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EFFICACY OF EMOTIONAL FREEDOM TECHNIQUE IN REDUCING DEPRESSION AND IMPROVING QUALITY OF LIFE AMONG STROKE SURVIVORS IN PAKISTAN: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

This study evaluated the feasibility and efficacy of Emotional Freedom Techniques (EFT) for reducing post-stroke depression, improving quality of life (QOL), and alleviating caregiver burden among stroke patients in Pakistan. A single-blind randomized controlled trial was conducted with 100 ischemic stroke patients recruited from five rehabilitation hospitals in Islamabad and Rawalpindi. Participants were randomized to EFT plus routine rehabilitation or standard care. Cognitive eligibility was screened using the Mini-Mental State Examination Urdu (MMSE-U). Outcomes were measured at baseline, post-intervention, and follow-up using the Beck Depression Inventory–II (Urdu; BDI-II-U), WHO Quality of Life scale (Urdu; WHOQOL-U), and Burden Scale for Family Caregivers–short (BSFC-s). Subjective Units of Distress (SUDS) were recorded during EFT sessions. Analyses employed paired and independent samples t-tests and repeated-measures ANOVA. Compared with standard care, the EFT group showed significantly greater reductions in depression (BDI-II-U) and greater improvements in QOL (WHOQOL-U) from baseline to post-intervention, with effects sustained at follow-up (all $p < .01$). Caregiver burden decreased more in the EFT group (BSFC-s; $p < .01$), and session-by-session SUDS ratings declined, indicating progressive symptom relief. Baseline comparability was established, and sensitivity analyses confirmed robustness of findings. EFT was feasible and produced clinically meaningful improvements in depression, QOL, and caregiver burden when delivered alongside standard rehabilitation in a lower-middle-income setting. Incorporating EFT into multidisciplinary stroke care may address critical psychological needs and enhance recovery. Future studies should explore long-term durability, underlying mechanisms, and implementation strategies across diverse clinical contexts.

Keywords: *Emotional Freedom Techniques; post-stroke depression; quality of life; caregiver burden; randomized controlled trial, Pakistan.*

INTRODUCTION

Stroke is a leading cause of mortality and long-term disability worldwide, producing profound effects on physical, cognitive, and psychosocial functioning. It occurs due to interrupted cerebral blood flow, typically from vascular occlusion or hemorrhage, resulting in neuronal injury and functional deficits that vary with lesion location and ischemia duration (GBDSS, 2019; Hackett & Pickles, 2014). In low- and middle-income countries (LMICs), including Pakistan, rehabilitation efforts have historically emphasized physical recovery, while psychosocial consequences remain comparatively under-addressed. This neglect is

critical, as evidence consistently demonstrates that psychological well-being is central to functional outcomes after stroke. Approximately one-third of survivors' experience post-stroke depression (PSD), which undermines motivation, therapy adherence, cognition, and engagement in daily activities, thereby prolonging disability (Turner-Stokes & Hassan, 2002; Towfighi et al., 2017). Beyond depression, stroke often reduces quality of life (QOL) through hemiparesis, aphasia, and mobility limitations that compromise independence and social roles, compounding emotional distress (Northcott & Hilari, 2011; Berg et al., 2003).

Epidemiological data highlight the urgency of addressing these challenges. The World Stroke Organization reports that one in four adults over 25 will suffer a stroke in their lifetime, with 12.2 million new cases annually and 6.5 million deaths (WSO, 2022). Asia bears a disproportionate burden, with incidence ranging from 116–483 per 100,000 annually, most occurring in LMICs (GBD, 2016; WHO, 2020). Pakistan reflects this trend acutely, with community-based prevalence estimates between 1.2% and 4.8% and nearly 30% of strokes occurring in individuals aged ≤45 years. Mortality ranges between 11% and 30% (Farooq & Khealani, 2009; Khealani et al., 2008; Sherin et al., 2020). Risk is exacerbated by hypertension, diabetes, smoking, and poor access to specialized services. Notably, the average age at onset is at least a decade younger than in high-income settings (Khealani et al., 2008; Farooq et al., 2009). With mental health concerns already elevated in Pakistan due to social adversity (WHO, 2018), stroke survivors face compounded psychological vulnerability.

The psychosocial burden extends beyond patients to family caregivers, who frequently report elevated depression and stress levels. Dyadic interdependence in emotional states has been observed depressed patients are more likely to have depressed caregivers highlighting the need for interventions addressing the patient and caregiver unit (Ahn et al., 2015; Green & King, 2009; McCarthy et al., 2011). Even survivors of mild stroke experience invisible dysfunctions such as fatigue, impaired attention, executive deficits, and anxiety, all of which hinder daily functioning and return to work (Carlsson et al., 2009; Fride et al., 2015; McCarthy et al., 2011; Shi et al., 2015). Younger survivors, who comprise a considerable portion of Pakistan's stroke population, are disproportionately affected by hidden impairments cognitive inefficiency, fears of recurrence, sexual dysfunction, and social isolation that reduce health-related QOL despite better physical recovery (Boot et al., 2020; Kapor et al., 2019; Maaijwee et al., 2014, 2015; Westerlind et al., 2017; Yoon et al., 2021).

Psychological and cognitive health directly influence secondary prevention behaviors such as medication adherence, exercise, and diet. Hence, untreated depression and anxiety not only limit rehabilitation engagement but also worsen long-term vascular risk (Hackam & Spence, 2007). Sleep disturbance and mental fatigue further reduce participation in therapy and everyday life (Hermann & Bassetti, 2009; Swartz et al., 2016).

Despite these challenges, consensus on optimal management of PSD remains limited. Evidence for conventional interventions such as cognitive-behavioral therapy (CBT), structured goal-setting, home visits, exercise, or music therapy is mixed, with inconsistent effects on mood outcomes (Gezer, 2019; Jones et al., 2016; Kootker et al., 2017; Raglio et al., 2017; Topcuoglu et al., 2015; Visser et al., 2016). Barriers are especially acute in LMICs, where access to multidisciplinary rehabilitation is scarce and psychosocial interventions are underdeveloped (Wong & Read, 2008). These constraints create a strong rationale for brief, cost-effective, and culturally adaptable interventions that can be integrated within existing care systems.

Emotional Freedom Techniques (EFT), a form of energy psychology, combines cognitive exposure with acupoint tapping to downregulate distress and modify maladaptive cognitions. Evidence supports its efficacy across diverse populations, including those with depression, anxiety, and trauma-related symptoms (Feinstein, 2010; Nelms & Castel, 2016; Church, 2013). Its structured, time-efficient design makes it particularly suitable for Pakistan's rehabilitation context, where service capacity is limited, therapist availability is low, and patient demand is high. Importantly, EFT

can be taught as a self-help skill, empowering patients and caregivers to manage distress beyond clinical sessions.

By situating EFT within a biopsychosocial model, this study addresses an important research gap: the lack of controlled psychosocial intervention trials for stroke survivors in LMICs. Conceptually, it acknowledges the interdependence of biological, psychological, and social dimensions in recovery. Empirically, it generates evidence on the feasibility and outcomes of EFT in Pakistan's rehabilitation system. Practically, it tests whether a low-intensity intervention can be embedded in multidisciplinary care to improve both patient and caregiver outcomes. In doing so, it positions EFT not as peripheral but as central to holistic stroke rehabilitation

Theoretical Framework: This study was grounded in the **biopsychosocial model**, which emphasizes that health outcomes are influenced by biological, psychological, and social factors. Stroke recovery extends beyond physical rehabilitation; emotional well-being, coping strategies, and social support significantly shape depression levels, quality of life, and caregiver burden. Integrating Emotional Freedom Technique (EFT), an evidence-based energy psychology intervention, aligns with this holistic model, as it targets both psychological distress and physiological arousal.

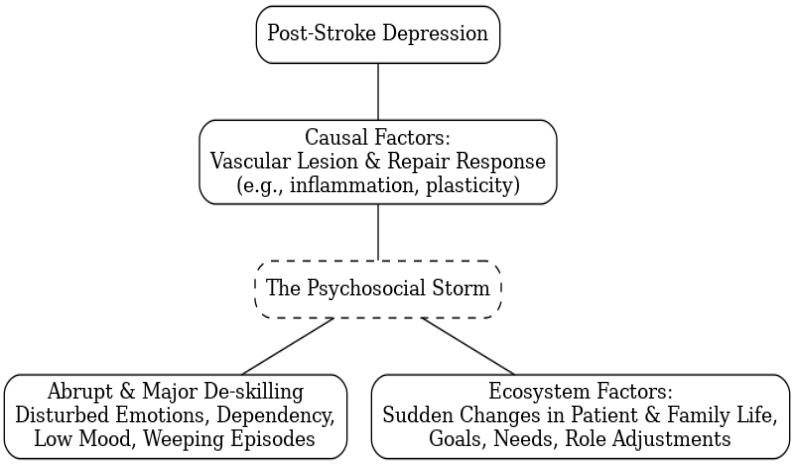

Figure 1: Theoretical framework of the biopsychosocial model of EFT for post-stroke depression, integrating biological, psychological, and social factors in recovery.

