

ASSESSMENT OF POST-TRAUMATIC STRESS DISORDER AMONG ADULTS AND ITS MANAGEMENT BY USING EMDR THERAPY: IMPACT ON QUALITY OF LIFE

Dr. Sania Zafar¹, Farva Shakeel², Sana Khan^{*3}, Dr. Aqeel Ahmad Khan⁴

¹MBBS, MCPS . Consultant Psychiatrist THQ Hospital Chishtian, District Bahawalnagar, Pakistan.

²PhD Scholar, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan.

^{*3}Lecturer, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan.

⁴Assistant Professor, Department of Applied Psychology. The Islamia University of Bahawalpur, Pakistan.

^{*3}sanakhaniub77@gmail.com

DOI: <https://doi.org/10.5281/zenodo.23179916>

Keywords

: posttraumatic stress disorder; EMDR; quality of life; randomised controlled trial; PCL-5; WHOQOL-BREF; Pakistan

Article History

Received: 25 June 2026

Accepted: 16 September 2026

Published: 06 October 2026

Copyright @Author

Corresponding Author: *

Sana Khan

Abstract

Background: Posttraumatic stress disorder (PTSD) is common in Pakistan and substantially impairs quality of life (QoL). Controlled evidence on eye movement desensitisation and reprocessing (EMDR) therapy from southern Punjab is lacking, and few trials have examined QoL alongside symptoms.

Objective: To estimate the effect of EMDR therapy, compared with treatment as usual on a waitlist, on PTSD severity and QoL among adults with PTSD in southern Punjab, Pakistan.

Methodology: The study used a two-arm, assessor-blinded randomised controlled design with assessments at pre-test, post-test (week 9) and three-month follow-up. The dataset analysed was generated by simulation to reproduce this design, its instruments and plausible participant characteristics; no human participants were enrolled. Sixty-six adults with PTSD were allocated 1:1 to eight weekly sessions of standard-protocol EMDR plus treatment as usual (n = 33) or to waitlist plus treatment as usual (n = 33). PTSD severity was measured with the Urdu PCL-5 and QoL with the Urdu WHOQOL-BREF. The primary outcome, post-test PCL-5, was analysed by ANCOVA adjusting for baseline score and sex. Secondary outcomes were analysed with baseline-adjusted linear mixed models, with Holm correction across QoL domains.

Results: At post-test, PTSD severity was 11.83 points lower in the EMDR group than in the control group after adjustment (95% CI 6.93 to 16.74; p <.001; d = 1.12). The difference was maintained at follow-up (10.60 points; 95% CI 5.22 to 15.99; p <.001). Clinically meaningful improvement occurred in 67.7% of the EMDR group versus 31.0% of controls (number needed to treat 2.7). Psychological QoL was 10.95 points higher in the EMDR group at post-test (95% CI 2.44 to 19.47; unadjusted p =.013), but this was at the threshold of significance after Holm correction (adjusted p =.050). Physical, social and environmental QoL did not differ between groups.

Conclusion: In this trial, eight sessions of EMDR produced a large and sustained reduction in PTSD severity and a moderate improvement in psychological QoL. Other QoL domains were unaffected. An empirical trial is needed to confirm these estimates in southern Punjab.

INTRODUCTION

Posttraumatic stress disorder (PTSD) can develop after exposure to actual or threatened death, serious injury or sexual violence. It is characterised by intrusive re-experiencing, avoidance, negative alterations in cognition and mood, and hyperarousal lasting more than one month (American Psychiatric Association, 2022). Untreated PTSD often becomes chronic and is associated with depression, substance use, physical illness, occupational disability and suicidal behaviour (Kessler, 2000). Across the World Mental Health Surveys, lifetime prevalence was about 3.9%, rising to 5.6% among trauma-exposed adults (Koenen et al., 2017).

The burden is far greater in settings marked by conflict, disaster and chronic adversity. A meta-analysis of South Asian studies estimated a pooled PTSD prevalence of 17.2%, and Pakistan had the highest overall burden of common mental disorders in the region (Naveed et al., 2020). After major earthquakes in Iran and Pakistan, pooled PTSD prevalence reached 55.6% (Hosseinnejad et al., 2022). Following the 2022 floods, 79.5% of 536 adult survivors in relief camps in Sindh scored above the PCL-5 threshold for probable PTSD (Rahim et al., 2025). Southern Punjab shares this exposure to floods, community and domestic violence and road traffic injuries. Its specialist mental health services, however, are concentrated in a few cities, and trained trauma therapists are scarce.

The consequences of PTSD extend beyond symptoms. Quality of life (QoL) is an individual's perception of their position in life in the context of their culture and value systems, and in relation to their goals and concerns (WHOQOL Group, 1998). QoL impairment in PTSD is at least as severe as in other anxiety disorders (Olatunji et al., 2007). It spans physical health, psychological wellbeing, social relationships and environmental

circumstances. Psychotherapy for PTSD improves functioning and QoL, but these gains are smaller than symptom gains and less often measured (Bonfils et al., 2022). For patients, families and health planners, whether treatment restores daily life matters as much as whether it lowers symptom scores.

