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Self-efficacy and social support as mediators of mental health among abused women

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Abstract

Supportive counseling and facilitated referrals to support organizations have shown positive effects on mental health and coping with domestic and family violence. However, the reasons why and how such effects are significant remain unknown. The current paper used data from a randomized controlled trial of a psychosocial intervention implemented in Nepal among 140 abused pregnant women. The hypothesized mediating effects of self-efficacy and social support on mental health and quality of life of abused pregnant women were tested using serial mediation analyses. Significance of parameter estimates and bias-corrected 95% confidence intervals (CIs) for the indirect effects were generated using bootstrapping. The postintervention changes in self-efficacy and social support were found to have significant mediating effects on the relationship between the intervention and changes in both mental health and quality of life of participants post intervention. The positive effects on outcomes were seen at follow-up as well, though to a lesser extent. Further interventions should focus on enhancing abused women's self-efficacy and social support to ensure their positive mental health and better lives.

KEYWORDS
domestic violence, mediation analysis, mental health, pregnancy, self-efficacy, social support

Key points
- An individually delivered psychosocial intervention led to greater self-efficacy and better perceived social support among study participants.

- Self-efficacy and perceived social support mediated the effects of the psychosocial intervention on mental health and quality of life of pregnant women exposed to domestic and family violence.
- The mediating effects of these psychosocial factors on the mental health outcomes decreased over time, suggesting the need for follow-up sessions to ensure prolonged engagement with women exposed to domestic and family violence.

1 | INTRODUCTION

Domestic and family violence (DFV) often begins during pregnancy and early motherhood, or if it already exists, it is exacerbated during this time (James et al., 2013). For the purpose of this paper, DFV refers to a pattern of behaviors, including physical, sexual, and/or, psychological violence, perpetrated against a woman by her husband or someone in her husband's family (Sapkota et al., 2022).[1] This definition is consistent with the description provided by the World Health Organization [WHO] (2013). Existing literature well documents the adverse impact of DFV during and around pregnancy on mental health and well-being of victims (Finnbogadóttir et al., 2020; Tavoli et al., 2016). As a result, interventions aiming to improve psychosocial outcomes of DFV victims have been increasing, albeit with continuing methodological limitations and mixed findings (Daley et al., 2020; Sapkota et al., 2019a). Evaluation of such interventions focuses on whether treatment effects are achieved and rarely explores the theorized underlying causal mechanism (Daley et al., 2020; Sapkota et al., 2022. Literature suggests a need for robust evidence to identify the context under which these interventions work better (Ogbe et al., 2020; Sapkota et al., 2019a).

2 | BACKGROUND

Globally, 1% to 28% of women are subject to DFV during pregnancy (WHO, 2013), with a higher prevalence in developing countries (27.7%) compared to developed countries (13.3%) (James et al., 2013). In Nepal, almost one in four pregnant women experiences DFV (Rishal et al., 2017; Sapkota et al., 2021).

Despite evidence supporting the detrimental effects of DFV on women and children's health, ending a violent relationship is not a solution, nor a victim's choice, in many cases (Davies, 2019; WHO, 2013). Personal circumstances, including perspectives, risks, and priorities of victims of DFV, may influence their decision to leave or stay in the relationship (Davies, 2019). Pregnant women are often reluctant to leave their relationship because of physical, emotional, and economic stress associated with single parenthood (Schaefer et al., 2021). When dealing with the experience of DFV, victims often develop their personal strengths, resilience, and coping strategies, which can be adaptive (e.g., engaging with support networks) or maladaptive (e.g., self-guilt or engaging in risky health behaviors; Schaefer et al., 2021).

Evidence for the effectiveness of DFV support interventions, such as counseling, psychoeducation, and cognitive behavioral therapy, on psychological well-being of victims is growing in low- and middle-income countries (LMICs; Daley et al., 2020; Sapkota et al., 2019a). Brief advocacy interventions delivered at an individual level are not able to fix everything that the victim is experiencing (Rivas et al., 2015). Instead, such interventions should have an overall aim of helping victims to feel safe in their home environment and have good social support, improved coping with DFV, and better lives and well-being (Davies, 2019). It is essential to empower victims by acknowledging their strengths and offering relevant information, options, strategies, and resources to enhance their coping skills (Daley et al., 2020; Davies, 2019; Sapkota et al., 2019a).

Against this backdrop, a psychosocial intervention was trialed among DFV victims attending an antenatal clinic in Nepal to improve their mental health and help-seeking behaviors. This intervention involved three components: a single-session of counseling and education, an information booklet, and telephone support (Sapkota et al., 2019b). Although there were improvements in general self-efficacy, social support, mental health, and quality of life (QOL) among DFV victims who received this intervention (Sapkota et al., 2022, there has been no analysis of how this intervention worked.

Changes in the outcome variables because of the psychosocial intervention are presumed to involve changes in mediating variables, namely self-efficacy and social support. Some sociological theories and few studies conducted, mostly in developed countries (Sapkota et al., 2019a; Valpied et al., 2019), provide indirect evidence on mediating roles of these psychosocial variables on improving mental health of DFV victims (Reisenhofer et al., 2019; Sapkota et al., 2019a; Sullivan et al., 2013).