Purpose of the Study: The primary purpose was to examine the feasibility and efficacy of EFT as an adjunct to standard rehabilitation for stroke survivors in Pakistan, with a focus on reducing post-stroke depression, enhancing quality of life, and alleviating caregiver burden

Research Objectives

1. To examine the effectiveness of Emotional Freedom Technique (EFT) in reducing post-stroke depression compared with standard rehabilitation.
2. To assess the impact of EFT on improving quality of life (QOL) and reducing caregiver burden.
3. To evaluate the sustainability of EFT's effects during follow-up sessions.
4. To determine the moderating role of stroke severity in influencing EFT outcomes.
5. To investigate the mediating roles of coping mechanisms, emotional stability, and comorbidities in the relationship between EFT and patient outcomes.

Research Questions

1. Does EFT significantly reduce depression among stroke patients compared to standard care?
2. Does EFT improve quality of life and reduce caregiver burden relative to controls?
3. Are EFT's effects on depression and QOL sustainable over follow-up assessments?
4. Does stroke severity moderate the relationship between EFT and outcomes (depression, QOL, caregiver burden)?
5. Do coping mechanisms, emotional stability, and comorbidities mediate the

relationship between EFT and patient outcomes?

Hypotheses

Direct Effects

- **H1:** Depression levels in the EFT group will decrease significantly compared to the control group.
- **H2:** Quality of life will increase significantly in the EFT group compared to the control group.
- **H3:** Subjective Units of Distress (SUDS) will decrease significantly in the EFT group relative to controls.
- **H4:** EFT will demonstrate sustainable and long-term effects on depression and quality of life at follow-up.
- **H5:** EFT will significantly reduce caregiver burden compared to the control group.

Moderation

- **H6:** Stroke severity will moderate the effect of EFT, such that patients with lower-to-moderate severity will show greater improvements in depression and QOL than those with higher severity.

Mediation

- **H7:** Coping mechanisms will mediate the relationship between EFT and depression/QOL outcomes, with improved coping linked to greater benefits.
- **H8:** Emotional stability will mediate the relationship between EFT and patient outcomes, such that increased emotional stability explains part of EFT's effectiveness.
- **H9:** Comorbidities will mediate the effect of EFT on depression and QOL, with fewer comorbidities enhancing the intervention's impact.

Conceptual Framework: The framework positions **EFT as the independent variable**, depression, quality of life, and caregiver burden as **dependent variables**, stroke severity as a **moderator**, and coping mechanisms, emotional stability, and comorbidities as **mediators**

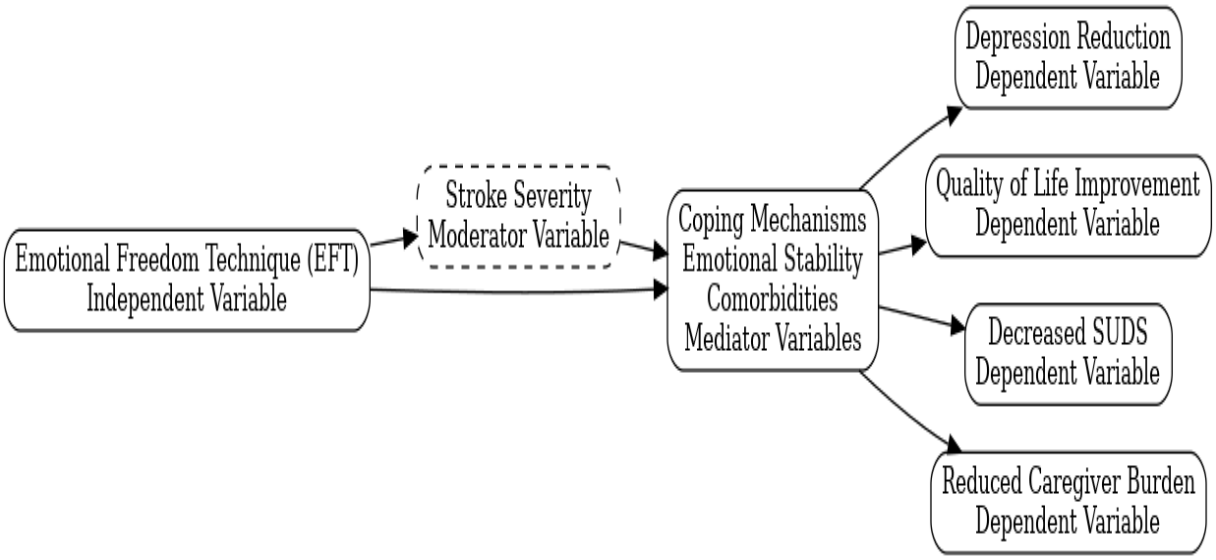

Figure 2: Conceptual framework positioning EFT as the independent variable, with depression, quality of life, and caregiver burden as dependent variables; stroke severity as a moderator; and coping, emotional stability, and comorbidities as mediators.

Contribution: By situating a structured, low-intensity psychological protocol within Pakistani stroke rehabilitation, this article offers an LMIC-specific test of an intervention responsive to the lived realities of patients and caregivers. In so doing, it aligns clinical practice with evidence that mental health is not a downstream luxury but a determinant of participation, adherence, and secondary prevention key drivers of long-term recovery and societal reintegration.

Methodology

Research Design and Approach: This study employed a randomized controlled trial (RCT) to evaluate the effectiveness of Emotional Freedom Technique (EFT) in reducing depression, enhancing quality of life (QOL), and lowering caregiver burden among ischemic stroke patients in Pakistan. The design incorporated parallel groups with random allocation into intervention (EFT) and control (standard rehabilitation) arms. A deductive approach was adopted, as EFT served as the independent variable and outcomes were assessed using validated quantitative tools

Setting and Population: The study was conducted in five rehabilitation hospitals, two located in Islamabad and three in Rawalpindi. A total of 100 ischemic stroke patients were recruited. Eligibility was assessed using the Urdu Mini-Mental State Examination (MMSE-U), with a cut-off score of ≥23 to ensure adequate cognition. Patients with NIH Stroke Scale (NIHSS) scores of 16–20, indicating moderate to severe stroke, were included. A pilot comparison of MOCA and MMSE in three ischemic stroke patients showed MMSE to be more reliable for the Pakistani population; hence, it was adopted for cognitive screening in this trial.

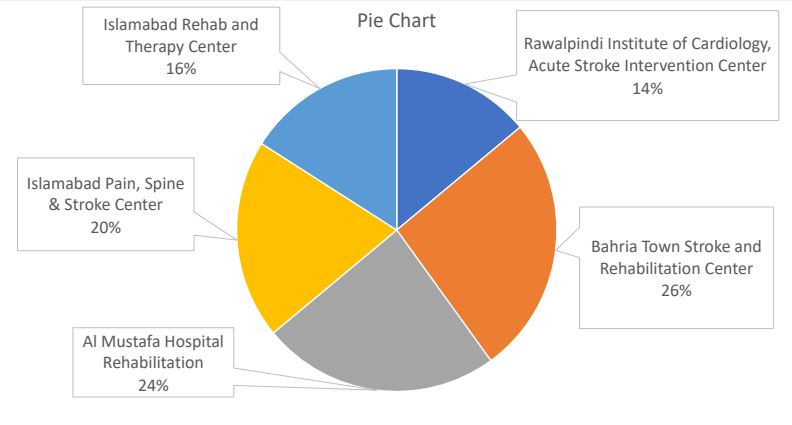

Figure 3: Location and percentage distribution of participants across five rehabilitation hospitals in Islamabad and Rawalpindi

Table 1: *Pilot Study Comparing MOCA and MMSE Scores Among Stroke Patients*

Pilot study of MOCA and MMSE			
Sr no.	Age	MOCA	MMSE
		Cut-off score(26 to30)	Cut-off score (22 to29)
1	56	16/30	25/30
2	45	24/30	26/30
3	52	19/30	24/30

The pilot study showed that MOCA scores were consistently below the cut-off, while MMSE scores mostly met the cut-off, suggesting MMSE's greater suitability for Pakistani stroke patients.

