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Mechanism Underlying Postpartum Depression and Well-being Among Low Resource Mothers

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Abstract

In this paper, the psychological pathways through which interpersonal resources contribute to the occurrence of postpartum depression and maternal well-being in a low-resource, collectivist society have been examined. For the purpose of the study, a correlational research design was used and data were collected from $N = 200$ highly distressed postpartum mothers ($EPDS > 13$) in District Bhakkar, Pakistan. Hayes' PROCESS Macro was used to examine mediation and moderation models. Competitive mediation was found to exist such that spousal support and social support contributed to adaptive coping but this, in turn, aggravated the symptoms of postpartum depression as a result of the uncontrollable nature of socio-economic stress. On the other hand, cognitive reappraisal and expressive suppression emerged as significant cultural moderators. Both emotion regulation strategies acted as buffers to the relationship between social support and maternal well-being owing to the contribution of both these emotion regulation strategies towards harmonious functioning in the traditional joint family system.

Keywords: Postpartum Depression, Well-being, Spousal Support, Perceived Social Support, Coping Strategies, Emotion Regulation, Cognitive Reappraisal.

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Introduction

Postpartum depression constitutes a serious public health issue globally as it has adverse effects on the health and well-being of mothers, affecting millions each year (O'Hara & McCabe, 2013). In Pakistan, this burden is compounded by limited resources, economic instability, lack of social support, and underdeveloped mental healthcare infrastructure. Therefore, understanding the specific psychological mechanisms behind the protection of maternal well-being and the reduction of depressive symptoms among these mothers is vital (Rahman et al., 2008).

Many empirical studies underscore the role of interpersonal resources, particularly social and spousal support, as important protective measures against perinatal psychological distress. Social support acts as a shield for psychological comfort that generates a feeling of safety and belonging, thereby enhancing maternal well-being and decreasing depressive feelings (Zimet et al., 1988). Among the various interpersonal relationships, spousal support proves to be the most crucial factor affecting the mother's well-being. Risk factor analysis through meta-analyses clearly reveals that non-support from one's partner and marriage dissatisfaction has been identified as some of the best predictors of postpartum depression (Beck, 2001).

Although interpersonal support serves as the fundamental source of maternal resilience, the channel through which it associates the postpartum experience is highly contingent upon personal coping skills. Within the transactional theory of stress and coping, the external resources such as social and spousal support shape the way the person cognitively assesses the stressful environment in order to implement adaptive coping strategies (Lazarus & Folkman, 1984). Low-resource mothers who feel that they have sufficient support network can rely on their emotional security to employ active and problem-solving or cognitive coping strategies instead of maladaptive and avoidant ones (Carver & Connor-Smith, 2010).

Aside from the personal ways of coping, the ability to effectively regulate one's internal state, which is referred to as emotion regulation, serves as an important boundary condition in the aforementioned model. Nonetheless, present day affective science stresses that emotion regulation is not a single construct. Rather, its separate components and specific behavioral strategies work via completely different psychological processes (Gross, 1998). In highly stressful and resource-limited environments, an aggregate level of emotion regulation can ignore the underlying differences, while separate domains of emotion regulation, such as a focused effort to regulate cognitive or expressive aspects of emotions, work as precise cognitive buffers that influence the power of interpersonal and coping factors on maternal well-being (Gross & John, 2003). Thus, the change of focus from the aggregate construct of emotion regulation to its separate domains will provide a more accurate picture of the boundary conditions in question.

This study's conceptual framework integrates four theories to ground the hypothesized relationship: Cognitive behavioral theory (CBT) which links adaptive coping to improved maternal well-being. Spousal/Social support theory, which posits that high social support acts as a buffer against depressive symptoms, Stress and Coping Theory (Lazarus & Folkman, 1984), which highlights how adaptive coping manages postpartum challenges and the Process Model of Emotion Regulation (Gross, 1998), which frames expressive suppression as a maladaptive strategy that depletes psychological resources. This integrated framework hypothesizes that a mother's vulnerability to postpartum depression is jointly determined by external support, cognitive behavioral responses, and emotion management tactics. The first of these gaps involved the current conditional process approach used to understand perinatal health. Most of these approaches were based in high-income, western countries that had well-established mental health infrastructure and,

hence, did not take into consideration the unique interpersonal relationships that existed in low-income collectivist societies like Pakistan, where any form of mental health help was almost non-existent and the responsibility of coping fell on the informal structure consisting of spouses and networks. The second gap existed in the fact that the emotion regulation construct was seen as an umbrella construct and the unique buffering effects of different constructs were not taken into consideration.

Exploring such mechanism within the socioeconomic framework of Pakistan was essential considering the complex issues of financial stress and lack of mental health service in the country. Determining the exact internal and external mechanisms associated with maternal health maintenance is an important aspect of public health. This research study explored how external spousal validation mechanisms are associated with internal coping mechanism and how certain emotion regulation skills could conditionally change this relationship.

Based on the combined theoretical perspectives and taking into account the research gaps noted, the main purposes of the present study were the following: To analyse the direct and indirect relationship of spouse support with postpartum depression and well-being mediated through maternal coping mechanisms. To estimate the universal moderating role of emotion regulation on the connection between perceived social support and maternal well-being. To reveal and investigate the conditional domain-specific role of cognitive reappraisal moderating the link between spousal emotional support and postpartum depression.

Hypotheses

1. Active adaptive coping significantly and positively mediates the relationship between spousal support and postpartum depression.
2. Active adaptive coping significantly and positively mediates the relationship between perceived social support and postpartum depression.
3. Cognitive reappraisal significantly and positively moderates the relationship between perceived social support and well-being.
4. Expressive suppression significantly and positively moderates the relationship between perceived social support and well-being.
5. Cognitive reappraisal significantly and positively moderates the relationship between spousal support and well-being.
6. Expressive suppression significantly and positively moderates the relationship between spousal support and well-being.

Literature Review

Spousal Support, Perceived Social Support, and Maternal Outcomes

For example, according to Dennis and Ross (2006), in a longitudinal study woman with less partner support had significantly higher chances of developing postpartum depression after 4 and 8 weeks post-delivery. Therefore, the quality of the close marital relations serves as a proximal buffer or stress factor for the new mother. Furthermore, it was shown that a broader network of interpersonal relations is also important. Reid and Taylor (2015) studied individual contributions of social and marital resources and found that high perceived social support was associated with maternal well-being and reduction in depressive symptoms even under high financial distress. The significance of the role of these factors was especially strong in low-income settings. The results of quantitative

analysis on Pakistani population proved that maternal distress depends largely on immediate family and social environment relations.

Mediating Role of Coping Strategies between Spousal Support and Maternal Outcomes

For instance, Terry et al. (1996) carried out a longitudinal study of the process of transitioning to parenthood and identified that the buffering effect of social support on maternal depression was largely mediated by coping strategies. Results showed that consistent supportive environment enabled women after childbirth to apply active and problem-oriented coping, which positively contributed to maintaining their wellbeing. In turn, lack of spousal and other relational resources left many mothers in resource-depleted condition and prompted them to develop maladaptive coping behavior.

According to the study by Razurel et al. (2011) stress and limited support networks after childbirth significantly predicted maternal distress, and it was also largely mediated by coping strategies chosen by women. Mothers lacking strong social or partner-based support systems used avoidant coping mechanisms that not only undermined their initial state of well-being but also increased their risk of developing postpartum depression. It therefore followed that adaptive coping mechanisms acted as the important cognitive link for transforming external marital resources into positive maternal outcomes.

