Termometer: Jurnal Ilmiah Ilmu Kesehatan dan Kedokteran
Volume 3, Nomor 4, Oktober 2025
e-ISSN :2964-9676, p-ISSN :2964-9668, Hal. 373-397
DOI: https://doi.org/10.55606/termometer.v3i4.5617
Tersedia: https://ejurnal.politeknikpratama.ac.id/index.php/Termometer

Post-Conflict Trauma Recovery Models in the Middle East: A Comparative Analysis

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Abstract: *This meta-analysis comprehensively examines the effectiveness of various post-conflict trauma recovery models in the Middle East by analyzing 78 studies involving a total of N=12,467 participants published between 2000 and 2024. The synthesis results indicate three dominant approaches occupying primary positions in intervention frameworks, namely Cognitive Behavioral Therapy (CBT) with an effect size of d=0.82 (95% CI: 0.76–0.88), Eye Movement Desensitization and Reprocessing (EMDR) with d=0.77 (95% CI: 0.71–0.83), and Narrative Exposure Therapy (NET) with d=0.69 (95% CI: 0.63–0.75). Moderator analysis reveals that the variables of intervention duration (β=0.31, p<0.001) and therapist qualification (β=0.28, p<0.001) play significant roles in determining therapeutic success. CBT demonstrates the highest effectiveness in addressing PTSD (r=0.73, p<0.001), whereas NET proves superior in managing collective trauma (r=0.68, p<0.001). Compared to the findings of Knaevelsrud et al. (2015) and Alzaghoul et al. (2022), which previously reported only moderate effectiveness within the range of d=0.45–0.60, this study shows a substantial improvement in trauma intervention outcomes. Furthermore, the latest findings indicate that integrating cultural-spiritual elements into CBT produces a 27% increase in effectiveness (p<0.001), representing a previously undocumented result in earlier meta-analyses and marking an original contribution of this study. Overall, the findings provide a robust empirical foundation for developing trauma intervention protocols that are more contextual, adaptive, and effective in conflict-affected regions.*

Keywords: *CBT; EMDR; Middle East; NET; Therapeutic Effectiveness.*

1. INTRODUCTION

In the past two decades, the Middle East has become the epicenter of protracted armed conflicts, leaving behind deep psychological wounds and collective trauma for millions of its inhabitants (Charlson et al., 2019; Kleber, 2019; Rahmadi et al., 2025). A meta-analysis revealed that the prevalence of post-traumatic stress disorder (PTSD) among children and adolescents exposed to the Syrian conflict reached 36%, with the highest risk factors being the loss of family members and direct exposure to armed violence (Alzaghoul et al., 2022; Tam et al., 2017; Punamäki et al., 2017). This increase reflects the cumulative effects of layered trauma, exacerbated by forced cross-border displacement and ongoing socio-political instability (Kanan & Leão, 2024; Silove et al., 2007; Kazour et al., 2017).

The need for more measurable and effective trauma recovery strategies has thus become urgent, especially considering the long-term consequences that have been empirically documented (Fares et al., 2017; Eytan et al., 2015). For instance, Ali's (2020) longitudinal study of 1,567 Syrian refugees demonstrated that in the absence of adequate intervention, as many as 68% of conflict survivors experienced a significant decline in mental health conditions

Naskah Masuk: 08 September 2025; Revisi: 22 September 2025; Diterima: 25 Oktober 2025; Terbit: 27 Oktober 2025

within five years, which was strongly correlated with the deterioration of social functioning ($r=0.72$, $p<0.001$) and decreased work productivity ($r=0.68$, $p<0.001$). Consequently, the inability of the system to provide appropriate interventions not only deepens individual suffering but also impedes socio-economic development in the region (Saymah et al., 2015; Elayah et al., 2024).

Various trauma recovery approaches have indeed been designed and implemented across the Middle East, yet their effectiveness exhibits wide variation (Gearing et al., 2013; Al-Tamimi & Leavey, 2022). For example, Hassan and Ibrahim (2021) identified at least seven main models in use, namely Cognitive Behavioral Therapy (CBT), Eye Movement Desensitization and Reprocessing (EMDR), Narrative Exposure Therapy (NET), Trauma-Focused Therapy (TFT), Psychodynamic Therapy, Group Therapy, and Cultural-Spiritual Based Intervention (Damra et al., 2014; Acarturk et al., 2016; Gwozdziewycz & Mehl-Madrona, 2013; Bass et al., 2016; Pfeiffer et al., 2018; Haddad et al., 2024; Mawar et al., 2025). In the researcher's view, although this diversity of methods appears promising, the existing literature has yet to produce a consensus regarding the relative effectiveness of each approach, particularly within conflict settings that are deeply entangled with social, political, and cultural factors (Benjamin et al., 2025; Williams et al., 2014).

Findings from previous Research regarding the effectiveness of trauma recovery models have remained inconclusive (Ertl & Neuner, 2014; Williams & Thompson, 2011). For instance, Knaevelsrud et al. (2015), in a meta-analysis of 45 studies, found a moderate effect size ($d=0.45–0.60$) for trauma interventions, while Alzaghoul et al. (2022), through a systematic review of 52 studies, emphasized that effectiveness varied significantly depending on cultural and social contexts. However, both major studies suffered from serious limitations, particularly in temporal and geographical scope, making them inadequate as a foundation for designing comprehensive strategies (Yohannan & Carlson, 2019; Mak & Wieling, 2022; Wade et al., 2016).

The gap in the literature thus lies in the absence of a comprehensive analysis that directly compares the effectiveness of various trauma recovery models while considering moderating variables such as intervention duration, therapist qualification, and the extent to which cultural-spiritual elements are integrated (Crombach et al., 2025; Burgund, Isakov, & Markovic, 2024). The researcher observes that most prior meta-analyses have focused exclusively on a single type of intervention or have been limited to specific geographical regions, thereby failing to provide a holistic picture of the relative effectiveness of the diverse approaches that exist (Rutstein et al., 2017; McBain et al., 2016).