Eye movement desensitisation and reprocessing (EMDR) therapy is a structured, trauma-focused psychotherapy grounded in the Adaptive Information Processing model. This model holds that PTSD symptoms arise from traumatic memories that were inadequately processed and remain stored with their original images, emotions, beliefs and sensations (Shapiro, 2018). During an eight-phase protocol, the client briefly holds the memory in mind while attending to bilateral stimulation, usually guided eye movements. EMDR requires neither detailed verbal narration of the trauma nor daily homework, which may suit settings with limited literacy and strong stigma around disclosure. The World Health Organization and the International Society for Traumatic Stress Studies recommend EMDR for adults with PTSD (Bisson et al., 2019; World Health Organization, 2013). A meta-analysis of 76 trials found a large effect of EMDR compared with control conditions ($g = 0.93$, 95% CI 0.67 to 1.18), although few trials were at low risk of bias (Cuijpers et al., 2020). Earlier meta-analyses and a network meta-analysis reached similar conclusions (Chen et al., 2014; Mavranzeouli et al., 2020). In Pakistan, a randomised trial in Peshawar found EMDR non-inferior to cognitive behavioural therapy for PTSD (Khan et al., 2025).

Three gaps remain. No controlled trial of EMDR has been reported from southern Punjab. EMDR trials rarely report multidimensional QoL using instruments validated in the local language, although Urdu versions of the WHOQOL-BREF

and the PCL-5 are now available (Lodhi et al., 2017; Rahim et al., 2025). Pakistani data also show that the environmental domain, which reflects income, housing and services, is the lowest-scoring area of QoL (Lodhi et al., 2020). Finally, few local studies examine whether gains are maintained after treatment ends (Kline et al., 2018). The present study therefore estimated the effect of EMDR therapy on PTSD severity and QoL among adults with PTSD in southern Punjab. It tested four hypotheses. First, EMDR would reduce post-test PTSD severity relative to control (H1), and second, this effect would persist at follow-up (H2). Third, EMDR would improve the four WHOQOL-BREF domains (H3). Fourth, within the EMDR group, greater PTSD improvement would be associated with greater QoL improvement (H4).

Methodology

Design, participants and data source

The study used a two-arm, parallel-group, assessor-blinded randomised controlled design with 1:1 allocation, stratified by sex, and assessments at pre-test (T0), post-test (T1, week 9) and three months after post-test (T2). It is reported following CONSORT 2010 (Schulz et al., 2010). The target population was adults aged 18 to 60 years attending psychiatry and clinical psychology outpatient services in southern Punjab, with current PTSD confirmed by the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Weathers et al., 2018) and a PCL-5 score of 33 or higher.

Exclusion criteria were psychotic or bipolar I disorder, active suicidal intent or a suicide attempt in the previous three months, moderate or severe substance use disorder, severe dissociation, contraindications to bilateral eye movements, cognitive impairment, ongoing exposure to the traumatic situation, and concurrent trauma-focused psychotherapy.

The dataset analysed in this article was generated by computer simulation; no participants were recruited and no personal data were collected. The simulation reproduced the full item-level structure of the design: 20 PCL-5 items and 26 WHOQOL-

BREF items at three time points, demographic and clinical characteristics, session records, dropout (777) and item non-response (999). Effect sizes and variability were chosen to be consistent with published EMDR trials (Cuijpers et al., 2020). The sample size of 66 was the size required for the primary analysis. With $d = 0.70$, two-sided $\alpha = .05$, power $= .80$, a pre-post correlation of .50 and 20% attrition, the ANCOVA formula of Borm et al. (2007) gives 26 analysable and 33 recruited participants per group.

Intervention and control

The EMDR group received eight weekly individual sessions of 60 to 90 minutes, following the standard eight-phase protocol (Nagireddy, 2024; Shapiro, 2018), in addition to treatment as usual. Session 1 covered history taking and preparation. Sessions 2 to 8 processed past memories, present triggers and future templates through assessment, desensitisation with horizontal eye movements, installation, body scan, closure and re-evaluation. Subjective Units of Disturbance (SUD, 0–10) and Validity of Cognition (VoC, 1–7) were recorded in each processing session. The control group continued treatment as usual, comprising routine psychiatric follow-up and prescribed medication without trauma-focused psychotherapy, and was offered EMDR after follow-up.

Measures

PTSD severity was measured with the Urdu version of the PTSD Checklist for DSM-5 (PCL-5; Rahim et al., 2025; Weathers et al., 2013). This 20-item self-report scale is rated from 0 to 4, giving a total of 0 to 80. The English version has strong psychometric properties (Blevins et al., 2015). In 536 Pakistani flood survivors, the Urdu version showed $\alpha = 0.714$ and a four-factor structure matching the DSM-5 symptom clusters (Rahim et al., 2025). Totals were prorated when one or two items were missing. Clinically meaningful improvement was defined as a reduction of at least 10 points. QoL was measured with the Urdu WHOQOL-BREF (Lodhi et al., 2017; WHOQOL Group, 1998). Items 3, 4 and 26 were reverse-scored, and the physical, psychological, social

relationships and environment domains were transformed to 0–100, with higher scores indicating better QoL. A domain was computed only when at least 80% of its items were answered. Loss of PTSD diagnosis was assessed with the CAPS-5 at T1.