Emotional Regulation as a Moderator between Perceived Social Support and Well-being

Lopes et al. (2005) which was devoted to the exploration of affective dynamics, the participants, who exhibited good emotional regulation abilities, were found to gain much more psychological benefit from their social network and thus preserve their initial well-being levels. On the contrary, the lack of effective emotional regulation was another significant mental barrier that negated the protective effect of social ties.

Gratz and Roemer (2004) studied the multi-dimensional features of the affective process and proved that high emotional dysregulation did not allow people to benefit from the support offered by the social support network within their reach. In poor socio-economic conditions during perinatal periods, mothers with low emotional regulation were extremely susceptible to environmental stress because the dysregulation inside their body prevented them from benefiting from the protective qualities of the support they were getting, which led to their overall deterioration of health condition.

Cognitive Reappraisal as a Domain Specific Moderator between Spousal Emotional Support and Postpartum Depression

Whereas global emotional abilities shape overall wellbeing, postpartum depression, among other clinical courses, relies on domain-specific cognitive systems. Herein, cognitive reappraisal, an antecedent-focused emotion regulation technique where emotions resulting from a stressful situation are reinterpreted through cognition, stood out as a key protective mechanism. Researchers suggested that assessing the individual regulatory domains and not the total score is better at predicting clinical distress amid structural limitations. Troy et al. (2013) showed how cognitive reappraisal mitigated the effects of high life stress on depressive symptoms. It is important to note that the results showed that cognitive reappraisal acted as an extremely powerful moderator under the situation of uncontrollable and continuous stress. This specific boundary effect is very relevant in comparison to the level of spousal emotional support received by the individual. When taking into consideration the interpersonal network within which new motherhood exists, lack of spousal emotional support becomes a major and sometimes even irreversible source of domestic stress. It

was found that when there is a lack of immediate spousal emotional support, high cognitive reappraisal helped the mothers reinterpret the situation.

In contrast, studies conducted by Gross and John (2003) have shown that people who employed little cognitive reappraisal were found to be suffering from greater levels of initial depression and also had trouble coping with their adaptive functioning in times of interpersonal conflicts. In low-resource contexts, when there is no availability of external structural help, cognitive reappraisal acted as a major internal cognitive buffer that associates the vulnerability process and prevented postpartum depression.

Research Methodology

Study II: Psychosocial Determinants of Postpartum Depression

Research Design

In order to assess the mechanisms that may be involved in explaining maternal mental health, Study II utilized a correlational design. The purpose of this part of the study was to uncover the structural relationships, predictive links, and conditional boundaries associated with spousal support, perceived social support, coping style, emotion regulation constructs, well-being, and postpartum depression. Instead of investigating the effectiveness of a particular treatment method, this design allowed for natural variation among participants, thus making possible the computation of mediation and moderation analyses.

Sampling Derivation via Universal Screening

Participants in this study have been purposefully selected by following a two-step sequential selection process. Firstly, the universal screening approach was used in selecting the health care institutions in District Bhakkar, Pakistan using the EPDS scale which is a screening tool developed in English language but has been translated to Urdu for evaluating the postpartum depression symptoms in mothers. Secondly, a strict purposive sampling procedure was used in the selected group to obtain the desired sample size for the statistical analysis stage. The operational sample consisted of mothers who met all inclusion criteria and who had a high level of distress (EPDS score >13). Selection of mothers having EPDS score greater than 13 was essential in understanding the psychological process of postpartum depression since it is a clinically vulnerable and highly distressed population. However, it should be stated that the present inclusion criterion limits the generalizability of the findings since the results are not applicable to normative postpartum mothers.

Inclusion Exclusion Criteria

Rigorous eligibility parameters governed the selection of the final operational sample ($N=200$):

Inclusion Criteria

(a) Reproductive aged women between age 18-40 years old, (b) Residing permanently in District Bhakkar, (c) Mothers in the immediate postnatal period within 6 weeks from giving birth with a parity range of 1-4 children, (d) Obstetric history comprising spontaneous delivery or Cesarean section.

Exclusion Criteria

(a) Age less than 18 years, (b) Grand multiparity having more than four live births, (c) Active case or history of postpartum psychosis, (d) Serious reproductive complications necessitating emergency treatments.

Measures

Demographic Sheet

Self-made sheet noted crucial confounders such as mother's age, family composition (joint vs nuclear family), monthly family income, mode of delivery (natural/vaginal versus major/ minor Cesarean section), education, perceived socio-economic status, and occupation status.

Brief Cope Scale

The mothers' coping styles were measured with the help of Brief COPE Scale (Carver, 1997) that had been translated into Urdu language and psychometrically tested by Nisa and Siddiqui (2020). It includes 28 items divided into 14 subscales (2 items each), which include active coping and planning. Response was made on a 4-point Likert scale from 1 (not at all) to 4 (a great deal). For scoring purposes, the items were categorized and summed into two major dimensions: adaptive coping and maladaptive coping, to evaluate functional versus dysfunctional coping strategies. The adaptive coping domain achieved reliability of $\alpha = .74$, and the maladaptive coping domain showed a reliability of $\alpha = .73$ in current study.

Dyadic Coping Inventory (DCI)

Spousal support was assessed through Dyadic Coping Inventory (Bodenmann, 2008), translated into Urdu by Shujja et al. (2020). This 37-item instrument uses a 5-point Likert scale ranging from 1 (very rarely/never) to 5 (very often/always). In order to define and quantify the core independent variables, spouse support and spouse emotional support were separately measured with the help of Supportive Dyadic Coping (SDC; 10 items) subscale, which measures partner empathy during stressful situation. In the current data set ($N = 200$), the SDC subscale showed an internal consistency of $\alpha = .73$.

Emotional Regulation Questionnaire (ERQ)

Maternal emotional regulation strategies were defined with the use of Emotion Regulation Questionnaire (Gross & John, 2003), where the Urdu version was developed by Abbasi and Kazmi (2022). This 10-item measure includes two independent scales for cognitive reappraisal (6 items) and expressive suppression (4 items), both measured with the help of a 7-point Likert scale. This scale has two main domains on which in this paper achieved reliability was on the domain of cognitive reappraisal $\alpha = .98$, and on the domain of expressive suppression achieved reliability was $\alpha = .94$.

Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional Scale of Perceived Social Support (Zimet et al., 1988) was used as an instrument to measure the perceived support from the external networks. This scale was translated into Urdu by Zafar and Kausar (2013). This scale contains 12 items that assess social support on the three factors: family, friends, and significant others based on a 7-point Likert scale. The total score range is between 12 and 84, in the present study ($N=200$), alpha coefficient was $\alpha = .85$.

Edinburgh Postnatal Depression Scale (EPDS)

For the continuous measurement of the severity of maternal distress during the past seven days, the Urdu version of 10-item EPDS scale was used. The internal consistency reliability coefficient of EPDS in this predictive phase was $\alpha = .87$.

WHO Five Well-being Index (WHO-5)

The maternal well-being was measured using the WHO-Five Well-being Index (World Health Organization, 1998). This measure consists of five positively framed questions, which are rated on a 6-point scale ranging from 5 (always) to 0 (never). The scores obtained are then multiplied by a factor of 4 to give percentages, where the lowest possible score is 0, indicating minimum well-being, and the highest score is 100, reflecting maximum well-being. In our study ($N = 200$) $\alpha = .91$.

