

RESEARCH ARTICLE

Changes in Adaptive Resources and Postpartum Distress: A Longitudinal Study from Pregnancy to Early Motherhood

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Introduction: The transition from pregnancy to early motherhood may increase vulnerability to psychological distress. Although prenatal distress and interpersonal support are established correlates of postpartum adjustment, less is known about broader adaptive strengths and their changes over time.

Aim: This longitudinal study examined whether Healthy Adult mode strengths during pregnancy and changes in these strengths were associated with postpartum psychological distress beyond prenatal distress, perceived social support, relationship satisfaction, age, and education.

Methods: The analytical sample comprised 102 women assessed during pregnancy (T1) and six weeks to six months postpartum (T2). Psychological distress was measured with the Depression Anxiety Stress Scales, and adaptive functioning with four domains of Bernstein's Strengths Scale: Self-directedness, Self-regulation, Connectedness, and Transcendence. Five-step hierarchical regression models examined baseline strengths and T2–T1 change scores.

Results: Self-directedness and Self-regulation declined significantly from T1 to T2, whereas distress did not change significantly at the group level. Prenatal distress alone explained 28.4% of the variance in postpartum distress. Baseline Self-directedness, Self-regulation, Connectedness, and Transcendence were associated with lower postpartum distress, β s = $-.28$ to $-.35$. Strength-change scores explained an additional 3.1% for Self-directedness, 10.7% for Self-regulation, and 3.9% for Connectedness, but only 1.8% for Transcendence, which was nonsignificant. Final models explained 38.7%–47.0% of postpartum distress variance; the Self-regulation model was strongest, $R^2 = .470$, adjusted $R^2 = .431$.

Conclusions: Postpartum distress was associated with prenatal distress, baseline adaptive resources, and concurrent changes in selected strengths. These findings are preliminary and do not establish temporal or causal effects.

Keywords: postpartum distress, pregnancy, Healthy Adult strengths, self-regulation, adaptive resources

Introduction

The postpartum period is a major developmental transition characterized by substantial biological, psychological, and relational change. For many women, it is a deeply meaningful and positive life phase, often associated with joy, bonding, and the emergence of a new maternal identity. At the same time, it is also a period of elevated vulnerability for mental health difficulties. Postpartum depression (PPD) is among the most common complications following childbirth, with major reviews typically placing prevalence between 13% and 19% (O'Hara & McCabe, 2013),

and a large global meta-analysis estimating a pooled prevalence of ~17% (Wang et al., 2021). Anxiety disorders are also common during pregnancy and the postpartum period, and anxiety frequently co-occurs with depressive symptomatology, indicating that postpartum distress is broader than depression alone (Falah-Hassani et al., 2017; Fawcett et al., 2019).

Postnatal mental health difficulties matter not only because of their effects on mothers' well-being but also because of their implications for caregiving and infant development. Postpartum depression has been associated with reduced maternal sensitivity, diminished emotional responsiveness, and less adaptive caregiving, while broader prenatal and postpartum maternal psychological distress has been linked to less favorable infant cognitive, behavioral, psychomotor, and socio-emotional outcomes (Kingston et al., 2012; O'Hara & McCabe, 2013; Slomian et al., 2019). Because early mother–infant interactions are foundational for later attachment organization (Ainsworth et al., 1978; Bowlby, 1982), the postpartum period is especially important from a developmental perspective.

Established evidence also indicates that postpartum distress is multifactorial. Reviews consistently identify prior depression, poor social support, intimate partner violence, sleep problems, stressful life events, family psychiatric history, and unintended pregnancy among the more robust risk factors, although the overall certainty of evidence is uneven across specific predictors (O'Hara & McCabe, 2013; Xu et al., 2026). Hungarian epidemiological data also indicate that postpartum depressive symptomatology is clinically relevant and is associated with prenatal depressive symptoms as well as relational and socioeconomic vulnerability (Nagy et al., 2011). This broader context is important because it suggests that postpartum distress is not the product of a single cause but emerges from the interaction of psychiatric vulnerability, relational stress, and contextual strain.