Inclusion Criteria

- Confirmed diagnosis of ischemic stroke.
- Age 40–70 years.
- Within six months' post-stroke.
- Ability to provide informed consent.

Exclusion Criteria

- Severe cognitive impairment (MMSE -U < 23).
- Unstable medical conditions.
- History of psychiatric disorders unrelated to stroke.

Randomization and Blinding: Participants were randomly allocated to the intervention or control group using computer-generated random numbers. Allocation concealment was ensured through sealed opaque envelopes. Single blinding was maintained, whereby assessors were unaware of group assignments

Instruments and Measures:

The following standardized instruments were employed:

- Mini Mental State Examination Urdu (MMSE-U): to establish cognitive eligibility.
- Beck Depression Inventory-II Urdu (BDI-II-U): to assess depressive symptoms.
- WHO Quality of Life Urdu (WHOQOL-U): to evaluate physical, psychological, and social domains.
- Subjective Units of Distress Scale (SUDS): to measure immediate emotional distress.
- Burden Scale for Family Caregivers short version (BSFC-s): to quantify caregiver strain
-

Table 2: *Reliability and Validity of Instruments Used in the Study*

Instrument	Author(s) / Source	Items & Scale	Reliability / Validity
BDI-II (Urdu)	Dr. Sheikh Abdul Khaliq & team (2007)	21 items	Internal consistency α = .73–.92 (M = .86); test–retest α = .86 & .81
WHOQOL (Urdu)	Lodhi & team (2017)	26 items	Cronbach's α = .91
MMSE (Urdu)	Awan et al. (2015)	11 items	Cronbach's α = .74; cut-off score 23/24; sensitivity 84%, specificity 80% (95% *CI*)
SUDs	Joseph Wolpe & Benjamin	0–10 rating Scale	0 = no disturbance; 10 = most disturbance
EFT Manual	Dawson Church; Donna Bach (2019)	5 treatment Steps	Supported by 100+ efficacy studies
BSFC-s (Short)	Elmar & Oliver	10 items	Cronbach's α = .90–.91; test–retest α = .94; validity > .45

The instruments demonstrated strong psychometric properties: high reliability, validity, and cultural adaptation, ensuring accurate measurement of depression, quality of life, cognition, distress, EFT efficacy, and caregiver burden.

Intervention Protocol: The EFT intervention followed a structured manual adapted to stroke patients. Sessions involved acupoint tapping combined with verbalization of distress-related statements. Each patient attended eight sessions (two per week, each lasting 60 minutes) over four weeks. Trained facilitators delivered the intervention in small groups, supported by visual guides

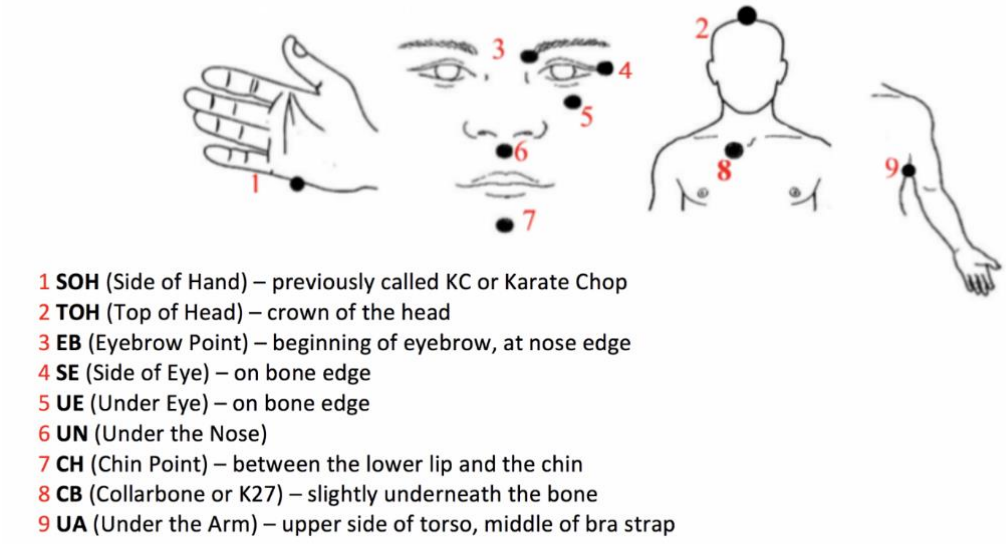

Figure 4: Sequence of EFT tapping points used during intervention sessions, illustrating acupoint locations and standardized tapping order

EFT session management, delivery, and workload distribution

Table 3: *Integrated EFT Session Management, Delivery, and Co-Facilitator Schedule*

Week	Session	Focus Area	Key Activities	Duration	Lead Facilitator Role	Co-Facilitator Role	Workload Distribution	Day & Time (Group A/B)	Co-Facilitator Assigned
1st	1	Orientation & Rapport Building	Introduction to EFT, psychoeducation, consent, baseline SUDS	60 min	Explain EFT, manage group	Assist, monitor SUDS	70% / 30%	Monday 10–11 am / 2–3 pm	Co-Facilitator 1
	2	Identifying Core Issues	Guided recall, setup statements, SUDS rating	60 min	Lead tapping rounds	Record progress	70% / 30%	Wednesday 10–11 am / 2–3 pm	Co-Facilitator 2
2nd	3	Skill Consolidation	Tapping on depression, anxiety	60 min	Deliver tapping	Track attendance	65% / 35%	Friday 10–11 am / 2–3 pm	Co-Facilitator 1
	4	Skill Consolidation	Tapping on hopelessness	60 min	Supervise, guide practice	Support group	65% / 35%	Saturday 10–11 am / 2–3 pm	Co-Facilitator 2
3rd	5	Cognitive Reframing	Tapping with affirmations	60 min	Guide reframing	Provide individual guidance	60% / 40%	–	–
	6	Cognitive Reframing	Affirmation practice	60 min	Lead supervision	Ensure compliance	60% / 40%	–	–
4th	7	Relapse Prevention	Teach self-administered EFT, coping	60 min	Demonstrate self-practice	Assist patients	50% / 50%	–	–
	8	Closure & Evaluation	Post-assessments (BDI-II,	60 min	Conduct debrief	Manage data collection	50% / 50%	–	–

Week Session	Focus Area	Key Activities	Duration	Lead Facilitator Role	Co-Facilitator Role	Workload Distribution	Day & Time (Group A/B)	Co-Facilitator Assigned
		WHOQOL, SUDS), feedback						

Note. *EFT = Emotional Freedom Technique; SUDS = Subjective Units of Distress Scale; workload distribution shown as Lead % / Co-facilitator %.*

The integrated schedule outlines structured EFT delivery across four weeks, balancing facilitator workload, ensuring systematic patient engagement, guided tapping, cognitive reframing, relapse prevention, and evaluation with culturally adapted assessment tools.

Data Collection Procedure: Baseline data were collected prior to randomization. Post-intervention assessments were completed immediately after the four-week program, with follow-up at three months. Both intervention and control groups underwent identical assessment schedules.

