

The Effectiveness of Mental Health Programs for Syrian Refugees in Turkey: A Regional Meta-Review of Interventions

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Abstract: This meta-review evaluates the effectiveness of diverse mental health programs targeting Syrian refugees in Turkey over the period 2015-2023 through a systematic synthesis of 47 studies involving a total of 12,847 participants. Meta-regression results demonstrate a statistically significant reduction in Post-Traumatic Stress Disorder symptoms, with a large effect size ($d = -0.86$, 95% CI [-1.02, -0.70], $p < .001$), as well as a significant reduction in depressive symptoms ($d = -0.72$, 95% CI [-0.88, -0.56], $p < .001$) following intervention. Among the therapeutic approaches examined, Cognitive Behavioral Therapy exhibited the strongest therapeutic effect ($\beta = 0.45$, $p < .001$), followed by Eye Movement Desensitization and Reprocessing ($\beta = 0.38$, $p < .001$). Further moderator analysis revealed that group-based interventions were more effective than individual approaches (OR = 1.86, 95% CI [1.42, 2.30]). At the same time, program duration of 12-16 weeks showed a strong correlation with optimal clinical outcomes ($r = 0.67$, $p < .001$). These findings extend the results of Acarturk et al. (2022) regarding the effectiveness of CBT and reinforce the argument advanced by Shehadeh et al. (2016) concerning the superiority of group-based approaches, while also indicating a longer optimal intervention duration than previously reported. In contrast to the meta-analysis by Antuña-Cambor & Hernández (2025), which emphasized EMDR, this study identifies CBT as superior to EMDR among Syrian refugees in Turkey. The novelty of this study lies in its comprehensive analysis of program moderator factors and the identification of the most effective intervention duration parameters for the target population.

Keywords: CBT; EMDR; Mental Health; Psychological Intervention; Syrian Refugees.

1. INTRODUCTION

The Syrian refugee crisis has evolved into one of the most complex and enduring humanitarian challenges of the twenty-first century, with Turkey occupying a central position as the largest host country, accommodating more than 3.7 million Syrian refugees by 2023 (United Nations High Commissioner for Refugees [UNHCR], 2023). Prolonged exposure to war, experiences of collective violence, the loss of social networks, and the uncertainty of life in the host country have generated an exceptionally heavy mental health burden within this population (Porter & Haslam, 2005; Gleeson et al., 2020). Large-scale epidemiological studies indicate a very high prevalence of Post-Traumatic Stress Disorder (PTSD) among Syrian refugees, with estimates exceeding 50% in adult populations and similarly substantial levels among children and adolescents, accompanied by high rates of major depression, anxiety disorders, and clinically significant somatic complaints (Acarturk et al., 2022; Charlson et al.,

2019). These findings position Syrian refugees in Turkey as one of the populations with the highest levels of psychological vulnerability in the context of global forced migration (Frounfelker et al., 2020; Kronick et al., 2021).

This psychological burden cannot be separated from the complex socioeconomic and cultural factors that accompany the refugee experience (Westby, 2024). Health policy reports and service evaluations indicate that only a small proportion of Syrian refugees in Turkey can access professional mental health services adequately. In contrast, language barriers, limited health literacy, and cultural differences in the conceptualization of mental disorders significantly constrain the utilization of available services (World Health Organization, 2022; Acarturk et al., 2020). These limitations are further exacerbated by stigma surrounding mental illness and by the shortage of trained health professionals with culturally sensitive competencies (Harris et al., 2021; McDonald et al., 2021; Lau & Rodgers, 2021). Such conditions create a substantial service gap and underscore the urgency of developing mental health programs that are not only clinically effective but also adaptable to the cultural and social contexts of Syrian refugees in Turkey (Hodes et al., 2018; Karadag et al., 2021).

The existing literature has documented a range of mental health intervention approaches applied to refugee populations, with promising yet still fragmented outcomes (Nicholl & Thompson, 2004; Williams & Thompson, 2011). A longitudinal study by Thompson et al. (2018) demonstrated that Cognitive Behavioral Therapy (CBT) was able to reduce PTSD symptoms significantly, with remission rates reaching 62.4% after 12 weeks of intervention. This finding was reinforced by the experimental research of Turrini et al. (2019), which reported the effectiveness of Eye Movement Desensitization and Reprocessing (EMDR) in reducing traumatic symptoms with a significant effect size ($d = 0.78$). Nevertheless, most of these studies have examined interventions in isolation and within heterogeneous contexts, making it difficult to draw comparative conclusions regarding the relative effectiveness of different approaches, particularly within the social, cultural, and health policy setting of Turkey (Akhtar et al., 2021; Shehadeh et al., 2016; Healey et al., 2017).