2.1 | Self-efficacy and mental health

Self-efficacy, a central concept of Social Cognitive Theory, refers to a person's ability or confidence in performing a particular behavior or action (Bandura, 2004; Benight & Bandura, 2004). Victims of DFV with low self-efficacy are found to have increased anxiety and depression symptoms (Lambert et al., 2013), whereas those with high self-efficacy have improved mental health and reduced depression scores (Lambert et al., 2013; Sullivan et al., 2013). Improving self-efficacy of victimized women can help them regain their sense of control, enhance their QOL and mental health, and enable them to create or maintain positive changes (Matheson et al., 2015; Reisenhofer et al., 2019). A study conducted among pregnant women in China reported that women with high self-efficacy could actively face

stressful life events and thus regulate their mood and prevent depression symptoms (Yu et al., 2020).

2.2 | Social support and mental health

Perceived social support is shown to have a positive link with improved mental health and well-being among victims of DFV (Beeble et al., 2009; Yu et al., 2020). Interventions focusing on supporting victims of DFV by improving their access to resources and coping strategies resulted in their better mental health outcomes (Ogbe et al., 2020). Social support is considered as a buffer against mental distress and believed to enable participants to optimize their capabilities by boosting their self-efficacy (Benight & Bandura, 2004; Ernsting et al., 2015). However, in an Australian study, women's perceived social support was not found to influence their process of making positive change against DFV (Reisenhofer et al., 2019).

3 | THIS STUDY

Mediation analyses are recommended for a better understanding of how and why certain interventions work, thus helping to maximize the efficiency and effectiveness of future programs (Hayes, 2013). Few studies have examined the possible pathways of positive impacts of psychosocial interventions on abused women, but they are mostly from high-income countries, are not conducted among pregnant women, and lack methodological rigor (Daley et al., 2020; Valpied et al., 2019). The authors did not find any research from low-income settings that had tested how psychosocial variables mediate the effects of exposure to a psychosocial intervention on the mental health improvements of abused pregnant women. This paper aimed to examine the mediating effects of self-efficacy and perceived social support on mental health and QOL among participants of a trial implemented in Nepal and to explore if such mediating effects persist over time. Elucidating the process by which the psychosocial intervention resulted in improved QOL and mental health would facilitate and guide successful replication or upscaling of interventions in multiple settings.

4 | METHODS

4.1 | Study design

The study used an individual randomized controlled design. Equal numbers of participants were allocated to either the intervention or control group using block randomization (block sizes of 2, 4, and 6). The use of block randomization reduces bias and ensures equal number of participants in both groups, particularly if a sample size is small (Sedgwick, 2014). The details of study procedures are published elsewhere (Sapkota et al., 2019b). The trial was approved by the Griffith University Human Research Ethics Committee (2018/227), Nepal Health Research Council (73/2018), and the Institutional Review Board of B.P. Koirala Institute of Health Sciences (BPKIHS; IRC/1250/018).

4.2 | Intervention description

The intervention used the Psychosocial Readiness Model (PRM) as a theoretical framework (Cluss et al., 2006). This model encompasses three internal factors, awareness, self-efficacy, and social support that need to work together to produce desired changes, while addressing the external factors posing challenges to the change process (Cluss et al., 2006). Several strategies suggested by Bandura (2012) were employed to improve general self-efficacy of women included in this trial. These included (1) encouraging participants to achieve their goals (performance accomplishments); (2) building confidence of participants by providing them with opportunities to learn from success stories (vicarious experience); (3) encouraging participants to make changes by providing verbal persuasion; and (4) supporting them to strengthen their physical and mental states (Bandura, 2012). With an intent of improving perceived social support, the participants were provided with four types of support: (1) appraisal support by providing information critical for self-evaluation; (2) emotional support by providing a favorable environment to share their experiences; (3) instrumental support by providing an information booklet, which served as a tangible and concrete learning resource; and (4) informational support by providing suggestions, options, and counseling.

A single-session counseling and education intervention, lasting around 1 hour, was implemented among 70 participants allocated to the intervention group (IG). Intervention participants were provided with information about DFV, its common types, and potential mental health consequences. They were also taught about a simple problem-solving approach, common stress management techniques, and strengthening their social support. The intervention was guided by motivational interviewing techniques where participants were asked open–ended questions and offered opportunities to discuss about their concerns and priorities. The counselor used reflective listening and summarized the key contents of the discussion at the end, which provided an opportunity to reinforce participants' learning and clarify any misconception that they had. Women were told that the person who uses violence needs to be ashamed of and is responsible for preventing or stopping the violence, not a victim who remains in a relationship or in contact, for whatever reasons. Given the brief nature of the intervention, it was not possible to discuss in detail on how women were currently coping or coped with the violence they have experienced. However, the counselor acknowledged the women's personal circumstances and helped them to recognize their strengths and skills and adopt effective coping strategies to deal with DFV.

Women were given an opportunity to consult with the counselor during the study period, if they needed further information regarding DFV or support in identifying the safety plan that best suits their circumstances or assistance in developing skills to maintain their good

health and well-being (Sapkota et al., 2019b). For women who were unable to initiate the discussion, as talking about personal experiences of DFV might cause distress, the discussion was facilitated with the examples included in the information booklet.