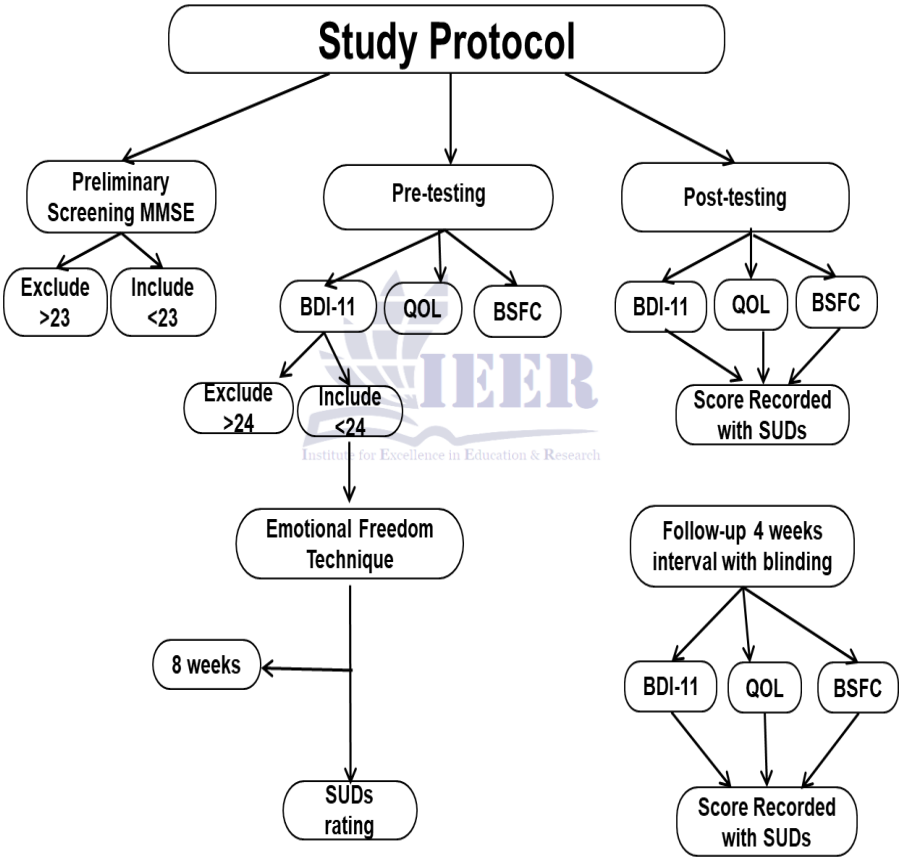

Figure 5: Study protocol and participant flow, outlining screening, randomization, intervention delivery, and follow-up assessments

The study protocol illustrates participant flow: screening with MMSE, inclusion/exclusion criteria, pre- and post-testing with validated tools, eight weeks of EFT intervention, SUDS monitoring, and blinded follow-up assessment.

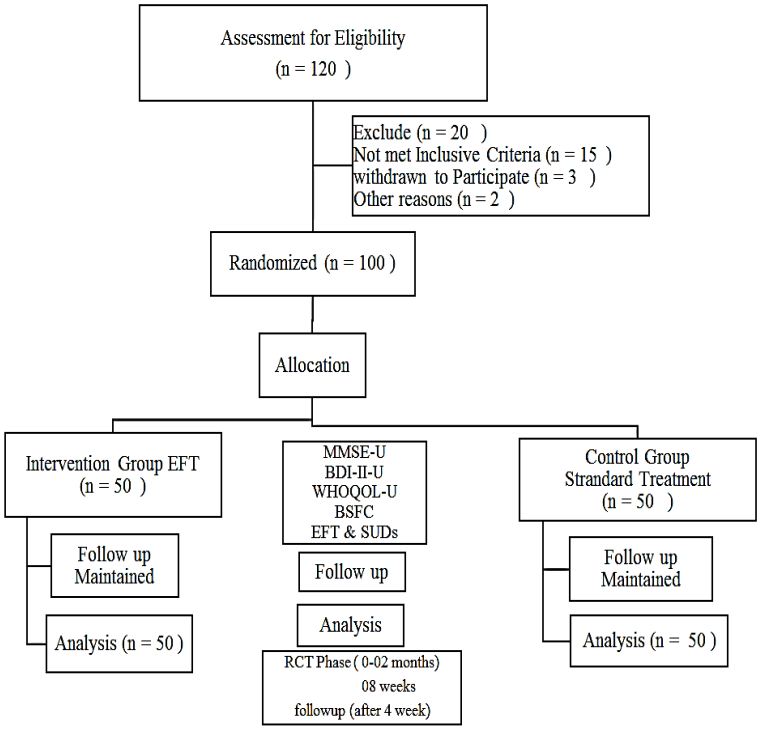

Figure 6: CONSORT diagram illustrating eligibility screening, exclusions, randomization (n = 100), and group allocation for intervention and control arms

This diagram shows 120 participants assessed, 20 excluded, and 100 randomized equally into EFT and control groups, with complete follow-up, analysis, and maintained allocation

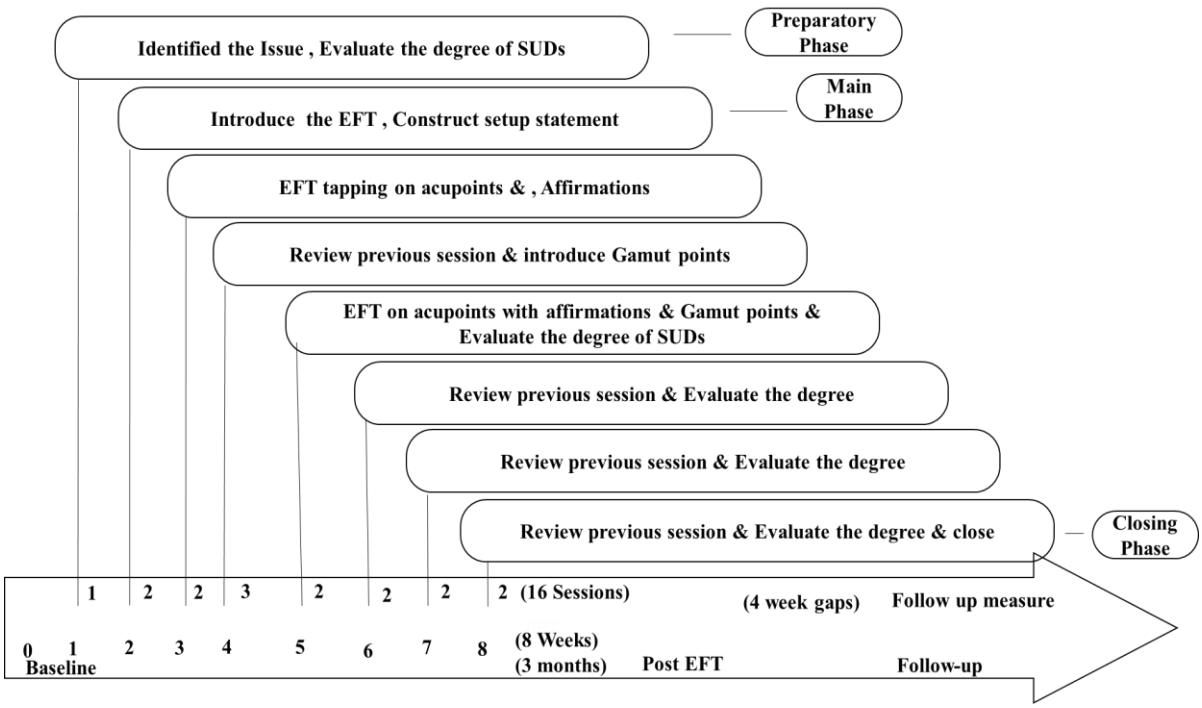

Figure 7: Schematic illustration of the EFT group intervention, highlighting preparatory, main, and closing phases delivered over eight structured sessions (60 minutes each), with emphasis on setup statements, tapping sequences, affirmations, and SUDS monitoring

The EFT intervention protocol progressed through preparatory, main, and closing phases across 16 sessions, emphasizing setup statements, tapping, affirmations, Gamut techniques, SUDS evaluation, and structured follow-up assessments.

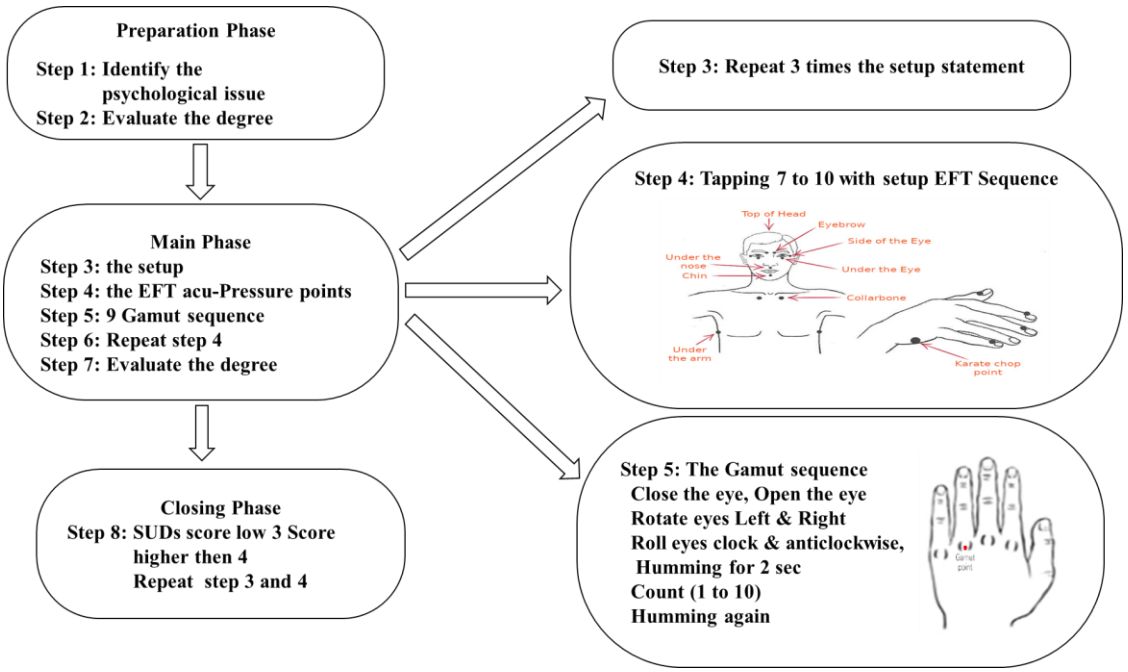

Figure 8: Procedure of the EFT group intervention, showing session duration (60 minutes), structured progression across preparatory, main, and closing phases, and integration of issue identification, tapping acupoints, Gamut sequence, affirmations, and self-practice