Procedure

Data gathering was carried out in a chronological manner. After the universal screening stage, the clinical sample ($N = 200$) was identified in accordance with the set criteria. After forming a good clinical relationship with the participants and verification of baseline data, the rest of the psychometric instruments including the Brief COPE Scale, the Dyadic Coping Inventory, Emotion regulation Questionnaire, and the WHO-Five Well-being Index were administered through counterbalancing. After the administration of the tests, formal thanks were accorded to the mothers and hospital management. Data were subsequently cleaned, screened, coded, and entered using IBM SPSS 27.0.

Data Analyses

Analytical procedures for inferential and descriptive statistics were performed using the statistical software, IBM SPSS (version 27.0). The Pearson product moment correlation was used to assess the direction and degree of the linear association among study variables. In order to examine the predicted conditional process models, OLS regression analysis was performed using PROCESS Macro from Hayes (2022). Specially, parallel mediation was tested using PROCESS Model 4, and moderation analyses were conducted using PROCESS Model 1. All PROCESS macro models utilized 5,000 bootstrapped resamples to estimate 95% confidence intervals.

Ethical Considerations

Ethical approval was sought from the Departmental Ethical Review Committee before data gathering in the field. Informed consent was acquired in writing from all subjects prior to starting the data gathering process. The mothers were completely briefed about the nature of the study, the aim of the study, and the structure of the research. Subjects were specifically briefed about their autonomy, stressing that they had a right to withdraw unconditionally at any stage of the research process without fear of institutional punishment or loss of regular health care benefits. Anonymization of data was achieved through alphanumeric coding. Due to the psychological sensitivity of this population, counseling services were provided immediately upon data gathering. Subjects who showed signs of psychological distress during testing received immediate counseling services.

Results

Table 1: *Demographic characteristics of Participants*

Characteristics	N	%
Age		
18–28	99	49.5
29–40	101	50.5
Family Structure		
Nuclear	64	32
Joint Family	136	68
Marriage Mode		
Arranged Marriage	180	90
Love Marriage	20	10
Delivery Method		
Normal	60	30
C section	140	70
Educational Level		
Illiterate–Primary	50	25
Middle–Matric	50	25
Intermediate–Graduation	50	25
Masters–Above	50	25
Socio-Economic Status		
Upper Class	10	5
Middle Class	32	16
Lower Class	158	79
Occupational Status		
Working Women	49	24.5
House Wife	151	75.5
Obstetrical History		
Number of children (1)	85	42.5
More than one child	115	57.5
Caregiver Postpartum		
Mother	40	20
Mother-in-law	51	25.5

Sister	48	24
Sister-in-law	53	26.5
Husband	8	4
Monthly Income		
20-30k	92	46
40-50k	85	42.5
60-70k	11	5.5
80k-Above	12	6
Hometown		
Urban	100	50
Rural	100	50

Table 1 shows the participants' demographics ($N = 200$). A fair number of participants fell under the age groups 18-28 (49.5%) and 29-40 (50.5%). The majority of the participants belonged to joint families (68%) whereas 32% belonged to nuclear families. A large proportion of individuals had arranged marriages (90%) and had cesarean section deliveries (70%). The education level of the respondents was uniformly distributed across four distinct tiers. A clear majority of the participants belonged to lower socio-economic status (79%). Concerning obstetrical history 42.5% ($n=85$) had one child, while 57.5% ($n=115$) had more than one child. The most common caregivers were sister-in-law (26%). The majority of the females were housewives (75.5%). Additionally, the majority of the population belongs to the 20-30 thousand per month salary domain (46%), there was an equal distribution of urban and rural participants (50% each).

Table 2: Correlation Among Study Variables ($N=200$)

Variable	1	2	3	4	5	6	7	8
1.Adaptive Coping	-							
2. Maladaptive Coping	.26**	-						
3. Cognitive Reappraisal	.36**	-.07	-					
4.Expressive Suppression	.34**	-.06	.94**	-				
5.Postpartum Depression	.57**	-.03	.28**	.26**	-			
6.Percieved Social Support	.28**	-.05	.76**	.71**	.24**	-		
7.Spousal Support	.35**	-.01	.17*	.18**	.05	.22**	-	
8. Well-being	.21**	-.01	.47**	.44**	-.03	.44**	.52**	-

Note. $N = 200$

* $p < .05$, ** $p < .01$

Table 2 presents the Pearson correlation coefficient. Maternal well-being demonstrated a strong positive correlation with spousal support ($r = .52$, $p < .01$) and moderate positive correlation with cognitive reappraisal ($r = .47$, $p = .01$) and perceived social support ($r = .44$, $p < .01$). Conversely, postpartum depression displayed significant but weak positive correlation with cognitive

reappraisal ($r = .28, p < .01$), expressive suppression ($r = .26, p < .01$), and perceived social support ($r = .24, p < .01$). Adaptive coping showed a strong positive correlation with postpartum depression ($r = .57, p < .01$). Non-significant correlations were observed between postpartum depression and both spousal support ($r = .05, p > .05$) and well-being ($r = -.03, p > .05$).

Table 3: Mean Differences on Study Variables Across Demographic Characteristics (N=200)