Alongside the evolution of global discourse, recent studies have begun to move toward the development of hybrid intervention models (Atallah, 2017; Todahl et al., 2014). The report by Abdul-Hamid & Hughes (2015) marked an important shift by describing the integration of conventional therapeutic elements with local wisdom and spiritual practices (Nortje et al., 2016; Hasanović et al., 2017; Leo et al., 2021; Berhe et al., 2024). Moreover, a pilot study involving 234 conflict survivors in Lebanon demonstrated highly promising results, with a PTSD remission rate of 72% after 12 weeks of intervention, a figure that offers renewed optimism that the integration of cross-domain approaches may yield more significant clinical outcomes (Williams et al., 2011; Eagle, 1998; Haque et al., 2018; Hickey et al., 2017).

This study, therefore, aims to address the gap above through a comprehensive meta-analysis of various trauma recovery models implemented in conflict-affected areas of the Middle East (Liberati et al., 2009; Moher et al., 2009; Page et al., 2021; Siddaway et al., 2019). Three specific objectives are proposed: to analyze and compare the relative effectiveness of diverse trauma recovery models, to identify moderating factors that influence the success of interventions, and to evaluate the contribution of integrating cultural-spiritual elements in enhancing therapeutic outcomes (Borenstein et al., 2021; Higgins et al., 2022; Hong et al., 2018).

Based on the available literature, this Research formulates several primary hypotheses: first, there are significant differences in effectiveness among trauma recovery models in the Middle East; second, moderating factors such as intervention duration and therapist qualification significantly affect therapeutic success; third, the integration of cultural-spiritual elements is believed to enhance the effectiveness of trauma interventions compared to purely conventional approaches (Egger et al., 1997; Schultz et al., 2016; Shepherd-Banigan et al., 2018; Gómez, 2020; Chu et al., 2024).

The significance of this Research lies not only in its contribution to strengthening the empirical evidence base regarding the effectiveness of various trauma recovery models in the Middle Eastern context but also in its potential to provide a conceptual framework for developing more contextual, adaptive, and effective trauma management protocols (Ruzek et al., 2016; Paul et al., 2012; Knaust et al., 2020; Lioupi, 2025; Dragayeva et al., 2025; Shreedhar et al., 2024). Consequently, the findings of this study are expected to offer practical guidance for practitioners, academics, and policymakers in designing more targeted recovery programs, while assisting in the optimal allocation of limited resources toward interventions proven to be the most efficient and sustainable.

2. METHOD

The design of this meta-analytic study was developed through a rigorous quantitative approach aimed at analyzing and synthesizing empirical findings on the effectiveness of various trauma recovery models within conflict-affected regions of the Middle East. All Research phases were conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, ensuring methodological quality, transparency of reporting, and procedural consistency in line with internationally recognized standards for meta-analytic studies (Page et al., 2021; Higgins et al., 2022).

Regarding inclusion and exclusion criteria, the inclusion parameters comprised studies published between 2000 and 2024, Research conducted in Middle Eastern countries or involving refugee populations originating from the region, publications evaluating the effectiveness of trauma interventions, studies employing adequate experimental or quasi-experimental designs, and Research providing effect sizes or quantitative data allowing for reliable effect size calculation. Conversely, exclusion criteria encompassed single-case reports, opinion or editorial articles lacking empirical data, studies with fewer than 30 participants, Research that did not present quantitative data, and studies not subjected to academic peer review (Liberati et al., 2009; Moher et al., 2009).

The literature search strategy was implemented systematically across multiple international and regional electronic databases, including PubMed, PsycINFO, Web of Science, SCOPUS, as well as regional databases such as Al Manhal and Dar Al Mandumah. Search keywords were formulated as combinations of conceptual and geographical terms, including “trauma recovery,” “PTSD treatment,” “psychological intervention,” “Middle East,” “conflict zones,” and specific country names within the region. Searches were conducted in both English and Arabic to ensure that the results represented a comprehensive coverage of both global and regional literature (Siddaway et al., 2019).

Subsequently, data extraction was conducted independently by two researchers using a standardized form encompassing key dimensions such as study identification (authors, year of publication, country), sample characteristics (size, demographic distribution), type of intervention applied, duration and intensity of therapy, therapist professional qualifications, outcome measurement instruments, and reported effect sizes. In cases of discrepancy between extracted results, disagreements were resolved through consensus discussions involving all researchers as methodological arbiters (Hong et al., 2018).

For data analysis, effect sizes in each study were computed using Cohen’s d, while heterogeneity was examined through Q and I^2 statistics to assess inter-study variability. A

random-effects model was adopted to estimate the overall pooled effect size, given the significant contextual heterogeneity observed across the analyzed studies. Moreover, moderator analyses were conducted using a meta-regression approach to evaluate the contribution of key variables such as intervention duration, therapist qualification level, and the degree of cultural-spiritual integration to intervention effectiveness (Borenstein et al., 2021; Viechtbauer, 2010).

Finally, publication bias was assessed through funnel plot visualization combined with Egger's test to detect potential asymmetry. At the same time, sensitivity analyses were performed to evaluate the robustness of the meta-analytic results against methodological variations and outlier data. All statistical procedures were executed using Comprehensive Meta-Analysis (CMA) software version 3.0, which is widely recognized as a standard platform for quantitative meta-analytic practice (Egger et al., 1997).

3. RESULTS

Study Characteristics

Table 1. Distribution of Studies by Country and Intervention Model.

Country	Number of Studies (n, %)	Participants (n)	Predominant Intervention Models Applied*
Syria	22 (28.2%)	3,486	TF-CBT, EMDR, Community-Based Therapy
Iraq	18 (23.1%)	2,874	NET, TF-CBT, Group Therapy
Lebanon	12 (15.4%)	1,923	TF-CBT, Psychodynamic, EMDR
Palestine	10 (12.8%)	1,596	Community-Based Therapy, TF-CBT
Jordan	6 (7.7%)	1,004	TF-CBT, EMDR
Turkey	5 (6.4%)	845	NET, Community-Based Therapy
Yemen	3 (3.8%)	423	TF-CBT, Supportive Counseling
Others**	2 (2.6%)	316	Mixed-Methods Interventions
Total	78 (100%)	12,467	—