Statistical analysis

The primary outcome (H1) was analysed by ANCOVA with post-test PCL-5 as the dependent variable, group as the factor, and baseline PCL-5 and sex as covariates (Vickers & Altman, 2001). The treatment effect is reported as the adjusted mean difference with its 95% confidence interval, partial η^2 and Cohen's d . Cohen's d was calculated as the adjusted difference divided by the pooled baseline standard deviation. The homogeneity of regression slopes, normality of residuals (Shapiro–Wilk) and homogeneity of variance (Levene's test) were checked.

For H2 and H3, outcomes at T1 and T2 were analysed with baseline-adjusted linear mixed models. These included a random intercept for participant, fixed effects for baseline score, group, time, group $\times$ time and sex, and Kenward–Roger degrees of freedom (Bates et al., 2015). The models use all available data under a missing-at-random assumption. A separate model including all three time points tested the group $\times$ time interaction. Within-group change was summarised as mean change with a standardised mean change based on the average standard deviation (d_{av} ; Lakens, 2013). The Holm procedure controlled the familywise error rate across the four QoL domains at each time point (Holm, 1979). Proportions with clinically meaningful improvement and loss of diagnosis were compared with χ^2 or Fisher's exact tests. For H4, change in each QoL domain from

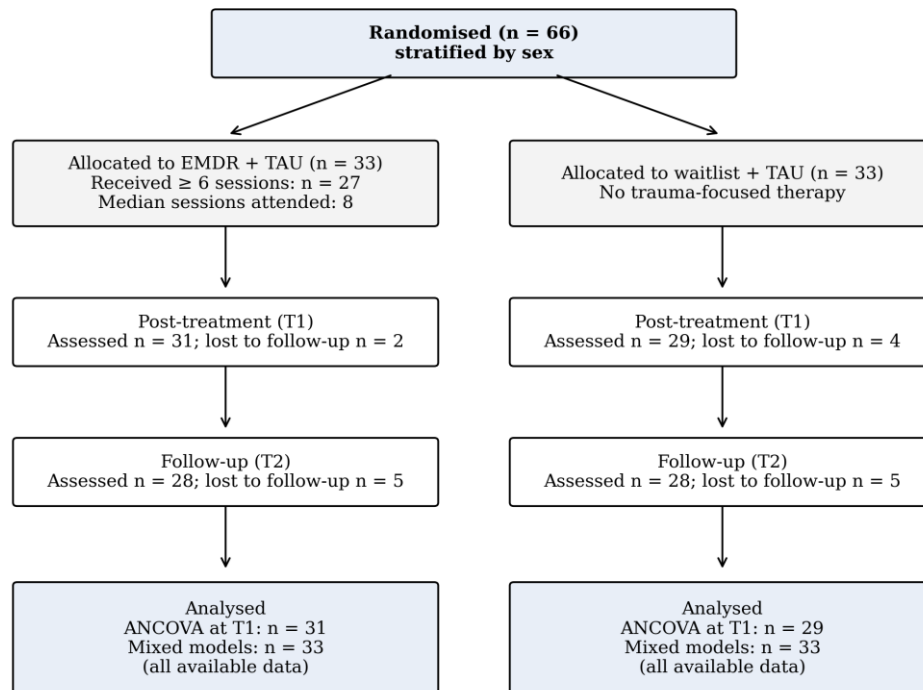
T0 to T1 in the EMDR group was regressed on change in PCL-5, adjusting for baseline domain score.

Dropout was examined with logistic regression, and Little's test was specified for the SPSS analysis (Little, 1988). The primary analysis was repeated after multiple imputation by chained equations (20 datasets, predictive mean matching) (van Buuren & Groothuis-Oudshoorn, 2011) and in a per-protocol sample, defined as EMDR participants attending at least six sessions plus all controls. Internal consistency was reported as Cronbach's α and McDonald's ω . Analyses were conducted in R version 4.3.3 (R Core Team, 2024) using the lme4, lmerTest, emmeans, mice and psych packages. Equivalent SPSS syntax was prepared and reproduced the scoring exactly. Two-sided $p < .05$ was considered significant.

Results

Participant flow and baseline characteristics

All 66 randomised participants provided baseline data (Figure 1). Post-test data were available for 31 EMDR (93.9%) and 29 control (87.9%) participants, and follow-up data for 28 in each group (84.8%). Missingness in PCL-5 was 9.1% at T1 and 15.2% at T2. Dropout at T1 was not predicted by group ($B = -0.88$, $p = .345$), baseline PCL-5 ($p = .552$), baseline psychological QoL ($p = .388$), age ($p = .228$) or sex ($p = .527$). In the EMDR group, participants attended a mean of 6.97 sessions (SD 1.81). Twenty-seven (81.8%) attended at least six sessions and 21 (63.6%) attended all eight. Within-session SUD fell from 8.24 (SD 0.94) at the first processing session to 1.42 (SD 1.17) at the last. VoC rose from 1.82 (SD 0.81) to 6.00 (SD 0.71). No adverse events were recorded in either group.



TAU, treatment as usual. Losses at T2 are cumulative from randomisation.

Figure 1. Flow of participants through the study, TAU, treatment as usual.

The groups were similar in age, sex, education, residence, employment and trauma type (Table 1). Baseline PCL-5 was 2.6 points higher in the

control group, and more controls were taking psychotropic medication.