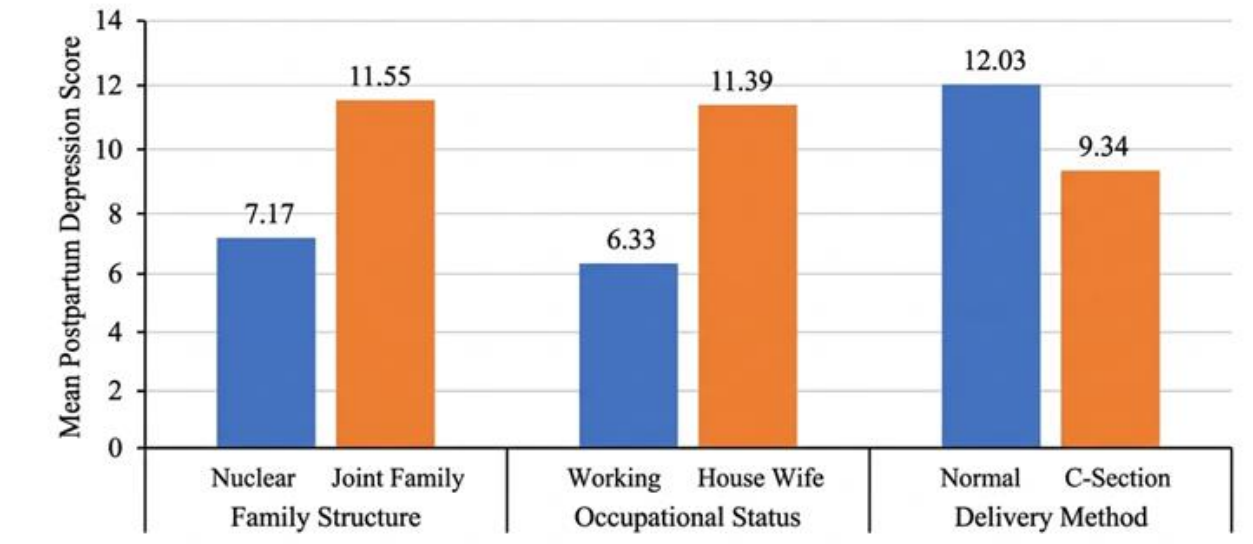
Demographic & Variables	Group1 M (SD)	Group 2 M (SD)	t (198)	p	Cohen's d
Maternal Age	18-28 (n=99)	29-40 (n=101)			
Perceived Social Support	61.65 (15.46)	51.23 (10.44)	5.60	<.001	0.79
Coping Strategies	75.82 (13.78)	79.74 (11.66)	-2.16	.030	0.31
Emotional Regulation	50.34 (13.77)	41.09 (8.18)	5.86	<.001	0.83
Spousal Support	42.55 (1.19)	40.51(7.99)	2.47	.010	0.35
Well Being	23.12 (2.72)	15.07 (4.40)	15.65	<.001	2.21
Postpartum Depression	8.84 (3.49)	11.44 (2.94)	-5.76	<.001	0.81
Family System	Nuclear (n=64)	Joint (n=136)			
Perceived Social Support	52.70 (11.92)	58.12 (14.79)	-2.77	.006	0.39
Coping Strategies	70.80 (14.93)	81.10 (10.30)	-4.99	<.001	0.86
Emotional Regulation	42.25 (9.64)	47.28 (12.94)	-3.07	.003	0.42
Spousal Support	42.08 (0.41)	41.25 (7.04)	1.37	.174	0.14
Well Being	22.09 (2.90)	17.63 (5.77)	7.28	<.001	0.89
Postpartum Depression	7.17 (3.06)	11.55 (2.67)	-10.30	<.001	1.56
Type of Marriage	Arranged (n=180)	Love (n=20)			
Perceived Social Support	56.85 (14.37)	52.20 (11.20)	1.40	.163	0.33
Coping Strategies	79.09 (11.78)	66.15 (16.41)	4.46	<.001	1.05
Emotional Regulation	45.99 (12.41)	42.80 (9.80)	1.11	.268	0.26
Spousal Support	42.36 (4.53)	33.90 (9.67)	6.67	<.001	1.61
Well Being	20.17 (4.52)	9.00 (0.01)	11.03	<.001	2.60
Postpartum Depression	10.46 (3.31)	7.40 (3.75)	3.87	<.001	0.91
Type of Delivery	Normal (n=60)	C-Section (n=140)			
Perceived Social Support	51.53 (10.82)	58.46 (14.89)	-3.25	.001	0.50
Coping Strategies	85.00 (15.00)	74.71 (14.33)	5.55	<.001	0.86
Emotional Regulation	40.47 (7.75)	47.79 (13.12)	-3.88	<.001	0.60
Spousal Support	43.93 (1.92)	40.48 (6.58)	3.99	<.001	0.62
Well Being	17.70 (0.96)	19.64 (6.60)	-2.33	.021	0.36

Postpartum Depression	12.03 (1.51)	9.34 (3.75)	5.37	<.001	0.83
Employment Status	Working (n=49)	House Wife (n=151)			
Perceived Social Support	49.73 (8.64)	58.54 (14.90)	-3.93	<.001	0.65
Coping Strategies	68.37 (15.08)	80.86 (10.42)	-6.48	<.001	1.07
Emotional Regulation	38.90 (4.12)	47.87 (13.11)	-4.71	<.001	0.77
Spousal Support	42.00 (10.00)	41.36 (6.69)	0.67	.504	0.11
Well Being	21.20 (2.76)	18.35 (5.90)	3.25	.001	0.53
Postpartum Depression	6.33 (2.02)	11.39 (2.88)	-11.41	<.001	1.88
Number of Children	1 Child (n=85)	More than 1 (n=115)			
Perceived Social Support	58.95 (15.07)	54.49 (13.15)	2.19	.030	0.32
Coping Strategies	74.31 (14.32)	80.38 (11.06)	-3.26	.001	0.48
Emotional Regulation	47.93 (13.14)	44.00 (11.11)	2.22	.028	0.33
Spousal Support	42.31 (0.82)	40.93 (7.60)	1.93	.057	0.24
Well Being	22.81 (2.81)	16.26 (5.26)	11.32	<.001	1.49
Postpartum Depression	8.51 (3.62)	11.37 (2.80)	-6.07	<.001	0.90
Residential Area	Urban (n=100)	Rural (n=100)			
Perceived Social Support	61.81 (15.47)	50.96 (10.14)	5.87	<.001	0.83
Coping Strategies	75.91 (13.74)	79.69 (11.71)	-2.09	.030	0.30
Emotional Regulation	50.54 (13.84)	40.80 (7.68)	6.15	<.001	0.87
Spousal Support	42.58 (1.23)	40.45 (8.01)	2.63	<.001	0.37
Well-being	23.14 (2.71)	14.97 (4.31)	16.06	<.001	2.27
Postpartum Depression	8.88 (3.49)	11.42 (2.95)	-5.56	<.001	0.79

Note. *N*=200, *M*=Mean, *SD*= Standard Deviation

Table 3 shows the independent samples *t*-tests indicated that young age, urban areas, and having only one baby were significantly linked with high emotional regulation and well-being ($p < .05$), while others showed significantly higher coping strategies and postpartum depression ($p < .05$). Joint family members, arranged married mothers, and housewives were also significantly higher on coping strategies and postpartum depression than nuclear family mothers, love-married mothers, and working mothers ($p < .01$). However, the non-significant demographic factors were identified for spousal support based on family type, employment, and number of babies, as well as social and emotional regulation based on marriage types ($p > .05$).

Figure 1: Mean Comparison of Postpartum Depression Scores Across High Risk Socio Demographic Cohorts



Note. $N = 200$. Visual summary of independent samples t -test values highlights significantly elevated postpartum depression averages among mothers living within joint family configurations, housewives, and that experiencing normal delivery trauma within the sampled population.

Table 4: Regression Coefficient for the Parallel Mediation Models

Model and Path	<i>B</i>	SE	<i>t</i>	<i>p</i>	95% CI [LL, UL]
Model 1 (X= Perceived Social Support, Y= Well-being)					
Perceived Social Support to Adaptive Coping (a^1)	.23	.06	4.19	<.001	[.12, .34]
Perceived Social Support to Maladaptive Coping (a^2)	-.01	.02	-0.64	.526	[-.05, .02]
Adaptive Coping to Well-being (b^1)	.05	.03	1.37	.172	[-.02, .11]
Maladaptive Coping to Well-being (b^2)	-.02	.10	-0.18	.860	[-.22, .18]
Direct Effect (c')	.16	.03	6.09	<.001	[.11, .21]
Total Effect (c)	.17	.02	6.84	<.001	[.12, .22]
Model 2 (X= Perceived Social Support, Y= Postpartum Depression)					
Perceived Social Support to Adaptive Coping (a^1)	.23	.06	4.19	<.001	[.12, .34]
Perceived Social Support to Maladaptive Coping (a^2)	-.01	.02	-0.64	.526	[-.05, .02]
Adaptive Coping to Postpartum Depression (b^1)	.18	.02	9.69	<.001	[.14, .22]
Maladaptive Coping to Postpartum Depression (b^2)	-.18	.06	-3.11	.002	[-.29, -.07]
Direct Effect (c')	.02	.01	1.07	.287	[-.01, .04]
Total Effect (c)	.06	.02	3.53	<.001	[.03, .09]

Model 3 (X= Spousal Support, Y= Well-being)

Spousal Support to Adaptive Coping (a^1)	.69	.13	5.29	<.001	[.44, .95]
Spousal Support to Maladaptive Coping (a^2)	.00	.04	-0.08	.937	[-.09, .08]
Adaptive Coping to Well-being (b^1)	.02	.03	0.48	.629	[-.05, .08]
Maladaptive Coping to Well-being (b^2)	-.02	.10	-0.18	.859	[-.21, .17]
Direct Effect (c')	.48	.06	7.78	<.001	[0.36, 0.60]
Total Effect (c)	.49	.06	8.59	<.001	[0.38, 0.60]

