estimates show prevalence rates of PTSD, mood and anxiety disorders that are two to three times higher in forced migrant populations compared to the general population (Henkelmann et al. 2020). There is variation, though, in these estimates, which may partly be due to differences in pre-, peri- and post-migration factors (see, e.g., Emmelkamp 2023; Verhülsdonk, Shahab, and Molendijk 2021) and resiliency towards coping with these factors. High prevalence rates of mental disorders also seem to apply to people subjected to more recent wars/conflicts (Abudayya et al. 2023; Karatzias et al. 2023). Hence, there is an ongoing need for effective interventions to treat these people.

Several empirically tested psychological interventions for PTSD, mood, and anxiety disorders in forced migrants are available. These include, among others, eye movement desensitization and reprocessing (EMDR) therapy (Yurtsever et al. 2018), cognitive behavioural therapy (CBT) (Shaw et al. 2019), trauma-focused group interventions (Pfeiffer et al. 2018), mindfulness-based trauma recovery interventions (Aizik-Reebs et al. 2021), and art therapy (Feen-Calligan et al. 2020). A meta-analysis by Kip et al. (2020) found that psychological interventions can effectively reduce symptoms of PTSD and depression in adult refugees. Two further meta-analyses found that EMDR significantly reduces PTSD symptoms in adult and child refugees (Macgowan, Naseh, and Rafieifar 2022; Turrini et al. 2021). Rafieifar and Macgowan (2022) found in a meta-analysis that different types of group-interventions can reduce PTSD and depression in immigrant and refugee children to some degree. Zadeh and Jogia (2023) performed a literature review showing that art therapy can be an effective first step to alleviating mental health symptoms in adult and child refugees. In contrast, a systematic review by Soltan et al. (2022) did not find evidence for the effectiveness of community-based interventions for symptoms of PTSD, depression, and anxiety in refugee children and adolescents. Lastly, Schäfer et al. (2023) performed a systematic review and meta-analysis and found a small effect of transdiagnostic psychosocial interventions to promote mental health in adult refugees but no effect for children and adolescents.

Much of the treatment literature has been summarized in excellent systematic reviews and meta-analyses. However, the current understanding of the efficacy of psychological and psychosocial interventions in forced migrants is not complete. For example, it is unclear if and to what extent individual and group interventions yield similar results or whether treatment effects are moderated by legal status (e.g., refugee vs. asylum seeker) or patient status (e.g., PTSD vs. depression). Also, no meta-analysis to date has investigated whether psychological interventions that are primarily intended to treat, for example, PTSD, also reduce symptoms of depression and anxiety and vice versa. The follow-up effects of treatment also have been largely ignored in previous meta-analyses. In other populations than forced migrants, such long-term effects have been established (Weber et al. 2021).

This systematic review and meta-analysis will examine the pre-post and follow-up effectiveness of psychological interventions for PTSD, depression, and anxiety in adult and child/adolescent forced migrants. We specifically consider whether different treatment types and individual versus group interventions are equally efficacious and whether legal and patient status at baseline moderate treatment efficacy. We chose a broad approach and separately will investigate treatment effects from randomized controlled trials (RCTs), comparison studies that are not RCT, and single arm treatment studies. An additional add-on is that we will analyse the data using both a classical (i.e., frequentist) and a Bayesian approach.

2 | Method

A protocol for the project was pre-registered in the international prospective register of systematic reviews (PROSPERO) (CRD42022316437).

2.1 | Search Strategy

We performed systematic searches in PubMed and Web of Science (final search date:September 1, 2023). We combined search terms related to our population ('forced migr*', 'asylum', 'refugee*', 'displaced') with terms related to the disorders of our interest ('MDD', 'depress*', 'mood', 'PTSD', 'posttraumatic*', 'anxiety') and terms related to the interventions of our interest ('treatment', 'intervention', 'psychother*', 'therapy', 'exposure', 'RCT', 'trial', 'counselling', 'CBT', 'NET', 'IPT') (see Appendix S1 for the full set of search strings). We also checked the reference lists of previous systematic reviews and meta-analyses on the topic, and we searched the preprint servers Psyarxiv.io and Biorxiv.org for eligible articles.

2.2 | Selection Process

Articles identified in our search were screened based on their title and abstracts. Interrater agreement was calculated and expressed as Cohen's weighted kappa, among member duos using random selections of 30 articles. A second round of selection was performed based on full-text assessment of the initially selected articles for in- or exclusion based on our selection criteria. Discrepancies were solved through discussion and consensus. Both rounds of article selection were performed independently by two team members of the review (MM, MS, ZA, JS and CB).

2.3 | Inclusion and Exclusion Criteria

Studies were eligible for inclusion if they reported on the effect of psychological and psychosocial interventions in reducing PTSD, depression and/or anxiety symptoms in child, adolescent and adult forced migrants and if they were written in English, Dutch, Spanish, Turkish, German or French. Studies were excluded if (1) they provided no original or quantitative data (e.g., editorials), (2) they reported on overlapping or similar data-sets as other studies which were deemed more informative for our purposes, (3) participants were not forced migrants (internally displaced persons were not categorized by us as forced migrants), (4) the intervention effect could not be distinguished from a medication effect (e.g., entire groups received an antidepressant together with the psychological intervention), (5) the record was an abstract for a conference talk or poster, (6) the intervention was preventive, (7) the article was not accessible or retracted or (8) the study was a case study.

