

MIGRATION-INDUCED STRESS, REMITTANCE RECEIPT, AND SUBJECTIVE WELL-BEING AMONG MIGRANT-SENDING FAMILIES: A PSYCHOMETRIC INVESTIGATION USING STRUCTURAL EQUATION MODELLING IN A PAKISTANI CONTEXT

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ABSTRACT

Labour remittances are a key component of remittances and Pakistan is one of the top seven countries for labour remittances, with 832,339 registered labour emigrants in 2022 and remittance receipts of USD 31.3 billion in fiscal year (FY) 2021-2022. To date, however, no psychometrically sound studies have tried to model the effects of migration-induced stress, remittance receipt, and subjective well-being (SWB) for Pakistani migrant-sending families at this scale, using structural equation modelling (SEM). This study fulfils this gap in literature by using a cross sectional quantitative design with $N = 420$, in the districts of Punjab and Khyber Pakhtunkhwa that are facing high emigration rates among the left behind households. Grounded in Lazarus and Folkman's (1984) Transactional Stress and Coping Model, Diener's (1984) Tripartite SWB Model, and the Remittance-Optimism Hypothesis (Ivlevs et al., 2019), the study deploys a two-phase SEM strategy: Phase 1 establishes measurement model validity through confirmatory factor analysis (CFA) with multi-group invariance testing across gender and province; Phase 2 tests the structural model with remittance amount and regularity as observed moderator variables. Ecological validity and district level migration exposure controls are set using secondary data from the BEOE outflow statistics (2019-2022) and SBP remittance flow data. Results indicate that migration induced stress has a significant direct negative effect on SWB ($\beta = -0.43$, $p < .001$) and a significant indirect positive effect on SWB through the receipt of remittances ($\beta = 0.27$, $p < .01$), thus confirming the partial mediation model. The relationship between stress and SWB is significantly moderated by remittance regularity (interaction $\beta = 0.19$, $p < .05$). The CFA result indicated that the three factors of the measurement model (migration stress, remittance adequacy, SWB) was confirmed with acceptable fit ($CFI = .94$, $RMSEA = .058$, $SRMR = .062$). There is multi-group invariance for gender and province. The study offers a psychometric instrument battery for cross-cultural research on migration mental health in Islamic South Asian contexts, which is culturally valid, and provides policy recommendations for support programmes for left-behind households.

KEYWORDS: migration-induced stress, remittance receipt, subjective well-being, structural equation modelling, confirmatory factor analysis, left-behind households, Pakistan, BEOE, family separation, psychometric validation.

1. INTRODUCTION

Pakistan is a Top labour Exporter Country. According to Gallup Pakistan, 14,114,918 Pakistanis registered for work overseas from 1971 till January 2025. BEOE posted 832,339 outflows in 2022 and remittances of USD 31.3 billion in fiscal year 2021-2022, which accounted for about 8.9 percent of GDP. Through systematic BEOE occupational disaggregation, Ashraf (2022a) demonstrated that the bulk of these outflows are male, low-to-semi skilled migrants heading to the Gulf Cooperation Council (GCC) countries, leaving their wives, children and dependent parents in the country to suffer from continued physical separation. Following this, Ashraf (2022b) added that a second, less apparent group of Pakistani professionals – doctors, engineers, nurses and IT specialists – uses employer-sponsored visa channels without going through BEOE registration at all, thus the extent of family separation resulting from Pakistani labour emigration is significantly higher than official statistics indicate. Ashraf (2022c) added the gender dimension in that female migrants make up less than one percent of total BEOE-registered outflows, and those who migrate towards the UK are concentrated in healthcare jobs, while those who migrate to the Gulf are concentrated in domestic service jobs; in both cases, left-behind households headed by women face the dual burden of maintaining household economies and of having to negotiate social norms that limit their independent decision-making authority.

The structural conditions that bring about the psychological consequences studied in this research are established by these migration patterns, in terms of volume, composition, gender structure, and geography of destination. Millions of Pakistani households receive remittance from abroad but at the same time their spouse, parent or child is missing for a prolonged period of time. It is not a question of the economic advantage of remittances and the psychological disadvantage of separation, it is two at the same time, two for the same households, as a part of the same migration decision. However, they have been mostly studied separately in the literature. Remittances studies are conducted on expenditure patterns, consumption and macroeconomic multipliers. The issues of decision making authority, child education and role of women in decision making are the areas of focus in the study of left behind households. Neither strand systematically models the psychological dimension, that is, the simultaneous presence of migration-induced stress nor remittance mediated well-being in the same household at the same time.

Among the left-behind Pakistani households, Ashraf (2025) offered the first validated measurement model of dual negative and positive mental health outcomes (family-separation distress and relief associated with the migration) and provided empirical support to a two-factor confirmatory factor analytic model of these outcomes. The present study builds on Ashraf (2025)'s measurement study to test the causal pathways linking migration-induced stress, remittance receipt, and subjective well-being and to analyze the moderating effect of the nature and size of remittances. This extension is required because this knowledge of the two factors being psychometrically distinct is alone not sufficient to explain how they causally relate or when such relationship is strengthened or weakened.

This paper has four contributions to make. First, it fills the gap identified by Ashraf (2025) between measurement validity and understanding of the structure of the migration stress, remittance, subjective well-being pathway in a Pakistani context. Second, it assesses remittance regularity and remittance amount as moderators, which are more nuanced than the binary "receives remittances, does not receive remittances" included in most of the studies available. Third, it tests the measurement model for invariance across gender and province, determining if the psychological constructs operate the same way across the two major demographic divisions of Pakistan's migration system. Fourth, it employs secondary BEOE and SBP data to create district level migration exposure controls to enhance the ecological validity of the psychological results.

1.1. Research Questions

This study addresses four research questions.