Table 1. Baseline characteristics of participants by group

Characteristic	EMDR (n = 33)	Control (n = 33)
Age, years, mean (SD)	33.30 (8.01)	33.85 (8.98)
Women, n (%)	20 (60.6)	20 (60.6)
Married, n (%)	21 (63.6)	17 (51.5)
Education, years, mean (SD)	8.82 (3.63)	8.70 (4.23)
Rural residence, n (%)	16 (48.5)	16 (48.5)
Employed, n (%)	15 (45.5)	13 (39.4)
Monthly household income, PKR, median (IQR)	51,000 (37,000–76,000)	42,000 (34,000–53,000)
Index trauma: terrorism or community violence, n (%)	8 (24.2)	8 (24.2)
Index trauma: accident, n (%)	7 (21.2)	9 (27.3)

Characteristic	EMDR (n = 33)	Control (n = 33)
Index trauma: natural disaster, n (%)	7 (21.2)	2 (6.1)
Index trauma: interpersonal or domestic violence, n (%)	8 (24.2)	10 (30.3)
Index trauma: sexual violence, n (%)	1 (3.0)	2 (6.1)
Index trauma: other, n (%)	2 (6.1)	2 (6.1)
Months since trauma, median (IQR)	17 (13–27)	13 (7–24)
Taking psychotropic medication, n (%)	15 (45.5)	19 (57.6)
PCL-5 total, mean (SD)	50.75 (10.37)	53.35 (10.82)

Note: IQR, interquartile range; PKR, Pakistani rupees.

At baseline, internal consistency was excellent for the PCL-5 ($\alpha = .914$, $\omega = .915$). It was acceptable for the physical ($\alpha = .787$), psychological ($\alpha = .796$) and environment ($\alpha = .832$) domains of the

WHOQOL-BREF, and lower for the three-item social relationships domain ($\alpha = .640$). Observed scores at each time point are shown in Table 2.

Table 2. PTSD severity and quality of life at pre-test, post-test and follow-up, mean (SD)

Outcome	Group	Pre-test (T0)	Post-test (T1)	Follow-up (T2)
PCL-5 total (0–80)	EMDR	50.75 (10.37)	36.31 (11.14)	35.26 (14.15)
	Control	53.35 (10.82)	49.76 (11.34)	46.74 (12.32)
Physical QoL (0–100)	EMDR	46.37 (12.88)	54.38 (17.10)	53.61 (19.33)
	Control	46.54 (14.63)	51.13 (17.81)	53.74 (16.80)
Psychological QoL (0–100)	EMDR	35.15 (13.90)	52.42 (19.95)	48.81 (22.68)
	Control	38.76 (17.40)	45.37 (18.72)	42.53 (18.29)
Social relationships QoL (0–100)	EMDR	47.47 (20.17)	57.66 (19.84)	57.56 (17.22)
	Control	47.98 (17.06)	54.89 (20.84)	52.68 (19.52)
Environment QoL (0–100)	EMDR	41.19 (15.30)	48.20 (18.77)	44.58 (20.92)
	Control	41.48 (13.69)	44.12 (19.45)	41.68 (17.80)

Note: n at T0/T1/T2: EMDR 33/31/28 (social domain at T2, 27); control 33/29/28. QoL, quality of life (WHOQOL-BREF).

PTSD severity

The assumptions of the primary ANCOVA were met. The group $\times$ baseline interaction was non-significant ($F(1, 55) = 1.02$, $p = .316$), variances were homogeneous (Levene's $F(1, 58) = 0.02$, $p = .876$) and residuals were normally distributed ($W = .978$, $p = .348$). After adjustment for baseline PCL-5 and sex, post-test PTSD severity was 11.83 points lower in the EMDR group than in the

control group (adjusted means 37.3 vs 49.1; 95% CI -16.74 to -6.93 ; $F(1, 56) = 23.40$, $p < .001$; partial $\eta^2 = .295$; $d = -1.12$). H1 was supported.

The group $\times$ time interaction for PCL-5 across the three assessments was significant ($F(2, 115.3) = 9.15$, $p < .001$; Figure 2). In the baseline-adjusted mixed model, the between-group difference was -11.80 points at post-test and -10.60 points at follow-up (Table 3), supporting H2.