2.4 | Data Extraction

Data were extracted from the remaining studies by four team members (MS, ZA, JS and CB) and checked by two other team members (MM and CR). We extracted data in the following categories: (1) pre- versus post-treatment and pre- versus follow-up outcome data (raw data or effect sizes with 95% confidence intervals on outcomes), (2) demographic data (mean age, percentage of males of the total number of participants, country of origin, country of study and residence and duration of time as a forced migrant), (3) clinical data (method of diagnostic assessment, type of disorder and presence of comorbid disorders at baseline [yes/no]), treatment data (type of treatment, type of control condition, number of sessions, duration of treatment in weeks, group-based or individual, linguistic and/or cultural adaptation) and (4) methodological data (method of outcome assessment, duration of follow-up in months and percentage of dropouts). If any important data was missing from a study, we reached out to the corresponding author of that study with a request to provide us with this data.

2.5 | Definition of Key Variables

Based on given descriptions of treatment type, we categorized articles according to whether effect sizes were derived from group, or individual, or mixed group-individual interventions. Drop-out rates were calculated as the percentage of participants failing to complete the intervention from pre- to post-treatment. A similar variable was calculated for the timeframe running from pre-treatment to follow-up. Countries were aggregated into regions of origin and region where the study was conducted in the following categories: East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, North America, South Asia and Sub-Saharan Africa as by the World Bank Organization (2023). Cultural and/or language adaptation of interventions was scored as *yes* in case studies reported that there was at least some level of intervention adaptation based on the language or the culture of the client.

2.6 | Methodological Quality

The *quality assessment of controlled intervention studies* and the *quality assessment tool for pre-post studies* were used for the assessment of the methodological quality of controlled and uncontrolled studies, respectively (National Heart, Lung, and Blood Institute 2021). In Tables S1 and S2, we provide the items that compose these scales. Each study was independently rated by two members of the team (MM, ZA, JS and CB), and the final scores were obtained by calculating the means of the two ratings. Interrater agreement was calculated using Cohen's weighted kappa.

2.7 | Statistical Analysis

We performed analyses in Stata version 17 (StataCorp 2021) and JASP (Jeffreys's Amazing Statistics Program; JASP Team 2017). Summary tables on the characteristics of the included studies were created.

The metric that we used as an outcome variable was Cohen's d and its standard error (SE) (Cohen 1988). Here, negative effect size estimates indicated a reduction in PTSD, depression, or anxiety symptoms over time. Cohen's d was calculated for each active and control arm, both for the change from pretreatment to posttreatment and, in case reported, from pretreatment to follow-up. Relative change (i.e., change in symptoms in the active arm versus that in a control arm) was also expressed as a Cohen's d. Negative effect size estimates indicated a larger reduction in symptoms in the active arm versus the control arm. Pooled outcomes were reported with 95% confidence intervals.

Our pre-registered analytic approach was a network meta-analysis. However, a larger part of the data did not meet the assumption of transitivity (Watt et al. 2019). For instance, there was an association between country of origin and treatment type. As an alternative, we applied random effects frequentist (i.e., classical) and Bayesian meta-analyses. The type of treatment was divided into seven categories (in alphabetical order): CBT, EMDR, expressive/art interventions, mindfulness and meditation interventions, mixed elements, narrative exposure therapy (NET) and psychoeducation. We compared these statistically regarding efficacy, but due to a lack of similarity in populations over treatment types (i.e., see the point about the assumption of transitivity above), we refrained from concluding on the existence of differences in efficacy due to treatment type or study characteristic. Analyses were run separately for children and adolescents (0–19 years old) and for adults (20 + years old) (World Health Organization n.d.). In all cases, data were analysed separately for RCTs, comparison studies that were not RCTs, and single arm treatment studies. The potential effects of the type of control condition (i.e., active control, waitlist control and care as usual or treatment as usual) on outcome were investigated. The frequentist approach was used for null-hypothesis significance testing and for acquiring effect-size estimates on intervention effectiveness. The Bayesian approach was applied to (1) confirm the robustness of results and (2) present the strength of evidence for the null or the alternative hypothesis. Bayes factors (BFs) were calculated for an effect-size estimate of 0.00 with a standard deviation of 0.25 to test for treatment effects in the obtained data. BF's interpretation was based on the thresholds suggested by Heck et al. (2023).

Heterogeneity among studies was assessed using the I^2 measure and the Q statistic. To explore which variables may explain variance among studies, we conducted moderator and subgroup analyses with the following variables: Percentage of males, average age, methodological quality, group versus individual treatment, number of sessions and cultural and/or language adaptation of the intervention. We followed the Cochrane handbook's advice and interpreted the results from sensitivity and moderator only when there were 10 or more studies available per analysis (Deeks et al. 2019). To assess publication bias, we visually inspected the funnel plot and performed the Egger's test (Egger et al. 1997). Findings were considered statistically significant when $p < 0.05$.

3 | Results

Systematic searches identified 116 (K) articles that met the inclusion criteria. Eighty-four (K) of the eligible articles reported treatment effects in adult forced migrants (pooled $N = 6302$) and 32 in child and adolescent forced migrants (pooled $N = 1097$). Figure 1 presents a PRISMA flow diagram of the search and selection process. Demographic, clinical and treatment characteristics of the included studies are provided in Tables 1 and 2 for adult forced migrants and child/adolescent forced migrants, respectively. Further study-level information is provided in Table S3.