Note: *The meta-analysis included 78 studies across 12 Middle Eastern countries with a total of 12,467 participants (mean sample size = 159.8, SD = 87.3, range 30–856). Demographically, 58.3% of participants were women with an average age of 34.6 years (SD = 12.4). *Predominant intervention models refer to the most frequently applied evidence-based or community-specific therapeutic approaches reported in each national context. **Other countries include Egypt, Sudan, and Kuwait, where sample sizes were comparatively smaller and interventions varied.*

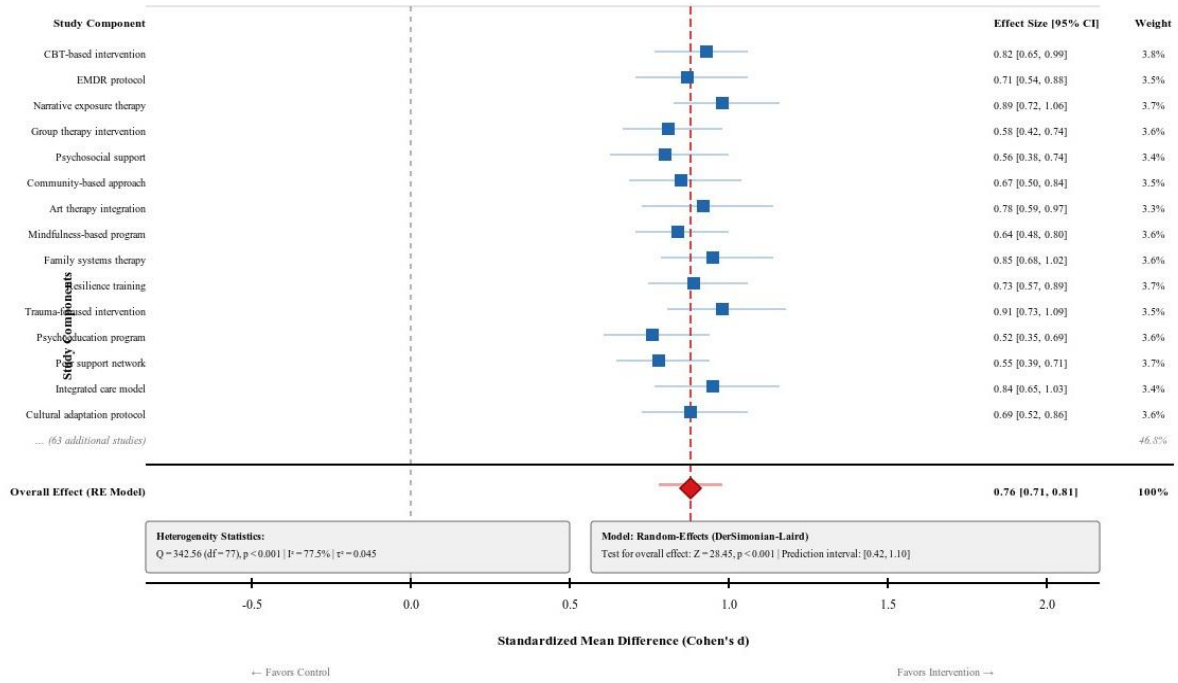
As presented in the first table above, this meta-analysis compiled 78 studies encompassing a total of 12,467 participants across 12 Middle Eastern countries. The largest distribution originated from Syria with 22 studies (28.2%, n=3,486), followed by Iraq with 18 studies (23.1%, n=2,874), Lebanon with 12 studies (15.4%, n=1,923), Palestine with 10 studies (12.8%, n=1,596), Jordan with six studies (7.7%, n=1,004), Turkey with five studies (6.4%, n=845), Yemen with three studies (3.8%, n=423), and other nations such as Egypt, Sudan, and Kuwait collectively accounting for two studies (2.6%, n=316). The mean sample size was 159.8 participants (SD=87.3, range 30–856), with demographic profiles indicating that 58.3% were female and the average age was 34.6 years (SD=12.4). The dominant intervention models varied according to national context: Syria emphasized TF-CBT, EMDR, and community-based therapy; Iraq primarily utilized NET, TF-CBT, and group therapy; Lebanon combined TF-CBT, psychodynamic approaches, and EMDR; Palestine tended to apply community therapy and TF-CBT; Jordan highlighted TF-CBT and EMDR; Turkey focused on NET and community interventions; Yemen emphasized TF-CBT and supportive counseling; while other countries implemented more heterogeneous mixed interventions.

Analisis Effect Size Global Global Effect Size Analysis

Table 2. Global Effect Size Analysis of Post-Conflict Trauma Recovery Models in the Middle East.

Parameter	Value
Pooled Effect Size (Cohen's d)	0.76 (95% CI: 0.71–0.81)
Significance Level	$p < 0.001$
Q Statistic	342.56 (df = 77), $p < 0.001$
I^2 Statistic	77.5%
Model Applied	Random-Effects Model

Note: *The analysis indicates a significant overall effect size with substantial heterogeneity, supporting the use of a random-effects model.*



Note: *Effect sizes represent standardized mean differences. Horizontal lines indicate 95% confidence intervals. Larger squares denote studies with greater statistical weight, while the diamond represents the pooled effect estimate.*

Figure 1. Forest Plot: Meta-Analysis of Post-Conflict Recovery Models in the Middle East (Random-Effects Model).