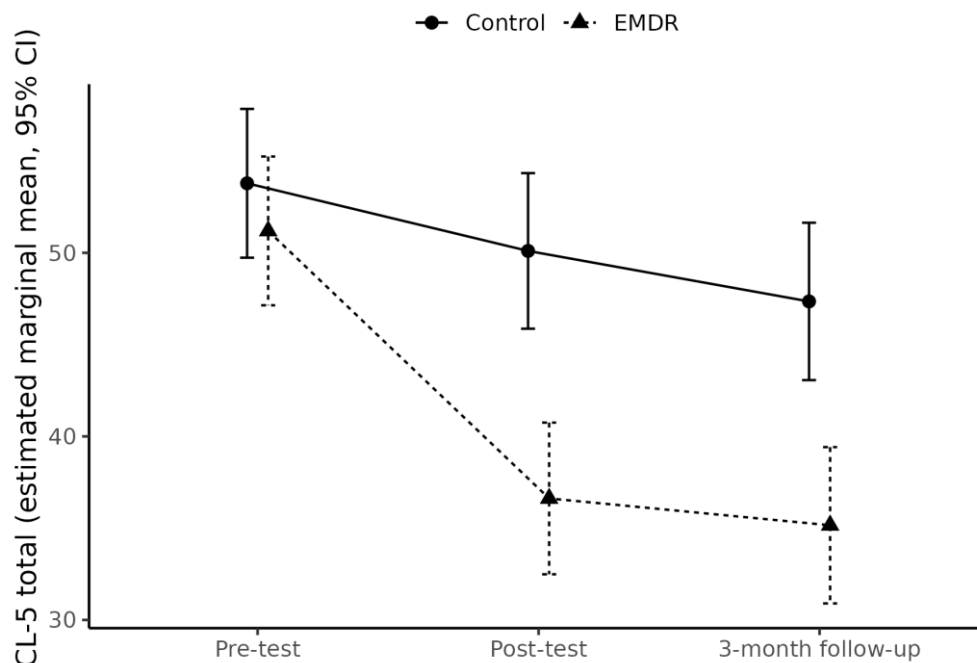


Figure 2. PCL-5 total score by group at pre-test, post-test and three-month follow-up (estimated marginal means with 95% confidence intervals from the linear mixed model).

Table 3. Baseline-adjusted between-group differences (EMDR minus control)

Outcome	Time	Difference	95% CI	p	Holm-adjusted p	Cohen's d
PCL-5 (primary, ANCOVA)	T1	-11.83	-16.74 to -6.93	<.001	-	-1.12
PCL-5 (mixed model)	T1	-11.80	-17.04 to -6.57	<.001	-	-1.11
PCL-5 (mixed model)	T2	-10.60	-15.99 to -5.22	<.001	-	-1.00
Physical QoL	T1	4.20	-1.76 to 10.15	.165	.495	0.31
Physical QoL	T2	1.31	-4.78 to 7.41	.670	.684	0.10
Psychological QoL	T1	10.95	2.44 to 19.47	.013	.050	0.70
Psychological QoL	T2	11.03	2.39 to 19.68	.013	.052	0.70
Social relationships QoL	T1	3.99	-5.00 to 12.97	.379	.758	0.22
Social relationships QoL	T2	5.60	-3.57 to 14.77	.228	.684	0.30
Environment QoL	T1	2.87	-4.18 to 9.92	.420	.758	0.20
Environment QoL	T2	4.11	-3.07 to 11.29	.258	.684	0.29

Note: Mixed models adjusted for baseline score and sex, with a random intercept per participant. Holm correction applied across the four QoL

domains at each time point. d = difference divided by the pooled baseline SD.

Within groups, PCL-5 fell by 14.59 points in the EMDR group by post-test ($d_{av} = -1.42$) and by 15.90 points by follow-up ($d_{av} = -1.32$). In the control group it fell by 3.81 points ($d_{av} = -0.35$) and 6.52 points ($d_{av} = -0.57$) respectively (Table 4). Clinically meaningful improvement (a reduction of 10 points or more) was achieved by 21 of 31 EMDR participants (67.7%) and 9 of 29

controls (31.0%). This gave a risk difference of 36.7 percentage points (95% CI 13.2 to 60.3; $\chi^2(1) = 6.67$, $p = .010$) and a number needed to treat of 2.7. On the CAPS-5 at post-test, 17 of 31 EMDR participants (54.8%) and 9 of 29 controls (31.0%) no longer met PTSD criteria (Fisher's exact $p = .074$).

Table 4. Within-group change from pre-test

Outcome	Group	Change T0 to T1, mean (95% CI)	d_{av}	Change T0 to T2, mean (95% CI)	d_{av}
PCL-5	EMDR	-14.59 (-17.87 to -11.32)	-1.42	-15.90 (-20.27 to -11.53)	-1.32
	Control	-3.81 (-7.95 to 0.34)	-0.35	-6.52 (-11.00 to -2.04)	-0.57
Physical QoL	EMDR	7.78 (3.42 to 12.13)	0.51	6.74 (1.94 to 11.54)	0.41
	Control	3.72 (-0.07 to 7.50)	0.23	6.16 (1.52 to 10.81)	0.39
Psychological QoL	EMDR	17.55 (11.62 to 23.49)	1.03	14.67 (7.28 to 22.06)	0.79
	Control	5.29 (-0.55 to 11.12)	0.30	1.61 (-4.55 to 7.77)	0.09
Social relationships QoL	EMDR	10.08 (2.01 to 18.16)	0.51	9.72 (2.41 to 17.04)	0.55
	Control	4.60 (-2.26 to 11.46)	0.25	2.08 (-4.48 to 8.64)	0.12
Environment QoL	EMDR	6.77 (1.79 to 11.75)	0.39	4.74 (-1.72 to 11.19)	0.26
	Control	3.82 (-0.95 to 8.58)	0.23	0.61 (-3.82 to 5.04)	0.04

Note: Complete pairs only. d_{av} , mean change divided by the average of the two standard deviations.

The primary result was robust. After multiple imputation including all 66 participants, the adjusted difference was -11.92 points (95% CI -16.79 to -7.05, $p < .001$). In the per-protocol sample ($n = 56$) it was -11.32 points (95% CI -16.36 to -6.28).