3.1 | Treatment Effects

Pre-post-treatment pooled effects by outcome type (i.e., PTSD, depression, and anxiety) and study design are presented in Table 3 for adult forced migrants and in Table 4 for child and adolescent forced migrants. Tables S4 and S5 describe the data on which results are presented per analysis.

In adult forced migrants, pooled-effect sizes, Cohen's d, ranged from −1.03 to −0.58 for PTSD outcomes, from −0.99 to −0.64 for depression outcomes and from −0.78 to −0.60 for anxiety outcomes. In children and adolescent forced migrants, pooled-effect sizes ranged from −1.05 to −0.26 for PTSD outcomes,

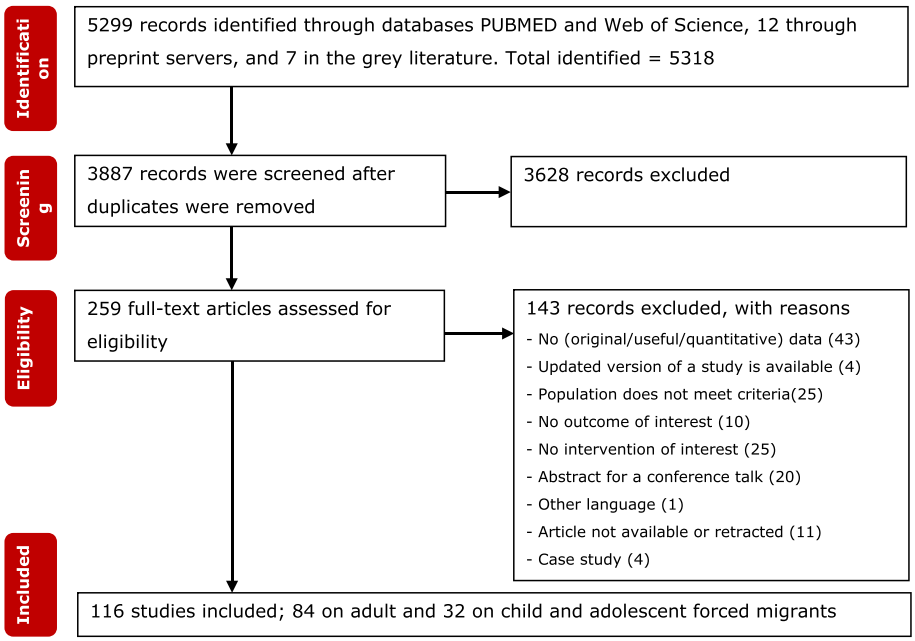

FIGURE 1 | Flowchart on identification, screening and inclusion of eligible publications.

TABLE 1 | Characteristics of included studies reporting on adult forced migrants.

Study	*N*[a]	Av. age	Origin[b]	Residence[b]	Diagnosis	Treatment
Acartürk et al. (2015)	29	34	SYR	TUR	PTSD	EMDR
Acartürk et al. (2016)	98	38	SYR	TUR	PTSD	EMDR
Adenauer et al. (2011)	19	41[median]	MIX	DEU	PTSD	NET
Aizik-Reebs et al. (2021)	98	N.R.	ERI	ISR	MIX	Medi/mind
Akhtar, Giardinelli, et al. (2021)	35	43	SYR	JOR	MIX	Psychoeducation
Ali (2020)	40	40[median]	SYR	JOR	PTSD	Mixed elements
Alsmadi et al. (2017)	49	39	IRQ	JOR	Anxiety	Psychoeducation
Beck et al. (2018)	16	40[median]	MIX	DNK	PTSD	ART/MUS/EXPR
Beck et al. (2021)	74	42	MIX	DNK	PTSD	ART/MUS/EXPR
Bernardi, Dahiya, and Jobson (2019)	7	50	MMR	AUS	PTSD	CBT
Bolton et al. (2014)	357	37	MMR	USA	MIX	Psychoeducation
Brakemeier et al. (2017)	26	34	MIX	DEU	MIX	Mixed elements
Brune et al. (2014)	190	34	MIX	MIX	MIX	Mixed elements
Bryant et al. (2022)	204	40	SYR	JOR	MIX	Psychoeducation
Buhmann et al. (2016)	138	45	MIX	DNK	PTSD	CBT
Cuijpers et al. (2022)	569	32	SYR	LBN	Depression	Mixed elements
d'Ardenne et al. (2007)	66	N.R.	MIX	DEU	PTSD	CBT
Danner et al. (2007)	14	45	VNM	USA	Depression	BT
de Graaff et al. (2020)	60	38	SYR	NLD	MIX	Psychoeducation
de la Rie et al. (2020)	97	46	MIX	NLD	PTSD	NET
Dibaj et al. (2017)	4	N.R.	MIX	NOR	MIX	NET
Djelantik et al. (2020)	52	42	MIX	NLD	MIX	Mixed elements
Drožđek and Bolwerk (2010)	88	38	MIX	NLD	MIX	Mixed elements
Drožđek et al. (2012)	72	38	MIX	NLD	PTSD	Mixed elements
K. Ellis and Jones (2022)	6	N.R.	SDN	EGY	PTSD	NET
Eskici et al. (2021)	12	35	SYR	TUR	MIX	CBT
Goninon et al. (2020)	43	33	COD	UGA	PTSD	CBT
Griggs, Liu, and Cooper (2022)	82	30	MIX	GBR	PTSD	CBT
Halvorsen and Stenmark (2010)	16	39	MIX	NOR	MIX	NET
Han et al. (2012)	9	54	KHM	USA	PTSD	Mixed elements
Hensel-Dittmann et al. (2011)	28	N.R.	N.R.	DEU	PTSD	NET and SIT
Hijazi et al. (2014)	63	48	IRQ	USA	MIX	NET
Hinton et al. (2004)	12	48	VNM	USA	PTSD	CBT
Hinton et al. (2005)	60	51	VNM	USA	PTSD	CBT
Hinton et al. (2009)	36	50	VNM	USA	PTSD	CBT
Holmqvist et al. (2006)	14	N.R.	For YUG	SWE	MIX	MIX
Im et al. (2018)	141	20	MIX	KEN	PTSD	Psychoeducation