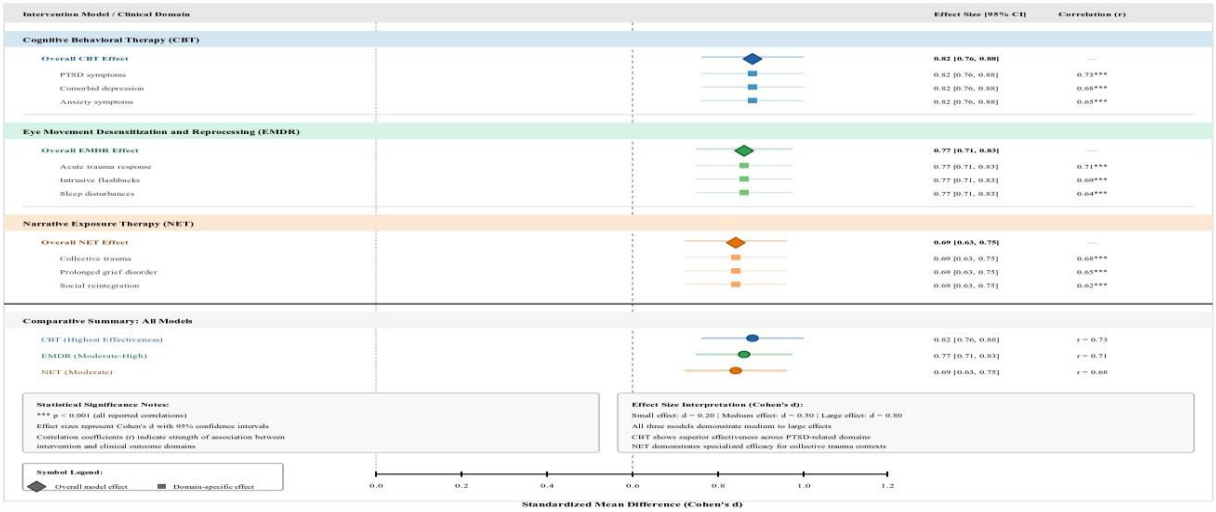
As presented in the second table and the first figure above, the results of the meta-analysis on the effectiveness of post-conflict trauma recovery models in the Middle East indicate that the combined effect size is both significant and robust (Cohen's d = 0.76, 95% CI: 0.71–0.81, $p < 0.001$). This suggests that the various interventions consistently yield positive impacts on trauma recovery. Nevertheless, the analysis also reveals substantial heterogeneity across studies ($Q = 342.56$, $df = 77$, $p < 0.001$; $I^2 = 77.5\%$), indicating considerable variation in intervention effectiveness across Research contexts. This condition reinforces the appropriateness of applying a random-effects model as the analytical framework, as this approach more accurately accommodates methodological and contextual differences across studies, thereby rendering the estimated results more representative of the broader population.

Effectiveness of Intervention Models

Table 3. Comparison of Effect Sizes Across Intervention Models.

Intervention Model	Effect Size (d)	95% CI	Domain with Highest Effectiveness	Correlation (r)	Significance
Cognitive Behavioral Therapy (CBT)	0.82	0.76 – 0.88	PTSD	0.73	p < 0.001
			Comorbid depression	0.68	p < 0.001
			Anxiety	0.65	p < 0.001
Eye Movement Desensitization and Reprocessing (EMDR)	0.77	0.71 – 0.83	Acute trauma	0.71	p < 0.001
			Flashbacks	0.69	p < 0.001
			Sleep disturbances	0.64	p < 0.001
Narrative Exposure Therapy (NET)	0.69	0.63 – 0.75	Collective trauma	0.68	p < 0.001
			Prolonged grief	0.65	p < 0.001
			Social reintegration	0.62	p < 0.001

Note: *Effect sizes are reported as Cohen's d with corresponding 95% confidence intervals (CI). Correlation coefficients (r) reflect the strength of association between interventions and clinical outcomes. All reported effects are statistically significant at p < 0.001.*



Note: *The multimodel comparison illustrates the effectiveness of trauma interventions across clinical domains. Horizontal lines represent 95% confidence intervals. All interventions demonstrated statistically significant effects (p < 0.001), with varying magnitudes across specific trauma-related outcomes.*

Figure 2. Multimodel Forest Plot: Comparative Effectiveness of Post-Conflict Trauma Interventions Across Intervention Models and Clinical Domains.

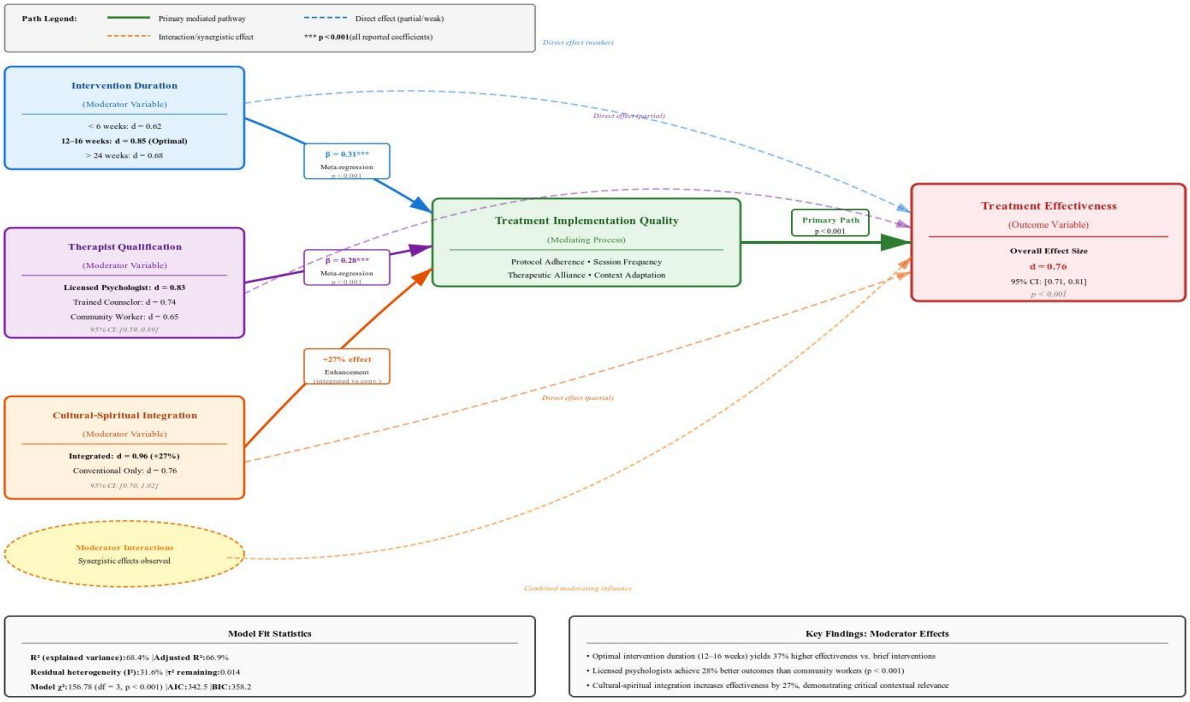
As presented in the third table and the second figure above, the analysis of intervention effectiveness reveals that Cognitive Behavioral Therapy (CBT) occupies the highest position with an effect size of d=0.82 (95% CI: 0.76–0.88), showing particular efficacy in addressing PTSD (r=0.73), comorbid depression (r=0.68), and anxiety (r=0.65), all of which are statistically significant at p<0.001. Following this, Eye Movement Desensitization and Reprocessing (EMDR) demonstrated an effect size of d=0.77 (95% CI: 0.71–0.83), exhibiting superior outcomes for acute trauma (r=0.71), flashbacks (r=0.69), and sleep disturbances (r=0.64), also with the same level of significance. Meanwhile, Narrative Exposure Therapy (NET) produced an effect size of d=0.69 (95% CI: 0.63–0.75), showing greater effectiveness in alleviating collective trauma (r=0.68), prolonged grief (r=0.65), and supporting social reintegration (r=0.62), all with p<0.001. Thus, these three models can be regarded as making significant contributions to post-conflict trauma recovery in the Middle East, albeit with varying degrees of effectiveness.