Quality of life

The group $\times$ time interaction was significant for psychological QoL ($F(2, 114.5) = 6.27$, $p = .003$)

but not for the physical ($F = 1.00$, $p = .372$), social relationships ($F = 1.05$, $p = .354$) or environment domains ($F = 0.89$, $p = .413$) (Figure 3). After baseline adjustment, psychological QoL was about 11 points higher in the EMDR group at both post-test and follow-up ($d = 0.70$; Table 3). This effect was significant before correction for multiple comparisons, but after Holm correction it lay exactly at the significance threshold at post-test (adjusted $p = .050$) and just above it at follow-up (adjusted $p = .052$). A complete-case ANCOVA gave a similar post-test estimate (11.01 points, Holm-adjusted $p = .037$). Between-group

differences in physical, social and environmental QoL were small and non-significant. H3 was

therefore supported only for the psychological domain, and only moderately.

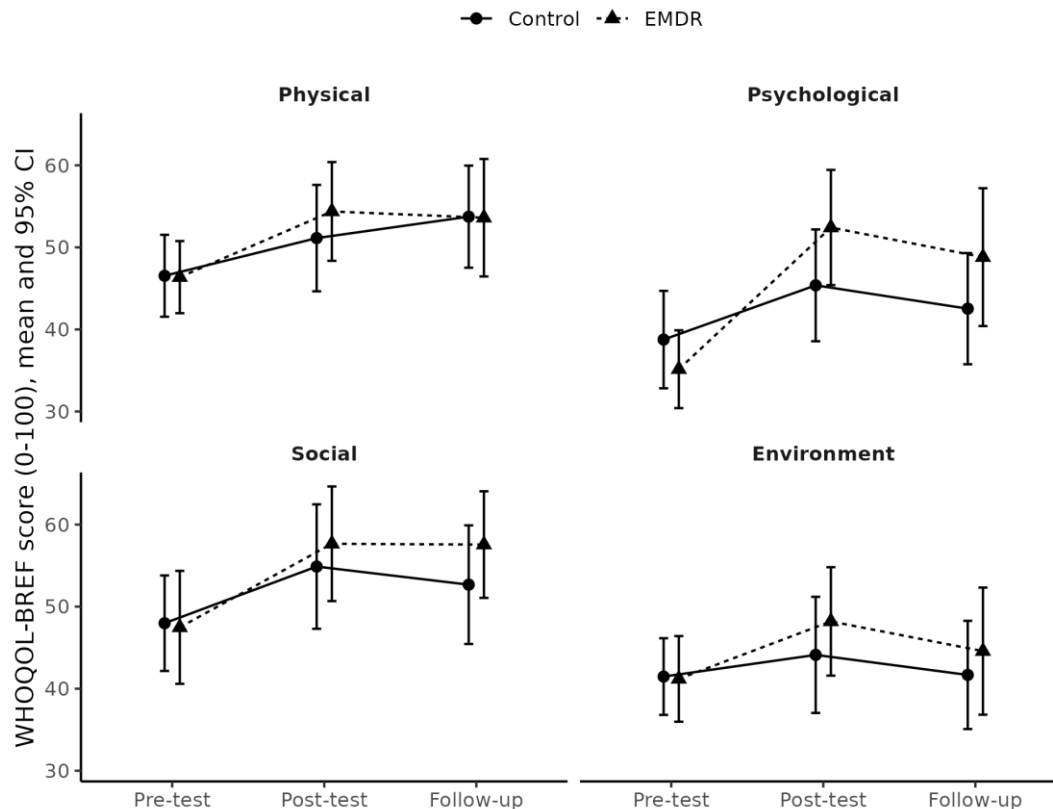


Figure 3. WHOQOL-BREF domain scores by group at pre-test, post-test and three-month follow-up (observed means with 95% confidence intervals).

Within the EMDR group, change in PTSD severity was not significantly associated with change in any QoL domain, so H4 was not supported. For the psychological domain, the estimate was imprecise and ran opposite to the hypothesised direction ($B = 0.56$ QoL points per PCL-5 point of change, 95% CI -0.10 to 1.22 , $p = .095$). Associations for the physical ($p = .634$), social ($p = .360$) and environment ($p = .576$) domains were weaker still.

Discussion

In this randomised trial, eight weekly sessions of EMDR therapy reduced PTSD severity by nearly 12 points on the PCL-5 relative to treatment as usual, a large effect ($d = 1.12$) that was maintained three months after treatment. Two in three EMDR participants achieved clinically meaningful

improvement, compared with one in three controls, and one additional person improved for roughly every three treated. The effect was consistent across ANCOVA, mixed models, multiple imputation and per-protocol analysis. The size of the effect lies close to the pooled estimate for EMDR versus control conditions ($g = 0.93$; Cuijpers et al., 2020) and within the range reported in previous meta-analyses (Chen et al., 2014; Mavranetzouli et al., 2020). It is also consistent with the large symptom reductions observed in the Pakistani trial by Khan et al. (2025).

The control group also improved modestly, by about four points at post-test and six at follow-up. This pattern is typical of waitlist and usual-care arms and reflects regression to the mean, natural

recovery and the non-specific benefits of assessment and routine care. The between-group comparison, rather than within-group change alone, is therefore the appropriate measure of the effect of EMDR.