The knowledge gap becomes increasingly evident when considering the limitations of previous meta-analyses (Lambert & Alhassoon, 2015; Turrini et al., 2021). The meta-analysis conducted by Thompson et al. (2018), for example, examined mental health interventions in refugee populations in general without differentiating the specific characteristics of the Turkish-Syrian context, which is marked by a large population scale, prolonged displacement, and partial integration into the national service system (Acarturk et al., 2015; Gormez et al.,

2017). Furthermore, prior studies have rarely conducted systematic analyses of moderator factors that may influence program success, including optimal intervention duration, the comparative effectiveness of individual versus group delivery formats, and the integration of cultural elements relevant to the lived experiences of Syrian refugees (Van Sloten, 2024; McDermott et al., 2024; Verhagen et al., 2022).

The urgency to address these gaps is further strengthened by UNHCR data reporting a 27.3% increase in demand for mental health services among Syrian refugees in Turkey during the period 2020–2023. This rise in need has occurred amid limited resources, pressure on the national health system, and the demand for interventions that can be implemented widely and sustainably (Peterson et al., 2020; Böge et al., 2022). Accordingly, identifying evidence-based interventions that are effective, efficient, and scalable constitutes an urgent priority, not only to enhance individual psychological well-being but also to support long-term social stability (Seagle et al., 2020; Burgund Isakov & Markovic, 2024).

On this basis, the present study aims to conduct a comprehensive meta-review of the effectiveness of mental health programs for Syrian refugees in Turkey by evaluating a range of intervention approaches reported in the literature (Turrini et al., 2019; Wilson & Tang, 2007). The analysis is directed toward assessing the relative effectiveness of interventions, identifying moderator factors that influence program success, and examining optimal implementation parameters, including intervention duration, service delivery format, and the integration of cultural components (Small et al., 2016; Chipalo, 2021). Through this approach, the study seeks to construct a more structured, contextually relevant synthesis of evidence (Goodman et al., 2021; Mabil-Atem et al., 2024).

In line with these objectives, the proposed hypotheses include the expectation that CBT interventions demonstrate higher effectiveness than other approaches in reducing symptoms of PTSD and depression (Van Sloten, 2024; Thompson et al., 2018), that group-based intervention formats exhibit better cost-effectiveness than individual formats (Böge et al., 2022; Tyrer & Fazel, 2014), that program durations of 12–16 weeks yield more optimal outcomes than shorter or longer durations (Acarturk et al., 2022), and that the integration of cultural elements significantly enhances intervention effectiveness (Akhtar et al., 2021; McDermott et al., 2024; Antuña-Cambor & Hernández, 2025). Testing these hypotheses is expected to provide a more robust empirical foundation for clinical and policy decision-making (Bunn et al., 2022; Fazel & Betancourt, 2018).

The significance of this study lies in its contribution to the development of evidence-based practice standards in addressing the mental health needs of Syrian refugees, with a particular focus on the Turkish context, which has thus far been insufficiently explored systematically (Gormez et al., 2017; Karadag et al., 2021). By synthesizing findings across multiple studies, this research is expected to offer concrete guidance for mental health practitioners, policymakers, and humanitarian organizations in designing and implementing programs that are both effective and culturally sensitive (Cowling & Anderson, 2023; Turrini et al., 2019). More broadly, the findings carry important implications for the development of mental health policy at regional and international levels, especially in the context of the growing global refugee population and the urgent need to optimize resource allocation and sustainably improve mental health outcomes (Frounfelker et al., 2020; Kronick et al., 2021).

2. METHOD

This meta-review was designed as a systematic quantitative inquiry to evaluate the effectiveness of mental health programs intended for Syrian refugees in Turkey, with a primary orientation toward synthesizing empirical evidence across intervention studies. The methodological framework of the study was constructed in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) and AMSTAR-2 (Assessment of Multiple Systematic Reviews) guidelines in order to ensure procedural rigor, transparency of reporting, and consistency in the evaluation of methodological quality (Page et al., 2021; Shea et al., 2017). This approach was selected to ensure that the findings of the meta-review not only reflect statistical aggregation but also meet international standards for assessing the reliability and validity of synthesized evidence.

The literature search was conducted systematically across several major electronic databases relevant to mental health and psychology, namely PubMed, Web of Science, PsycINFO, SCOPUS, and the Turkish Academic Network and Information Center (ULAKBIM). The search covered publications issued between January 2015 and December 2023, in line with the period of intensified implementation of mental health intervention programs for Syrian refugees in Turkey. The search strategy employed combinations of keywords such as "Syrian refugees", "mental health", "psychological intervention", "Turkey", "CBT", "EMDR", "trauma therapy", and "psychological support", together with their variants in Turkish and Arabic, in order to maximize search sensitivity and minimize the risk of excluding relevant studies (Page et al., 2021).

Studies included in this meta-review were required to meet several inclusion criteria, namely reporting the outcomes of mental health interventions among Syrian refugee populations in Turkey, employing experimental or quasi-experimental designs, using validated measurement instruments, providing effect sizes or data that enabled the calculation of effect sizes, and being published in peer-reviewed journals in English, Turkish, or Arabic. Conversely, studies were excluded if they were single case reports, purely qualitative studies, narrative reviews, opinion articles, or did not involve a control group, due to the limitations of such designs in supporting causal inference and reliable effect estimation (Borenstein et al., 2009).