The booklet provided to the intervention participants included information about DFV, its mental health consequences, stress management and problem-solving techniques, and common safety planning behavior. To ensure confidentiality and safety of participants, the information booklet was given a neutral title and included general information regarding pregnancy and postpartum care in addition to the information on DFV and mental health. The participants allocated to the control group (CG) received standard prenatal care and a booklet containing general information about pregnancy and postpartum care and a referral list of support services/organizations working against DFV. This was in accordance to the WHO's guidelines of conducting intervention studies on violence against women (WHO, 2016).

4.3 | Data collection and sampling

Pregnant women attending an antenatal clinic of BPKIHS were screened in a confidential area against predetermined eligibility criteria: (a) aged 18 years and above, (b) been in a married relationship, (c) had experienced DFV at least once at some point in their lives, and (d) 24–34 weeks pregnant. The presence of DFV was assessed using the Abuse Assessment Screen, which is considered a valid and reliable tool for screening against DFV among pregnant women (McFarlane et al., 2002). Eligible participants completed baseline interviews with a research nurse and were then randomized equally to either the IG or CG.

A total of 625 women were screened, of whom 140 eligible women were recruited into the trial (70 participants in each group). Participants' age ranged from 18 to 44 years ($M = 25.51$, $SD = 5.26$). Most participants had completed their secondary level of education (54.3%, $n = 76$), and only 6.4% ($n = 9$) had completed a bachelor's degree or above. In terms of employment, only 37.1% ($n = 52$) reported having a personal source of income. More than two thirds ($n = 93$) of women were living in a joint family (i.e., a family that consists of two or three generations from the same paternal line and sharing cooking facilities). Of the 140 women included in the trial, 72 women had given birth to at least one child with the average number of children being one.

4.4 | Measures

A self-constructed questionnaire was used to assess sociodemographic variables (e.g., age, ethnicity, education, occupation, income, and family type), obstetric and neonatal variables (e.g., planned pregnancy, parity, mode of delivery, gestation week at birth, birth weight, and complications). The research nurse, who was unaware of the participants' allocation status, assessed outcomes three times using the same set of questionnaires; baseline or preintervention (T0), 4 to 6 weeks after the intervention (T1), and 6 weeks after birth of a baby (T2).

Anxiety and depression symptoms were measured using the 14-item Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). The scale consists of seven items to measure depression and seven to measure anxiety level. Items were self-reported on a four–point Likert scale ranging from 0 to 3. QOL was measured with the 26-item WHO Quality of Life Abbreviated Scale (WHO, 1998). The scale consists of four domains: physical, psychological, social, and environmental, and each item was rated on a scale of 1 to 5. Perceived social support was measured using the five-item Medical Outcomes Study-Social Support Scale, self-reported on a Likert scale from 1 to 5 (Sherbourne & Stewart, 1991). Participants' self-efficacy was measured with the 10-item Generalized Self-Efficacy Scale, self-reported on a four-point Likert scale ranging from 1 to 4 (Schwarzer & Jerusalem, 1995).

4.5 | Data analysis

All analyses were performed using SPSS (Version 26.0). Descriptive statistics, expressed as means and SDs, were computed for the outcomes and potential mediators at T0, T1, and T2. As change was of interest in the present analysis, residualized change scores were calculated for the potential mediators and outcome variables at both T1 and T2.

Creation of residualized change scores. Residualized change scores, which are frequently used in mediation analyses, represent the difference between the score at follow-up compared with what was predicted at baseline, thereby controlling for baseline scores (Mansell et al., 2016). They were calculated by running a linear regression with the follow-up score as the outcome and the baseline score as the predictor, and saving the residual values, which were then used in all subsequent analyses. Outliers were assessed using Mahalanobis, Cook's, and Leverage values and calculated using a linear regression analysis. Participants having outliers as determined by more than two of the aforementioned tests were removed from mediation analyses.

Serial mediation analyses (Model 6) were conducted using the PROCESS v3.5 for SPSS macro developed by Hayes (2013) using 10, 000 bootstrap samples. Figure 1 illustrates the generic model of the serial multiple mediation with two mediators. The independent variable (X) was dichotomous (control = 0 versus intervention = 1), and changes in QOL score (Δ QOL) and changes in anxiety and depression scores (Δ Anx and Δ Dep) were the dependent variables (Y). The age of the respondent was considered a covariate and adjusted during mediation analyses.