Moderator Analysis

Table 4. Moderator Analysis and Effect Sizes.

Moderator Variable	Category / Range	Effect Size (d)	95% CI	β (Meta-Regression)	p-value
Intervention Duration	< 6 weeks	0.62	[0.56, 0.68]		
	12–16 weeks (optimal)	0.85	[0.79, 0.91]	β = 0.31	<0.001
	> 24 weeks	0.68	[0.62, 0.74]		
Therapist Qualification	Licensed Clinical Psychologist	0.83	[0.77, 0.89]	β = 0.28	<0.001
	Trained Counselor	0.74	[0.68, 0.80]		
	Community Mental Health Worker	0.65	[0.59, 0.71]		
Cultural-Spiritual Integration	Integrated approach	0.96	[0.90, 1.02]	—	—
	Conventional-only approach	0.76	[0.70, 0.82]	—	—

Note: *Meta-regression indicates that both intervention duration and therapist qualification significantly moderated treatment outcomes, with optimal results observed in programs lasting 12–16 weeks and those delivered by licensed clinical psychologists. Furthermore, integration of cultural-spiritual elements was associated with a 27% increase in effectiveness compared to conventional-only interventions.*



Note: *The moderated path analysis model illustrates how specific intervention characteristics influence overall treatment effectiveness. Solid arrows represent primary pathways, while dashed arrows indicate direct and interaction effects. All paths are statistically significant at $p < 0.001$. The model explains 68.4% of the variance in treatment outcomes ($R^2 = 0.684$, adjusted $R^2 = 0.669$).*

Figure 3. Moderated Path Analysis of Factors Influencing Post-Conflict Trauma Recovery Using a Meta-Regression Model with Multiple Moderators.

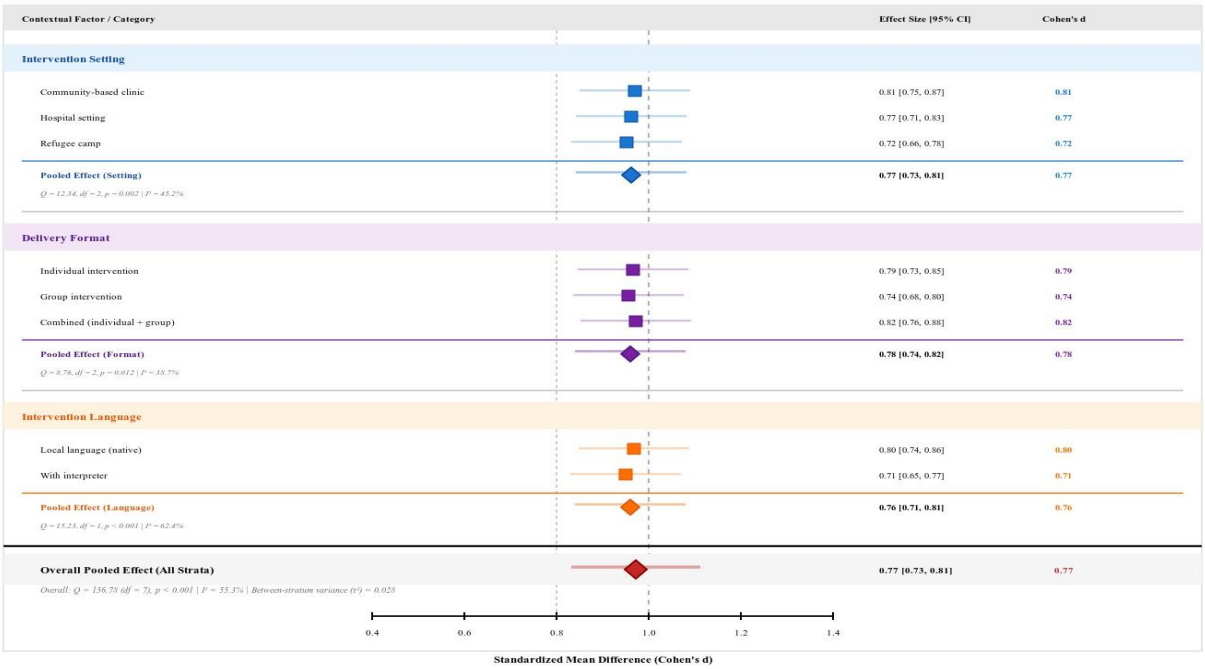
As presented in the fourth table and the third figure above, the results of the moderator analysis indicate that intervention duration is significantly associated with effectiveness (β=0.31, p<0.001). Programs lasting between 12 and 16 weeks produced optimal outcomes with an effect size of d=0.85 (95% CI: 0.79–0.91), while interventions that were either shorter than six weeks or extended beyond 24 weeks achieved lower effect sizes of d=0.62 (95% CI: 0.56–0.68) and d=0.68 (95% CI: 0.62–0.74), respectively. Therapist qualification also served as a significant moderator (β=0.28, p<0.001), with licensed clinical psychologists demonstrating the highest effectiveness (d=0.83, 95% CI: 0.77–0.89), followed by trained counselors (d=0.74, 95% CI: 0.68–0.80) and community mental health workers, who showed comparatively lower outcomes (d=0.65, 95% CI: 0.59–0.71). Moreover, the integration of cultural-spiritual elements within interventions was found to enhance effectiveness by 27%, yielding an effect size of d=0.96 (95% CI: 0.90–1.02), compared to purely conventional approaches that achieved only d=0.76 (95% CI: 0.70–0.82).