Against this background, postpartum adjustment may be understood not only through deficits and symptoms but also through adaptive psychological resources. This perspective is compatible with positive psychology more broadly (Seligman & Csikszentmihalyi, 2000) and with Bernstein's strengths-based schema therapy framework more specifically (Bernstein, 2021; Miklósi et al., 2024). In his book, *Building Strengths in Therapy*, Bernstein (2021) conceptualized adaptive functioning in terms of a Healthy Adult system supported by 16 personal strengths organized into four broader domains: self-directedness, self-regulation, connectedness, and transcendence. These dimensions refer, respectively, to the ability to set and pursue one's life course, regulate one's emotions, thoughts, impulses, and behavior, form meaningful and mutual relationships, and find meaning and purpose in life. Although this framework was not originally developed for postpartum research, it offers a plausible integrative model for studying how broad adaptive capacities may help mothers navigate the demands of early motherhood.

Among these domains, self-regulation appears especially central for the postpartum period. A recent systematic review concluded that emotion regulation is an important transdiagnostic factor in perinatal depression and anxiety: Maladaptive strategies such as rumination, avoidance, and non-acceptance are associated with higher symptom levels, whereas more adaptive regulation is associated with better adjustment (Verhelst et al., 2024). Similarly, Haga and colleagues (2012), in a longitudinal sample of 737 new mothers, found that cognitive emotion regulation strategies predicted postpartum depressive symptoms over time together with breastfeeding self-efficacy and social support. These findings suggest that postpartum distress may depend not only on baseline symptom burden but also on whether mothers are able to maintain effective emotional self-regulation as the demands of early motherhood accumulate.

The domains of self-directedness and connectedness can also be linked to established empirical literature. From the perspective of self-determination theory (Brenning & Soenens, 2017), autonomy, competence, and relatedness are basic psychological needs, and their satisfaction appears relevant during the transition to motherhood. Gauthier and colleagues (2010) reported longitudinal associations between competence-, relatedness-, and autonomy-related processes and women's depressive symptoms during the transition to motherhood. Brenning and Soenens (2017) likewise found that prenatal need satisfaction and especially need frustration were prospectively related to postnatal depressive symptoms and early parenting behaviors. This line of work suggests that maternal adjustment depends not only on changes in depressive, anxiety, and stress-related symptoms but also on the extent to which women retain a sense of agency, efficacy, and relational security during the postpartum period.

This interpretation is reinforced by research on self-efficacy and social support. Maternal self-efficacy has been associated with better postnatal adjustment, while perceived social support has consistently emerged as a protective factor in relation to postpartum depressive symptomatology. Dennis and Letourneau (2007) found that both higher global and relationship-specific support predicted lower postpartum depressive symptomatology, and Leahy-Warren and colleagues (2012) similarly reported that social support and maternal parental self-efficacy were negatively associated with postnatal depression in first-time mothers. More recently, Brandão and colleagues (2024) showed that the association between lower social support and higher postpartum depressive symptoms

was partly mediated by emotion regulation difficulties, suggesting that close relationships may protect mothers in part by helping sustain self-regulatory functioning under stress. Hungarian population-based findings likewise underscore the importance of the interpersonal context, with psychosocial and relational factors contributing substantially to postpartum depressive risk (Kozinszky et al., 2011). Findings also suggest that perceived social support may buffer the adverse psychological correlates of maternal depressive and anxiety symptoms in the perinatal period (Lefkovich et al., 2018).

The fourth domain, transcendence, is less strongly anchored in the postpartum literature than the other three domains. In Bernstein's model, transcendence refers to strengths such as gratitude and wisdom, that is, a broader orientation toward meaning, perspective, and value rather than immediate symptom control (Bernstein, 2021; Miklósi et al., 2024). At present, the postpartum evidence base for this domain is relatively limited compared with the literature on emotion regulation, needs satisfaction, or social support. Religiousness and spirituality (Cheadle et al., 2015; Cheadle et al., 2018) were identified as important resources. More specifically, higher levels of forgiveness (both self and other) predicted lower postpartum depression and better quality of life, even when controlling for other risk factors such as early trauma or demographic disadvantages (Handelzalts et al., 2020). Research on psychological growth after childbirth suggests that appreciation of life may emerge as a salient positive outcome of the postpartum transition, particularly among women facing childbirth-related stress, although some findings indicate that it may also reflect a coping response under emotional strain (Babu et al., 2022; Berman et al., 2021; Nishi & Usuda, 2017). Thus, transcendence should be treated more cautiously in the present context: as a theoretically relevant but empirically less developed domain of adaptive functioning rather than a strongly established predictor of postpartum mental health.