1. Does migration-induced stress have a significant negative direct effect on subjective well-being among left-behind household members in high-emigration districts of Pakistan?
2. Does remittance receipt mediate the relationship between migration-induced stress and subjective well-being, such that migration produces both a negative direct effect on well-being through stress and a positive indirect effect through the financial relief of remittances?
3. Do remittance amount and regularity moderate the strength of the stress–well-being relationship, such that higher and more regular remittances buffer the negative well-being impact of migration-induced stress?
4. Does the three-factor measurement model of migration stress, remittance adequacy, and subjective well-being demonstrate measurement invariance across gender and province, confirming that the psychological constructs function equivalently across Pakistan's major demographic divisions?

2. LITERATURE REVIEW

2.1. Migration, Family Separation, and Psychological Stress

The psychological impact of family separation by labour migration is well documented in the international literature. Through a systematic review of 31 studies from Asian and African countries, Siriwardhana and Stewart (2013) identified higher levels of depression, anxiety and feelings of loneliness in left-behind spouses and children of migrants, and that these psychological effects were higher for women than men. Hu (2012) carried out a study on left-behind wives in rural China and found that 47.2% of the respondents had high levels of depressive symptoms, while 28.4% of the non-separated women had high levels of depressive symptoms. Vanore, Mazzucato and Siegel (2015) investigated the effects on depression risk in the context of migration separation in the case of Moldova, and they concluded that the risk of depression was significantly heightened by a migration separation, with the length of the separation and the uncertainty of the migrant's wellbeing being the strongest predictors.

Abbasi and Irfan (2019) studied the socioeconomic consequences of international migration on the left-behind families and found that remittances enhance the material wellbeing of the family but are no substitute to the male breadwinner's role in the family decision-making process and results in long term social tensions. In the case of left-behind women in rural Punjab, Ahmed (2020) found that a paradox of financial gain and social deprivation arises in the form of remittances for women, which are seen as enhancing their consumption, but at the same time, they are missing out on social support and joint decision-making within intact households. In Gujrat district, one of the highest emigrating districts of Pakistan, Iqbal, Iqbal and Mozmi (2014) found that while financial gain was seen as a benefit among left-behind families, there was also considerable social pressure on left-behind families not to move beyond their own gender, and therefore women's mobility was not increased.

This study was carried out by Ashraf (2022a) who revealed that Pakistan's major emigration profile is male, low-to-semi-skilled and towards the Gulf countries with 96 percent of emigrants heading to the GCC countries and 53.7 percent of them being unskilled or semi-skilled. This profile includes mostly wives and children of manual workers in the transport, construction and service industries in the gulf, typically employed for prolonged durations, who lack communication with their families, and are liable to deportation. The psychological nature of separation from a manual worker in the Gulf is likely distinct from that of a worker in the UK's NHS, but rarely have these differences been distinguished in the literature. The invisible corridor of non-BEOE migration has been identified by Ashraf (2022b) who highlighted that merely less than 0.5 per cent of registered emigrants in USA and UK produce 24-31 per cent of Pakistan's total remittance inflows. Since these professionals are left-behind by their spouses, their material situation and their psychological situation may differ from those of families with a male Gulf worker, and both are lumped together in most of the available studies.

The most relevant recent evidence was offered by Ashraf (2025). He validated a measurement model of dual mental health outcomes among left-behind Pakistani households by conducting CFA, which indicated that family-separation distress and remittance-associated psychological relief are psychometrically different constructs that exist in the same households. His research validated the notion that migration creates a combination of negative and positive psychosocial outcomes at the same time and that this cannot be captured in a single well-being instrument. In the present study, Ashraf's (2025) validated measurement model is used as the psychometric structure and the causal pathways are extended and tested as a full structural model.

2.2. Remittances and Subjective Well-Being

Remittances and subjective welfare do not necessarily go hand in hand. The following three hypotheses have been suggested in the literature. The Remittance-Optimism Hypothesis (Ivlevs, Nikolova, & Graham, 2019) suggests that the well-being effects of remittances are immediate and occur both via the direct channel of additional income and consumption and via the indirect channel of the remittance's effect on the remitter's self-assessment. According to this hypothesis, there should be a positive link between remittance receipt and SWB. The Relative Deprivation Hypothesis (Knight, Song & Gunatilaka, 2009) suggests that remittances have a negative impact on the well-being of receiving communities as it raises relative deprivation among non-receiving communities, through increased social comparisons. This is the idea of the Absence Cost Hypothesis (Antman, 2012) that remittances serve economic functions when someone is physically absent, but do not have an impact on emotional well-being or may even have a negative impact, while at the same time they may be positively associated with material well-being.

The evidence for developing countries that has come to light does support both of the first two hypotheses, and also parts of the third, depending on the context and the measure. A positive relationship between remittance receipt and well-being has been documented in Eastern Europe and Central Asia (ECA) by Nikolova and Graham (2015). Ivlevs et al. (2019) discovered that remittances have a short-term negative effect on life satisfaction, but their impact is lessened as the duration of separation increases. In the context of Pakistan, Nadir et al., (2025) confirmed that remittances provide a short-term boost to economic growth, whereas Altaf (2016) indicated that remittances can have a positive relationship with increased emigration over the long run, implying a demonstration effect rather than a retention or satisfaction effect. The Remittance-Optimism, Relative Deprivation, and Absence Cost hypotheses have not been tested together in a single study in a Pakistani household sample using a psychometrically validated SWB scale.

2.3. Subjective Well-Being: Theory and Measurement

The subjective well-being (SWB) is a multidimensional concept consisting of three components: Positive affect (positive emotions experienced frequently); Negative affect (negative emotions experienced infrequently); and Life satisfaction (cognitive evaluation of life in general). The most widely accepted model in SWB research is the three-part model developed by Diener (1984) that has been tested in various cultural settings. The Satisfaction with Life Scale (SWLS) was developed by Diener et al. (1985) and has good psychometric properties that are supported by cross-cultural research. The Positive and Negative Affect Schedule (PANAS) was created by Watson, Clark and Tellegen (1988) for affective components. These instruments have been utilized together in more than 4,000 published studies in more than 50 countries.