The following hypotheses were proposed:

1. Self-efficacy has a significant mediating relationship between the intervention and outcomes (anxiety, depression, and QOL) at both T1 and T2.
2. Social support has a significant mediating relationship between the intervention and outcomes (anxiety, depression, and QOL) at both T1 and T2.
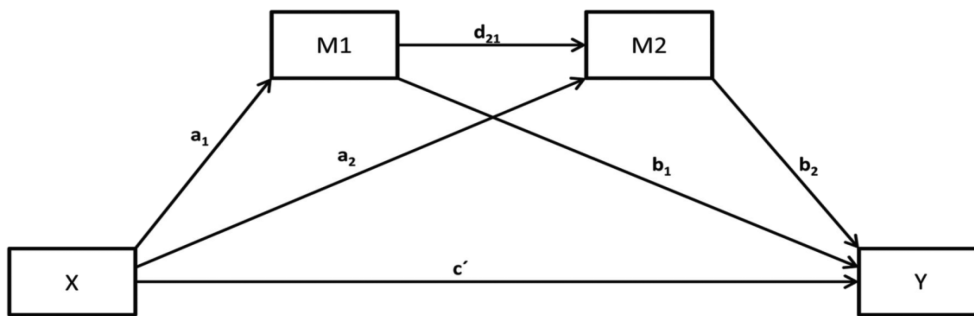
FIGURE 1 A hypothesized model showing relationship between independent variables, outcomes, and potential mediators

3. Social support has a significant serial mediating effect through self-efficacy on the relationship between the intervention and outcomes (anxiety, depression, and QOL).

Because mediation is a causal process, we assigned Mediator 1 (Δ M1) as changes in social support and Mediator 2 (Δ M2) as changes in self-efficacy. This serial multiple mediation model contains three indirect effects (Ind1, Ind2, and Ind3) and one direct effect, estimated as products of regression coefficients linking X to Y. The total indirect effect is equal to the sum of indirect effects and is constructed by multiplying the regression weights corresponding to each step: Ind1 $= X \rightarrow M1 \rightarrow Y$; Ind 2 $= X \rightarrow M2 \rightarrow Y$; and Ind3 $= X \rightarrow M1 \rightarrow M2 \rightarrow Y$. The indirect effect quantifies how much two cases that differ by a unit on X are estimated to differ on Y because of X's influence on M, which in turn influences Y. A p value of < 0.05 was considered statistically significant.

The bootstrapping method is advocated for testing mediation as it has fewer assumptions and therefore, is applicable in many situations (Hayes, 2013). It is a computer-intensive resampling technique that involves repeated sampling from the data set and estimating the indirect effect in each resampled dataset (Hayes, 2013). This technique is considered the best method over other methods to test the serial multiple mediating effects as it provides the most robust and reasonable way to construct confidence interval (CI) for the indirect effects (Fritz & MacKinnon, 2007; Taylor et al., 2008). The finding can be interpreted as significant if it does not include zero; positive if the bootstrap confidence interval (BCI 95%) is above zero and negative if the BCI 95% is below zero (Fritz & MacKinnon, 2007).

5 | RESULTS

Of the 70 IG participants, 63 completed the T1 survey and 51 completed the T2 survey. Of the 70 CG participants, 65 completed the T1 survey and 59 completed the T2 survey. The flow of participants through the trial and differences in outcome measures between those who were lost to follow-up and those retained in the study are described elsewhere (Sapkota et al., 2021). The outcome measures and potential mediators were compared from T0 to T1 and from T1 to T2 using paired t-tests for both groups. Means, SDs, and mean difference of outcomes are presented in Table 1. There were significant reductions in both anxiety and depression scores at T1, compared to

baseline values in the IG ($p < 0.01$), but not in the CG ($p > 0.05$). Similarly, intervention participants showed significant improvements in QOL, self-efficacy, and social support from T0 to T1 ($p < 0.001$), but there were no changes in the CG ($p > 0.05$). Compared to T1 values, intervention participants showed a further decrease in their anxiety scores at T2 ($MD = 1.44$, $SE = 0.40$, $p < 0.01$), but the depression scores did not reduce significantly at T2. Participants allocated to the CG showed a further increase in the QOL scores at T2 compared to T1 ($MD = -0.90$, $SE = 0.31$, $p < 0.01$). There were no significant changes in self-efficacy and social support at T2 compared to T1 values in either group.

5.1 | Mediating effect of social support and self-efficacy on mental health and QOL at T1

Mediation was tested by regressing the predictor variable (allocation to the psychosocial intervention) on changes in outcomes (anxiety, depression, and QOL), while including the proposed mediators (changes in self-efficacy and social support scores). Mediation analyses for residualized changes in self-efficacy and social support at T1 as mediators of the relationships between allocation to the psychosocial intervention and residualized changes in the outcome measures during the same time are shown in Figures 2–4.

The value of 0.82 for the a_1 path between the intervention allocation and social support can be interpreted as the change in social support between T0 and T1 being 0.82 units higher among the intervention participants compared to those in the CG. Similarly, the a_2 path of 0.39 can be interpreted as that IG participants had 0.39 units higher self-efficacy compared to those in the CG at T1. The b_1 path of -0.18 can be interpreted as that one unit change in social support resulted in 0.18 units reduction in anxiety change scores at T1. Likewise, the b_2 path of -0.24 indicates a reduction in anxiety scores by 0.24 units with one unit increase in change in self-efficacy. Similarly, one unit increase in change in social support improved self-efficacy by 0.39 units in the IG compared to the CG (see Figure 2).

Similarly, one unit increase in change in social support and self-efficacy at T1 was associated with 0.29 units and 0.24 reduction in depression scores at T1, respectively, among the intervention participants (see Figure 3).