**Model 4 (X= Spousal Support,
Y= Postpartum Depression)**

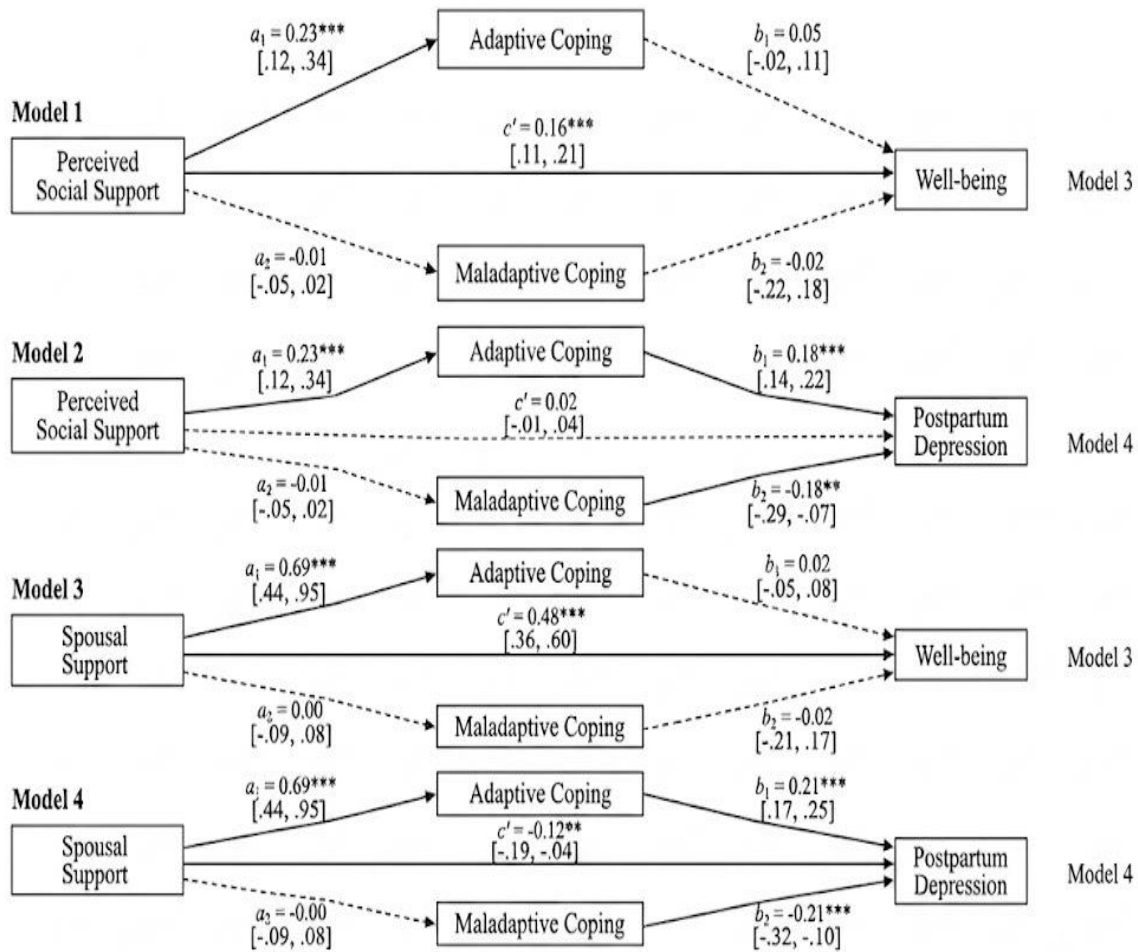
Spousal Support to Adaptive Coping (a_1)	.69	.13	5.29	<.001	[0.44, 0.95]
Spousal Support to Maladaptive Coping (a_2)	-.00	.04	-0.08	.937	[-0.09, 0.08]
Adaptive Coping to Postpartum Depression (b_1)	.21	.02	11.21	<.001	[0.17, 0.25]
Maladaptive Coping to Postpartum Depression (b_2)	-.21	.06	-3.67	<.001	[-0.32, -0.10]
Direct Effect (c')	-.12	.04	-3.23	.002	[-0.19, -0.04]
Total Effect (c)	.03	.04	0.74	.463	[-0.05, 0.11]

Note. $N= 200$. B = Unstandardized coefficient; SE = Standard error; CI = Confidence interval; LL = Lower limit; UL = Upper limit. Model constants are omitted from the display for reporting clarity.

Table 4 shows Model 1 (Y = Well-being): Perceived social support significantly predicted adaptive coping ($B = .23$, $p < .001$) but not maladaptive coping ($B = -.01$, $p = .526$). Neither mediator significantly predicted well-being (Adaptive: $B = .05$, $p = .172$; Maladaptive: $B = -.02$, $p = .860$). The direct effect remained significant ($B = .16$, $p < .001$). Model 2 (Y = Postpartum Depression): Both mediators significantly predicted postpartum depression: Adaptive coping ($B = .18$, $p < .001$) and maladaptive coping negatively ($B = -.18$, $p = .002$). Controlling for mediators the direct effect of perceived social support became non-significant ($B = .02$, $p = .287$). Model 3 (Y = Well-being): Spousal support significantly predicted adaptive coping ($B = .69$, $p < .001$) but not maladaptive coping ($B = .00$, $p = .937$). Neither mediator significantly predicted well-being while the direct outcome remained strongly significant ($B = .48$, $p < .001$). Model 4 (Y = Postpartum depression): Both adaptive coping ($B = .21$, $p < .001$) and maladaptive coping ($B = -.21$, $p < .001$) significantly predicted postpartum depression. The direct result of spousal support was also significant and negative ($B = -.12$, $p = .002$).

Figure 2: Path Diagrams Showing Unstandardized Regression Coefficient (*B*) and 95% Confidence Intervals for the Mediation Models.

Note.



Note. $N = 200$. Unstandardized regression coefficient (*B*) and their 95% confidence intervals (in brackets) are displayed on each path. Solid lines indicate statically significant paths ($p < .05$), and dashed lines indicate non- significant paths. Significance levels: $*p < .05$, $**p < .01$, $***p < .001$.

All diagrams represent parallel mediation model. Model 1 and Model 3 use well-being as the outcome. Model 2 and Model 4 use postpartum depression as outcome. Perceived social support is the predictor for Model 1 and 2. Spousal support is the predictor for Model 3 and 4.