The cross-cultural reliability of SWB measures in Islamic South Asian contexts, however, has been doubted. While SWLS scores are linked to positive feelings, Joshanloo (2013) demonstrated that fear of happiness (FOH) – the worry that positive emotions lead to negative outcomes – is more often noted in Muslim majority societies than in Western societies, and can independently reduce SWLS scores regardless of overall levels of well-being. Komaraju and Cokley (2008) demonstrated that there are various SWB response patterns associated with collectivist cultural frameworks and individualist cultural frameworks. Bashir et al. (2017) used SWB measures with samples from Pakistan, where they found acceptable validity for the measures, but indicated that the family centered items performed better than the individual centered items. In the present study, the SWB battery has been adapted for the context of migration in Pakistan and items have been added related to family and the validated SWLS items have been used as per Ashraf's (2025) approach.

2.4. Structural Equation Modelling in Migration Mental Health Research

Structural equation modelling (SEM) is an appropriate method for simultaneously estimating multiple regression equations, and latent variable measurement models, especially for the study of complex mediation and moderation relationships, such as those that have been hypothesized in the present study. Byrne (2016) showed that SEM's ability to account for measurement error makes it superior to path analysis with observed variables for constructs like stress and well-being that cannot be measured without error. Kline (2016) suggested the methodological standard for the application of SEM in psychological studies: he advised using multiple indices for the assessment of model fit (e.g., CFI, RMSEA, and SRMR), and multi-group invariance testing when comparing models across demographic groups. In the field of migration mental health, SEM has been applied by Siriwardhana et al. (2015) to explore how the pathway from forced migration exposure leads to the development of post-traumatic stress and resilience among internal migrants in Sri Lanka. Lau and Takeuchi (2001) conducted SEM tests to examine pathways from immigration stress to depression among Asian American samples. To the best of our knowledge, this is the first study that models the pathway of migration stress – remittance – SWB using SEM in a sample of Pakistani households. Ashraf (2025) laid the foundation for the measurement, and this study builds the model on that foundation.

2.5. Research Gaps

This study is justified by four research gaps. The first is that there is no validated psychometric battery for the study of mental health and migration in Pakistani contexts. Ashraf (2025) filled this gap for the dual mental health outcome measurement model. The aim of the present study is to fill this missing link between the two sets of outcomes, namely the complementarity of the validated structural model linking them to their antecedents. The second point of interest is the simultaneous testing of remittance mediation and moderation. To date, most research has examined remittances as a mediator, a moderator, or neither. The question of mediation concerns the relationship between economic benefits of migration and well-being: Do they flow through remittances? The question of moderation is whether the frequency and intensity of remittances can lessen the negative effects of separation stress on well-being. The two questions have policy implications and are both theoretically important.

Multi-group invariance testing of the third gap across gender and province. Migration experience is quite different for women in KPK, where migration culture is well ingrained and women's mobility is heavily restricted (Ashraf, 2022c), and for women in Punjab, where migration culture is also strong but social restrictions are not as great. It remains an empirical question whether these psychological constructs, namely migration stress, remittance adequacy and SWB, have the same meaning across these groups. The fourth gap is the use of secondary data from BEOE or SBP to set up migration exposure controls at the district level. Ashraf (2022a) revealed that specifically, high-emigration districts of Punjab makes 50-55 per cent of registered emigrants and high-emigration districts of KPK makes 27-30 per cent of registered emigrants of Pakistan. There is a risk of confounding stress effects with exposure effects if psychological studies of households are conducted at the household level, instead of taking into account this difference in migration exposures on the district level.

3. THEORETICAL FRAMEWORK AND HYPOTHESES

3.1. Transactional Stress and Coping Model

The main theoretical framework used in this study is that of Lazarus and Folkman (1984), Transactional Stress and Coping (TSC) Model. The TSC model suggests that the stress reaction is triggered not by the event itself but by how the event is perceived and evaluated by the individual as demanding or threatening to his or her coping resources. Migration-induced family separation is assessed as stressful if left-behind household member feels that the responsibilities of household management outweigh their social, emotional and financial support. Remittances change this evaluation: if remittances are sufficient and consistent, they bolster the perception of financial coping resources, which lessen the evaluation of the migration situation as a strain on resources, which lessens stress, which improves SWB.

In the context of migration in Pakistan, the TSC model suggests that: migration-induced stress has a direct negative impact on the SWB (H1); receipt of remittances lowers the level of migration-induced stress, which in turn increases the availability of coping resources (H2); and this has an indirect, positive effect on SWB mediated through the reduction in migration-induced stress (H3). Based on this, the model also predicts that the regularity of remittances will moderate the stress–SWB relationship by smoothing the fluctuations in coping resources across time (H4).

3.2. Diener's Tripartite SWB Model

According to the tripartite model of SWB by Diener (1984), there are three separable elements: life satisfaction (LS), positive affect (PA), and negative affect (NA). The TSC model predicts differential effects on these three elements in the context of migration. Migration-induced stress is likely to boost NA and reduce LS, while PA is likely to be reduced because of a loss of social support and positive life events during migration. The additional income received via remittance should increase LS via the consumption and security effects of remittance receipt, while decreasing NA via the reduction in financial anxiety. The impact of remittance on PA depends on the emotional benefits of

knowing that the migrant is safe and providing financially outweigh the emotional costs of being separated from him/her.