(Continues)

TABLE 1 | (Continued)

Study	*N*[a]	Av. age	Origin[b]	Residence[b]	Diagnosis	Treatment
Jeon et al. (2020)	15	37	PRK	KOR	MIX	CBT
Jeon et al. (2020)	23	38	PRK	KOR	MIX	Medi/mind
Kaltenbach et al. (2020)	26	29	AFG	DEU	MIX	NET
Kananian et al. (2017)	7	26	MIX	DEU	MIX	CBT
Knappe, Colledge, and Gerber (2019)	45	26	MIX	GRC	MIX	Exercise
Knefel et al. (2022)	88	34	AFG	AUT	MIX	Psychoeducation
Kruse et al. (2009)	64	44	BIH	DEU	PTSD	Mixed elements
Lehnung et al. (2017)	18	31	MIX	DEU	MIX	EMDR
Mateos-Fernández and Saavedra (2022)	11	31	MIX	ESP	MIX	ART/MUS/EXPR
Mazzulla et al. (2021)	18	N.R.	MIX	USA	MIX	Psychoeducation
Meffert et al. (2014)	19	N.R.	SDN	EGY	MIX	IPT
Morath et al. (2014)	34	30	MIX	DEU	PTSD	NET
Neuner et al. (2004)	29	33	SDN	UGA	PTSD	MIX
Neuner et al. (2008)	177	35	MIX	UGA	PTSD	NET, counselling
Neuner et al. (2010)	32	31	MIX	UGA	PTSD	NET
Northwood et al. (2020)	224	42	MMR	USA	Depression	Mixed elements
Opaas and Hartmann (2021)	22	39	MIX	NOR	MIX	Mixed elements
Orang et al. (2022)	85	31	MIX	DEU	MIX	Psychoeducation
Palić and Elklit (2009)	36	39	MIX	DNK	PTSD	CBT
Paunovic and Öst (2001)	12	31	N.R.	SWE	PTSD	CBT
Poudel-Tandukar, Jacelon, Poudel, et al. (2021)	103	41	BTN	USA	MIX	Mixed elements
Poudel-Tandukar, Jacelon, Tai, et al. (2021)	44	31	BTN	USA	MIX	Mixed elements
Rees et al. (2013)	42	33	CON	UGA	MIX	Medi/mind
Robertson et al. (2019)	65	49	MIX	USA	MIX	Psychoeducation
Röhr et al. (2021)	68	33	SYR	DEU	PTSD	Psychoeducation
Schauer et al. (2006)	32	31	MIX	DEU	PTSD	NET
Schulz et al. (2006)	53	46	MIX	USA	PTSD	CBT
Shaw et al. (2019)	39	32	AFG	MYS	MIX	CBT
Small et al. (2016)	81	53	MIX	USA	MIX	Psychoeducation
Snodgrass et al. (1993)	11	19	VNM	USA	MIX	Psychoeducation
Spaaij et al. (2022)	39	40	SYR	CHE	MIX	Psychoeducation
Steel et al. (2022)	10	40	MIX	GBR	PTSD	Mixed elements
Steil et al. (2021)	16	29	MIX	DEU	PTSD	CBT
Stenmark et al. (2013)	81	35	MIX	NOR	PTSD	NET
Tay et al. (2020)	322	37	MMR	BGD	MIX	CBT, mixed elements

(Continues)

TABLE 1 | (Continued)

Study	*N*[a]	Av. age	Origin[b]	Residence[b]	Diagnosis	Treatment
Tay et al. (2021)	144	37	MMR	BGD	MIX	Mixed elements
ter Heide et al. (2011)	20	41	MIX	NLD	MIX	EMDR
ter Heide et al. (2016)	62	41	MIX	NLD	MIX	EMDR
Tol et al. (2020)	695	31	SDN	UGA	MIX	Psychoeducation
Trilesnik et al. (2019)	133	31	MIX	DEU	MIX	Mixed elements
van Wyk et al. (2012)	62	34	MMR	AUS	MIX	Mixed elements
Weine et al. (1998)	20	45	BOS	USA	MIX	Mixed elements
Weinstein, Khabbaz, and Legate (2016)	41	29	SYR	JOR	MIX	Mixed elements
Westermeyer (1988)	15	35	LAO	USA	Depression	Mixed elements
Whitsett and Sherman (2017)	105	35	MIX	USA	MIX	Mixed elements
Yurtsever et al. (2018)	47	40	SYR	TUR	PTSD	EMDR
Zehetmair et al. (2018)	43	25	MIX	DEU	PTSD	Medi/mind