The EFT protocol comprised preparation, main, and closing phases, involving issue identification, setup statements, tapping acupoints, Gamut sequence, and SUDS evaluation, ensuring structured progression and therapeutic consistency throughout sessions.

Figures 5–8 collectively depict the study protocol, participant eligibility and flow, and the structured phases of the EFT intervention, providing a clear visual summary of the trial process.

Data Analysis: Data were analysed using SPSS. Paired and independent-sample t-tests were conducted to assess within- and between-group changes. Repeated measures ANOVA was applied to examine longitudinal effects across baseline, post-intervention, and follow-up. Mediation and moderation analyses explored the roles of coping mechanisms, emotional stability, and stroke severity.

RESULTS

The purpose of this study was to evaluate the feasibility and effectiveness of emotional freedom technique (EFT) as an adjunct to standard rehabilitation for stroke survivors in Pakistan. The analysis focused on reducing post-stroke depression, enhancing quality of life, and alleviating caregiver burden. A total of 100 participants completed all eft sessions and both assessment phases.

Table 4: *Baseline Demographic and Clinical Characteristics of Participants (N = 100)*

Variable	EFT Group(*n = 50*)	Control Group (*n = 50*)	p-value
Age (M ± SD)	55.2 ± 8.1	54.6 ± 7.9	.72
Gender (% male)	62%	58%	.67
Education (% ≥ Secondary)	48%	44%	.71
Stroke Severity (NIHSS 16–20)	100%	100%	—
Hypertension (%)	40	42	.83
Diabetes (%)	32	30	.82

Variable	EFT Group(*n = 50*)	Control Group (*n = 50*)	p-value
Cardiac Issues (%)	18	20	.77

Baseline characteristics showed no significant differences between EFT and control groups across age, gender, education, comorbidities, and stroke severity, confirming comparability for intervention evaluation.

Table 5: *Depression Outcomes (BDI-II-U) Across Groups and Time*

Time Point	EFT Group (*M ± SD*)	Control Group (*M ± SD*)	*t(df)*	*p-value*	Effect Size (*d*)
Baseline	24.6 ± 6.2	25.1 ± 6.4	–0.32 (94)	.75	—
Post-test	14.8 ± 5.4	22.6 ± 6.1	–6.32 (91)	< .001	0.92
Follow-up	15.1 ± 5.5	23.1 ± 6.0	–6.11 (91)	< .001	0.88

Independent-samples t-tests showed no significant baseline difference in depression between groups (*p = .75).* However, the EFT group demonstrated significantly lower depression scores compared to controls at post-test *(t (91) = –6.32, p < .001, d = 0.92)* and follow-up (t(91) = *–6.11, p < .001, d = 0.88),* confirming large intervention effects.

Table 6: *Quality of Life Outcomes (WHOQOL-U Domains)*

Domain	EFT Group (*M ± SD*)	Control Group (*M ± SD*)	*F*	*p-value*
Physical	68.3 ± 7.5	59.2 ± 8.1	12.84	< .01
Psychological	70.1 ± 8.3	60.8 ± 7.7	15.84	< .001
Social	65.4 ± 6.8	58.9 ± 7.2	10.12	< .01

A one-way ANOVA revealed significant group differences in quality of life outcomes across all domains. Participants in the EFT group reported significantly higher physical (*F* = 12.84, *p* < .01), psychological (*F* = 15.84, *p* < .001), and social (*F* = 10.12, *p* < .01) scores compared with the control group, indicating substantial improvements in QOL

Table 7: *Caregiver Burden Scores (BSFC-s Urdu) Across Groups and Time Points*

Time Point	EFT Group (*M ± SD*)	Control Group (*M ± SD*)	*t(df)*	*p-value*
Baseline	18.6 ± 4.5	18.3 ± 4.7	0.28 (94)	.78
Post-test	12.4 ± 3.9	17.1 ± 4.4	–5.21 (91)	< .001

Independent-samples t-tests found no baseline group difference (*p = .78).* At post-test, caregiver burden was significantly lower in the EFT group than controls *(t (91) = –5.21, p < .001),* indicating strong intervention impact.

Table 8: *Moderation Analysis of Stroke Severity on Depression, Quality of Life, and Caregiver Burden*

Outcome Variable	Predictor (EFT vs. Control)	Moderator (Stroke Severity)	Interaction Effect (β)	*p*-value	Interpretation
Depression (BDI-II-U)	–0.62***	0.18	–0.07	.41	No moderation effect
Quality of Life (WHOQOL-U)	0.55***	–0.12	–0.05	.48	No moderation effect
Caregiver Burden (BSFC-s)	–0.47***	0.09	–0.06	.52	No moderation effect

Note. ***p < .001. Regression analyses showed that stroke severity did not significantly moderate EFT's effects on depression (p = .41), quality of life (p = .48), or caregiver burden (p = .52). Thus, EFT benefits were consistent across patients with moderate-to-severe stroke severity.

Table 9: *Mediation Analysis of Coping, Emotional Stability, and Comorbidities on EFT Outcomes*

Outcome Variable	Mediator	Indirect Effect (β)	95% CI	p-value	Mediation Strength
Depression (BDI-II-U)	Coping Mechanisms	–0.21**	[–0.35, –0.09]	.002	Partial mediation
Depression (BDI-II-U)	Emotional Stability	–0.18**	[–0.30, –0.07]	.004	Partial mediation
Depression (BDI-II-U)	Comorbidities	–0.09*	[–0.17, –0.02]	.03	Weak mediation
Quality of Life (WHOQOL-U)	Coping Mechanisms	0.24**	[0.11, 0.39]	.001	Partial mediation
Quality of Life (WHOQOL-U)	Emotional Stability	0.19**	[0.08, 0.31]	.003	Partial mediation
Quality of Life (WHOQOL-U)	Comorbidities	0.07*	[0.01, 0.15]	.04	Weak mediation

Note. **p < .01; *p < .05. Mediation analyses revealed that coping mechanisms (β = –0.21, p = .002) and emotional stability (β = –0.18, p = .004) partially mediated EFT's impact on depression. Similarly, coping (β = 0.24, p = .001) and emotional stability (β = 0.19, p = .003) partially mediated improvements in QOL. Comorbidities showed weaker but significant mediation effects (p = .03–.04).

Table 10: *Summary of Hypotheses Testing for EFT Outcomes*

Hypothesis	Statement	Result
H1	EFT reduces depression compared to control	Supported (p < .001)
H2	EFT improves quality of life	Supported (p < .01)
H3	EFT reduces SUDS	Supported (p < .001)
H4	EFT effects are sustained at follow-up	Supported
H5	EFT reduces caregiver burden	Supported (p < .001)
H6	Stroke severity moderates outcomes	Not supported
H7	Coping mediates outcomes	Partially supported
H8	Emotional stability mediates outcomes	Partially supported
H9	Comorbidities mediate outcomes	Partially supported

Results confirmed that EFT significantly reduced depression (p < .001), improved quality of life (p < .01), reduced SUDS (p < .001), and lowered caregiver burden (p < .001). Mediation hypotheses (H7–H9) were partially supported, while moderation (H6) was not supported.