A one unit increase in change in social support and self-efficacy at T1 among the intervention participants was associated with

Outcome measures	Group	Baseline score M (SD)	Change from T0 to T1 MD (SE)	Change from T1 to T2 MD (SE)
Anxiety	IG	9.61 (4.95)	3.84 (0.62)***	1.44 (0.40)**
	CG	8.49 (4.29)	0.60 (0.50)	0.96 (0.57)
Depression	IG	6.90 (3.67)	2.96 (0.51)***	0.43 (0.43)
	CG	6.10 (4.09)	−0.20 (0.46)	0.17 (0.49)
QOL	IG	13.50 (2.02)	−3.34 (0.31)***	−0.37 (0.23)
	CG	13.93 (2.28)	−0.36 (0.31)	−0.90 (0.31)**
Self-efficacy	IG	2.88 (0.69)	−0.57 (0.75)***	−0.01 (0.05)
	CG	3.04 (0.55)	−0.18 (0.06)**	0.11 (0.07)
Social support	IG	3.40 (0.90)	−0.86 (0.10)***	−0.05 (0.08)
	CG	3.68 (0.87)	−0.09 (0.11)	−0.09 (0.12)

Abbreviations: CG, control group; IG, intervention group; QOL, quality of life.
*p < 0.05; **p < 0.01; ***p < 0.001.

FIGURE 2 Serial mediation model for mediating effects of change in social support and self-efficacy on the relationship between intervention allocation and change in anxiety at postintervention (n = 136). Δ Residualized change. *p < 0.05. **p < 0.01. All values are standardized. Abbreviation: HADS, Hospital Anxiety and Depression Scale
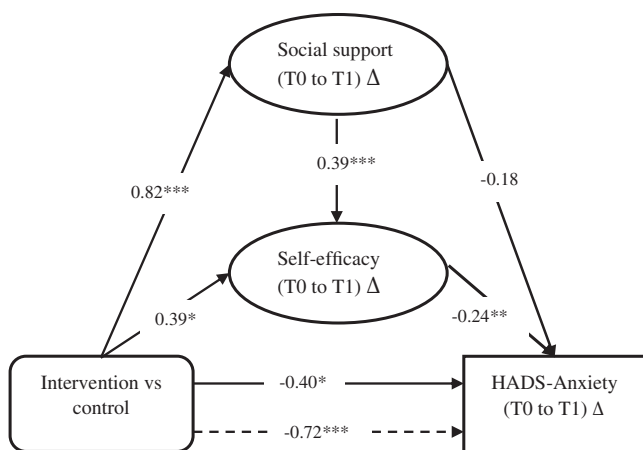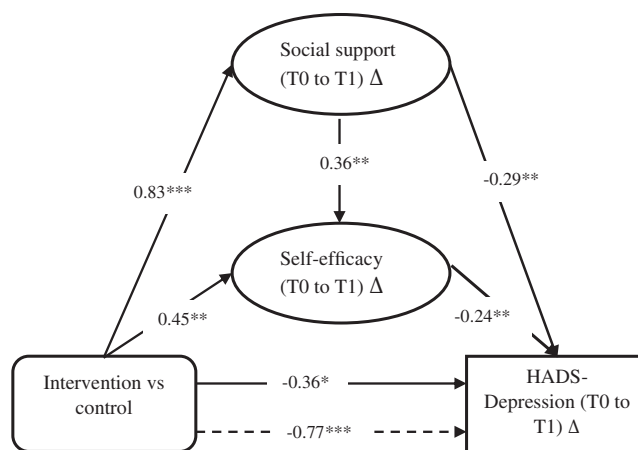

FIGURE 3 Serial mediation model for mediating effects of change in social support and self-efficacy on the relationship between intervention allocation and change in depression at postintervention (n = 136). Δ Residualized change. *p < 0.05. **p < 0.01. All values are standardized. Abbreviation: HADS, Hospital Anxiety and Depression Scale

0.44 units and 0.37 units increase in change in QOL scores at T1, respectively (see Figure 4).

Table 2 shows the total, direct, and indirect effects for these mediation paths. Bootstrapping was used to estimate the indirect effects of social support and self-efficacy. Two significant indirect paths from the intervention to change in anxiety scores at T1 were identified: through self-efficacy, the indirect effect was −0.10 (95% CI: −0.23, −0.01); and through social support and self-efficacy, the indirect effect was −0.08 (95% CI: −0.16, −0.02) However, the indirect effect on the change in anxiety scores at T1 through social support was not significant (−0.14 (95% CI: −0.35, 0.01). Similarly, for the change in depression scores at T1, three significant indirect paths were identified, through social support, the indirect effect was −0.24 (95% CI: −0.43, −0.09); through self-efficacy, the indirect effect was −0.11 (95% CI: −0.25, −0.02); and through social support and self-

efficacy, the indirect effect was −0.07 (95% CI: −0.14, −0.02). For the change in QOL scores at T1, three significant indirect paths were identified, through social support, the indirect effect was 0.37 (95% CI: 0.21, 0.55); through self-efficacy, the indirect effect was 0.15 (95% CI: 0.03, 0.29); and through social support and self-efficacy, the indirect effect was 0.11 (95% CI: 0.05, 0.19).