Taken together, these findings point toward a multidimensional system of protective factors. However, much of the existing research has focused either on risk factors or on isolated protective variables. Less is known about whether broader adaptive resource domains can be meaningfully tracked across time in the postpartum period and whether reductions in these capacities are associated with baseline-adjusted postpartum distress over and above baseline symptom levels.

An important implication of Bernstein's (2012) framework is that adaptive strengths are not necessarily mobilized automatically, even when they are present. Bernstein argued that people often possess more strengths than they consciously recognize and tend to underutilize these capacities in everyday life. This tendency may become especially pronounced under conditions of stress, when attention is increasingly drawn to negative events, distress, and dysfunctional reactions rather than to positive inner resources. In this sense, adversity may not only reveal vulnerability but may also interfere with the recognition and use of existing adaptive capacities. Applied to the transition from pregnancy to the postpartum period, this perspective suggests that increasing maternal demands may contribute not only to distress but also to the underutilization or reduced availability of Healthy Adult strengths over time.

The Purpose of the Current Study

Previous research has identified prenatal psychological distress, perceived social support, and relationship quality as important correlates of postpartum adjustment. However, these studies have generally focused on symptoms, interpersonal resources, or individual protective factors separately. Less is known about whether broader domains of adaptive functioning contribute to postpartum adjustment beyond these established factors. The present study therefore examined four domains derived from Bernstein's strengths framework for the Healthy Adult mode – Self-directedness, Self-regulation, Connectedness, and Transcendence – in relation to psychological distress across the transition from pregnancy to early motherhood.

We expected that higher perceived social support and better relationship satisfaction during pregnancy would be associated with lower postpartum distress and that prenatal distress would remain a substantial predictor of postpartum distress. Beyond these established correlates, we hypothesized that higher prenatal levels of each Healthy Adult strength domain would be prospectively associated with lower postpartum distress. We further expected that greater decreases in Self-directedness, Self-regulation, Connectedness, and Transcendence from pregnancy to the postpartum assessment would be associated with higher baseline-adjusted postpartum distress and would explain additional variance beyond prenatal distress, age, education, perceived social support, relationship satisfaction, and the corresponding baseline strength level. Because changes in strengths and postpartum distress were assessed across the same T1–T2 interval, these change-score associations were interpreted as reflecting parallel changes rather than temporal or causal effects.