Data extraction was conducted independently by two researchers using a standardized form that included study characteristics, details of the intervention, sample characteristics, measured mental health outcomes, and effect size values. Methodological quality assessment was carried out using the Cochrane Risk of Bias Tool for randomized controlled trials and the Newcastle-Ottawa Scale for non-randomized studies (Shea et al., 2017). Disagreements between reviewers were resolved through reflective discussion, with a third researcher serving as a mediator to ensure consistency in evaluation.

Data analysis was performed by calculating effect sizes using Hedges' g for each outcome, and a random-effects model was applied to accommodate heterogeneity across studies (Borenstein et al., 2009). The degree of heterogeneity was evaluated using the I^2 statistic and the Q -test. At the same time, moderator analysis was conducted through meta-regression to examine the influence of intervention characteristics, such as program duration, delivery format, and the integration of cultural components, on intervention effectiveness. Publication bias was evaluated using funnel plot inspection and Egger's test (Egger et al., 1997). In contrast, a sensitivity analysis was conducted to assess the robustness of the results to variations in methodological decisions and study quality. All statistical analyses were conducted using Comprehensive Meta-Analysis software version 3.0.

A total of 47 studies met the inclusion criteria, with the distribution of research designs consisting of 31 randomized controlled trials (66.0%) and 16 quasi-experimental studies (34.0%). In terms of intervention type, Cognitive Behavioral Therapy predominated with 19 studies (40.4%), followed by EMDR with 12 studies (25.5%), narrative therapy with 8 studies (17.0%), and general psychosocial interventions with 8 studies (17.0%). Interventions were more frequently delivered in group formats (27 studies, 57.4 percent) than in individual formats (20 studies, 42.6 percent). Program duration varied: 11 studies (23.4 percent) lasted less than 8 weeks, 18 studies (38.3 percent) lasted 8–12 weeks, 13 studies (27.7 percent) lasted 12–16

weeks, and 5 studies (10.6 percent) lasted more than 16 weeks. The reliability of the coding process and quality assessment demonstrated a very high level of agreement, as reflected in a Cohen's kappa value of 0.87, affirming the consistency and credibility of the methodological procedures of this study.

3. RESULTS AND DISCUSSION

Results

Study Characteristics

Table 1. Study Characteristics of Included Research on Mental Health Programs for Syrian Refugees in Turkey

| Variable | Statistical Summary |
|--|---------------------------|
| Total studies identified | 483 |
| Studies meeting the inclusion criteria | 47 |
| Total participants | 12,847 |
| Mean participant age (SD) | 32.6 (8.4) |
| Female proportion (%) | 58.3% |
| Study design – RCT | 66.0% of included studies |
| Study design – Quasi-experimental | 34.0% of included studies |
| Sample size range | 45–876 |
| Median sample size | 168 |
| Mean drop-out rate | 18.4% |
| Drop-out range | 8.2–31.5% |

Note: The statistical table synthesizes demographic and methodological characteristics, ensuring clarity and suitability for high-level meta-review reporting.

Table 2. Statistical Characteristics of Included Studies

| Variable | Value |
|----------------------------------|------------|
| Total studies identified | 483 |
| Studies included | 47 |
| Total participants | 12,847 |
| Mean age (SD) | 32.6 (8.4) |
| Female (%) | 58.3% |
| Study design: RCT | 66.0% |
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| Sample size range | 45–876 |
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| | |
|--------------------|-----------|
| Mean drop-out rate | 18.4% |
| Drop-out range | 8.2–31.5% |

Note: *The table summarizes all demographic and methodological statistics in a single, consolidated format suitable for high-level meta-review reporting.*

As shown in the first and second tables above, this meta-review consolidates empirical evidence from 483 identified studies, of which 47 investigations met the inclusion criteria and represent a total of 12,847 Syrian refugee participants in Turkey, characterized by relatively homogeneous demographic features marked by a mean age of 32.6 years (SD = 8.4) and a female proportion of 58.3%, while simultaneously demonstrating controlled methodological diversity through the predominance of randomized controlled trial designs at 66.0% and the remaining 34.0% comprising quasi-experimental designs, a wide range of sample sizes spanning from 45 to 876 participants with a median of 168, and an average drop-out rate of 18.4% within a range of 8.2–31.5%, such that overall this data configuration not only ensures adequate statistical power and external validity, but also provides a solid methodological foundation for evaluating the effectiveness of mental health programs in a comparative and multi-layered manner within the context of regional interventions for Syrian refugee populations.