5.2 | Mediating effect of social support and self-efficacy on mental health and QOL at T2

Mediation analyses showing effects of the intervention on change in anxiety, depression, and QOL scores at T2 through changes in social support and self-efficacy at T2 were also conducted (see Table 3). The intervention had significant positive effects on the change in self-

efficacy and QOL scores from T1 to T2; however, there were no effects on the change in social support, anxiety, and depression scores. One unit change in social-support score was associated with
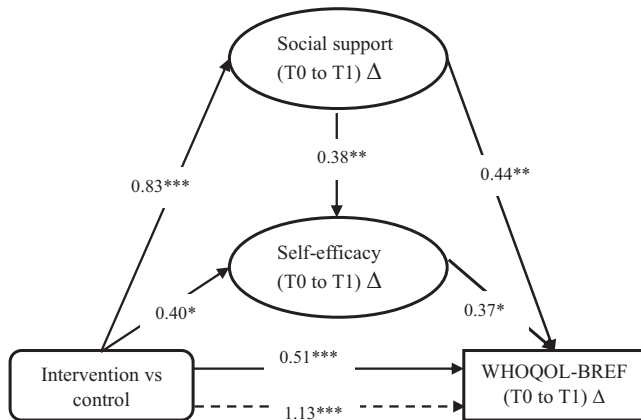
positive improvements in self-efficacy and outcome scores ($p < 0.05$). Total, direct, and indirect effects of the mediation model on the change in the outcome measures at T2 compared to T1 are shown in Table 2. At follow-up, the indirect effect from a group assignment to change in anxiety scores via self-efficacy was significant ($\beta = -0.21$; 95% CI: -0.40, -0.07). Similarly, the intervention had significant mediating effects on depression and QOL through self-efficacy ($\beta = -0.18$, 95% CI: -0.35, -0.05; and $\beta = 0.28$, 95% CI: 0.11, 0.47, respectively, see Table 2). However, the intervention did not have significant effects on the outcome variables via social support at T2. Similarly, the analyses did not reveal the serial mediation effects of social support through self-efficacy on any of the outcome variables.

FIGURE 4 Serial mediation model for mediating effects of change in social support and self-efficacy on the relationship between intervention allocation and change in QOL at post-intervention ($n = 135$). Δ Residualized change. $*p < 0.05$. $**p < 0.01$. All values are standardized. Abbreviation: WHOQOL-BREF, World Health Organization Quality of Life Abbreviated Scale

6 | DISCUSSION

Mediation analyses were used to understand the nature and extent of underlying causal pathways of the psychosocial intervention trialed in an antenatal setting in Nepal. This study showed that the level of self-efficacy and perceived social support significantly improved among intervention participants at both T1 and T2, compared to those in the CG. Changes in self-efficacy and social support were identified as

TABLE 2 Total, direct, and indirect effects of the mediation model on change in outcome measures

Effect	Change from T0 to T1		Change from T1 to T2	
	β (SE)	95% CI	β (SE)	95% CI
ΔHADS-anxiety				
Total (c)	−0.72 (0.16)	**−1.08, −0.46**	−0.39 (0.16)	**−0.72, −0.07**
Direct (c')	−0.40 (0.17)	**−0.74, −0.06**	−0.16 (0.15)	−0.46, 0.14
Indirect effects ($X \rightarrow M1 \rightarrow Y_1$) [†]	−0.14 (0.09)	−0.35, 0.01	−0.02 (0.04)	−0.12, 0.05
Indirect effects ($X \rightarrow M2 \rightarrow Y_1$) [†]	−0.10 (0.06)	**−0.23, −0.01**	−0.21 (0.09)	**−0.40, −0.07**
Indirect ($X \rightarrow M1 \rightarrow M2 \rightarrow Y_1$) [†]	−0.08 (0.04)	**−0.16, −0.02**	−0.01 (0.03)	−0.08, 0.04
ΔHADS-Depression				
Total (c)	−0.77 (0.16)	**−1.08, −0.46**	−0.50 (0.16)	**−0.82, −0.17**
Direct (c')	−0.36 (0.17)	**−0.68, −0.03**	−0.28 (0.15)	−0.58, 0.01
Indirect effects ($X \rightarrow M1 \rightarrow Y_2$) [†]	−0.24 (0.09)	**−0.43, −0.09**	−0.03 (0.04)	−0.13, 0.05
Indirect effects ($X \rightarrow M2 \rightarrow Y_2$) [†]	−0.11 (0.06)	**−0.25, −0.02**	−0.18 (0.08)	**−0.35, −0.05**
Indirect ($X \rightarrow M1 \rightarrow M2 \rightarrow Y_2$) [†]	−0.07 (0.03)	**−0.14, −0.02**	−0.02 (0.03)	−0.09, 0.03
ΔWHOQOL-BREF				
Total (c)	1.13 (0.14)	**0.85, 1.42**	0.24 (0.17)	−0.09, 0.57
Direct (c')	0.51 (0.11)	**0.28, 0.74**	−0.11 (0.12)	−0.35, 0.13
Indirect effects ($X \rightarrow M1 \rightarrow Y_3$) [†]	0.37 (0.09)	**0.21, 0.55**	0.05 (0.05)	−0.05, 0.18
Indirect effects ($X \rightarrow M2 \rightarrow Y_3$) [†]	0.15 (0.06)	**0.03, 0.29**	0.28 (0.09)	**0.11, 0.47**
Indirect ($X \rightarrow M1 \rightarrow M2 \rightarrow Y_3$) [†]	0.11 (0.04)	**0.05, 0.19**	0.04 (0.04)	−0.04, 0.13