Methods

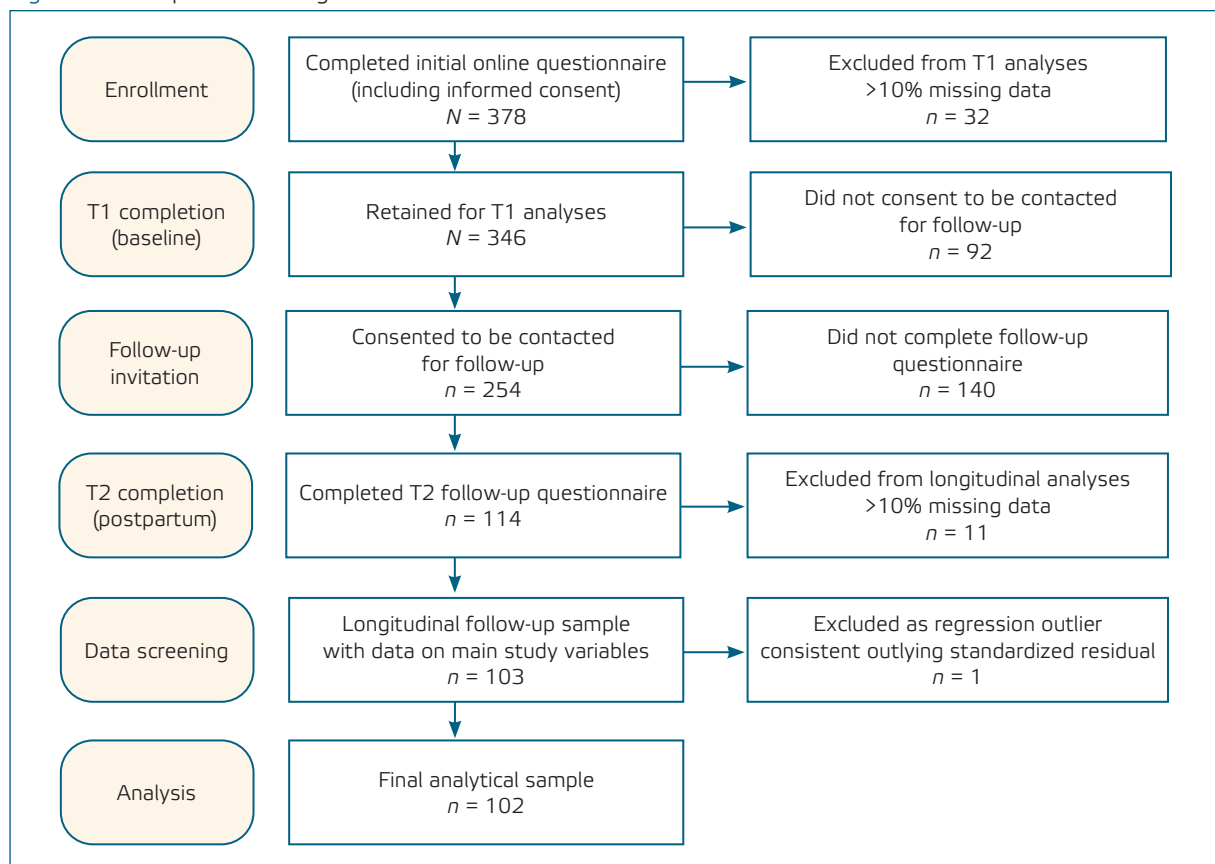
Participants and Data Collection

The present study was conducted as the postpartum follow-up of a broader longitudinal research project examining pregnant women's psychological well-being, personal strengths, perceived social support, and relationship satisfaction, as well as their implications for later parental adjustment and the mother–infant relationship (Vasvári & Miklósi, 2025). Ethical approval for the project was obtained from the Institutional Research Ethics Committee of the Institute of Psychology, Eötvös Loránd University (No. 2023/53-2). Pregnant women were recruited through prenatal social media groups and maternal health networks. Recruitment started from the 12th week of gestation onward in order to avoid the ethically sensitive early gestational period and to ensure a more stable baseline assessment. Participants were eligible if they reported that they were not under neurological or psychiatric treatment at the time of the study. Before participation, all respondents provided informed consent after receiving detailed information about the aims of the study, the voluntary nature of participation, the anonymity of the data collection, and the confidential handling of the data. Data were collected through an online questionnaire administered on the Qualtrics platform.

In the prenatal wave, 378 women completed the questionnaire; after excluding cases with more than 10% missing data, 346 pregnant women were retained for analysis. A subset of 254 women consented to be contacted again for follow-up assessment, of whom 114 filled out the questionnaire. Data from 11 participants were excluded because of > 10% missing data. Thus, the longitudinal follow-up sample consisted of 103 women with data on the main study variables at both time points.

Before the main analyses, regression diagnostics identified one case with a consistently outlying standardized residual (> 3) across the regression models. To apply the same analytical sample across the reported analyses, this case was excluded, resulting in a final analytical sample of 102 participants (Figure 1).

Figure 1. Participant Flow Diagram



Note. T1 = pregnancy baseline (from 12th gestational week onward); T2 = postpartum follow-up (six weeks to six months after childbirth).

The present analyses are based on the longitudinal subsample who also participated in the postpartum assessment. In the second wave (T2), participants completed a follow-up online questionnaire six weeks to six months after childbirth. Thus, the design allowed the examination of how strengths assessed during pregnancy, and their changes from pregnancy to the postpartum period, were related to later postpartum distress.