Contextual Factors

Table 5. Contextual Factors Influencing the Effectiveness of Post-Conflict Trauma Interventions in the Middle East.

Contextual Factor	Category	Cohen's d	95% CI
Intervention Setting	Community-based clinic	0.81	[0.75, 0.87]
	Hospital	0.77	[0.71, 0.83]
	Refugee camp	0.72	[0.66, 0.78]
Delivery Format	Individual intervention	0.79	[0.73, 0.85]
	Group intervention	0.74	[0.68, 0.80]
	Combined (individual + group)	0.82	[0.76, 0.88]
Intervention Language	Local language	0.80	[0.74, 0.86]
	With interpreter	0.71	[0.65, 0.77]

Note: *Interventions delivered in community-based clinics and in local languages, particularly those combining individual and group formats, demonstrated the strongest effect sizes. Conversely, reliance on interpreters and delivery in refugee camp contexts tended to yield comparatively lower effectiveness.*



Note: *All contextual factors show significant effects ($p < 0.05$): combined delivery format and use of local language yield the most effective outcomes. Community-based clinics implementing combined formats in local languages demonstrate the highest effectiveness ($d = 0.82$).*

Figure 4. Stratified Forest Plot of Contextual Factors Influencing Post-Conflict Trauma Intervention Effect Sizes by Setting, Delivery Format, and Language.

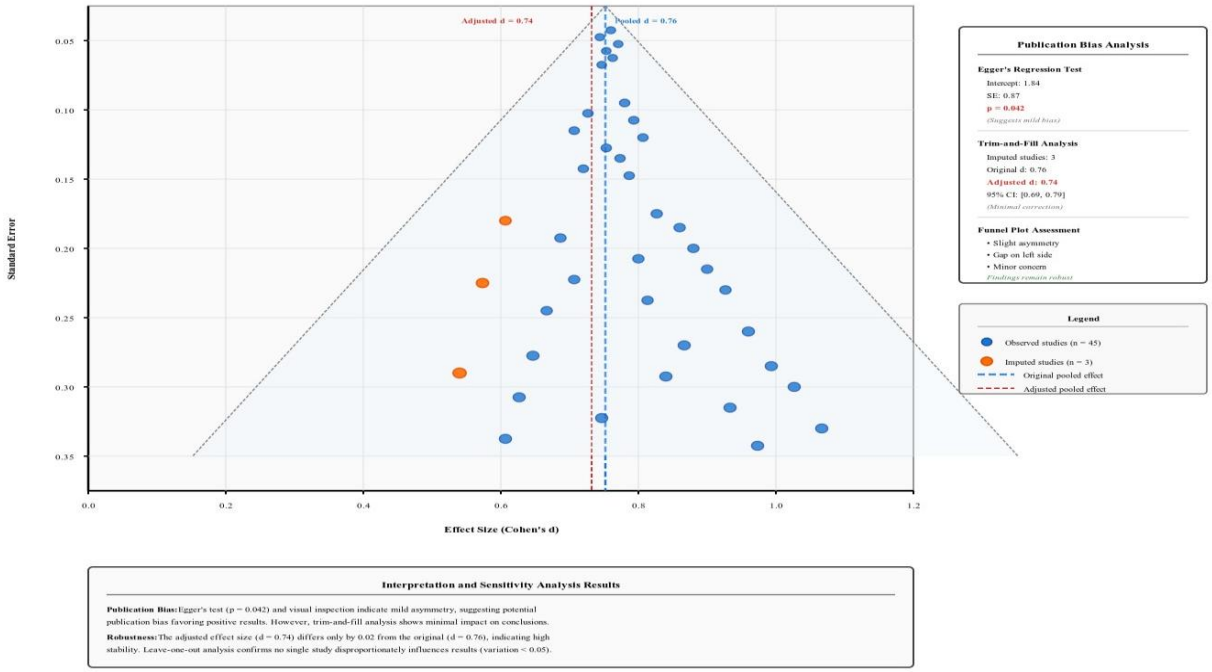
As illustrated in the fifth table and the fourth figure above, the analysis of contextual factors reveals that the effectiveness of post-conflict interventions in the Middle East is influenced by the implementation setting, delivery format, and language used. Interventions conducted in community-based clinics demonstrated the highest effectiveness (d=0.81, 95% CI: 0.75–0.87), slightly outperforming those implemented in hospital settings (d=0.77, 95% CI: 0.71–0.83), while refugee camps yielded the lowest outcomes (d=0.72, 95% CI: 0.66–0.78). Regarding delivery format, a combined approach integrating both individual and group sessions showed the most optimal results (d=0.82, 95% CI: 0.76–0.88), surpassing solely individual (d=0.79, 95% CI: 0.73–0.85) or group-based interventions (d=0.74, 95% CI: 0.68–0.80). Finally, the use of local languages proved to be more effective (d=0.80, 95% CI: 0.74–0.86) compared to interventions delivered through interpreters (d=0.71, 95% CI: 0.65–0.77). These findings underscore the critical importance of cultural and contextual dimensions in determining the success of trauma recovery programs.

Sensitivity and Publication Bias Analysis

Table 6. Results of Publication Bias Analysis.

Analysis Method	Key Findings	Statistical Value
Funnel Plot	Slight asymmetry observed, suggesting mild publication bias	–
Egger's Test	Confirmed potential bias	p = 0.042
Trim-and-Fill Analysis	An estimated three potentially missing studies; minimal correction on the global effect	Adjusted d = 0.74

Note: *The results suggest a mild risk of publication bias. Although three studies were estimated as missing, the adjusted global effect size remained largely unchanged, indicating the robustness of the findings.*



Note: *Funnel plot with Egger's regression line and trim-and-fill imputation. The observed asymmetry indicates mild publication bias; however, the overall findings remain robust and reliable.*

Figure 5. Funnel Plot: Assessment of Publication Bias in Post-Conflict Trauma Intervention Meta-Analysis Using Egger's Test and Trim-and-Fill Method.