Note: The category *psychoeducation* includes *problem solving* approaches.
Abbreviations: ART/MUS/EXPR, art therapy, music therapy or other types of expressive therapy; Medi/mind, therapy using meditation and/or mindfulness elements; NET, narrative exposure therapy; N.R., not reported; SIT, stress inoculation therapy.
[a]The reported *N* represents the total sample size at baseline/start of treatment.
[b]Alpha 3 three-letter country code. Full names for the given abbreviations can be found here: https://en.wikipedia.org/wiki/ISO_3166-1_alpha-3.

from −0.67 to −0.11 for depression outcomes and from −0.91 to −0.61 for anxiety outcomes. Effect size estimates reflecting follow-up effects of treatment (i.e., pre-treatment to follow-up) are presented in Tables S6 and S7 for adult and for child/adolescent forced migrants, respectively. These were largely in the range of pooled effect-sizes that were observed for pre-post assessments. In neither the adult and the child and adolescent data nor pre-post and follow-up data, there were differences between study designs (i.e., RCT, non-RCT comparative study and single arm intervention). This latter is partly due to a lack of effect in the control conditions that were applied, such as treatment as usual and waitlist control conditions. Effect-sizes yielded in control conditions are provided in Table S8 per outcome type for both adult and child/adolescent studies. We tested whether child versus adolescent status moderated effects in the child/adolescent data. This was not the case.

Analyses were repeated by specific treatment type. Results of these analyses are reported in Tables S8–S13. In most cases, the parameters (*d* and lower and upper level of the 95% CI) obtained in this study were well in range with parameters obtained from the analyses reported above. A notable exception is that CBT and EMDR outperform psychoeducation in the treatment of depression in adult forced migrants (see Table S8).

In Figures S1 and S2, we visualize the pooled *d* parameters (*d* and 95% CI) on psychological treatment effects for PTSD, depression, and anxiety in the general patient population. These effect-sizes were derived from earlier meta-analyses pooling data on treatment effects on PTSD, depression, and anxiety, yielded by similar interventions as reported here. References to the sources of these effect-sizes are provided as supporting information. It is notable that in most cases, there is substantial overlap in CIs derived data on the general patient population and data on forced migrants. However, it also seems evident that, on average, treatment effects seem somewhat smaller in forced migrants relative to the effect observed in patients from the general population. We refrained from formal testing for differences between these populations because of notable differences among them different populations and treatment types.

3.2 | Meta-Regression and Sub-Group Analyses and Publication Bias

Between-study heterogeneity in outcomes was present in practically all analyses that were performed (see Tables 3 and 4 and Tables S8–S13). Meta-regression analyses with, for example, average age and percentage of female samples as predictor variables and subgroup analyses by, for example, country of residence, country of origin and legal status were performed to investigate whether some of this heterogeneity could be explained. The results of these analyses are presented in Tables S14 and S15. In some instances, there were statistically significant associations. However, there was no consistent evidence for moderation effects.

Studies were classified based on cultural and/or language adaptation of the interventions that were applied (see Tables S16 and S17). A problem that we encountered during classification was that many studies did not make explicit whether an intervention was adapted—to any or a certain extent—to the client's cultural and or language background. The absence of information on adaptation does not necessarily imply that there was no adaptation, as authors could well have tailored the intervention, but they could have decided not to present this information in their article. There were no studies in our dataset that explicitly mentioned *not to have* adapted the tested intervention to the

TABLE 2 | Characteristics of included studies reporting on child and adolescent forced migrants.