Demographic characteristics were assessed at T1. In the final analytical sample ($N = 102$), participants' mean age was 33.50 years ($SD = 4.83$, range = 22–45). Thirteen women (12.7%) reported a medium level of education, and 89 women (87.3%) reported a high level of education. All participants resided in Hungary; 65 women (63.7%) lived in the capital city, while 37 women (36.3%) lived outside the capital. Forty-five women (44.1%) were not working at the time of the first assessment, whereas 57 women (55.9%) were working. All participants reported being in a relationship, and 93 women (91.2%) were married. Subjective financial status was reported as good by 12 women (11.8%) and satisfactory by 90 women (88.2%). Seventy women (68.6%) reported that this was their first baby, whereas 32 women (31.4%) had previous childbirth experience. Gestational week at T1 was available only for a subset of the longitudinal follow-up sample. Among follow-up completers with available data ($n = 66$), gestational week ranged from 12 to 40 weeks ($M = 30.01$, $SD = 7.00$). According to the coded trimester variable, 20 participants (30.3% of valid cases) were in the second trimester of pregnancy, and 46 participants (69.7% of valid cases) were in the third trimester.

Data on perinatal complications were assessed at T2 and were available for 100 participants; of these, 32 women (32.0%) reported a perinatal complication, and 68 women (68.0%) did not. Postpartum assessment timing was available for 69 participants; among these women, the T2 questionnaire was completed between 39 and 193 days after childbirth.

To examine potential attrition bias, women who completed the follow-up assessment were compared with those who did not complete the follow-up questionnaire on baseline demographic and study variables. Follow-up completers were significantly older than non-completers with a small-to-moderate effect size. They were also more likely to have a high educational level; however, the effect size was small. Both differences remained significant after Bonferroni correction across the attrition comparisons. No other continuous baseline study variable or categorical demographic variable differed significantly between completers and non-completers after correction. Full attrition analyses are presented in [Appendix Table 1](#).

Measures

Perceived Social Support

Perceived social support was assessed at baseline (T1) using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988; Hungarian adaptation: Papp-Zipernovszky et al., 2017). The MSPSS is a 12-item measure comprising three four-item subscales assessing perceived support from family, friends, and a significant other. The Hungarian version (Papp-Zipernovszky et al., 2017) contains 10 items rated on a 5-point Likert-type scale ranging from 1 (“not at all agree”) to 5 (“totally agree”). We used the total score (sum of the item scores), with higher scores indicating greater overall perceived social support. In our data, the Cronbach's alpha of the MSPSS was excellent ([Table 1](#)).

Relationship Satisfaction

Relationship satisfaction was measured at T1 using the Relationship Assessment Scale (RAS; Hendrick, 1988; Hungarian adaptation: Martos et al., 2014). The RAS is a 7-item unidimensional measure assessing global relationship satisfaction. Items are rated on item-specific 5-point response scales ranging from 1 to 5, with higher responses indicating more positive evaluations of the relationship after reverse-scoring the negatively worded items. The total score (sum of the item scores) was used.

In previous studies, both the original and the Hungarian version showed good psychometric properties (Hendrick, 1998; Martos et al., 2014). In our data, the internal consistency of the scale was good ([Table 1](#)).

Psychological Distress

Depressive symptoms, anxiety, and stress were assessed both at T1 and T2 using the Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995). The DASS consists of 21 items measuring three subscales: depression, anxiety, and stress. Participants rated the extent to which each statement applied to them over the past week

on a 4-point Likert scale ranging from 0 (“did not apply to me at all”) to 3 (“applied to me very much or most of the time”). Psychometric properties of the Hungarian version have been reported by Horváth (2022). We used the total score (sum of the item scores), where higher scores indicate greater psychological distress. The internal consistencies of the scale were excellent at both T1 and T2 (Table 1).