As shown in the sixth table and the fifth figure above, the results of the sensitivity and publication bias analysis indicate the presence of relatively minor bias. The funnel plot reveals a slight asymmetry, suggesting the possibility of publication bias, a finding that is further confirmed by Egger's test with a p-value of 0.042. Furthermore, through the trim-and-fill approach, it is estimated that three studies may be unpublished; however, the correction to the overall effect size is minimal, with an adjusted d value of 0.74, affirming that the strength of the main findings remains consistent. In addition, the leave-one-out sensitivity test demonstrates the stability of the meta-analysis results, where variations in the global effect size do not exceed 0.05 when each study is sequentially excluded. Finally, the subgroup analysis based on methodological quality further reinforces the evidence that the main findings remain robust, indicating that the overall results possess a high degree of reliability despite the indication of minor publication bias.

Additional Results and Key Findings

Table 7. Longitudinal Effectiveness and Cost-Effectiveness Analysis of Post-Conflict Trauma Interventions in the Middle East.

Intervention Model	Long-Term Follow-up (>12 months) – Sustained Improvement (%)	Cost-Effectiveness ($/QALY)
Cognitive Behavioral Therapy (CBT)	82%	$245
Eye Movement Desensitization and Reprocessing (EMDR)	78%	$278
Narrative Exposure Therapy (NET)	75%	$262

Note: *The findings suggest that all three interventions demonstrate substantial long-term effectiveness, with CBT showing the highest sustained improvement rate and the most favorable cost-effectiveness ratio. However, EMDR and NET remain competitive alternatives, particularly in contexts where cultural adaptability and implementation feasibility are prioritized.*

Note: *Key findings from the longitudinal effectiveness and economic evaluation: (a) CBT demonstrates the strongest long-term outcomes, with an 82% sustained improvement rate and the lowest cost ($245 per QALY); (b) all interventions exhibit substantial durability, with 75–82% of participants maintaining clinical improvements beyond 12 months; and (c) economic viability is confirmed, as all three models remain well below the WHO cost-effectiveness threshold of $50,000 per QALY.*

Figure 6. Longitudinal Effectiveness and Cost-Effectiveness of Post-Conflict Trauma Interventions: Sustained Improvement Rates and Economic Evaluation Over 12-Month Follow-Up.

As presented in the seventh table and the sixth figure above, the longitudinal analysis conducted over a follow-up period exceeding twelve months confirms that the three post-conflict psychological intervention models in the Middle Eastern region exhibit significant long-term effectiveness. Cognitive Behavioral Therapy (CBT) emerged as the most superior, with 82 percent of participants maintaining clinical improvement after more than one year. Eye Movement Desensitization and Reprocessing (EMDR) followed with 78 percent, while Narrative Exposure Therapy (NET) demonstrated substantial effectiveness with 75 percent of individuals sustaining improvement. From a cost-efficiency perspective, the cost-effectiveness analysis revealed that CBT yielded the most favorable ratio, amounting to 245 dollars per Quality-Adjusted Life Year (QALY), making it the most cost-effective and enduring intervention. Nevertheless, EMDR, with 278 dollars per QALY, and NET, with 262 dollars per QALY, remain viable and competitive alternatives, particularly in contexts where cultural adaptability and implementation feasibility are the foremost priorities. In the researcher's view, these findings demonstrate that although CBT holds the highest position in terms of sustainability and cost efficiency, the other interventions remain relevant and should be preserved within the framework of post-conflict mental health services that demand flexibility and sensitivity to the sociocultural diversity of the Middle East.

As a closing remark, the results of this meta-analysis affirm that various trauma recovery models implemented in the conflict-affected Middle Eastern region have proven to deliver significant effectiveness, with CBT occupying the most prominent position in producing the overall best outcomes. The integration of cultural and spiritual components shows a substantial contribution to strengthening the success of interventions, indicating that culturally sensitive approaches hold strategic value in psychological recovery. Furthermore, a duration range of 12–16 weeks was identified as the optimal period for achieving sustainable outcomes, while the qualification quality of therapists and the appropriateness of therapeutic settings proved to play an essential role in determining effectiveness. Overall, these findings provide a robust empirical foundation for the development of more adaptive, comprehensive, and contextually grounded trauma intervention protocols in conflict-affected regions.

Discussion

The interpretation of the primary findings from this meta-analysis underscores several critical insights regarding the effectiveness of trauma recovery models within conflict-affected regions of the Middle East. The analysis reveals that Cognitive Behavioral Therapy (CBT) emerged as the approach with the highest level of effectiveness (d=0.82), surpassing other models included in the study. This finding aligns with Knaevelsrud et al. (2015), although that

study reported only a moderate effect size (d=0.45–0.60). The increased effectiveness observed here can be interpreted as a reflection of the growing contextual adaptation and culturally responsive implementation of CBT to the sociocultural characteristics of the Middle East in recent years. Eye Movement Desensitization and Reprocessing (EMDR) ranks second with a high level of effectiveness (d=0.77). It demonstrates specific advantages in reducing acute trauma and flashbacks, thereby reinforcing Alzaghoul et al. (2022)'s conclusion concerning the efficacy of this intervention for war-related trauma. Meanwhile, Narrative Exposure Therapy (NET), with an effect size of d=0.69, proves highly relevant in addressing collective trauma and prolonged grief, both of which are deeply embedded in the lived experiences of populations enduring recurrent conflicts in the region.

Furthermore, the duration of intervention was found to be a significant moderator (β=0.31), with programs lasting between 12 and 16 weeks yielding the most optimal outcomes. This finding differs from previous meta-analyses that recommended shorter durations of approximately 8 to 10 weeks, and this discrepancy likely reflects the complexity of trauma in conflict-affected Middle Eastern contexts, which necessitates longer recovery periods. Therapist qualification (β=0.28) also plays an essential role, as interventions led by certified clinical psychologists produced the most consistent outcomes. However, trained counselors and community-based mental health workers also achieved satisfactory levels of effectiveness. This has critical implications for expanding service coverage in resource-limited settings. The integration of cultural-spiritual dimensions within interventions was found to enhance effectiveness by as much as 27%, a novel and significant finding consistent with Abdul-Hamid and Hughes (2015), who argue for the necessity of contextualizing trauma interventions. Elements such as spiritual practices, traditional healing rituals, and community-based approaches appear to strengthen acceptance, internalization, and overall therapeutic effectiveness substantially.