Study	*N*[a]	Av. age	Origin[b]	Residence[b]	Diagnosis	Treatment
Akhtar, Malik, et al. (2021)	33	12	SYR	JOR	MIX	Mixed elements
Barrett, Moore, and Sonderegger (2000)	20	16	For YUG	AUS	Anxiety	CBT
Doumit et al. (2020)	31	14	SYR	LBN	MIX	CBT
Ehntholt, Smith, and Yule (2005)	26	13	MIX	GBR	MIX	CBT
El-Khani et al. (2018)	16	10	SYR	TUR	MIX	Mixed elements
El-Khani et al. (2021)	119	10	SYR	LBN	MIX	Mixed elements
B. Ellis et al. (2013)	15	13	MIX	USA	MIX	Mixed elements
Eruyar and Vostanis (2020)	15	12	SYR	TUR	PTSD	ART/MUS/EXPR
Feen-Calligan et al. (2020)	15	10	SYR	USA	MIX	ART/MUS/EXPR
Garoff, Kangaslampi, and Peltonen (2019)	18	15	MIX	FIN	PTSD	Mixed elements
Gormez et al. (2017)	32	12	SYR	TUR	MIX	CBT
Grasser et al. (2019)	16	10	SYR	USA	MIX	ART/MUS/EXPR
Koch, Ehring, and Liedl (2020)	44	12	AFG	DEU	PTSD	Mixed elements
Michalek et al. (2021)	49	10	MIX	JOR	MIX	ART/MUS/EXPR
Möhlen et al. (2005)	10	14	MIX	DEU	MIX	Mixed elements
Murray et al. (2018)	38	11	SOM	USA	MIX	Psychoeducation
Onyut et al. (2005)	6	14	SOM	UGA	MIX	NET
Oras, de Ezpeleta, and Ahmad (2004)	13	10	MIX	SWE	PTSD	EMDR
Park et al. (2020)	20	19	PRK	KOR	PTSD	NET
Perilli et al. (2019)	14	11	SYR	TUR	PTSD	EMDR
Pfeiffer and Goldbeck (2017)	29	17	MIX	DEU	PTSD	Mixed elements
Pfeiffer et al. (2018)	99	17	MIX	DEU	PTSD	Mixed elements
Rondung et al. (2022)	14	18	MIX	SWE	MIX	Mixed elements
Ruf et al. (2010)	25	12	MIX	DEU	PTSD	NET
Sarkadi et al. (2018)	60	16	N.R.	SWE	MIX	Psychoeducation
Sim et al. (2021)	88	10	SYR	CAN	MIX	Psychoeducation
Thabet, Vostanis, and Karim (2005)	111	12	PSE	Gaza	MIX	Mixed elements
Uğurlu, Akca, and Acartürk (2016)	42	9	SYR	TUR	MIX	ART/MUS/EXPR
Unterhitzenberger et al. (2015)	6	17	MIX	DEU	MIX	CBT
Unterhitzenberger et al. (2019)	19	17	MIX	DEU	MIX	CBT
Van der Gucht et al. (2019)	13	15	MIX	BEL	MIX	MEDI/MIND
van Es et al. (2021)	41	15	MIX	NLD	MIX	Mixed elements

Abbreviations: ART/MUS/EXPR, art therapy, music therapy or other types of expressive therapy; Medi/mind, therapy using meditation and/or mindfulness elements; NET, narrative exposure therapy; N.K., not known.
[a]The reported *N* represents the total sample size at baseline/start of treatment.
[b]Alpha 3 three-letter country code. Full names for the given abbreviations can be found here: https://en.wikipedia.org/wiki/ISO_3166-1_alpha-3.

client population under study. So, we decided to classify studies into the following three categories: (1) no information reported on adaptation (22% of the studies), (2) adapted for language or culture (41% of the studies; in all cases, these were studies that adapted for the language of the client and not only culture) and (3) adapted for both language and culture (38% of the studies).

TABLE 3 | Results from frequentist meta-analyses on outcome (PTSD symptoms, depressive symptoms and anxiety symptoms) pre-post treatment in adult forced migrants per study type.

	k	*N*	Cohen's *d* (95% CI)	BF_{10}[a]	I^2	Egger's *t*
PTSD outcome						
Treatment vs. control (RCT)	44	4326	−0.99 (−1.33 to −0.66)***	578,916++++H_1	94%***	1.96
Treatment vs. control (non-RCT)	11	357	−0.58 (−1.27 to 0.12)	2+H_1	90%***	0.83
Treatment (no control)	32	1262	−1.03 (−1.37 to −0.71)***	287,009++++H_1	88%***	0.32
Depression outcome						
Treatment vs. control (RCT)	35	3927	−0.91 (−1.32 to −0.49)***	369++++H_1	97%***	−0.77
Treatment vs. control (non-RCT)	12	432	−0.64 (−1.09 to −0.19)**	10++H_1	78%**	−2.39*
Treatment (no control)	27	1110	−0.89 (−1.14 to −0.63)***	1460++++H_1	78%***	−1.91
Anxiety outcome						
Treatment vs. control (RCT)	20	2747	−0.60 (−1.04 to −0.16)***	6++H_1	95%***	−0.64
Treatment vs. control (non-RCT)	12	432	−0.77 (−1.01 to −0.53)***	3524++++H_1	24%**	−4.02**
Treatment (no control)	18	851	−0.78 (−1.10 to −0.48)***	6303++++H_1	73%**	−0.21

[a]Evidence category for the results from Bayesian analyses: + anecdotal evidence for H_0 or H_1; ++ moderate evidence for H_0 or H_1; +++ strong evidence for H_0 or H_1; ++++ very strong evidence for H_0 or H_1.
*$p < 0.05$, **$p < 0.01$, and ***$p < 0.001$.

Analysing this variable in relation to outcome—accepting that the data likely contained a substantial amount of noise for the reason given above—largely led to null results, suggesting the absence of association between adaptation of the intervention and outcome (see Tables S14 and S15). There was a single exception. In the data-file reporting intervention effects from RCTs on PTSD outcomes in adults, we found that adaptation was associated with a less favourable treatment outcome.

Based on a reviewer's comment and not according to the pre-registered plan, we also explored whether the therapists' background, training and/or supervision moderated treatment outcome. Here also we encountered the problem of many studies not reporting sufficient detailed information for adequate categorization. In fact, only 8% of studies reported specifically on the training of the therapists or counsellors involved in the study and 31% on actual supervision sessions or the possibility thereto (see Tables S16 and S17). These relatively low numbers led to too few studies or too little variation to allow for sub-group or moderator analyses (see Section 2 and Deeks et al. [2019]).