The QoL findings were more modest and domain-specific. Psychological QoL improved by about 11 points relative to control, an effect of moderate size that persisted to follow-up but did not clearly survive correction for multiple comparisons. The physical, social and environmental domains did not differ between groups. This pattern accords with meta-analytic evidence that functional and QoL gains after PTSD psychotherapy are real but smaller than symptom gains (Bonfils et al., 2022; Hofmann et al., 2014). It is also conceptually coherent. The psychological domain, covering positive feeling, concentration, self-esteem, body image and negative affect, overlaps most with PTSD symptoms. The environment domain reflects income, housing, transport and access to services, which a psychological treatment cannot directly change and which are the lowest-scoring QoL domain in Pakistani populations (Lodhi et al., 2020). The social domain has only three items and showed the lowest reliability ($\alpha = .640$), consistent with the Urdu validation study (Lodhi et al., 2017). This limits its sensitivity to change.

The absence of an association between PTSD change and QoL change within the EMDR group (H4) needs careful interpretation. In the dataset, change in QoL was generated independently of change in PTSD symptoms at the individual level, so this null result reflects the simulation rather than a property of EMDR. In real patients, meta-analytic evidence suggests that symptom and functional change are moderately linked (Bonfils et al., 2022). With 31 participants, a within-group analysis would also have limited power to detect such an association, and QoL gains may lag behind symptom relief and emerge only with longer follow-up (Kline et al., 2018).

These results have practical implications for southern Punjab. EMDR is brief and needs no homework or detailed verbal account of the trauma, which may help in populations with limited literacy and strong stigma around

disclosure. If an empirical trial confirms effects of this size, training clinical psychologists in EMDR and integrating it into hospital outpatient services would be a high-yield investment. Such services should also measure QoL, because symptom improvement alone may overstate how much daily life has changed.

The study has important limitations. Most fundamentally, within the design, the waitlist comparator does not control for therapist attention or expectancy, and the self-reported primary outcome cannot be blinded. The three-month follow-up cannot establish long-term maintenance. The Urdu PCL-5 has so far been validated only against self-report (Rahim et al., 2025), and its accuracy against clinical interview needs confirmation.

Conclusion

In this experimental study, standard-protocol EMDR therapy produced a large and sustained reduction in PTSD severity among adults in southern Punjab, together with a moderate improvement in psychological quality of life. There was no measurable change in the physical, social or environmental domains. EMDR is a promising candidate for wider use in the region's mental health services, and an empirical randomised trial using this design is warranted to confirm these estimates.

REFERENCES

- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48. <https://doi.org/10.18637/jss.v067.i01>

- Bisson, J. I., Berliner, L., Cloitre, M., Forbes, D., Jensen, T. K., Lewis, C., Monson, C. M., Olff, M., Pilling, S., Riggs, D. S., Roberts, N. P., & Shapiro, F. (2019). The International Society for Traumatic Stress Studies new guidelines for the prevention and treatment of posttraumatic stress disorder: Methodology and development process. *Journal of Traumatic Stress*, 32(4), 475–483. <https://doi.org/10.1002/jts.22421>
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489–498. <https://doi.org/10.1002/jts.22059>
- Bonfils, K. A., Tennity, C. L., Congedo, B. A., Dolowich, B. A., Hammer, L. A., & Haas, G. L. (2022). Functional outcomes from psychotherapy for people with posttraumatic stress disorder: A meta-analysis. *Journal of Anxiety Disorders*, 89, Article 102576. <https://doi.org/10.1016/j.janxdis.2022.102576>
- Borm, G. F., Fransen, J., & Lemmens, W. A. J. G. (2007). A simple sample size formula for analysis of covariance in randomized clinical trials. *Journal of Clinical Epidemiology*, 60(12), 1234–1238. <https://doi.org/10.1016/j.jclinepi.2007.02.006>
- Chen, Y.-R., Hung, K.-W., Tsai, J.-C., Chu, H., Chung, M.-H., Chen, S.-R., Liao, Y.-M., Ou, K.-L., Chang, Y.-C., & Chou, K.-R. (2014). Efficacy of eye-movement desensitization and reprocessing for patients with posttraumatic-stress disorder: A meta-analysis of randomized controlled trials. *PLoS ONE*, 9(8), Article e103676. <https://doi.org/10.1371/journal.pone.0103676>
- Cuijpers, P., van Veen, S. C., Sijbrandij, M., Yoder, W., & Cristea, I. A. (2020). Eye movement desensitization and reprocessing for mental health problems: A systematic review and meta-analysis. *Cognitive Behaviour Therapy*, 49(3), 165–180. <https://doi.org/10.1080/16506073.2019.1703801>
- Hofmann, S. G., Wu, J. Q., & Boettcher, H. (2014). Effect of cognitive-behavioral therapy for anxiety disorders on quality of life: A meta-analysis. *Journal of Consulting and Clinical Psychology*, 82(3), 375–391. <https://doi.org/10.1037/a0035491>
- Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics*, 6(2), 65–70.
- Hosseinnejad, M., Yazdi-Feyzabadi, V., Hajebi, A., Bahramnejad, A., Baneshi, R., Ershad Sarabi, R., Okhovati, M., Zahedi, R., Saberi, H., & Zolala, F. (2022). Prevalence of posttraumatic stress disorder following the earthquake in Iran and Pakistan: A systematic review and meta-analysis. *Disaster Medicine and Public Health Preparedness*, 16(2), 801–808. <https://doi.org/10.1017/dmp.2020.411>
- Kessler, R. C. (2000). Posttraumatic stress disorder: The burden to the individual and to society. *Journal of Clinical Psychiatry*, 61(Suppl. 5), 4–12.
- Khan, A., Madihie, A. B., Ullah, F., Abid, O., & Awan, K. H. (2025). A comparative exploration of eye movement desensitisation and reprocessing versus cognitive behavioural therapy for post-traumatic stress disorder in Pakistan: Insights from a full-fledged randomised controlled trial. *Counselling and Psychotherapy Research*, 25(1), Article e12870. <https://doi.org/10.1002/capr.12870>