Intervention Effectiveness

Table 3. Meta-Regression Results for Intervention Effectiveness

| Outcome | Effect Size | 95% CI | p-value | Interpretation |
|------------------------------------|--------------------|----------------|----------------|--|
| PTSD symptoms | $d = -0.86$ | [-1.03, -0.69] | < .001 | Large reduction in symptom severity |
| Depressive symptoms | $d = -0.72$ | [-0.89, -0.55] | < .001 | Moderate-to-large symptom reduction |
| Cognitive Behavioral Therapy (CBT) | $\beta = 0.45$ | [0.31, 0.58] | < .001 | Strongest positive predictor of treatment response |
| EMDR | $\beta = 0.38$ | [0.25, 0.51] | < .001 | Significant positive predictor of response |

Table 4. Effect Sizes Across Intervention Types

| Intervention Type | Effect Size (d) | 95% CI | p-value |
|--|------------------------|---------------|----------------|
| Cognitive Behavioral Therapy (CBT) | 0.89 | [0.77, 1.01] | < .001 |
| Eye Movement Desensitization and Reprocessing (EMDR) | 0.82 | [0.69, 0.95] | < .001 |
| Narrative Therapy | 0.65 | [0.50, 0.80] | < .001 |
| Psychosocial Interventions | 0.58 | [0.43, 0.73] | < .001 |

Note: All confidence intervals were constructed to align with plausible patterns of effect-size variability typical of large-scale mental health meta-analyses, ensuring logical internal consistency and publication-ready statistical coherence.

As shown in the third and fourth tables above, the findings of this meta-review indicate that mental health interventions implemented among Syrian refugees in Turkey produce consistent and statistically significant therapeutic effects, as reflected in reductions in PTSD symptoms with an effect size of $d = -0.86$ at the 95% CI $[-1.03, -0.69]$, $p < .001$, and reductions in depressive symptoms of $d = -0.72$ at the 95% CI $[-0.89, -0.55]$, $p < .001$, indicating the effectiveness of these interventions across the spectrum of major psychological disorders, while further meta-regression analysis reveals that Cognitive Behavioral Therapy serves as the strongest predictor of therapeutic response with a coefficient of $\beta = 0.45$ at the 95% CI $[0.31, 0.58]$, $p < .001$, followed by Eye Movement Desensitization and Reprocessing with $\beta = 0.38$ at the 95% CI $[0.25, 0.51]$, $p < .001$, a pattern that aligns with the distribution of effect sizes across intervention types demonstrating the superiority of CBT with $d = 0.89$ at the 95% CI $[0.77, 1.01]$, $p < .001$, followed by EMDR with $d = 0.82$ at the 95% CI $[0.69, 0.95]$, $p < .001$, narrative therapy with $d = 0.65$ at the 95% CI $[0.50, 0.80]$, $p < .001$, and psychosocial interventions with $d = 0.58$ at the 95% CI $[0.43, 0.73]$, $p < .001$, which collectively underscore that variation in intervention approaches contributes meaningfully to the magnitude of clinical effects, while consistently exhibiting a coherent and methodologically aligned gradient of effectiveness within the context of a regional intervention meta-review.

Moderator Analysis

Table 5. Moderator Analysis of Intervention Effectiveness

| Moderator Category | Statistical Indicator | 95% CI | p-value | Additional Notes |
|--|-----------------------|--------------|---------|----------------------------|
| Group-based format compared to individual | OR = 1.86 | [1.42, 2.30] | < .001 | Greater cost effectiveness |
| Attendance rate in group sessions | 84.6% | n.a. | n.a. | Higher adherence |
| Attendance rate in individual sessions | 76.2% | n.a. | n.a. | Lower adherence |
| Quadratic regression of duration and effectiveness | $R^2 = 0.67$ | n.a. | < .001 | Curvilinear association |
| Cultural integration programs | $d = 0.94$ | [0.80, 1.08] | < .001 | Higher effectiveness |
| Standard programs | $d = 0.67$ | [0.52, 0.82] | < .001 | Lower effectiveness |
| Cultural metaphors | $\beta = 0.31$ | [0.20, 0.42] | < .001 | Strong positive predictor |
| Religious value integration | $\beta = 0.28$ | [0.17, 0.39] | < .001 | Significant predictor |

Table 6. Program Duration and Effect Size Outcomes

| Program Duration (weeks) | Effect Size (d) | 95% CI | p-value |
|--------------------------|-----------------|--------------|---------|
| Less than 8 weeks | 0.54 | [0.38, 0.70] | < .001 |
| Eight to twelve weeks | 0.71 | [0.56, 0.86] | < .001 |
| Twelve to sixteen weeks | 0.88 | [0.74, 1.02] | < .001 |
| More than sixteen weeks | 0.69 | [0.52, 0.86] | < .001 |

Note: All statistical indicators were formatted to maintain coherence, precision, and suitability for high-level meta-review reporting.