3.3. Remittance-Optimism Hypothesis

Ivlevs et al. (2019) suggest that remittances have a positive impact on well-being in two ways: the “income effect”, which involves the material improvement in living standards of the recipient, and the “signalling effect”, which represents the signal that the migrant has received that he or she is alive, working in the laboratory country, and dedicated to the family. The context of migration in Pakistan is particularly important in this regard, as it offers no solid information regarding migrants' welfare: First, migration system is unable to provide information to manual workers in the Gulf Countries and second, irregular migrants lack a formal documentation. In this context, remittance is not just remittance money, but a message of safety and continued commitment that diminishes uncertainty anxiety and contributes to a migrant's emotional well-being.

3.4 Hypotheses

Six hypotheses follow from the theoretical framework.

H1: Migration-induced stress has a significant negative direct effect on subjective well-being among left-behind household members.

H2: Remittance receipt has a significant negative effect on migration-induced stress, mediated by improved financial coping resource availability.

H3: Remittance receipt has a significant positive indirect effect on subjective well-being through reduced migration-induced stress (mediation).

H4: Remittance regularity significantly moderates the stress–subjective well-being relationship, with higher regularity strengthening the buffering effect of remittances on stress.

H5: The three-factor measurement model of migration stress, remittance adequacy, and subjective well-being demonstrates configural, metric, and scalar invariance across gender groups.

H6: The three-factor measurement model demonstrates configural, metric, and scalar invariance across provincial groups (Punjab vs. KPK).

4. METHODOLOGY

4.1. Research Design

The type of research used in this study is a cross-sectional quantitative research with a two-phase SEM approach. The validity of the measurement model is first established in Phase 1 by conducting confirmatory factor analysis (CFA) and testing for multi-group invariance. In step 2, the structural model with the mediation and moderation paths is tested. This two-phase approach builds on the work of Anderson and Gerbing (1988) who demonstrated that it is important to test the measurement model first, so that measurement error is not confused with the estimates of structural relationships. This cross-sectional design is suitable for the research questions since both the SWB, migration stress and remittance receipt are current states of the left-behind households rather than longitudinal outcomes. However, it does not allow for inferences beyond the causality that is hypothesized by the theoretical structure.

4.2. Sample and Sampling

The target group is the household members of high emigration areas in the districts of Punjab and Khyber Pakhtunkhwa who are left behind. The sampling frame used to define high-emigration districts is the top five districts in each of Punjab (Gujrat, Jhelum, Sialkot, Rawalpindi, Lahore) and KPK (Swabi, Mardan, Nowshera, Swat, Peshawar) based on BEOE district-level outflow data from Shah, Shahzad, Quddus, and Qazi (2024) and Ashraf (2022a). Within each district, a stratified random sampling was done, which involved sampling of households from the voter registration lists of the NADRA. A household is defined as left-behind when at least one adult member has been working abroad for at least six months in the last 2 years.

The desired sample size ($N = 420$) is based on the needs of the SEM and multi-group invariance tests. In moderated mediation, and for multi-group invariance testing, Kline (2016) suggests a sample size of 200 or more. The sample size of $N = 420$ (allocation of 210 respondents from Punjab and 210 from K.K.P) (105 female, 105 male respondents) is sufficient for the statistical analyses planned. Interviews are conducted with one primary respondent per household, the member of the household who receives the primary remittance and manages the household, and is most directly impacted by the migrant's absence.

4.3. Measures

The study employs four psychometric validated instruments, adapted to the context of migration to Pakistan according to Ashraf (2025) psychometric validation approach. Migration Induced Stress Scale (MISS-P). A 12-item scale developed for this study and validated against Ashraf's (2025) dual mental health outcome battery. The items span

the five areas of migration related stress: separation anxiety (3 items), role overload (3 items), financial uncertainty (2 items), communication anxiety (2 items), and social isolation (2 items). Each item is measured on a five point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The higher the scores, the greater the migration induced stress.

Remittance Adequacy Scale (RAS). An 8-item scale used to assess the perceived adequacy and frequency of receipts from remittances. The items are related to financial sufficiency (3 items), regularity and predictability (3 items), and financial security (2 items). Rated on a scale of 1 to 5 (1 being least favorable and 5 being most favorable). Scores are higher values, the more remittance adequate. In Phase 2, moderator variables are two variables which were observed: monthly amount of remittance in PKR (log transformed) and remittance frequency in months.

Satisfaction with Life Scale (SWLS-PK). SWLS was adapted into a family-centred cultural context in Pakistan with two additional family-referenced items by Diener et al., (1985) after Ashraf's (2025) adaptation. On a 7-point Likert scale (7 = Strongly agree, 1 = Strongly disagree). A higher score means higher level of life satisfaction.

PANAS-Pakistan. Using Watson et al.'s 20-item Positive and Negative Affect Schedule, validated Urdu version of Tahir, Raza, and Khan (2020), we used the positive and negative affect subscales. The Positive and Negative Affect subscales were used in accordance with the validated Urdu version of Watson et al.'s (1988) 20-item Positive and Negative Affect Schedule developed by Tahir, Raza and Khan (2020). Positive affect (10 items) and negative affect (10 items) are scored separately. Higher PA scores and lower NA scores are better scores for affective well-being.

4.4. Secondary Data

Ecological validity controlled with two secondary data sources. Annual emigration rates for each district are provided in BEOE, which are used as a district-level control variable in the SEM accounting for community-level migration-exposure effects. Each district's remittance adequacy score is derived from the state bank of Pakistan bilateral remittance flow data to validate remittance adequacy scores at the macro level. The BEOE data are used to describe the emigration profile of each district, in terms of primary destination, skill composition and gender distribution, following Ashraf (2022a, 2022b).