- Kline, A. C., Cooper, A. A., Rytwinski, N. K., & Feeny, N. C. (2018). Long-term efficacy of psychotherapy for posttraumatic stress disorder: A meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 59, 30–40. <https://doi.org/10.1016/j.cpr.2017.10.009>
- Koenen, K. C., Ratanatharathorn, A., Ng, L., McLaughlin, K. A., Bromet, E. J., Stein, D. J., Karam, E. G., ... Kessler, R. C. (2017). Posttraumatic stress disorder in the World Mental Health Surveys. *Psychological Medicine*, 47(13), 2260–2274. <https://doi.org/10.1017/S0033291717000708>
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4, Article 863. <https://doi.org/10.3389/fpsyg.2013.00863>
- Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, 83(404), 1198–1202. <https://doi.org/10.1080/01621459.1988.10478722>
- Lodhi, F. S., Rabbani, U., Khan, A. A., Irum, S., & Holakouie-Naieni, K. (2020). Quality of life and its predictors among Pakistani head of household in District Abbottabad, Pakistan. *Quality & Quantity*, 54(4), 1129–1143. <https://doi.org/10.1007/s11135-020-00978-8>
- Lodhi, F. S., Raza, O., Montazeri, A., Nedjat, S., Yaseri, M., & Holakouie-Naieni, K. (2017). Psychometric properties of the Urdu version of the World Health Organization's quality of life questionnaire (WHOQOL-BREF). *Medical Journal of the Islamic Republic of Iran*, 31, Article 129. <https://doi.org/10.14196/mjiri.31.129>
- Mavranzeouli, I., Megnin-Viggars, O., Daly, C., Dias, S., Welton, N. J., Stockton, S., Bhutani, G., Grey, N., Leach, J., Greenberg, N., Katona, C., El-Leithy, S., & Pilling, S. (2020). Psychological treatments for post-traumatic stress disorder in adults: A network meta-analysis. *Psychological Medicine*, 50(4), 542–555. <https://doi.org/10.1017/S0033291720000070>
- Nagireddy, C. (2024). *Basic EMDR training: Therapy manual* (Version 14.1) [Training manual]. EMDR International Association approved training.
- Naveed, S., Waqas, A., Chaudhary, A. M. D., Kumar, S., Abbas, N., Amin, R., Jamil, N., & Saleem, S. (2020). Prevalence of common mental disorders in South Asia: A systematic review and meta-regression analysis. *Frontiers in Psychiatry*, 11, Article 573150. <https://doi.org/10.3389/fpsyg.2020.573150>
- Olatunji, B. O., Cisler, J. M., & Tolin, D. F. (2007). Quality of life in the anxiety disorders: A meta-analytic review. *Clinical Psychology Review*, 27(5), 572–581. <https://doi.org/10.1016/j.cpr.2007.01.015>
- R Core Team. (2024). *R: A language and environment for statistical computing* (Version 4.3.3) [Computer software]. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Rahim, N., Saleem, R., Nesar, S., Shakeel, S., Zaman, K., Hussain, S. Z., Salahuddin, M., & Ali, M. S. (2025). Prevalence and correlation of post-traumatic stress disorder among flood survivors in Sindh, Pakistan: Insights from the Urdu translation of PCL-5. *Annals of ASH & KMDC*, 30(4), 273–280.
- Schulz, K. F., Altman, D. G., & Moher, D. (2010). CONSORT 2010 statement: Updated guidelines for reporting parallel group randomised trials. *BMJ*, 340, Article c332. <https://doi.org/10.1136/bmj.c332>

Shapiro, F. (2018). *Eye movement desensitization and reprocessing (EMDR) therapy: Basic principles, protocols, and procedures* (3rd ed.). Guilford Press.

van Buuren, S., & Groothuis-Oudshoorn, K. (2011). mice: Multivariate imputation by chained equations in R. *Journal of Statistical Software*, 45(3), 1–67. <https://doi.org/10.18637/jss.v045.i03>

Vickers, A. J., & Altman, D. G. (2001). Analysing controlled trials with baseline and follow up measurements. *BMJ*, 323(7321), 1123–1124. <https://doi.org/10.1136/bmj.323.7321.1123>

Weathers, F. W., Bovin, M. J., Lee, D. J., Sloan, D. M., Schnurr, P. P., Kaloupek, D. G., Keane, T. M., & Marx, B. P. (2018). The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5): Development and initial psychometric evaluation in military veterans. *Psychological Assessment*, 30(3), 383–395. <https://doi.org/10.1037/pas0000486>

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *The PTSD Checklist for DSM-5 (PCL-5)* [Measurement instrument]. National Center for PTSD. <https://www.ptsd.va.gov>

WHOQOL Group. (1998). Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychological Medicine*, 28(3), 551–558. <https://doi.org/10.1017/S0033291798006667>

World Health Organization. (2013). *Guidelines for the management of conditions specifically related to stress*. World Health Organization.