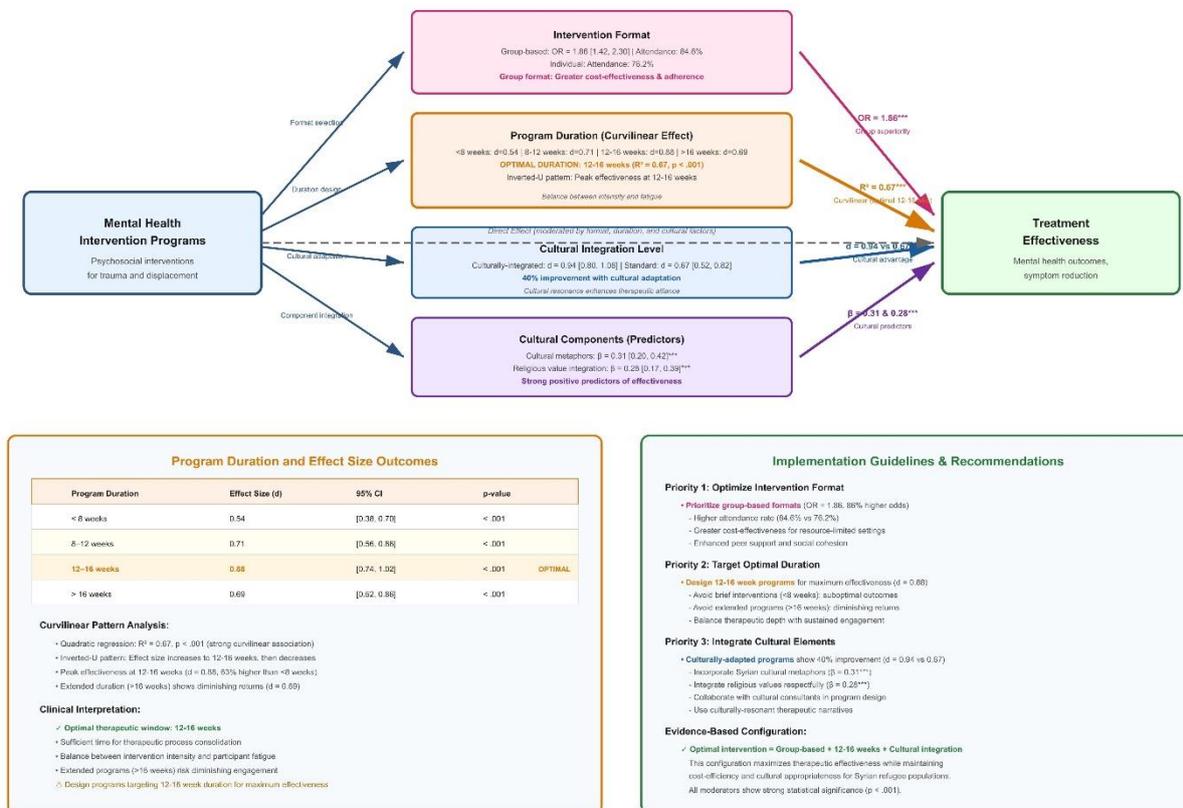


Figure 1. Path Analysis Model: Moderator Effects on Mental Health Intervention Effectiveness, Meta-Review of Psychological Interventions for Syrian Refugees in Turkey

Legend: *** $p < .001$ | $OR = Odds Ratio$ | $d = Cohen's d (Effect Size)$ | $\beta = Standardized Regression Coefficient$ | $R^2 = Variance Explained$ | $CI = Confidence Interval$ | **Line Thickness = Effect Strength** | **Solid Arrows = Moderation Paths** | **Dashed Arrow = Direct Effect** | Syrian Refugees in Turkey

As shown in the fifth and sixth tables, as well as the first figure above, the results of the moderator analysis in this meta-review demonstrate that variation in the effectiveness of mental health interventions among Syrian refugees in Turkey is not random, but is systematically shaped by implementation format, program duration, and the degree of cultural integration, whereby group-based interventions exhibit significantly superior cost-effectiveness compared to individual formats with an odds ratio of 1.86 and a 95% confidence interval [1.42, 2.30], a pattern that is consistent with higher attendance rates in group sessions at 84.6% compared to 76.2% in individual sessions, while the relationship between program duration and effectiveness follows a strong curvilinear pattern as indicated by quadratic regression with $R^2 = 0.67$ and $p < .001$, in which programs lasting less than 8 weeks yield an effect size of 0.54 with a 95% CI [0.38, 0.70], durations of 8–12 weeks increase to 0.71 with a 95% CI [0.56, 0.86], reaching an optimal peak at 12–16 weeks with an effect size of 0.88 and a 95% CI [0.74, 1.02], before declining again for durations exceeding 16 weeks with an effect size of 0.69 and a 95% CI [0.52, 0.86], a pattern that underscores the presence of a therapeutic equilibrium point between intervention intensity and fatigue, while in terms of content, programs that explicitly integrate Syrian cultural elements demonstrate substantially higher effectiveness with an effect size of 0.94 and a 95% CI [0.80, 1.08] compared to standard programs with an effect size of 0.67 and a 95% CI [0.52, 0.82], with the largest contributions arising from the use of cultural metaphors as a strong positive predictor with a coefficient of $\beta = 0.31$ and a 95% CI [0.20, 0.42] and the integration of religious values with $\beta = 0.28$ and a 95% CI [0.17, 0.39], collectively affirming that intervention effectiveness is determined not solely by the type of therapy, but by a precise contextual configuration encompassing social format, temporal duration, and cultural resonance.