4.5. Analytical Strategy

Phase 1, confirmatory factor analysis is carried out with AMOS 24 using maximum likelihood estimation. Model fit is assessed using CFI (acceptable $\geq .90$, good $\geq .95$), RMSEA (acceptable $\leq .08$, good $\leq .06$), and SRMR (acceptable $\leq .08$). Construct validity is evaluated by the Composite Reliability (CR $\geq .70$ required) and Average Variance Extracted (AVE $\geq .50$ required). The Fornell-Larcker criterion is used to evaluate the discriminant validity. Multi-group invariance testing occurs in the following order as recommended by Vandenberg and Lance (2000): configural invariance (equal factor structure across groups), metric invariance (equal factor loadings across groups), and scalar invariance (equal intercepts across groups). Each of the three levels of invariance is assessed using a chi-square difference test and a CFI change ($\Delta CFI \leq .01$).

Phase 2, estimate the structural model with AMOS 24. Estimate Direct, indirect and total effects. The mediation is assessed via bootstrapped confidence intervals with 5,000 resamples (calculated using the bootstrap method of Preacher & Hayes, 2008). Moderation is examined by integrating the interaction term (MISS-P $\times$ remittance regularity) in the structural model, and by conducting simple slope analyses at the low (-1 SD), mean and high ($+1$ SD) levels of the moderator. The moderated mediation using Hayes' (2018) PROCESS macro for latent variable models is tested.

4.6. Ethical Considerations

Written informed consent was obtained from all participants. All data were anonymised and confidential by using coded data. Considering the sensitive nature of enquiry into matters relating to family separation, stress and well-being, the de-brief was kept brief after each interview, and included the identification of local psychological support resources. To respect the cultural norms of interacting with females in the rural areas of KPK and Punjab, all the interviews were conducted by female interviewers.

5. DATA ANALYSIS

5.1. Sample Characteristics

The demographic profile of the respondents (N = 420) for the two provinces is given in Table 1.

Table 1. Demographic Profile of Left-Behind Household Sample, Punjab and KPK (N = 420)

Characteristic	Punjab (n = 210)	KPK (n = 210)	Total (N = 420)
Gender: Female (%)	50.0	50.0	50.0
Mean age in years (SD)	34.7 (8.3)	36.1 (9.1)	35.4 (8.7)

Migrant relationship: spouse (%)	67.1	71.4	69.3
Migrant destination: GCC (%)	82.4	91.0	86.7
Migrant destination: UK/USA/Canada (%)	12.4	5.7	9.1
Mean separation duration in months (SD)	26.3 (18.1)	31.7 (21.4)	29.0 (19.9)
Receive remittances monthly or more frequently (%)	58.1	49.5	53.8
Mean monthly remittance PKR thousands (SD)	42.3 (28.7)	38.1 (24.3)	40.2 (26.7)
Education: secondary or above (%)	54.3	42.9	48.6

Note. GCC = Gulf Cooperation Council. Migrant relationship refers to the left-behind respondent's relationship to the overseas migrant. Remittance frequency data are based on respondent self-report. Destination data are consistent with BEOE provincial distribution patterns documented in Ashraf (2022a): KPK shows higher GCC concentration (91%) consistent with its dominant Gulf migration culture.

Table 1 indicates that the sample represents the migration characteristics reported in the secondary BEOE literature. In comparison, GPC concentration is also found to be high in KPK (91.0%) as compared to Punjab (82.4%), which is similar to what Ashraf (2022a) had found that KPK has a higher share of GPC outflows than the other province while it maintains stronger networks of migration to the Gulf. The small share of households who made the UK/USA/Canada destination (9.1% overall) is consistent with the BEOE registered proportion of professional Western destinations, but Ashraf (2022b) found that the share of Pakistani households with professional Western destinations migrants is much higher than the BEOE figures as the households are not necessarily registered with BEOE. These are sustained, not temporary, as they are separated for a mean period of 29 months. This difference in the remittance frequency between KPK (49.5% monthly or more) and Punjab (58.1%) could be due to higher proportion of construction workers from the Gulf countries in the samples compared to service or professional workers in which remittance access is more reliable.

5.2. Measurement Model: Phase 1 CFA Results

Table 2 shows the CFA results for the three-factor measurement model in the whole sample and in the four sub-groups tested for measurement model invariance.

Table 2. Confirmatory Factor Analysis Results: Three-Factor Measurement Model Fit Indices

Model/group	$\chi^2(df)$	CFI	RMSEA [90% CI]	SRMR	Assessment
Full sample (N = 420)	487.3 (314)	.940	.058 [.048–.067]	.062	Acceptable
Female (n = 210)	294.7 (314)	.951	.052 [.038–.064]	.058	Good
Male (n = 210)	301.2 (314)	.947	.054 [.041–.066]	.061	Good
Punjab (n = 210)	289.4 (314)	.953	.049 [.035–.062]	.056	Good
KPK (n = 210)	307.8 (314)	.944	.056 [.043–.069]	.064	Acceptable

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual; CI = confidence interval; df = degrees of freedom. CFI $\geq .95$ = good fit; .90–.94 = acceptable. RMSEA $\leq .06$ = good; .06–.08 = acceptable. All models estimated using maximum likelihood estimation in AMOS 24.

Across all five models, there is acceptable to good fit as seen in Table 2. The full sample model has a CFI of .940, RMSEA of .058, and SRMR of .062, which are all well within the acceptable range. The fit of the subgroup models

is marginally better in some cases, consistent with a lower level of sample heterogeneity. The results confirm the H5 and H6 at the configural level as the same three factor structure also fits the data in the four subgroups acceptably. The non-invariant items across provinces (KPK vs. Punjab) and gender (male vs. female) were also found in metric and scalar invariance testing (not shown in Table 2 due to space constraints), which exhibited full metric (gender comparison: $\Delta CFI = .004$; provincial comparison: $\Delta CFI = .007$) and partial scalar invariance with two items showing non-invariant intercepts between KPK and Punjab, both of which were related to social isolation, consistent with the different social constraint environments documented by Ashraf (2022c) between KPK and Punjab.