In a few analyses, we found evidence that suggested the presence of publication bias. This was so in the datasets on non-RCT comparative studies on anxiety and depression in adults, RCT comparative studies on PTSD in children and adolescents, and non-RCT comparative studies on depression in children and adolescents (see Tables 3 and 4). Trim-and-fill analyses were performed, and their results suggested, in all instances, somewhat attenuated yet rather similar treatment effects relative to those reported from primary analyses.

4 | Discussion

Overall, our results suggest that psychological interventions are effective in the treatment of PTSD, depression, and anxiety in adult and child/adolescent forced migrants. Pooled-effect size estimates were medium to large, and treatment effects remained evident at follow-up. Interventions from different theoretical approaches (e.g., EMDR and CBT) yielded effect-sizes of similar strength, except for depression in adult forced migrants, where CBT and EMDR outperformed psychoeducation. Reductions in symptoms were similar for individual and group treatment approaches. Analyses stratified by region of origin and region of trial performance gave rather similar results, too. Also, in many cases, the effects of the interventions that we observed were largely comparable to those observed in intervention studies in non-forced migrant patient samples, although they were perhaps somewhat less effective for certain outcomes. This highlights similarities in treatment responses between these groups, yet it is crucial to conduct future studies that specifically address the unique psychological needs and resilience factors of forced migrants (Johnson & Thompson, 2008). Please note that when comparing study characteristics and treatment types within and outside our own data, we refrain from strong conclusions. The reason for this is the same as for why network analyses were not performed. The larger part of the data did not meet the assumption of transitivity (Watt et al. 2019). An example is the following. Treatments that are offered differ over continents, as does the origins of client populations. Hence, when comparing the efficacy of, for example, a treatment type, it is

TABLE 4 | Results from frequentist meta-analyses on outcome (PTSD symptoms, depressive symptoms and anxiety symptoms) pre-post treatment in child and adolescent forced migrants per study type.

	k	*N*	Cohen's *d* (95% CI)	BF_{10}[a]	I^2	Egger's *t*
PTSD outcome						
Treatment vs. control (RCT)	6	347	−1.05 (−1.81 to −0.28)*	29+++H_1	69%**	−0.49
Treatment vs. control (non-RCT)	5	272	−0.26 (−0.81 to 0.29)	0.3++H_0	67%**	4.68*
Treatment (no control)	19	446	−0.96 (−1.31 to −0.61)***	4730++++H_1	71%***	−2.09
Depression outcome						
Treatment vs. control (RCT)	4	278	−0.61 (−0.84 to −0.38)**	10+++H_1	34%	−9.76**
Treatment vs. control (non-RCT)	6	317	−0.11 (−0.88 to 0.67)	0.2++H_0	82%**	0.15
Treatment (no control)	11	382	−0.67 (−0.95 to −0.40)**	586++++H_1	44%*	−1.99
Anxiety outcome						
Treatment vs. control (RCT)	*No data*					
Treatment vs. control (non-RCT)	3	63	−0.91 (−1.36 to −0.47)*	29+++H_1	0%	−1.13
Treatment (no control)	7	227	−0.62 (−0.92 to −0.32) **	72++++H_1	24%	−1.83

[a]Evidence category for the results from Bayesian analyses: + anecdotal evidence for H_0 or H_1; ++ moderate evidence for H_0 or H_1; +++ strong evidence for H_0 or H_1; ++++ very strong evidence for H_0 or H_1.
*$p < 0.05$, **$p < 0.01$, and ***$p < 0.001$.

inherent that client populations and treatment locations also differ and hence it is impossible to isolate treatment effects in a meta-analysis.

4.1 | Practical and Theoretical Implications

The significant and medium to large treatment effects that we report offer promising clinical implications for treating PTSD, depression, and anxiety in the growing forced migrant population (Henkelmann et al. 2020; Verhülsdonk, Shahab, and Molendijk 2021). The universal efficacy across treatment types, in case they are due to the type of treatment and not to differences in, for example, populations that are selectively assigned to certain treatments, suggests that a forced migrant is likely to benefit from a psychological intervention regardless of treatment type. The exception here was *only psychoeducation*, as this seemed to yield somewhat smaller effect-size estimates for depression in adult forced migrants compared to CBT and EMDR. Some key points from our data that are highly relevant for practitioners are: (I) that psychosocial interventions are effective in the treatment of forced migrants of all age groups, (II) that treatment effects remain evident at (long-term) follow-up and (III) that the efficacy of treatment that is focused on certain symptom clusters (e.g., PTSD) transfers to other symptom clusters (e.g., depression).

Considering the strain of mental health care resources, this insight can aid policymakers and humanitarian organizations in better allocating resources to maximize treatment reach. Forced migrants face many barriers to accessing mental health assessment and treatment, such as language barriers or stigma, among others (Emmelkamp 2023; Satinsky et al. 2019), as well as cultural and logistical challenges related to relocation. Our findings highlight the importance of future research to explore how to increase access to these effective psychological interventions. It is imperative to create scalable effective treatments, which, based on our findings, could be provided in a group setting, for which we show that they are not inferior to individualized treatment.