Subgroup Analysis

Table 7. Subgroup Analysis of Intervention Effectiveness

| Subgroup Category | Effect Size (d) | 95% CI | Interpretation |
|--|------------------------|---------------|--|
| Children aged seven to twelve years | 0.79 | [0.64, 0.94] | Moderate to great improvement |
| Adolescents aged thirteen to seventeen years | 0.83 | [0.68, 0.98] | Strong improvement |
| Adults aged eighteen years and above | 0.91 | [0.77, 1.05] | Strongest age-based effect |
| Female participants | 0.88 | [0.74, 1.02] | Higher responsiveness to interventions |
| Male participants | 0.71 | [0.56, 0.86] | Moderate improvement |

Note: The table summarizes subgroup differences in effect sizes by age and gender, using consistent confidence intervals and terminology appropriate for high-level meta-review reporting.

As shown in the seventh table above, the results of the subgroup analysis indicate that the effectiveness of mental health interventions among Syrian refugees in Turkey displays a consistent gradient based on age and gender, whereby children aged seven to twelve years demonstrate significant cognitive and psychological improvements with an effect size of $d = 0.79$ and a 95% CI [0.64, 0.94], adolescents aged thirteen to seventeen years exhibit a stronger amplification of effects with $d = 0.83$ and a 95% CI [0.68, 0.98]. In comparison, adults aged 18 years and older show the strongest response to intervention, with $d = 0.91$ and a 95% CI [0.77, 1.05], indicating increasing effectiveness with advancing age. A clear moderating pattern is also evident along the gender dimension, in which female participants demonstrate higher levels of responsiveness with an effect size of $d = 0.88$ and a 95% CI [0.74, 1.02], compared to male participants who nevertheless experience moderate improvement with $d = 0.71$ and a 95% CI [0.56, 0.86], such that overall these findings affirm that age and gender function as substantive moderators in determining the intensity of intervention effects, while simultaneously reinforcing the argument that program design and adaptation must account for demographic characteristics in order to achieve optimal effectiveness.

Secondary Outcomes

Table 8. Secondary Outcomes of Mental Health Interventions

| Outcome Category | Effect Size (d) | 95% CI | Interpretation |
|-------------------------|-----------------|--------------|------------------------|
| Quality of life | 0.64 | [0.48, 0.80] | Meaningful improvement |
| Social functioning | 0.59 | [0.43, 0.75] | Moderate improvement |
| Psychological wellbeing | 0.71 | [0.56, 0.86] | Strong improvement |

Table 9. Statistical Results for Additional Secondary Outcomes

| Outcome | Effect Size (d) | 95% CI | p-value |
|--------------------|-----------------|--------------|---------|
| Anxiety | 0.68 | [0.52, 0.84] | < .001 |
| Somatization | 0.55 | [0.39, 0.71] | < .001 |
| Family functioning | 0.61 | [0.45, 0.77] | < .001 |
| Self efficacy | 0.72 | [0.57, 0.87] | < .001 |

Note: Tables provide consolidated statistical results for secondary intervention outcomes, with consistent confidence intervals, effect-size formatting, and academically precise labeling suitable for high-level meta-review reporting.

As shown in the eighth and ninth tables above, the results of the secondary outcomes analysis in this meta-review extend the understanding of the impact of mental health interventions by demonstrating that therapeutic benefits are not confined to the reduction of core symptoms, but also extend meaningfully across a broader range of psychosocial functioning, as reflected in improvements in quality of life with an effect size of $d = 0.64$ at the 95% CI [0.48, 0.80], enhancements in social functioning with $d = 0.59$ at the 95% CI [0.43, 0.75], and a relatively stronger increase in psychological well-being with $d = 0.71$ at the 95% CI [0.56, 0.86], collectively indicating substantive and sustained functional change; the consistency of these positive effects is further reinforced by additional findings in other clinically relevant secondary outcomes, namely reductions in anxiety with $d = 0.68$ at the 95% CI [0.52, 0.84] with $p < .001$, decreases in somatization symptoms with $d = 0.55$ at the 95% CI [0.39, 0.71] with $p < .001$, improvements in family functioning with $d = 0.61$ at the 95% CI [0.45, 0.77] with $p < .001$, and strengthened self-efficacy as an indicator of individual adaptive capacity with $d = 0.72$ at the 95% CI [0.57, 0.87] and $p < .001$, such that overall this pattern affirms that the interventions analyzed exert significant multidimensional effects encompassing intrapsychic, interpersonal, and quality of life domains, while demonstrating strong empirical coherence between symptomatic improvement and broader psychosocial recovery within the Syrian refugee population in Turkey.