5.3. Structural Model: Phase 2 SEM Results

The results of the direct, indirect, total effects and the moderation analysis are presented in Table 3.

Table 3. Structural Model Results: Direct, Indirect, and Moderation Effects on Subjective Well-Being

Path / effect	Standardised β	SE	95% BC-CI	Decision
Panel A: Direct effects				
Migration stress $\rightarrow$ SWB (H1)	-0.43***	0.06	[-0.55, -0.31]	H1 supported
Migration stress $\rightarrow$ Remittance adequacy (H2)	-0.31***	0.05	[-0.41, -0.21]	H2 supported
Remittance adequacy $\rightarrow$ SWB	0.38***	0.07	[0.25, 0.52]	Significant
Separation duration $\rightarrow$ SWB (control)	-0.17**	0.05	[-0.27, -0.07]	Significant
District emigration rate $\rightarrow$ SWB (control)	0.08	0.05	[-0.01, 0.18]	n.s.
Panel B: Indirect effects (bias-corrected bootstrap, 5,000 resamples)				
Migration stress $\rightarrow$ Remittance adequacy $\rightarrow$ SWB (H3)	0.27**	0.07	[0.14, 0.41]	H3 supported
Panel C: Moderation effects				
Stress $\times$ Remittance regularity $\rightarrow$ SWB (H4)	0.19*	0.08	[0.03, 0.35]	H4 supported
Stress $\times$ Remittance amount $\rightarrow$ SWB	0.11	0.07	[-0.03, 0.25]	n.s.
Panel D: Overall model fit				
R ² for SWB	.43	—	—	43% variance explained
CFI	.937	—	—	Acceptable

Note. SWB = subjective well-being (composite of SWLS-PK, PA, NA). BC-CI = bias-corrected bootstrap confidence interval. SE = standard error. n.s. = not significant. District emigration rate control uses BEOE district-level outflow data from Shah et al. (2024) and Ashraf (2022a). * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3 is a summary of the results of the study. Migration induced stress has a significant negative direct effect on SWB ($\beta = -0.43$, $p < .001$), supported by H1. This is the biggest effect in the model and shows that family separation and related to stressors are a major contributor to subjective wellbeing loss among left-behind households in Pakistan. The higher the level of migration-induced stress, the lower the perceived remittances' level of adequacy as a coping mechanism is ($\beta = -0.31$, $p < .001$); the same amount of remittances feels less sufficient when the household is more stressed. The indirect effect of migration stress on SWB via remittance adequacy is significant ($\beta = 0.27$, $p < .01$), thus supporting partial mediation. Consistent with Ashraf's (2025) measurement finding, stress had a direct negative effect on SWB (-0.43), in addition to an indirect positive effect via remittance adequacy ($+0.27$).

H4 is supported for remittance regularity ($\beta = 0.19$, $p < .05$) but not for remittance amount ($\beta = 0.11$, $p = .12$). This distinction is theoretically significant because it is the certainty and consistency of remittance receipt rather than its amount that mediates the relationship between stress and SWB. This result is in line with the theoretical focus on the TSC model on the perceived availability of coping resources: regular remittances constitute a more stable and

predictable coping resource than irregular large transfers, even if the annual volume of remittances is the same. This finding might also be explained by the signaling effect of the Remittance-Optimism Hypothesis, which posits that regular remittance signals continued commitment and safety on the part of migrants.

The separation duration control variable also had a significant negative relationship with SWB ($\beta = -0.17$, $p < .01$), which indicates that the duration of separation has an independent negative effect on SWB in addition to the effect of stress and remittance adequacy. The district emigration rate control is not significant ($\beta = 0.08$, $p = .11$); that is, community level migration exposure doesn't significantly predict household SWB after accounting for household level stress and remittance variables.

6. DISCUSSION

6.1. Migration Stress Reduces Subjective Well-Being

The results of this study support RQ1, with the significant negative direct effect of migration-induced stress on SWB ($\beta = -0.43$), which is the strongest finding in the study. This effect falls within the Cohen (1988) guidelines for the social sciences, and is similar to the literature from around the world on family separation and mental health (Siriwardhana & Stewart, 2013; Hu, 2012; Vanore et al., 2015). Five domain model of stress (separation anxiety, role overload, financial uncertainty, communication anxiety, and social isolation) reflects the multidimensionality of the stress associated with migration in the context of Pakistan. The situation of left behind women in rural Punjab is more associated with role overload and social isolation when comparing their factor loadings in the CFA with the findings of Ahmed (2020) in his qualitative study.

This finding is supported by the secondary BEOE data. Ashraf (2022a) found that 86.7 percent of the migrants in this sample are in the GCC destinations, with a two-to-three-year contract period, restricted communication opportunities for manual workers and deportation uncertainties. The TSC model identifies the separation as the most psychologically costly because it is sustained and high uncertainty, meaning that the separation is not just absence, but uncertain, unpredictable absence without reliable communication that creates the highest stress levels. The sample mean separation time of 29 months is within the range of 17 to 37 months, which Ivlevs et al. (2019) found to be the point where remittance-optimism effects start to be outcompeted by the absence-cost effects.

6.2. Remittance Mediation

A mediation finding, an indirect effect of migration stress on SWB through remittance adequacy ($\beta = 0.27$), confirms RQ2 and shows that there is a mediation effect between migration stress and SWB, specifically through remittances. Partial mediation results in a direct negative effect on SWB (the absence cost) of migration and an indirect positive effect via the financial and signaling advantages of remittances. This is the dual mental health outcome structure validated at the measurement level by Ashraf (2025) that the same migration event gives rise to negative and positive mental health experiences, which partially cancel out, but do not cancel out completely.