Personal Strengths

Personal strengths were measured both at baseline and follow-up using the Bernstein’s Strengths Scale (BSS; Bernstein, 2021). The 48 items of the BSS assess 16 strengths associated with the Healthy Adult mode, organized into four higher-order domains: self-directedness, self-regulation, connectedness, and transcendence. Items are rated on a 5-point Likert-type scale ranging from 1 (“not true”) to 5 (“extremely true”). Though the Bernstein’s Strengths Model is widely used in clinical settings (Bernstein, 2021), empirical evidence on the psychometric properties of the BSS remains limited. To date, the principal published psychometric investigation has examined the Hungarian version developed by our research group (Miklósi et al., 2024). For the present analyses, we used the four theoretically derived BSS domains rather than the 16 narrower strength subscales. This decision was made because the study hypotheses concerned broad Healthy Adult capacities and because the longitudinal analytical sample was too small to support stable modelling of all 16 subscales separately. The practical use of the four domain scores (sum scores) was additionally examined in the full prenatal sample using confirmatory factor analysis, as described in the Statistical Analyses section. The four subscales showed good to excellent internal reliability (Table 1).

Statistical Analyses

Data were analyzed using IBM SPSS Statistics for Windows, Version 26.0. Descriptive statistics are reported. Internal consistency was assessed using Cronbach’s alpha.

To evaluate the practical use of the four theoretically defined BSS domains, a hierarchical confirmatory factor analysis was conducted in the full prenatal sample ($N = 346$) using JASP (Version 0.17.3). The model specified the 16 first-order strengths as indicators of four second-order domains: Self-directedness, Self-regulation, Connectedness, and Transcendence. Because the BSS items were ordinal, the model was estimated using diagonally weighted least squares (DWLS) based on a polychoric correlation matrix. Model fit was evaluated using the chi-square statistic, comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA) with its 90% confidence interval, and standardized root mean square residual (SRMR).

Attrition analyses compared all follow-up completers ($n = 103$) with non-completers on baseline continuous and categorical variables; the single case subsequently excluded based on regression diagnostics was retained in these analyses. Skewness and kurtosis values were inspected to evaluate distributional characteristics. T1 and T2 DASS showed moderate positive skewness (skewness = 0.93 and 0.82; kurtosis = 0.33 and 0.11, respectively). The BSS domains showed small to moderate skewness and kurtosis at both T1 (skewness range = -0.77 to -0.05 ; kurtosis range = -0.32 to 0.43) and T2 (skewness range = -0.92 to 0.13 ; kurtosis range = -0.56 to 0.56). These values did not indicate severe departures from normality and supported the use of parametric analyses (Table 1). Bivariate associations between background variables and the study variables were examined using Pearson’s correlations for continuous variables and independent-samples t -tests for categorical variables. Paired-sample t -tests were used to assess differences in study variables at baseline and follow-up. Throughout bivariate analyses, Bonferroni corrections were used for multiple statistical tests.

Because baseline assessment took place across a broad pregnancy window, gestational week at T1 was examined in preliminary correlational analyses. These analyses were conducted both in the full baseline sample and in the longitudinal follow-up sample to evaluate whether pregnancy-stage variability was associated with baseline distress, perceived social support, relationship satisfaction, or the four BSS domains. Gestational week was not included as a covariate in the primary regression models because it was available only for a subset of participants.

The number of days elapsed since childbirth was also examined in preliminary correlational analyses because the postpartum assessment window was relatively broad. This variable was available for 69 participants only; therefore, it was not included in the primary regression models in order to avoid a substantial reduction in sample size. Its associations with the main study variables are reported in the Results section and considered in the Limitations. In addition, timing-adjusted sensitivity analyses were conducted in the subsample where postpartum assessment time was available ($n = 69$). In these models, the number of days elapsed since childbirth was entered as an additional covariate together with age and education. These analyses were used to examine whether heterogeneity in postpartum assessment timing influenced the main regression findings.

To examine the unique contribution of baseline distress, social protective factors, initial strengths, and change in strengths to postpartum distress, controlling for age and education, a series of five-step hierarchical multiple regression analyses were conducted with T2 DASS as the dependent variable. A separate model was estimated for each strength factor. In each model, predictors were entered in the following order:

Step 1: T1 DASS

Step 2: age and education

Step 3: MSPSS and RAS

Step 4: the T1 level of the focal strengths factor

Step 5: the change score of the same strengths factor from T1 to T2.