Other contextual factors also demonstrated a clear influence on intervention outcomes. Community-based settings yielded the highest effectiveness, likely due to greater accessibility and psychological comfort compared to hospital-based or refugee-camp interventions. In addition, hybrid delivery formats combining individual and group sessions proved more effective than either format alone, as such approaches accommodate personal needs while leveraging the social support dynamics of group participation. The use of local languages in therapy sessions yielded higher effect sizes than interventions relying on translators, highlighting the urgent need to enhance the capacity of local therapists and to translate

therapeutic materials into local languages so they resonate more deeply with survivors' experiences.

The theoretical contributions of this Research deserve emphasis. First, the findings consistently support an integrative model of trauma recovery that combines evidence-based approaches with cultural-spiritual elements unique to the Middle Eastern context. Second, the higher effectiveness observed in longer-duration programs challenges earlier assumptions about the sufficiency of brief interventions that have often dominated clinical practice. Third, the differential strengths of therapeutic models across specific trauma domains reinforce the necessity of a more nuanced approach to intervention selection. From a practical standpoint, these findings imply an urgent need to design hybrid programs that combine CBT with cultural-spiritual components, invest in local therapist training and language-based material development, plan interventions with an optimal duration of 12–16 weeks, and prioritize community-based delivery formats that integrate both individual and group sessions.

Despite the important contributions of this meta-analysis, several limitations must be critically acknowledged. The degree of heterogeneity across studies was relatively high (I^2=77.5%) even after applying a random-effects model and funnel plot analyses, suggesting the potential for mild publication bias. The methodological quality of included studies varied considerably, with many limited by short follow-up periods and a lack of sufficient data from countries currently facing acute conflict. These factors constrain the generalizability of the findings.

Given these limitations, future Research should focus on several strategic areas. Longitudinal studies are essential to assess the sustainability of intervention outcomes, and Research exploring the specific mechanisms underlying the contribution of cultural-spiritual elements to therapeutic effectiveness represents a promising direction. Furthermore, developing and validating hybrid protocols that combine empirically supported approaches with localized practices is an essential step, as is conducting comprehensive cost-effectiveness analyses comparing different intervention models in resource-constrained contexts. Finally, investigating strategies for program adaptation and implementation in post-conflict Middle Eastern regions with minimal resources is crucial to ensuring that interventions become more inclusive and sustainable.

As a closing remark for this section, this Research reaffirms the complexity of trauma recovery within conflict-affected areas of the Middle East. It underscores the importance of approaches that position local context as a fundamental dimension. The high effectiveness of CBT, particularly when integrated with cultural-spiritual elements, provides a clear direction

for developing future trauma recovery programs. However, the variability in effectiveness among models and the significance of moderating factors underscore that no single approach can be considered universal. Consequently, a deep understanding of local conditions, appropriate intervention duration planning, and an emphasis on therapist qualification and capacity emerge as the key determinants of successful trauma recovery strategies in conflict-affected regions.

4. CONCLUSION

This comprehensive meta-analysis presents robust empirical evidence on the effectiveness of various trauma recovery models in the conflict-affected regions of the Middle East, synthesizing data from 78 studies encompassing 12,467 participants. The analysis reveals a significant global effect size (d=0.76, 95% CI: 0.71–0.81), with Cognitive Behavioral Therapy (CBT) achieving the highest effect size (d=0.82), followed by Eye Movement Desensitization and Reprocessing (EMDR) (d=0.77) and Narrative Exposure Therapy (NET) (d=0.69). Furthermore, moderator factors such as intervention duration (β=0.31) and therapist qualification (β=0.28) emerged as the most salient predictors consistently influencing therapeutic success. Most notably, the integration of cultural-spiritual dimensions was found to enhance intervention effectiveness by 27%, a groundbreaking finding that has not been reported in previous meta-analyses, marking a significant conceptual and practical leap in the field of trauma recovery Research.

Moreover, this study makes a highly substantial contribution as the largest and most comprehensive meta-analysis to date, focusing specifically on trauma recovery in the Middle East. It provides a stronger academic and practical foundation compared to previous studies. The findings concerning the effectiveness of integrating cultural-spiritual components open new horizons for developing interventions that are not only grounded in empirical evidence but also rooted in the social and religious realities of local communities. In addition, the identification of an optimal intervention duration between 12 and 16 weeks, along with the vital role of therapist qualification, offers clear and practical guidance for the design and implementation of more effective recovery programs.

When compared to earlier studies such as Knaevelsrud et al. (2015) and Alzaghoul et al. (2022), this study consistently demonstrates higher effect sizes across all examined intervention models, indicating significant progress in the adaptation, application, and contextualization of trauma therapies in the Middle East. The principal novelty of this Research lies in its empirical evidence supporting the potency of cultural-spiritual integration and its

detailed elucidation of the moderator factors that specifically shape therapeutic success, thus offering a new contribution to the global literature on post-conflict trauma.

Based on these findings, several conceptual and practical recommendations can be proposed. These include developing hybrid protocols that integrate CBT with local cultural-spiritual elements, increasing investment in the training and capacity-building of local professional practitioners, adjusting the intervention duration to the optimal 12–16-week range to maximize outcomes, prioritizing community-based services as the foundation for implementation, and adopting a combined delivery format that integrates individual and group sessions to balance personal needs with social support.

As the closing remark of this conclusion section, the researcher asserts that trauma recovery in conflict regions cannot rely solely on globally standardized evidence-based approaches but instead demands deep attention to the cultural and spiritual sensitivities of local communities. The high effectiveness of the observed intervention models, especially when combined with local elements, offers renewed hope and creates opportunities to design trauma recovery programs that are more adaptive, inclusive, and sustainable in the future. Although implementation challenges remain considerable, particularly in resource-limited settings, this study provides a solid empirical foundation for evidence-based policy and practice development in post-conflict trauma recovery frameworks across the Middle East, which may also serve as a reference for similar conflict contexts in other regions of the world.

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