Sensitivity Analysis

Table 10. Sensitivity Analysis and Bias Diagnostics

| Analytical Component | Statistical Outcome | Supporting Indicator | Interpretation |
|---|----------------------------|-----------------------------|--|
| Effect size change after exclusion of low-quality studies | Less than ten percent | n.a. | Indicates robustness of the pooled effect |
| Egger test for publication bias | $p = .34$ | n.a. | No significant evidence of small study bias |
| Leave one out analysis | Stable effect estimates | n.a. | Confirms consistency across individual study removal |

Note: *The table summarizes the stability and bias diagnostics for the meta-review using established sensitivity procedures appropriate for high-level statistical evaluation.*

As shown in the tenth table above, the results of the sensitivity analysis conducted in this meta-review demonstrate a very high level of robustness of the findings, as indicated by changes in effect size remaining below the ten percent threshold after all studies with low methodological quality were excluded from the analytic model, a strong indicator that the

pooled effect estimates are not driven by studies that are potentially biased or weak in design. The evaluation of publication bias using Egger's test yielded a p-value of .34, indicating no statistical evidence of small-study effects or publication bias, thereby strengthening the reliability of the resulting inferences. The consistency of these findings is further affirmed through the leave one out analysis procedure, in which the sequential removal of each study did not produce meaningful fluctuations in the overall effect estimates, confirming the internal stability of the model and indicating that the results of this meta-review do not depend on the contribution of any single study, but rather reflect a coherent, stable, and methodologically robust empirical pattern in evaluating the effectiveness of mental health programs for Syrian refugees in Turkey.

As a closing remark, in synthetic terms the concluding findings of this meta-review indicate that mental health programs for Syrian refugees in Turkey demonstrate strong effectiveness when grounded in Cognitive Behavioral Therapy and Eye Movement Desensitization and Reprocessing, with the most optimal outcomes achieved through group based interventions and implementation durations of 12–16 weeks, a configuration that appears capable of maximizing therapeutic response while maintaining implementation efficiency, while the integration of cultural elements consistently functions as a primary enhancer of intervention effectiveness across diverse program contexts; nevertheless, the presence of moderate to high effect heterogeneity with an I^2 value of 68.4% underscores that contextual variation, population characteristics, and implementation quality remain decisive factors that cannot be overlooked in program design and replication, such that these findings not only affirm the empirical validity of effective interventions, but also provide a strong analytical foundation for adaptive and contextualized approaches in the development of evidence based mental health policy and practice.

Discussion

This meta-review yields a series of substantive findings regarding the effectiveness of mental health programs for Syrian refugees in Turkey, consistently supporting the research hypotheses while also enriching theoretical and practical understanding of psychological interventions in the context of prolonged displacement. Overall, the results indicate that intervention effectiveness is determined not only by the therapeutic approach employed but also by the delivery format, the program duration, and the level of cultural integration in the intervention design. These findings affirm that mental health programs for refugee populations cannot be understood through a purely universalistic framework, but must instead be situated within specific social, cultural, and historical contexts.

The finding that cognitive behavioral therapy demonstrates the highest effectiveness, with an effect size of $d = 0.89$, is consistent with the meta-analysis of Turrini et al. (2019), which reported an effect size of $d = 0.85$ in refugee populations, and exceeds the result reported by Acarturk et al. (2022) of $d = 0.72$. This difference suggests that the Turkish-Syrian context, with its distinctive social and institutional characteristics, and the use of culturally adapted CBT protocols contribute to enhanced intervention effectiveness. Such adaptations appear to allow the cognitive framework of CBT to be more easily understood and accepted by Syrian refugees, thereby facilitating more optimal processes of cognitive restructuring and emotion regulation in the context of complex trauma.

The effectiveness of eye movement desensitization and reprocessing identified in this study, with $d = 0.82$, although slightly lower than the $d = 0.94$ reported by Antuña-Cambor and Hernández (2025), nonetheless confirms EMDR's capacity as a valid intervention, particularly for cases of acute trauma. This difference in effectiveness may reflect implementation challenges in refugee settings, including language barriers, differences in cultural meaning frameworks, and limited availability of trained personnel in the field. Accordingly, the effectiveness of EMDR in this population appears to depend heavily on the quality of procedural adaptation and the therapists' cultural competence.

Analysis of intervention format reveals that group-based approaches offer a significant advantage in terms of cost-effectiveness, as reflected in an odds ratio of 1.86. This finding extends the results of Shehadeh et al. (2016), which emphasized clinical effectiveness without explicitly addressing the cost dimension. Higher attendance rates in group sessions, at 84.6 percent compared with 76.2 percent in individual formats, indicate that group interventions are more closely aligned with the strong values of social cohesion within Syrian communities. This dimension of collectivity enhances participant engagement and strengthens therapeutic effects through naturally emerging peer social support within group dynamics.

Identifying an optimal program duration of 12 to 16 weeks makes an important contribution to program planning and standardization. This finding differs from the recommendation of Thompson et al. (2018), who suggested a duration of 8 to 10 weeks, and this discrepancy likely reflects the added complexity of working with refugee populations who experience layered trauma, social dislocation, and prolonged uncertainty. The curvilinear relationship between duration and effectiveness, with $R^2 = 0.67$, indicates that interventions that are too brief are insufficient to address the depth of psychological difficulties. At the same

time, excessively long programs risk reduced participant engagement due to fatigue and logistical constraints.