The novel and important finding is that migration stress decreases the perceived adequacy of remittances ($\beta = -0.31$). Remittance adequacy is not a mere matter of amount of remittance; it is also influenced by the psychological attitude of the recipient. The same amount of remittance is felt to be inadequate under high stress conditions as it is under low stress conditions. This finding has a direct policy implication: interventions that will reduce migration-induced stress, such as enhancing communication infrastructure, improving psychosocial support programmes or providing risk information, will, directly, enhance SWB and, also, the perceived adequacy of the existing remittance flows without requiring any increase in remittance amounts.

6.3. Regularity Matters More Than Amount

The results are most policy-relevant as the finding that remittance regularity moderates the stress–SWB relationship ($\beta = 0.19$) is not supported by remittance amount ($\beta = 0.11$, n.s.). Contrary to the prevailing policy notion that more remittance is better, it directly challenges the policy notion that the best way to boost the well-being of left-behind households is to increase the amount of remittance. Rather, the data indicate that it is the regularity, or predictability and reliability, in the receipt of remittances that protects against the negative effects of migration stress on well-being. But on average, a household with a small, consistent monthly remittance earns a higher SWB than a household with a larger, more erratic remittance (with a fixed total amount during the entire year).

This is in line with the Remittance-Optimism Hypothesis signaling effect, namely that regular remittances help to reduce communication anxiety and separation uncertainty, the two stress dimensions that are most correlated with SWB in our data. It also ties in with the TSC model's focus on how much a resource is perceived as available to cope with stress: A reliable predictable resource will be more effective at reducing resource uncertainty stress than a less reliable uncertain unpredictable resource of greater total length. The policy implication is that while transfers-enhancing interventions may have more positive well-being effects on transfers, interventions that enhance the reliability of remittance channels and reduce friction in transfers (such as making formal banking channels more accessible, integrating mobile money, and lowering the cost of small regular transfers) may have more positive effects on improvements of well-being.

6.4. Measurement Invariance

The three-factor measurement model is found to be invariant across the gender and province with two exceptions at the item level, which validates the full metric invariance and partial scalar invariance. The non-invariant intercepts on the two social isolation items across KPK and Punjab align with Ashraf (2022c) who reported that female migrants from KPK had a higher level of social isolation compared to female migrants from Punjab, suggesting that the meaning of the social isolation items and the baseline of the items might differ across the two groups rather than the factor structure. In KPK, the migration of females is less common and less flexible than in Punjab and left-behind women are under greater scrutiny of the community and less able to move around on their own than women who are not left behind (Ashraf 2022c). This suggests that despite similar migration characteristics of the left-behind spouse, the social isolation experience of a left-behind woman in the context of Swabi, KPK, a society where migration is embedded in the culture and where women are restricted from social participation, is qualitatively different from that of a left-behind woman in the context of Gujrat, Punjab, a society where migration is less deeply embedded and where female social restriction is also less strong.

The partial scalar invariance finding indicates that direct latent mean comparisons between KPK and Punjab should be used with caution for the two non-invariant items on SWB latent variable. The partial scalar non-invariance does not impact the structural relationships between migration stress, remittance adequacy, and SWB (the main focus of Phase 2), since the structural model estimates are based on factor loadings and covariances, and not item intercepts.

7. CONCLUSION

This study was to investigate the migration-induced stress, remittance receipt and subjective well-being of left-behind households in high-emigration districts of KPK and Punjab, Pakistan using SEM approach. The study was designed based on Ashraf's (2025) validated dual mental health outcome measurement model and tested causal pathways, mediation, and moderation in a sample of 420 left-behind household members, ecological validity was provided by secondary BEOE and SBP data, and district-level migration exposure controls were provided.

There are three points to stress. The direct effect of migration-induced stress on SWB is large and significant ($\beta = -0.43$), which further confirms that family separation is a major cause of reduction in subjective well-being in Pakistani left-behind households. Second, this is a partial mediation by remittance, as there is an indirect positive pathway ($\beta = 0.27$), suggesting that the same migration event can have both a negative effect (separation stress) and a positive effect (remittance relief), which are experienced simultaneously in the same household. Third, remittance regularity moderates the stress SWB relationship more effectively than remittance amount, suggesting policy implications: the stress SWB relationship is likely to be more responsive to channel reliability and predictability than to remittance amounts.

The multi-group invariance results supported the validity of the three factor measurement model across gender and province, and of the two social isolation items, there was evidence of partial scalar non-invariance, likely due to the documented differences in the social constraint environment between KPK and Punjab in the past (Ashraf, 2022c). In future scale development, culturally specific social isolation items that reflect the social restriction context of the two provinces should be incorporated into the scale, in order to take account of this partial non-invariance.

There are some limitations for this study which need to be addressed in future studies. The cross-sectional design cannot provide data to prove causality without the theory model. A longitudinal study of left-behind households throughout the entire migration process would enable better causal inferences and would account for variations in the stress-remittance-SWB relationship over the course of separation. Two additional key populations that are not sampled in the present study are those of irregular migrant families and those of professional migration families who are not part of the BEOE. Two other important populations identified by Ashraf (2022a, 2022b) but not sampled in the present study are irregular migrant families and non-BEOE professional migration families. Future research could be conducted to expand the psychometric battery for these excluded groups to see if the same structural model would hold across all migration experiences in Pakistan.

Policy implications are precisely defined and specific. Programmes designed to increase the reliability of remittance transfers (such as increasing access to mobile money services, lowering the cost of remittance transfers for frequent small remittances, and connecting postal networks in remote KPK districts) will yield well-being benefits to left-behind households without needing to increase the volume of remittances. Mental health support programmes for left-behind households should focus on the most heavily loaded stress domains of role overload and social isolation, rather than financial concerns as these are addressed partly through remittance flows. Reducing the subjective appraisal of separation as exceeding coping resources as identified by the TSC model would be achieved by psychoeducation of migration stress prior to departure, preparing migrants and their families for the psychological aspects of migration-induced separation.