Abbreviations: Δ, residualized change scores; β, standardized coefficients; c, Total effect of independent variable on dependent variable; c', direct effect of independent variable on dependent variable; CI, confidence interval; HADS, Hospital Anxiety and Depression Scale; M_1, Mediator 1 (Social support); M_2, Mediator 2 (Self-efficacy); WHOQOL-BREF, World Health Organization Quality of Life Abbreviated Scale; X, Intervention condition; Y, Dependent variable (Y_1, Δ anxiety, Y_2, Δ depression and Y3 = Δ quality of life).

[a]Values obtained from 10 000 bootstrap sampling; Bold indicates significant values.

TABLE 3 Mediating effect of change in social-support and self-efficacy on the relationship between the intervention and change in outcomes from T1 to T2

Model 1 (n = 133)	M1 (social support)		M2 (self-efficacy)		Y$_1$ (Δ anxiety)	
	β (SE)	95% CI	β (SE)	β CI	β (SE)	95% CI
X (Intervention)	0.08 (0.15)	−0.23, 0.38	0.48 (0.14) ***	**0.21, 0.75**	−0.14 (0.15)	−0.46, 0.14
M1 (Social support)	–	–	0.39 (0.08) ***	**0.24, 0.55**	−0.20 (0.09) *	**−0.37, −0.02**
M2 (Self-efficacy)	–	–	–	–	−0.42 (0.09) ***	**−0.61, −0.24**
Covariate (Age)	0.00 (0.02)	−0.03, 0.04	−0.01 (0.01)	−0.04, 0.02	−0.02 (0.02)	−0.05, 0.01
Model 1 Summary	$R^2 = 0.002$		$R^2 = 0.24$		$R^2 = 0.27$	
	$F(2, 130) = 0.08$		$F(3, 129) = 13.59^{***}$		$F(4, 126) = 12.01^{***}$	
Model 2 (n = 133)	M1 (Social support)		M2 (Self-efficacy)		Y$_2$ (Δ Depression)	
	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI
X (Intervention)	0.11 (0.16)	−0.20, 0.43	0.45 (0.13) **	**0.00, 0.18**	−0.28 (0.15)	−0.58, 0.01
M1 (Social support)	–	–	0.42 (0.07) ***	**0.28, 0.57**	−0.22 (0.09) *	**−0.39, −0.04**
M2 (Self-efficacy)			–	–	−0.38 (0.10) **	**−0.57, −0.19**
Covariate (Age)	−0.00 (0.02)	−0.04, 0.03	−0.01 (0.01)	−0.04, 0.01	−0.01 (0.01)	−0.04, 0.02
Model 2 Summary	$R^2 = 0.001$		$R^2 = 0.28$		$R^2 = 0.28$	
	$F(2, 130) = 0.27$		$F(3, 129) = 17.05^{***}$		$F(4, 128) = 12.76^{***}$	
Model 3 (n = 134)	M1 (Social support)		M2 (Self-efficacy)		Y$_3$ (Δ QOL)	
	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI
X (Intervention)	0.15 (0.16)	−0.16, 0.45	0.46 (0.14) *	**0.18, 0.73**	−0.11 (0.12)	**−0.35, 0.13**
M1 (Social support)	–	–	0.43 (0.08) ***	**0.27, 0.58**	0.33 (0.07) ***	**0.19, 0.47**
M2 (Self-efficacy)	–	–	–	–	0.58 (0.07) ***	**0.44, 0.73**
Covariate (Age)	−0.01 (0.02)	−0.04, 0.02	−0.01 (0.01)	−0.04, 0.02	−0.00 (0.01)	**−0.02, 0.02**
Model 3 Summary	$R^2 = 0.01$		$R^2 = 0.27$		$R^2 = 0.53$	
	$F(2, 131) = 0.68$		$F(3, 130) = 15.70^{***}$		$F(4, 129) = 37.05^{***}$	

Note: Bold indicates significant values.

Abbreviations: Δ, residualized change scores (T1 to T2); β, standardized coefficients; CI, confidence interval; M$_1$, Mediator 1 (Social support); M$_2$, Mediator 2 (Self efficacy); X, Intervention condition; Y, Dependent variable (Y$_1$, Δ anxiety, Y$_2$, Δ depression and Y3, Δ quality of life).

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

significant mediators of the effects of the intervention on mental health and QOL at T1, but the positive impacts reduced over time.