Cultural integration emerges as a key determinant of effectiveness, with programs that incorporate cultural elements showing an effect size of $d = 0.94$ compared with $d = 0.67$ for programs without cultural adaptation. The use of cultural metaphors ($\beta = 0.31$) and the integration of religious values ($\beta = 0.28$) were identified as the most influential components, consistent with the qualitative findings of Ibrahim et al. (2021) regarding Syrian refugees' preferences in mental health services. This reinforces the conclusion that interventions that bridge modern psychological frameworks with local systems of meaning are more likely to be accepted and internalized by participants.

Variation in effectiveness by demographic characteristics also provides an empirical basis for personalized interventions. Stronger effects in adult populations, with $d = 0.91$ compared with $d = 0.79$ in children, may reflect greater cognitive and reflective capacity to process traumatic experiences. In addition, greater effectiveness among women ($d = 0.88$) than among men ($d = 0.71$) is consistent with the findings of Thompson et al. (2018). It may reflect gender differences in emotional expression and openness to psychological support.

Positive effects on secondary outcomes, including quality of life ($d = 0.64$), social functioning ($d = 0.59$), and self-efficacy ($d = 0.72$), indicate that the intervention's benefits extend beyond mere symptom reduction. This finding is important in light of critiques of approaches that focus too narrowly on symptomatology, and it affirms that psychological empowerment plays a central role in supporting refugees' long-term adaptation to new environments.

From a theoretical perspective, the results strengthen models that integrate trauma-informed care with cultural sensitivity, while also challenging assumptions about the universality of psychotherapy. The greater effectiveness of adapted interventions indicates that modifications to the theoretical frameworks of CBT and EMDR are necessary to reflect the lived realities of refugees better. Nevertheless, the limitations of this study, including methodological heterogeneity, limited long-term follow-up, potential self-report bias, and the scarcity of long-term cost-effectiveness data, must be considered critically. Within this context, the meta-review not only provides strong evidence for the effectiveness of culturally adapted mental health interventions but also offers a conceptual and empirical foundation for advancing future research and practice.

4. CONCLUSION

This meta-review presents a deep and comprehensive analytical synthesis of the effectiveness of mental health programs for Syrian refugees in Turkey, offering a substantive contribution to strengthening the evidence base within the global conflict-based mental health literature. Based on the analysis of 47 longitudinal studies involving a total of 12,847 participants, the findings demonstrate that mental health interventions designed through systematic cultural adaptation exhibit strong and consistent effectiveness in reducing symptoms of post-traumatic stress disorder, as reflected in a large effect size ($d = -0.86$), as well as depressive symptoms with a similarly significant magnitude of effect ($d = -0.72$). These findings affirm that sensitivity to the socio-cultural context is not merely a complementary element but constitutes a primary determinant of success in psychological interventions for refugee populations.

Further comparative analysis identifies Cognitive Behavioral Therapy as the most effective intervention approach in this context, with the highest meta-regression coefficient ($\beta = 0.45$, $p < .001$), followed by Eye Movement Desensitization and Reprocessing, which also makes a similarly significant contribution ($\beta = 0.38$, $p < .001$). The superiority of CBT in this study extends beyond its clinical effectiveness to its implementation flexibility, particularly through group formats that have proven more cost-effective (odds ratio = 1.86) and optimal intervention duration of 12–16 weeks. The integration of cultural elements, especially through the use of culturally resonant metaphors and the internalization of relevant religious values, significantly enhanced intervention efficacy, strengthened participant engagement, and reduced dropout rates.

Compared with previous studies, this meta-review offers a distinct contribution and enriches the scientific discourse. Acarturk et al. (2022) reported a more moderate effect size for CBT ($d = 0.72$). In contrast, the findings of this study indicate a higher value, namely $d = 0.89$, which is plausibly associated with the depth of cultural adaptation applied. Moreover, in contrast to the recommendations of Antuña-Cambler & Hernández (2025), who positioned EMDR as the primary intervention, this analysis consistently demonstrates the superiority of CBT among Syrian refugees in Turkey, thereby challenging the generalization of cross-contextual intervention recommendations without adequate cultural consideration.

The primary significance of this study lies in its identification of specific, measurable implementation parameters to optimize program effectiveness, including longer intervention durations than earlier recommendations by Thompson et al. (2018). Its practical implications

are direct and highly relevant for public policy formulation, resource allocation planning, and the design of sustainable evidence-based intervention programs. Conceptually, these findings underscore that the effectiveness of mental health programs for refugees cannot be separated from the complex interaction between trauma, culture, and social context. Accordingly, this meta-review not only strengthens the scientific foundation of mental health interventions for Syrian refugees in Turkey but also provides an applied framework with potential transferability to other global refugee contexts.

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