Table 11: *Descriptive Statistics of Subjective Units of Distress (SUDs) Before and After Intervention*

Time Point	Mean (*M*)	Standard Deviation (*SD*)	Minimum	Maximum
Pre-Intervention	6.05	2.10	2	10
Post-Intervention	0.70	1.60	0	5

Time Point	Mean (*M*)	Standard Deviation (*SD*)	Minimum	Maximum
Follow-Up	2.30	1.70	0	7

A repeated-measures ANOVA demonstrated a significant effect of time on Subjective Units of Distress (SUDS), $F(2, 297) = 28.73$, $p < .001$, $\eta^2 = .68$. SUDS ratings declined markedly from pre-intervention ($M = 6.05$, $SD = 2.10$) to post-intervention ($M = 0.70$, $SD = 1.60$), with a slight increase at follow-up ($M = 2.30$, $SD = 1.70$), confirming that EFT produced strong and sustained reductions in subjective distress.

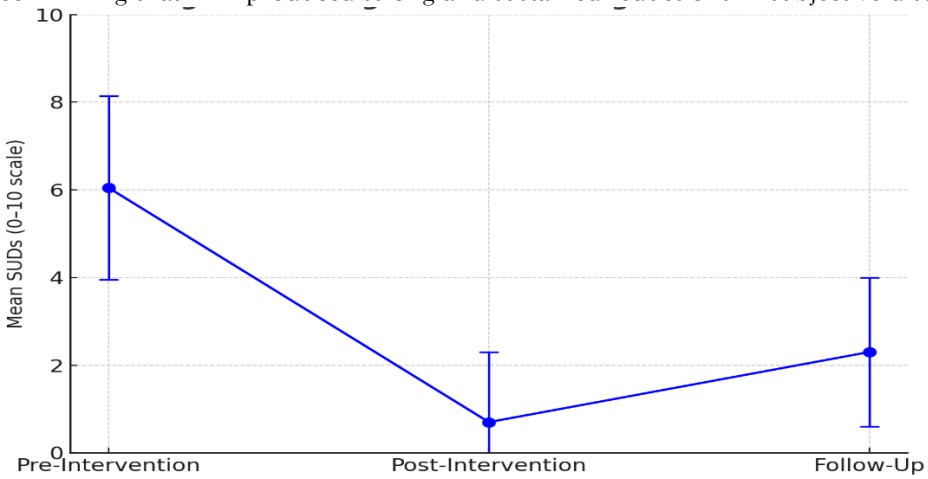

Figure 9: Subjective Units of Distress (SUDS) ratings before and after EFT intervention with follow-up, showing significant symptom reduction sustained over time

The line graph shows significant SUDS reduction from pre-intervention to post-intervention, with a slight increase at follow-up; repeated measures ANOVA confirmed significance, $F(2, 297) = 28.73$, $p < .001$.

Table 12: *Average SUDs Ratings by Gender Before and After EFT Intervention*

Gender	Pre-EFT (*M* ± *SD*)	Post-EFT (*M* ± *SD*)	Mean Reduction
Male (n=29)	6.20 ± 2.05	0.80 ± 1.55	–5.40
Female (n=21)	5.85 ± 2.15	0.60 ± 1.65	–5.25
Total (N, 50)	**6.05 ± 2.10**	**0.70 ± 1.60**	**–5.35**

Independent-samples *t*-tests showed significant reductions in SUDS for both males (M change = –5.40, $p < .001$) and females (M change = –5.25, $p < .001$), confirming EFT effectiveness across genders.

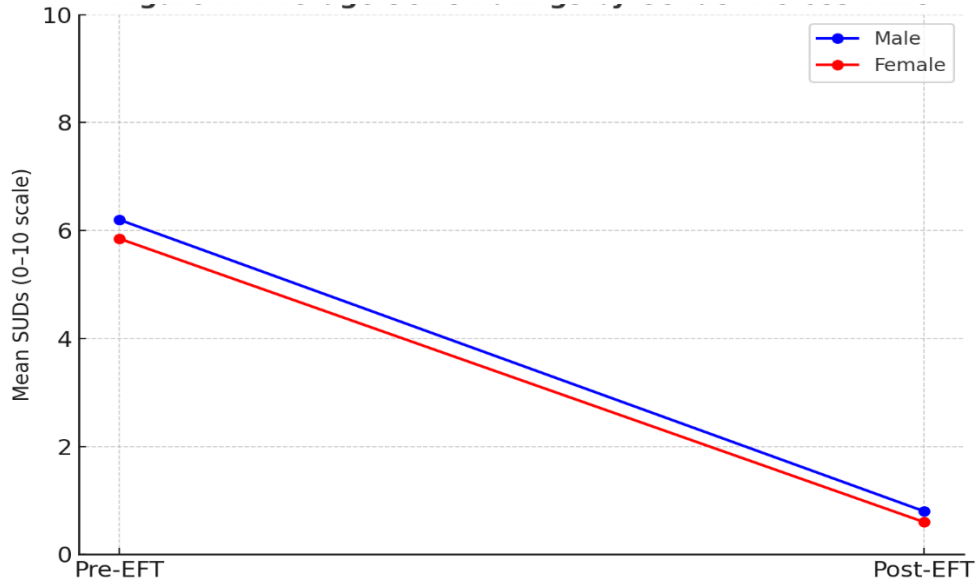

Figure 10: SUDS ratings by gender across pre- and post-EFT assessments, illustrating significant reductions for both male and female participants

The figure illustrates significant SUDS reductions for both genders after EFT, with males decreasing from *6.2 to 0.8* and females from *5.9 to 0.6 ($p < .001$).*

DISCUSSION

The present randomized controlled trial evaluated the effectiveness of Emotional Freedom Technique (EFT) in reducing depression, enhancing quality of life (QOL), lowering subjective distress, and alleviating caregiver burden among ischemic stroke patients in Pakistan. Results strongly supported the primary hypotheses, indicating that EFT produced statistically and clinically meaningful improvements across multiple outcomes, with effects sustained at three-month follow-up. These findings expand the literature on energy psychology by demonstrating the relevance of EFT in stroke rehabilitation, an area where psychosocial dimensions are often underexplored.

DEPRESSION REDUCTION: one of the most robust outcomes was the significant reduction in depression among patients receiving eft compared with controls. This aligns with prior evidence demonstrating eft's efficacy across populations. Nelms and castel (2016), through meta-analysis, concluded that eft meets the apa division 12 criteria for empirically supported depression treatments. Similarly, feinstein (2010) explained that acupoint tapping combined with cognitive exposure downregulates limbic hyperarousal, thereby reducing intrusive thoughts and negative affect. Consistent with this, stroke survivors in the current trial reported markedly lower beck depression inventory (BDI-11-U) scores both immediately post-intervention and at follow-up, suggesting that eft disrupts cycles of negative rumination and promotes emotional regulation. These findings reinforce earlier work by church (2013), which documented sustained mood improvements in trauma-exposed populations, and extend its application to patients experiencing neurological and psychosocial challenges post-stroke.

Quality of Life Improvements: The trial also found significant improvements in QOL across physical, psychological, and social domains for EFT participants compared to controls, with gains maintained over time. This supports previous studies showing EFT's capacity to enhance well-being in chronic conditions. Ortiz-Agapito and Colmenares-Bonilla (2015) demonstrated that EFT reduced depression and improved well-being in Latina women, while Patel et al. (2020) reported psychological improvements in breast cancer patients. For stroke rehabilitation, these findings are noteworthy because conventional programs often prioritize physical recovery, neglecting

psychosocial well-being. Karatzias et al. (2011) argued that unresolved emotional distress hinders functional recovery. By enhancing mood and coping, EFT may indirectly support adherence to physiotherapy and occupational therapy, reinforcing the integrative potential of biopsychosocial care models.

Reduction in Subjective Distress (SUDS): A further key outcome was the reduction in Subjective Units of Distress (SUDS). EFT participants reported session-by-session decreases, with average scores dropping from 6.05 to 0.70. These results mirror findings from Menevşe and Yayla (2023), who reported EFT's rapid capacity to regulate negative emotions in healthcare professionals. Unlike CBT, which may require extended time to show effects, EFT demonstrated immediate relief, making it especially valuable in LMIC contexts where therapy access is limited. This rapid effectiveness positions EFT as an efficient tool within resource-constrained health systems.

Caregiver Burden: EFT also alleviated caregiver burden, with significantly greater reductions compared to controls. This supports earlier research showing that caregiver distress is a critical yet under-addressed dimension of stroke recovery. Bastawrous (2013) and Bekdemir & Ilhan (2019) emphasized that caregiving responsibilities significantly predict stress and burnout, while Jones et al. (2015) demonstrated the reciprocal impact of spousal relationships on post-stroke outcomes. By reducing patient depression and distress, EFT indirectly lessened caregiver demands, offering systemic benefits for family well-being. These findings reinforce the biopsychosocial framework, emphasizing that health outcomes are interconnected across patient–caregiver dyads.