This study supports the use of motivational interviewing techniques to allow participants to openly discuss their concerns, which aligns to findings from a study by Valpied and colleagues (Valpied et al., 2019). Qualitative interviews with participants revealed that such approach helped them by increasing their knowledge on effective coping with DFV and managing mental health consequences of DFV (Sapkota et al., 2020). Such an increase in knowledge is critical in improving self-efficacy of women. With a high sense of self-efficacy, abused women develop optimistic beliefs about their abilities to cope with DFV and change their situation (Bandura, 2004). Such improved self-esteem would be critical in improving QOL of women and reducing their vulnerability to adverse mental health impacts.

Consistent with previous studies, this study supports the positive impact of perceived support from a therapeutic relationship on enhancing emotional well-being of DFV victims (Schaefer et al., 2021; Valpied et al., 2019). The use of tangible and intangible supports are considered critical in strengthening victims' self-esteem; diminishing their dependency; and helping them to feel connected, loved, and valued, which could improve their well-being, mental health, and access to resources (Salazar et al., 2012; Sullivan, 2018). However, Sullivan and Goodman (2019) assert that providing information about support services and encouraging them to use those services are not sufficient. Instead, individual and systems advocacy were recommended to assist DFV victims and work actively with them to ensure their access to and uptake of resources and opportunities (Schaefer et al., 2021; Sullivan & Goodman, 2019).

The use of serial mediation analyses supports the theory that perceived social support directly improves health outcomes and well-being and contributes indirectly by improving the self-efficacy behaviors of victims of DFV. Although these findings need replication, this study supports the use of the PRM in developing DFV interventions and is likely to strengthen methodological development in this area. This is especially valuable in LMICs where specialized community DFV support services are limited and DFV intervention research is emerging.

Effects of the psychosocial intervention on social support and self-efficacy were found to be diminishing over time. The counselor and the participants met only once during their prenatal hospital visit and a one-time visit might not be sufficient for sustaining improvements achieved. Despite having an opportunity to contact the counselor to get support against DFV, few women opted to do so. When they contacted, the primary reason was to seek information about the postpartum nutrition and child immunization, rather than seeking help for dealing with DFV (Sapkota et al., 2020). Further research is required to explore women's perspectives on how they can be supported in a better and more effective way. One possible approach would be developing interventions with multiple one-on-one follow-up sessions that would allow prolonged engagement with participants and more learning opportunities.

6.1 | Strengths and limitations

This study has addressed significant knowledge gaps on the mechanisms through which complex interventions operate, particularly in the field of DFV in low-income countries. This individual-level intervention provided women with relevant information and resources to help them feel better prepared to deal with DFV and adopt strategies to strengthen their safety and social support. With the use of a robust methodology, this study provides evidence on the role of improving social support and self-efficacy to improve mental health and QOL of pregnant women, which are among one of the most-at-risk groups for experiencing DFV. Improving self-efficacy and social support of victims should be included as important components of interventions targeting psychosocial outcomes among abused pregnant women. The use of a CG and multiple assessment points have added to the validity and robustness of the conclusions made.

Despite these strengths, the authors acknowledge some limitations. Data were collected using self-reported scales, which can lead to social-desirability bias, particularly in studies about sensitive issues, such as DFV and mental health. Further studies need to adopt multiple evaluation methods, including more objective methods. Future studies with a diverse sample and those implemented in multiple settings would help to strengthen and expand on current findings. Given the relative lack of DFV intervention research in Nepal, there is a constant need of process evaluations of further trials to expand on the existing evidence. DFV is a complex issue associated with several societal and family-level factors, which can act as risk or protective factors. Consideration of such factors, including the impact of partner's abuse or birth of a new baby or relocation to a new setting, was beyond the scope of this study. This limitation has been previously acknowledged in a paper based on the qualitative findings of the trial (Sapkota et al., 2020).

7 | CONCLUSION

Although there is evidence on the effectiveness of counseling interventions on mental health of DFV victims; the mechanism with which such interventions impact on their mental health and well-being is rarely studied. This study is the first study to examine the mediating roles of self-efficacy and social support on the relationship between the intervention and outcome measures among abused pregnant women in Nepal. Overall, these findings suggest that providing individual counseling and education to pregnant women exposed to DFV can improve their self-efficacy and make them feel supported, though there were gradual reductions in the scores over time. The findings also suggest that these changes mediated reductions in anxiety and depression symptoms, and improvements in QOL.

RELEVANCE FOR CLINICAL PRACTICE

This study supports that psychosocial interventions that target mental health and QOL of DFV victims need to consider women's skills and strengths and help them enhance those skills. It further highlights the need to provide continual support to victims to enable them to develop positive coping mechanisms against DFV. This study illustrates an important role that a trained healthcare provider can play in reducing the mental health impacts associated with DFV and improving the sense of support and well-being among DFV victims.

ENDNOTE
[1] Within the literature, DFV is frequently used interchangeably or with slight variations in meaning with the other common terms, "intimate partner violence," "partner abuse," or "domestic violence." In the site of this study, a woman often lives with her husband in his family home, and in-laws are also the common perpetrators of violence. Hence, DFV has been used throughout the paper.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available from the corresponding author upon reasonable request.

AUTHOR CONTRIBUTIONS
Study design: DS, KB, DA. Data collection: DS. Data analysis: DS, AS, CS. Manuscript writing: DS, KB, AS, CS, DA.

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