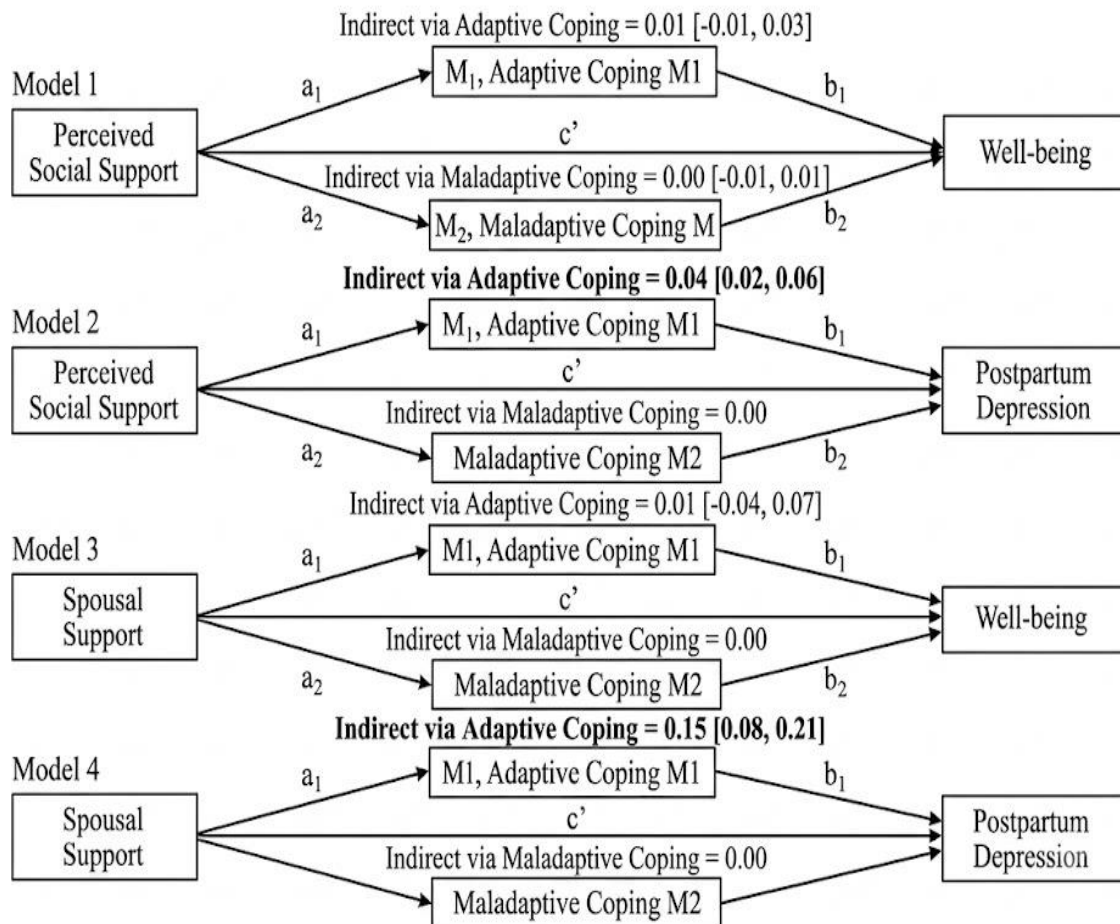
Table 5: Bootstrapped Indirect Effects for the Parallel Mediation Models

Model and Indirect Path	Effect	Boot SE	95% CI [LL, UL]
Model 1 (X= Perceived Social Support, Y= Well-being)			
Total Indirect Effect	.01	.01	[-0.01,0.03]
Perceived Social Support➤Adaptive Coping➤Well-being	.01	.01	[-0.01, 0.03]
Perceived Social Support ➤Maladaptive Coping ➤Well-being	.00	.00	[-0.01, 0.01]
Model 2 (X= Perceived Social Support, Y= Postpartum Depression)			
Total Indirect Effect	.04	.01	[0.03, 0.06]
Perceived Social Support ➤Adaptive Coping ➤Postpartum Depression	.04	.01	[0.02, 0.06]
Perceived Social Support ➤Maladaptive Coping ➤Postpartum Depression	.00	.00	[-0.00, 0.01]
Model 3 (X= Spousal Support, Y= Well-being)			
Total Indirect Effect	.01	.03	[-0.05, 0.07]
Spousal Support ➤Adaptive Coping ➤Well-being	.01	.03	[-0.04, 0.07]
Spousal Support ➤Maladaptive Coping ➤Well-being	.00	.01	[-0.02, 0.02]
Model 4 (X= Spousal Support, Y= Postpartum Depression)			
Total Indirect Effect	.15	.03	[0.09, 0.20]
Spousal Support ➤Adaptive Coping ➤Postpartum Depression	.15	.03	[0.08, 0.21]
Spousal Support ➤Maladaptive Coping ➤Postpartum Depression	.00	.01	[-0.03, 0.03]

Note. $N = 200$. Boot SE = Bootstrapped standard error. Estimates are based on 5,000 bootstrap replicates. Bolded parameters or paths whose confidence intervals do not straddle zero denote statistical significant at the $\alpha = .05$

Table 5 shows Models 1 and 3 (Y= Wellbeing): No statistical mediation was observed, all specific indirect pathways via adaptive and maladaptive coping were non-significant as their 95% confidence intervals straddled zero. Model 2 (Y= Postpartum Depression): A significant total indirect outcome was found ($B = .04$, $SE = .01$, 95% CI [.03, .06]). This relationship was fully mediated exclusively through adaptive coping ($B = .04$, $p = .01$, 95% CI [.02, .06]). Model 4 (Y= Postpartum Depression): A significant total indirect outcome emerged ($B = .15$, $SE = .03$, 95% CI [.10, .20]) driven entirely by adaptive coping ($B = .15$, 95% CI [.09, .21]). Because the direct effect ($B = -.12$) and indirect effect operated in opposite directions, a competitive mediation (suppression) framework is supported.

Figure 3: Multiple Parallel Mediation Models of Social and Spousal Support, Coping, and Psychological Outcomes



Note. $N = 200$. Boot SE = Bootstrapped standard error. Estimates are based on 5,000 bootstrap replicates. Bolded values (with 95% CI not crossing zero) are statistically significant at $p < .05$.

Table 6: Moderation Analysis Results for Predicting Postpartum Depression

Predictor Model/ Variables	B	SE	t	p	95% CI [LL, UL]
Model 1: Spousal Support x Cognitive Reappraisal					
Constant	10.18	.25	41.24	<.001	[9.70, 10.67]
Spousal Support (X)	-0.01	.05	-0.23	.815	[-0.12, 0.09]
Cognitive Reappraisal (W)	0.14	.04	3.87	<.001	[0.07, 0.21]
Spousal Support x Cognitive Reappraisal	-0.00	.01	-0.48	.632	[-0.02, 0.01]
Model 2: Spousal Support x Expressive Suppression					
Constant	10.14	.25	41.07	<.001	[9.65, 10.63]
Spousal Support (X)	0.01	.05	0.15	.884	[-0.10, 0.11]
Expressive Suppression (W)	0.18	.05	3.54	<.001	[0.08, 0.28]
Spousal Support x Expressive Suppression	0.00	.01	0.16	.875	[-0.02, 0.03]
Model 3: Perceived Social Support x Cognitive Reappraisal					
Constant	10.06	.35	28.47	<.001	[9.36, 10.75]
Perceived Social Support (X)	0.02	.03	0.64	.525	[-0.04, 0.07]
Cognitive Reappraisal (W)	0.09	.06	1.57	.118	[-0.02, 0.21]
Perceived Social Support x Cognitive Reappraisal	0.00	.00	0.35	.725	[-0.01, 0.01]
Model 4: Perceived Social Support x Expressive Suppression					
Constant	10.13	.32	31.19	<.001	[9.49, 10.77]
Perceived Social Support (X)	0.03	.02	1.10	.272	[-0.02, 0.08]
Expressive Suppression (W)	0.12	.07	1.72	0.87	[-0.02, 0.27]
Perceived Social Support x Expressive Suppression	0.00	.00	0.07	.943	[-0.01, 0.01]

Note. CI = confidence interval; LL = lower limit; UL = upper limit. Predictor variables were mean centered prior to analysis.