In the past decade, a particularly promising approach has been developed by the WHO: the problem management plus intervention (PM+; World Health Organization 2018). This is a short-term therapeutic approach that combines counselling in problem-solving with behavioural techniques in an individual or group setting. PM+ is developed for populations that, on average, are impaired by distress because of, for example, war or disease. PM+ is typically delivered by non-specialists, and it has been proven to be effective in reducing psychological problems in different populations (Mwangala et al. 2024). We incorporated three studies that specifically tested the efficacy of PM+ in forced migrants (de Graaff et al. 2020; Knefel et al. 2022; Spaaij et al. 2022), and on all relevant outcomes, they yielded medium to large effect-size estimates (e.g., ranging from $d = 0.57$ to 0.61).

Overall, there was little evidence suggesting that culture and language adaptation of interventions moderated treatment outcomes (Hall et al. 2016). However, the data on these variables were lacking or incomplete for many studies, and hence, we may not have been able to detect true signals in the data because of too much noise. This null finding does not disregard the need to further investigate the cross-cultural nuances of symptom manifestation and treatment outcome and the match between individual and treatment. The following sentence from one of the

included studies (Knappe, Colledge, and Gerber 2019, p. 5) illustrates this need very well ... *however, due to language barriers, the* [therapeutic] *activities had to be simple and easy to understand* ... (Knappe, Colledge, and Gerber 2019, p. 5).

Our findings suggest shared underlying mechanisms and/or therapeutic principles, such as the therapeutic bond between the explored treatments in our analysis, which is in line with the common factor model (Rosenzweig 1936; Schnyder et al. 2015; Wampold 2001, 2015). However, all studies were treatment outcome studies on heterogeneous datasets that were not developed to investigate specific mechanisms of change. Future dismantling studies with credible control conditions could investigate mechanisms of change in more detail. Also, there seems to be a dearth of studies investigating the potential effects of pharmacological interventions for PTSD, depression, and/or anxiety in forced migrants. The data that does exist on this topic is inconclusive, so it seems (Sonne et al. 2017). The scarcity and inconclusiveness of studies on pharmacological treatments for mental health issues in forced migrants are particularly concerning, given the evidence that different ethnicities may react and absorb psychotropic compounds differently (Marazziti et al. 2021). Another potentially important topic that is hardly discussed relates to difficulties in the assessment of culturally specific presentations of complaints (e.g., somatization versus psychological) and/or cultural differences in the explanatory models of such complaints. Misdiagnoses are a potential threat in such cases, and the danger of inadequate treatment assignment—and with that poor outcome—as well. A potential solution for this is to match the cultural background of the client and healthcare professional or the use of trained and culturally matched interpreters (Emmelkamp 2023). In our data set, we found that the use of interpreters is quite common in intervention studies. A match on cultural background, however, is something that is less common, except perhaps in intervention studies that follow the PM+ approach.

A final factor that future studies, reviews and meta-analyses should take into consideration is cost-effectiveness. While more and more data regarding the effectiveness of different treatments are brought to life, data are lacking on the actual financial costs of treatments which is a crucial factor for a forced migrant population that is so often limited on financial resources and dependent on services provided by humanitarian organizations.

4.2 | Limitations

Limitations of the meta-analysis largely stem from the limited number of studies per subgroup, their unbalanced distribution and a lack of transitivity of the data. Future studies could notably focus on the efficacy of interventions for child and adolescent forced migrants to create a larger evidence base for this population. While the trial quality was not always high, the methodological quality score of studies was not related to the outcome. Notably, the lack of effects observed in control conditions could indicate that the control conditions may not have been experienced as credible treatment conditions, controlling for common treatment effects such as attention and expectancy. Another concern is the high level of between-study heterogeneity, unexplained by the predictors explored in the analysis. Cross-cultural variability could have been better accounted for in the study's diverse origins and treatment location of forced migrants. Relatively few articles were included representing child and adolescent forced migrant (32 vs. 84 on adult forced migrants), and, in some cases, no formal diagnostic data were available on this population.

The strength of this study is its robust outcome due to the inclusion of many studies on several types of outcomes and treatment types, which stands out from the existing meta-analyses on the topic. The study's findings were also supported with follow-up data. This is a strength of the current work since it provides relevant information to improve clinical and policy decisions. Despite these insights, further longitudinal research is necessary to explore the long-term sustainability and relapse rates in forced migrant populations beyond the follow-up periods covered in our study. Such studies would enhance our understanding of treatment durability and inform the need for booster sessions to maintain treatment effects over time.

This systematic review with meta-analyses aimed to provide a synthesis of the literature reporting the effects of psychological treatment on PTSD, depression and anxiety in forced migrants of all ages. Our findings show medium to large effect sizes for all major types of treatment, from pre- to post-treatment and at follow-up. The main implication of our work is that practitioners can consider several types of psychological treatment approaches for PTSD, depression and anxiety in child, adolescent and adult forced migrants.

Author Contributions

M.M. had full access to the data and takes responsibility for the integrity of the data and the accuracy of the results presented in this manuscript. Concept and design: all authors. Data acquisition, quality grading, classification and analysis: C.B., J.S., L.M., Z.A., M.S., C.R. and M.M. Drafting of the manuscript: C.B., C.S. and MM. Critical revision of the manuscript for important intellectual content: all authors.

Ethics Statement

This study was deemed exempt from ethical approval from an Institutional Review Board because all data that were use were derived from published studies.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.