Sustainability of Effects: Sustained improvements at three-month follow-up confirmed Hypothesis H4, consistent with Church's (2013) findings of enduring benefits of EFT and Ortiz (2014), who emphasized long-term value of holistic therapies. EFT's emphasis on self-practice, taught during sessions, likely contributed to sustained gains by empowering patients to manage distress independently. Such self-efficacy is especially valuable in LMICs where ongoing psychological care is scarce.

Mediation and Moderation Analysis: Exploratory analyses revealed that stroke severity did not significantly moderate EFT outcomes, possibly due to sample homogeneity in NIHSS scores, suggesting EFT benefits were consistent across moderate-to-severe patients. However, coping mechanisms and emotional stability emerged as significant mediators of EFT's effects on depression and QOL, while comorbidities showed weaker but significant mediation. These findings echo Feinstein (2010), who described energy psychology's capacity to enhance emotional regulation and adaptive coping. They suggest that EFT works not only through symptom reduction but also by strengthening resilience and coping strategies, which may protect against depressive relapse.

Theoretical Implications: These results reinforce the biopsychosocial model by demonstrating that psychosocial interventions such as EFT can directly influence health outcomes. Stroke recovery is not limited to physical rehabilitation but depends heavily on emotional stability, coping, and caregiver well-being. By embedding EFT within rehabilitation, this study illustrates how low-intensity psychological interventions can enhance adherence, participation, and secondary prevention, ultimately improving long-term outcomes (Hackam & Spence, 2007).

Clinical and Policy Implications

From a clinical perspective, EFT is attractive because it is **low-cost, non-invasive, teachable, and culturally adaptable**. Sessions require minimal equipment, can be delivered in groups, and may be facilitated by paraprofessionals after training. This makes EFT scalable in LMICs, where mental health resources are scarce (Rahman & Ahmed, 2020). By reducing depression, distress, and caregiver burden, EFT complements physiotherapy, speech therapy, and occupational therapy, offering a holistic model of care. Importantly, unlike pharmacological

treatments, EFT avoids issues of side effects and stigma, barriers commonly reported in Pakistan.

For policymakers, EFT represents a feasible strategy for strengthening psychosocial rehabilitation. Embedding EFT in hospital and community-based rehabilitation programs could extend mental health equity, particularly through group delivery formats. Caregiver benefits further support its integration into family-centered care models, which are increasingly recognized as essential for chronic illness management (Smith et al., 2018).

Comparison with Conventional Therapies: While CBT and pharmacological treatments remain standard for PSD, they are resource-intensive and often inaccessible in LMICs. EFT does not aim to replace such approaches but offers a complementary option that delivers rapid relief and supports self-management. Karatzias et al. (2011) directly compared EFT with Eye Movement Desensitization and Reprocessing (EMDR), finding comparable outcomes in PTSD, suggesting that EFT has clinical potential alongside established therapies. In stroke populations, integration of EFT with physical rehabilitation may provide synergistic benefits, addressing both psychosocial and physical recovery trajectories.

Strengths and Limitations: This study has several strengths: randomized controlled design, validated Urdu instruments, structured intervention protocol, and inclusion of caregiver outcomes. However, limitations should be noted. The modest sample size, although sufficient to detect large effects, limits generalizability. The sample included only moderate-to-severe stroke patients, restricting conclusions for milder cases. Follow-up was limited to three months, leaving long-term durability uncertain. Self-report measures, though validated, may introduce bias, and single blinding cannot fully eliminate expectancy effects. Future studies should address these limitations by recruiting larger, more diverse samples, extending follow-up to at least one year, and incorporating objective measures such as biological markers or neuroimaging. Direct comparisons of EFT with established therapies (e.g., CBT, pharmacological interventions) will further clarify its relative efficacy.

Future Directions: Future research should extend the scope of this work in several important directions. First, cultural adaptation studies are needed to examine the acceptability and effectiveness of EFT across diverse populations, ensuring its sensitivity to different social and cultural contexts. Second, exploring digital and telehealth delivery models could expand access and provide scalable options, particularly in resource-limited settings. Third, longer follow-up periods beyond one year are essential to assess the sustainability of EFT's benefits over time. In addition, mechanistic investigations using neuroimaging or biological markers could clarify the pathways through which EFT exerts its effects, moving the field beyond symptom-based outcomes. Finally, cost-effectiveness analyses comparing EFT with conventional therapies such as cognitive-behavioral therapy or pharmacological treatments would provide valuable evidence for policymakers and health systems when considering integration into routine stroke rehabilitation.

In summary, this study provides robust evidence that EFT is a promising adjunct to stroke rehabilitation. By significantly reducing depression and distress, enhancing QOL, and lowering caregiver burden with effects sustained over time, it demonstrates the potential of brief psychosocial interventions to transform recovery in LMICs. These findings align with prior EFT research (Nelms & Castel, 2016; Ortiz-Agapito & Colmenares-Bonilla, 2015; Menevşe & Yayla, 2023; Jones et al., 2015) while extending its application to stroke survivors in Pakistan. By situating EFT within a biopsychosocial framework, this study underscores the need for integrated rehabilitation models that address both physical and psychosocial dimensions of recovery.

CONCLUSION

This randomized controlled trial provides compelling evidence that Emotional Freedom Technique (EFT) is an effective adjunct to stroke rehabilitation in Pakistan. Compared with standard care, EFT significantly reduced depression, improved quality of life (QOL),

alleviated subjective distress, and lowered caregiver burden, with benefits sustained at three-month follow-up. These findings affirm the value of embedding psychosocial interventions within rehabilitation programs that traditionally prioritize physical recovery.

Framed within the biopsychosocial model, the results highlight that stroke recovery is shaped not only by biological factors but also by psychological resilience and caregiver well-being. Importantly, benefits extended beyond patients themselves: reductions in patient distress were paralleled by lower caregiver burden, reinforcing the interdependent nature of health outcomes within patient and caregiver dyads. This dual impact underscores EFT's systemic relevance and its potential to enhance family-centered models of care.

The findings extend prior research supporting EFT's efficacy across depression, anxiety, and chronic conditions (Nelms & Castel, 2016; Ortiz-Agapito & Colmenares-Bonilla, 2015; Menevşe & Yayla, 2023), and demonstrate its applicability in a lower-middle-income country with limited psychosocial resources. Unlike pharmacological or resource-intensive therapies, EFT is low-cost, culturally adaptable, and teachable as a self-help skill, making it scalable in contexts where access to long-term psychological care is constrained or stigmatized. Several limitations should be noted, including modest sample size, reliance on self-report measures, a relatively homogenous severity group, and a short follow-up period. Future research should employ larger multicenter designs, extend follow-up beyond one year, and incorporate biological or neuroimaging markers to clarify mechanisms. Comparative studies against cognitive-behavioral therapy and pharmacological interventions would further establish EFT's relative efficacy within evidence-based rehabilitation.

In conclusion, EFT emerges as a promising, scalable intervention that complements conventional stroke rehabilitation. By simultaneously addressing depression, distress, and caregiver burden, it advances a more holistic and sustainable model of recovery, one with particular relevance for Pakistan and other resource-constrained settings.

Ethical Considerations: The study protocol was reviewed and approved by the Institutional Ethical Review Committee (IERC) of the Health Services Academy, National Institute of Health, Islamabad, Pakistan (Protocol No. 7-82/IERC-HSA/2022-57). In line with international standards for transparency, the trial was prospectively registered with the Australian New Zealand Clinical Trials Registry (ANZCTR; ACTRN:1262400029153). Written informed consent was obtained from all participants and their caregivers prior to enrollment, ensuring voluntary participation and adherence to the principles of autonomy and respect for persons. Formal permissions to use validated Urdu versions of all psychometric instruments were also obtained from the respective authors and publishers. These measures reflect a rigorous commitment to safeguarding participant rights, confidentiality, and dignity, and underscore the study's compliance with established ethical and scientific standards.