Table 6 shows the interaction terms involving spousal support were non-significant for both cognitive reappraisal (Model 1: $B = -.00$, $SE = .01$, $t = -0.48$, $p = .632$, 95% CI [-0.02, .01]) and expressive suppression (Model 2: $B = .00$, $SE = .01$, $t = .16$, $p = .875$, 95% CI [-0.02, .03]). Similarly, no significant moderation outcomes emerged for perceived social support, with non-significant interaction terms observed for cognitive reappraisal (Model 3: $B = .00$, $SE = .00$, $t = .35$, $p = .725$, 95% CI [-0.01, .01]) and expressive suppression (Model 4: $B = .00$, $SE = .00$, $t = .07$, $p = .943$, 95% CI [-0.01, .01]).

Table 7: Moderation Analysis Results for Predicting Psychological Well-being

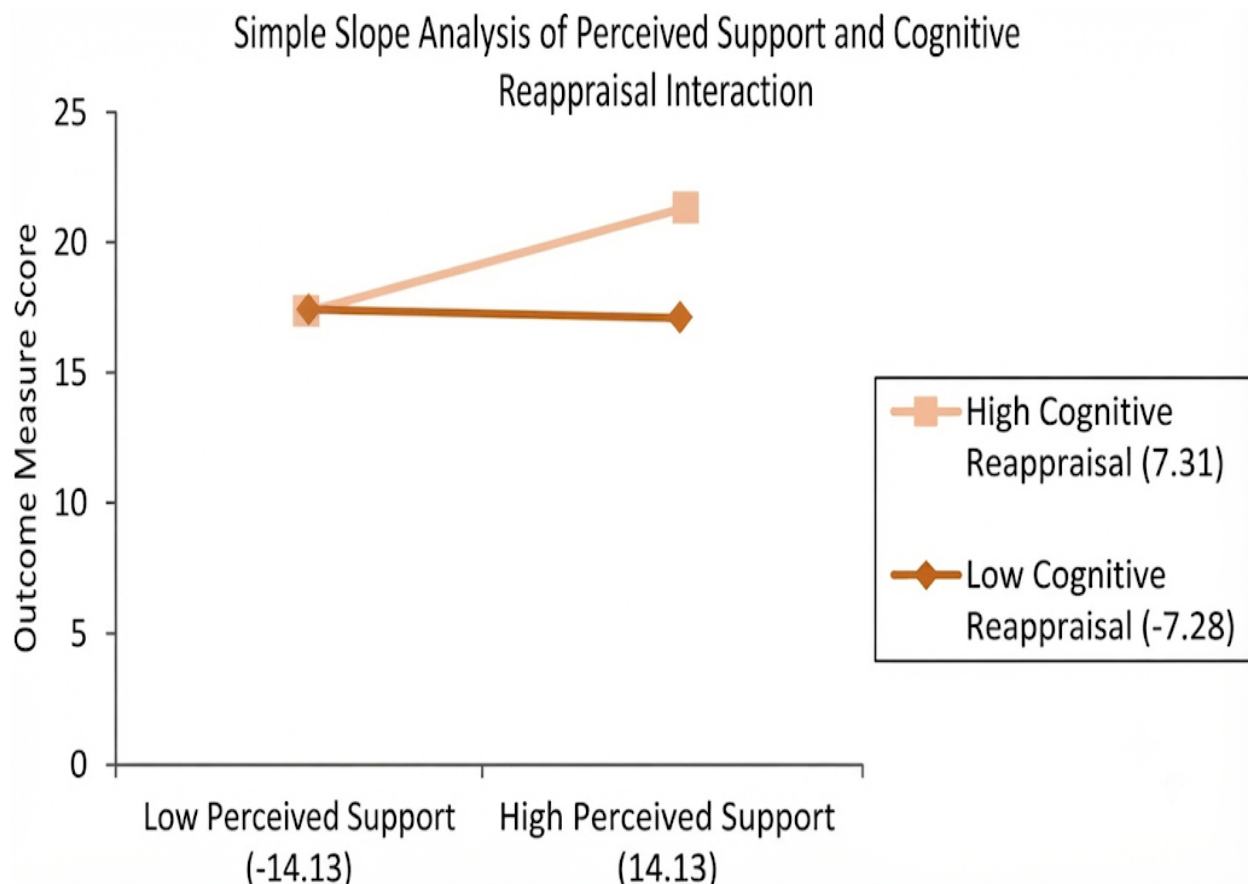
Predictor Model/ Variables	B	SE	t	p	95% CI [LL, UL]
Model 5: Spousal Support x Cognitive Reappraisal					
Constant	18.99	0.31	61.85	<.001	[18.38, 19.59]
Spousal Support (X)	0.46	0.07	6.90	<.001	[0.33, 0.59]
Cognitive Reappraisal (W)	0.28	0.04	6.25	<.001	[0.19, 0.37]
Spousal Support x Cognitive Reappraisal	0.01	0.01	0.77	.445	[-0.01, 0.03]
Model 6: Spousal Support x Expressive Suppression					
Constant	18.94	0.31	60.94	<.001	[18.33, 19.56]
Spousal Support (X)	0.48	0.07	7.16	<.001	[0.35, 0.62]
Expressive Suppression (W)	0.36	0.06	5.72	<.001	[0.24, 0.49]
Spousal Support x Expressive Suppression	0.02	0.02	1.35	.179	[-0.01, 0.05]
Model 7: Perceived Social Support x Cognitive Reappraisal					
Constant	18.26	0.50	36.47	<.001	[17.27, 19.25]
Perceived Social Support (X)	0.06	0.04	1.75	.082	[-0.01, 0.14]
Cognitive Reappraisal (W)	0.14	0.09	1.62	.106	[-0.03, 0.31]
Perceived Social Support x Cognitive Reappraisal	0.01	0.00	2.14	.033	[0.00, 0.02]
Model 8: Perceived Social Support x Expressive Suppression					
Constant	18.18	0.46	39.71	<.001	[17.27, 19.08]
Perceived Social Support (X)	0.07	0.04	1.89	.060	[-0.00, 0.14]
Expressive Suppression (W)	0.18	0.10	1.79	.074	[-0.02, 0.38]
Perceived Social Support x Expressive Suppression	0.02	0.01	2.81	.005	[0.01, 0.03]

Note. CI = confidence interval; LL = lower limit; UL = upper limit. Predictor variables were mean centered prior to analysis. Significant interaction terms are bolded.

Table 7 shows a series of moderation analyses evaluated the interaction effects of social support and emotion regulation on well-being for spousal support no significant interaction effects were found with either cognitive reappraisal (Model 5: $B = .01$, $p = .445$) or expressive suppression (Model 6: $B = .02$, $p = .179$). Conversely significant moderation effects emerged for perceived social support. The interaction between perceived social support and cognitive reappraisal was statistically significant (Model 7: $B = .01$, $SE = 0.00$, $t = 2.14$, $p = .033$, 95% CI [0.00, 0.02]). Similarly, the interaction between perceived social support and expressive suppression

significantly predicted wellbeing (Model 8: $B = .02$, $SE = .01$, $t = 2.81$, $p = .005$, 95% CI [0.01, 0.03]).

Figure 4: *Horizontal Interaction Effect of Perceived Social Support and Cognitive Reappraisal on Well-being*



Note. Low and high values of all variables are based on ± 1 SD from the mean.