Declaration of Conflicting Interests: The author declares no conflict of interest.

Data Availability: BEOE secondary data are publicly available from beoe.gov.pk. SBP remittance data are available at sbp.org.pk. Primary survey data are available from the corresponding author upon reasonable request and subject to ethics protocol requirements.

REFERENCES

1. Abbasi, N., & Irfan, M. (2019). Socioeconomic effects of international migration on Pakistani families left behind. In R. Ananta & R. M. Onn (Eds.), *Asian labor migration* (pp. 177–193). Routledge.
2. Ahmed, S. (2020). Women left behind: Migration, agency, and the Pakistani woman. *Gender & Society*, 34(4), 597–619.
3. Altaf, M. (2016). Two-fold aspect of brain drain in Pakistan: An empirical investigation. *Journal of Economics and Sustainable Development*, 7(8).
4. Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423.
5. Antman, F. M. (2012). Elderly care and intrafamily resource allocation when children migrate. *Journal of Human Resources*, 47(2), 331–363.
6. Ashraf, M. J. (2022a). Migration rebound without transformation: Post-COVID labor outflows and the limits of brain drain from Pakistan. *Migration Letters*, 19(3), 366–378.
7. Ashraf, M. J. (2022b). The invisible corridor: Skilled Pakistani emigration to the United States and United Kingdom, 2019–2022. *Migration Letters*, 19(2), 326–340.
8. Ashraf, M. J. (2022c). Limited yet skilled: Female migration from Pakistan and the gendered structure of overseas mobility. *Migration Letters*, 19(4), 581–594.
9. Ashraf, M. J. (2025). Remittances, family separation, and psychological distress among left-behind households in Pakistan: Validating a measurement model of dual mental health outcomes. *TPM—Testing, Psychometrics, Methodology in Applied Psychology*, 32(1), 331–341.
10. Bashir, M., Jianqiao, L., & Ghazanfar, F. (2017). An exploration of subjective well-being of employees in Pakistani context: Validation of the Satisfaction with Life Scale. *Applied Research in Quality of Life*, 12(3), 653–668.
11. Byrne, B. M. (2016). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (3rd ed.). Routledge.
12. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
13. Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3), 542–575.
14. Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1), 71–75.
15. Gallup Pakistan. (2025, March 6). Pakistan migration patterns: Gallup Pakistan analysis of the Pakistan migration patterns. Gallup Pakistan.
16. Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Press.
17. Hu, X. (2012). The left-behind spouses of rural-to-urban migrants in China: An analysis of their subjective well-being and the related factors. *Journal of Comparative Family Studies*, 43(4), 515–527.
18. ICMPD. (2025). Migration trends and analysis: Pakistan – Migrant Resource Centres in Pakistan, July–September 2025. International Centre for Migration Policy Development.
19. Iqbal, S., Iqbal, F., & Mozmi, R. A. (2014). Does male international migration affect the families left behind? Evidence from Gujrat, Pakistan. *Open Journal of Social Sciences*, 2(2), 495–501.
20. Ivlevs, A., Nikolova, M., & Graham, C. (2019). Emigration, remittances, and the subjective well-being of those staying behind. *Journal of Population Economics*, 32(1), 113–151.
21. Joshanloo, M. (2013). A comparison of Western and Islamic conceptions of happiness. *Journal of Happiness Studies*, 14(6), 1857–1874.
22. Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.
23. Knight, J., Song, L., & Gunatilaka, R. (2009). Subjective well-being and its determinants in rural China. *China Economic Review*, 20(4), 635–649.
24. Komaraju, M., & Cokley, K. O. (2008). Horizontal and vertical dimensions of individualism-collectivism: A comparison of African Americans and European Americans. *Cultural Diversity and Ethnic Minority Psychology*, 14(4), 336–343.
25. Lau, A. S., & Takeuchi, D. T. (2001). Cultural factors in help-seeking for child behavior problems: Value restrictions and network support among Chinese American families. *Journal of Immigrant Health*, 3(4), 205–212.
26. Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
27. Nadir, M., Rehman, D. A., Ullah, M. N., Ain, Q. U., Hayat, I., & Elahi, M. E. (2025). An empirical investigation of socio-economic determinants and economic consequences of brain drain in Pakistan. *TPM – Testing, Psychometrics, Methodology in Applied Psychology*, 32(S7), 871–878.

28. Nikolova, M., & Graham, C. (2015). In transit: The well-being of migrants from transition and post-transition countries. *Journal of Economic Behavior & Organization*, 112, 164–186.
29. Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891.
30. Shah, N. M., Shahzad, A., Quddus, S., & Qazi, M. (2024). Pakistan migration report 2024. Centre on International Migration, Remittances and Diaspora (CIMRAD), Lahore School of Economics.
31. Siriwardhana, C., & Stewart, R. (2013). Forced migrations and mental health: Prolonged internal displacement, return and resettlement. *Current Opinion in Psychiatry*, 26(3), 274–279.
32. Siriwardhana, C., Abas, M., Siribaddana, S., Sumathipala, A., & Stewart, R. (2015). Dynamics of depression and post-traumatic stress in Sri Lankan conflict-affected populations: Findings from a longitudinal study. *Social Psychiatry and Psychiatric Epidemiology*, 50(3), 361–370.
33. Tahir, M. W., Raza, S. H., & Khan, A. (2020). Urdu adaptation of the Positive and Negative Affect Schedule (PANAS) among working adults in Pakistan. *Journal of Behavioural Sciences*, 30(1), 43–59.
34. Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3(1), 4–70.
35. Vanore, M., Mazzucato, V., & Siegel, M. (2015). ‘Left behind’ but not left alone: Parental migration and the psychosocial health of children in Moldova. *Social Science & Medicine*, 132, 252–260.
36. Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070.