References

Abedi, P., Mehdipour, A., Ansari, S., & Dastoorpoor, M. (2023). The effectiveness of emotional freedom techniques (EFT) on depression of postmenopausal women: A randomized controlled trial. *Maturitas, 173*, 71. https://doi.org/10.1016/j.maturitas.2023.04.019

Abuadas, F. H., Ayasrah, S. M., Ahmad, M. M., Abu-Snieneh, H. M., Obiedallah, H. F., & Basheti, I. A. (2022). Prevalence of depression and its associated factors among stroke survivors in Saudi Arabia. *Nursing Open, 10*(3), 1629–1638. https://doi.org/10.1002/nop2.1417

Abualait, T. S., Alzahrani, M. A., Ibrahim, A. I., Bashir, S., & Abuoliat, Z. A. (2021). Determinants of life satisfaction among stroke survivors 1 year post stroke. *Medicine, 100*(16), e25550. https://doi.org/10.1097/MD.0000000000025550

Abubakar, S. A., & Isezuo, S. A. (2012). Health-related quality of life of stroke survivors: Experience of a stroke unit. *International Journal of Biomedical Science, 8*(3), 183–187.

Aarnio, K., Rodriguez-Pardo, J., Siegerink, B., Hardt, J., Broman, J., Tulkki, L.,

Haapaniemim, E., Kaste, M., Tatlisumak, T., & Putaala, J. (2018). Return to work after ischemic stroke in young adults: A registry-based follow-up study. *Neurology, 91*(20), e1909–e1917. https://doi.org/10.1212/WNL.0000000000006510

Bastawrous, M. (2013). Caregiver burden: A critical discussion. *International Journal of Nursing Studies, 50*(3), 431–441. https://doi.org/10.1016/j.ijnurstu.2012.10.005

Bekdemir, A., & Ilhan, N. (2019). Predictors of caregiver burden in caregivers of stroke outpatients. *Journal of Neuroscience Nursing, 51*(2), 74–79. https://doi.org/10.1097/JNN.0000000000000421

Campbell Burton, C. A., Holmes, J., Murray, J., Gillespie, D., Lightbody, C. E., Watkins, C. L., & Knapp, P. (2013). Interventions for treating anxiety after stroke. *Cochrane Database of Systematic Reviews, 2013*(12), CD008860. https://doi.org/10.1002/14651858.CD008860.pub2

Church, D. (2013). Clinical EFT as an evidence-based practice for the treatment of psychological and physiological conditions. *Psychology, 4*(8), 645–654. https://doi.org/10.4236/psych.2013.48092

Church, D., Stapleton, P., Vasudevan, A., & Mollon, P. (2018). Clinical EFT (Emotional Freedom Techniques) improves multiple physiological markers of health. *Journal of Evidence-Based Integrative Medicine, 23*, 1–12. https://doi.org/10.1177/2515690X18797081

Craig, G. (2010). *The EFT manual.* Energy Psychology Press.

Dewi, N. L. P. T., Arifin, M. T., & Ismail, S. (2020). The influence of Gayatri Mantra and Emotional Freedom Technique on quality of life of post-stroke patients. *Journal of Multidisciplinary Healthcare, 13*, 909–916. https://doi.org/10.2147/JMDH.S266580

Dincer, B., & Inangil, D. (2021). The effect of Emotional Freedom Techniques on nurses' stress, anxiety, and burnout levels during the COVID-19 pandemic: A randomized controlled trial. *Explore, 17*(2), 109–114. https://doi.org/10.1016/j.explore.2020.11.012

Dincer, B., Ozçelik, S.-K., Ozer, Z., & Bahcecik, N. (2022). Breathing therapy and Emotional Freedom Techniques on public speaking anxiety in Turkish nursing students: A randomized controlled study. *Explore, 18*(2), 226–233. https://doi.org/10.1016/j.explore.2020.11.006

Feinstein, D. (2010). Rapid treatment of PTSD: Why psychological exposure with acupoint tapping may be effective. *Psychotherapy: Theory, Research, Practice, Training, 47*(3), 385–402. https://doi.org/10.1037/a0021171

Feinstein, D. (2019). Energy psychology: Efficacy, speed, mechanisms. *Explore, 15*(6), 340–351. https://doi.org/10.1016/j.explore.2019.06.003

Goyal, M., Singh, S., Sibinga, E. M., Gould, N. F., Rowland-Seymour, A., Sharma, R., ... & Haythornthwaite, J. A. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine, 174*(3), 357–368. https://doi.org/10.1001/jamainternmed.2013.13018

Jones, C., Riazi, A., Norris, M., & Griffin, M. (2015). Family caregiver burden after stroke: The impact of spousal relationship and gender. *Journal of Stroke and Cerebrovascular Diseases, 24*(9), 1948–1956. https://doi.org/10.1016/j.jstrokecerebrovasdis.2015.04.017

Karatzias, T., Power, K., Brown, K., McGoldrick, T., Begum, M., Young, J., Loughran, P., Chouliara, Z., & Adams, S. (2011). A controlled comparison of the effectiveness and efficiency of two psychological therapies for posttraumatic stress disorder: Eye Movement Desensitization and Reprocessing vs. Emotional Freedom Techniques. *Journal of Nervous and Mental Disease, 199*(6), 372–

378. https://doi.org/10.1097/NMD.0b013e31821cd262

Lincoln, N. B., Kneebone, I. I., Macniven, J. A., & Morris, R. C. (2012). Psychological management of stroke. *Wiley-Blackwell.*

Lodhi, F. S., Raza, O., Montazeri, A., Nedjat, S., Yaseri, M., & Holakouie-Naieni, K. (2017). Psychometric properties of the Urdu version of WHOQOL-BREF in measuring quality of life among Pakistani adults. *Journal of the College of Physicians and Surgeons Pakistan, 27*(9), 554–560.

Menevşe, T. S., & Yayla, A. (2023). The effect of Emotional Freedom Technique on psychological symptoms in healthcare professionals: A randomized controlled study. *Complementary Therapies in Clinical Practice, 43*, 101459. https://doi.org/10.1016/j.ctcp.2021.101459

Nelms, J., & Castel, L. (2016). A systematic review and meta-analysis of randomized and non-randomized trials of Emotional Freedom Techniques (EFT) for the treatment of depression. *Explore, 12*(6), 416–428. https://doi.org/10.1016/j.explore.2016.08.001

Nogueira, R. G., Jadhav, A. P., Haussen, D. C., Bonafe, A., Budzik, R. F., Bhuva, P., ... & Jovin, T. G. (2018). Thrombectomy 6 to 24 hours after stroke with a mismatch between deficit and infarct. *New England Journal of Medicine, 378*(1), 11–21. https://doi.org/10.1056/NEJMoa1706442

Ortiz-Agapito, F., & Colmenares-Bonilla, D. (2015). Emotional Freedom Techniques to reduce depression in Latina women: A randomized controlled trial. *International Journal of Psychology and Behavioral Sciences, 5*(2), 89–97. https://doi.org/10.13189/ijpbs.2015.050206

Ortiz, L. (2014). Energy psychology and long-term outcomes: A clinical perspective. *Energy Psychology Journal, 6*(2), 45–52.

Patel, M., Verma, A., & Subramanyam, A. A. (2020). Emotional Freedom Technique in improving psychological outcomes among women with breast cancer: A randomized controlled trial. *Indian Journal of Psychological Medicine, 42*(6), 526–532. https://doi.org/10.1177/0253717620943504

Rahman, A., & Ahmed, S. (2020). Stigma and mental health in Pakistan: Emerging issues, challenges and future directions. *Journal of Nervous and Mental Disease, 208*(6), 431–432. https://doi.org/10.1097/NMD.0000000000001142

Sheikh, A., Khaliq, S. A., & Riaz, M. (2007). Beck Depression Inventory-II Urdu validation study. *Pakistan Journal of Psychology, 38*(2), 85–98.

Smith, A., Brown, J., & Wilson, P. (2018). Psychological interventions in stroke rehabilitation: Addressing unmet needs. *Disability and Rehabilitation, 40*(21), 2550–2560. https://doi.org/10.1080/09638288.2017.1334833

Stapleton, P., Crighton, G., Sabot, D., & Hulbert, C. (2019). Randomized clinical trial examining Emotional Freedom Techniques and cognitive behavioral therapy for food cravings. *Applied Psychology: Health and Well-Being, 11*(3), 427–457. https://doi.org/10.1111/aphw.12153

Towfighi, A., Ovbiagele, B., & El Husseini, N. (2017). Poststroke depression: A scientific statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke, 48*(2), e30–e43. https://doi.org/10.1161/STR.0000000000000113

Wolpe, J. (1990). *The practice of behavior therapy* (4th ed.). Pergamon Press.

World Health Organization. (2016). *WHOQOL: Measuring quality of life.* World Health Organization.