Discussion

The main purpose of this study is to uncover the complex nature of the relationship between interpersonal resources (such as spousal support and perception of social support), emotional regulation processes (cognitive reappraisal and expressive suppression), and coping mechanisms for psychological outcomes (such as postpartum depression and psychological well-being) in low-income women from District Bhakkar, Punjab, Pakistan (O'Hara & McCabe, 2013; Rahman et al., 2008). The findings of the study offer valuable information that challenges Western-focused theories about stress and resilience, as they demonstrate the effect of collectivist socio-cultural norms, conventional marital roles, and poverty on the inner psychological processes (Lazarus & Folkman, 1984). This study provides an insight into the interaction of external social environment and inner cognitive mechanisms and thus contributes to the global literature on perinatal mental health in a culturally sensitive way (Rahman et al., 2008; Shoaib et al., 2025).

The first hypothesis was accepted (Competitive Mediation Model) based on the empirical evidence. An unexpected but crucial finding emerged in the correlation analysis, where adaptive coping showed a strong positive association with postpartum depression ($r = .57$). Rather than universally reducing distress, in the specific socio-cultural context of District Bhakkar

characterized by high financial stress and rigid patriarchal structures active coping appears to operate as a process of high cognitive hyper-vigilance. When a mother actively attempts to solve structural issues that cannot easily be altered (such as systemic poverty), she drains her psychological resources. This indicates that the ‘Goodness-of-fit’ model of coping (Forsythe & Compas, 1987) is highly relevant here active coping against uncontrollable stressors can paradoxically increase psychological distress instead of providing relief. Therefore, while spousal support encourages active coping the socio-economic constraints of this specific demographic turn this coping strategies into an aggravating factor for depression. It is important to note that these dynamics are heavily influenced by the specific local context and may not be generalized to urban or high-resource population.

The second hypothesis was supported (as a mediation model) based on the empirical findings from Table 4 (Model 2) and Table 5 (Model 2). Perceived social support was found to predict adaptive coping significantly ($B = .23, p < .001$), and adaptive coping significantly correlated with postpartum depression ($B = .18, p < .001$). The total indirect effect was statistical significant ($B = .04, 95\% \text{ CI } [0.02, 0.06]$) whereas the direct effect became entirely insignificant ($B = .02, p = .287$) for full mediation. Whereas the global models always underscore the importance of social networks as protective factors from maternal psychological distress, there is additional complexity in terms of interpersonal relationships in collectivist rural and suburban Pakistan (Reid & Taylor, 2015; Zimet et al., 1988). In a society where 68 % of the surveyed mothers live in joint family structures. Mothers trying to exercise active coping and planning within such a complicated network face heavy role strain and performance anxiety (Razurel et al., 2011). Thus, an objective resource of outside help becomes a constant source of interpersonal distress and exhaustion, increasing the clinical markers of postpartum depression (Shoaib et al., 2025). This concept is well-supported through international cross-cultural research on the cost of social support (Kim et al., 2008). Studies from across the world have shown that in Asian or collectivist cultures, seeking out or organizing social networks often comes at very high psychological transaction costs, such as relational tensions, fears of bringing down the family name, and the pressure to return the favor within the kinship network. Hence, this is why you observed in your path analysis the complete mediation effect to increase depression scores, consistent with findings from all around the world (Kim et al., 2008; Taylor et al., 2004).

The third hypothesis was accepted (as a moderating model of significance) due to findings in Table 7 (Model 7). Empirical findings narrated that there was found to be a significant interaction effect ($B = .01, SE = .00, t = 2.14, p = .033, 95\% \text{ CI } [0.00, 0.02]$) through Table 7 (Model 7), with cognitive reappraisal emerging as a necessary boundary condition (moderator). In international affective science, it is essential that external social resources be complemented by effective cognitive processing for optimizing one's well-being. In the low resource settings of Pakistan, families are a source of both physical and psychological comfort, but at the same time they can be too intrusive, domineering, and judgmental. Females with high cognitive reappraisal abilities are able to cognitively reframe the demands of the family and find support within the family structure despite the complexity of the situation. Cognitive processing makes it possible for women to effectively utilize the social network around them, thereby transforming potential social support into psychological well-being; thus proving that cognitive reappraisal acts as an important psychological shield (Troy et al., 2013). This type of interaction is similar to the resource-activation theories of contemporary international research. According to global literature, social support does not necessarily lead to well-being unless the person has the ability to use executive emotion regulation and process information from the social environment (Lopes et al., 2005;

Peñley et al., 2002). Through the significant interaction effect you have found in your study, you have proved that cognitive reappraisal acts as the major cognitive filter for rural Pakistani mothers when they evaluate useful resources from social clutter.

The fourth hypothesis was accepted (as an important model for moderation) based on Table 7 (Model 8). Based on the results from Table 7 (Model 8), there was a statistical significant interaction effect of social support perception and expressive suppression on maternal well-being ($B = .02$, $SE = .01$, $t = 2.81$, $p = .005$, 95 % CI [0.01, 0.03]). According to western literature on psychology, expressing suppression is considered an unhealthy way of regulating emotions that associate unhappiness and develops psychological distress (Gratz & Roemer, 2004). Yet, the findings have the advantage of giving a different perspective in cross-cultural psychology (Abbasi & Kazmi, 2022). In the context of a collectivist patriarchy-based joint family system in Pakistan, deliberately keeping oneself free from expressing negative emotions in order to avoid domestic discord is essential which in turn helps improve their psychological well-being. This critical observation successfully replicates classic cross-cultural studies of emotion regulation. Classic international research has proven conclusively that the detrimental impact of expressive suppression on well-being is solely relevant in a Western context. Expressive suppression in collectivist cultures built on interdependency is highly adaptive behavior it ensures harmony within relationships, avoids personal conflicts, and meets the requirement of social conformity imposed by the culture (Butler et al., 2007; Soto et al., 2011). Your finding that expressive suppression interacts with social support to increase maternal well-being serves as compelling evidence of cross-cultural dynamics, showing that suppression is an essential relational adaptation strategy for mothers coping with scarce joint-family living.

Hypotheses 5 and 6, which posited that emotion regulation strategies (cognitive reappraisal and expressive suppression) would moderate the relationship between spousal support and well-being, were not supported by the data. The statistical results indicated that these interaction effects were non-significant. This simply suggests that within the current sample, the positive association between spousal support and maternal well-being remains consistent regardless of the specific emotion regulation strategies employed by the mothers. Since these paths did not yield significant effects, no further theoretical interferences are drawn from them.

Limitations of Study

However, there are certain limitations that need to be addressed. For instance, the sample size used for this study ($N=200$) has been randomly selected from health institutions in District Bhakkar, Punjab, and it largely reflects the rural and suburban populations that experience resource constraints. Therefore, the results cannot be generalized to wealthy, highly educated women in urban areas of Pakistan. Lastly, the use of self-report psychological measures in Urdu can be biased towards socially desirable responses especially when dealing with culturally sensitive issues such as spousal satisfaction and repression of emotions.

Future Suggestions

Further research on this topic should incorporate longitudinal designs that will enable the tracing of changes and fluctuations in coping techniques and emotion regulation from the pre-pregnancy period till the first year postpartum. Such studies will be necessary to establish whether active coping techniques become adaptive with increased situational stability, as it was observed in the current research. In addition, using qualitative and quantitative methods of data collection simultaneously will provide additional insight into the lives of women in joint families. Further

research can incorporate different areas of Pakistan with comparison of various socio-economic groups urban, semi-urban and rural.

Conflict of Interest

The authors showed no conflict of interest.

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