Change scores were computed as the difference between T2 and T1 values for each strength factor. Accordingly, a negative value indicated a decline from T1 to T2.

In the regression models, T1 DASS was entered in the first step as a baseline distress indicator, functioning as an autoregressive control. Accordingly, subsequent predictors were interpreted as explaining additional variance in T2 distress beyond prenatal distress. The analyses were controlled for age and education (Step 2) and initial interpersonal protective factors (Step 3). Baseline strength variables were treated as prospective predictors because they were assessed during pregnancy. In contrast, strength change scores were interpreted as indicators of change occurring across the same interval as the change in distress. Therefore, the coefficients for strength change scores were interpreted as associations between parallel changes rather than as evidence of temporal prediction.

Results

Preliminary Analyses

Descriptive statistics and reliabilities of study variables are presented in Table 1.

Table 1. Descriptive Statistics and Reliabilities

Variable	α	Min	Max	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
Age (years)	NA	22	45	33.50	4.83	0.14	-0.45
MSPSS	.90	21	50	42.94	6.21	-1.18	1.39
RAS	.86	17	35	31.99	3.58	-2.06	5.16
T1 DASS	.91	1	43	13.97	9.33	0.93	0.33
T2 DASS	.92	0	44	14.39	9.69	0.82	0.11
T1 BSS Self-directedness	.90	23	70	53.85	9.08	-0.71	0.43
T1 BSS Self-regulation	.88	29	75	53.90	8.80	-0.05	-0.18
T1 BSS Connectedness	.84	34	60	50.32	6.30	-0.54	-0.32
T1 BSS Transcendence	.85	13	30	25.03	3.98	-0.77	-0.07
T2 BSS Self-directedness	.89	20	70	51.90	9.30	-0.41	0.34
T2 BSS Self-regulation	.88	24	75	50.52	9.23	0.13	0.41
T2 BSS Connectedness	.84	32	60	49.41	6.58	-0.46	-0.56
T2 BSS Transcendence	.84	11	30	24.61	4.18	-0.92	0.56
Δ BSS Self-directedness (T2-T1)	NA	-21	18	-1.95	6.65	0.08	0.64
Δ BSS Self-regulation (T2-T1)	NA	-23	12	-3.38	5.98	-0.04	0.64
Δ BSS Connectedness (T2-T1)	NA	-14	10	-0.91	4.51	-0.41	0.08
Δ BSS Transcendence (T2-T1)	NA	-8	7	-0.42	2.82	0.12	0.49

Note. *N* = 102. DASS: Depression Anxiety Stress Scale; RAS: Relationship Assessment Scale; MSPSS: Multidimensional Scale of Perceived Social Support; BSS: Bernstein's Strengths Scale. Δ scores are coded T2 - T1; negative values indicate decline.

Associations with Sociodemographic, Perinatal, and Assessment-Timing Variables

Age was not related to any of the main study variables, including T2 DASS scores ($r = -.01$, $p = .945$). Similarly, level of education, living in the capital, subjective financial status, marital status, first-birth experience, and perinatal complication were likewise not significantly associated with T2 DASS in the available bivariate analyses.

Gestational week at T1 was examined to evaluate whether variability in baseline pregnancy timing was associated with the main baseline variables. In the full baseline sample, gestational week was not significantly associated with perceived social support, relationship satisfaction, T1 DASS, or any of the four BSS domains ($r_s = -.04$ to $.13$, $p_s = .108$ to $.913$). The same pattern was observed among follow-up completers: Gestational week was not significantly associated with perceived social support, relationship satisfaction, T1 DASS, or baseline BSS domains ($r_s = -.13$ to $.16$, $p_s = .207$ to $.935$). Thus, although the baseline assessment covered a broad pregnancy window, the available data did not suggest that gestational timing was systematically related to baseline distress or strengths.

Postpartum timing was available for 69 participants. The number of days elapsed since childbirth was not significantly associated with T2 DASS, the T2 strength domains, or the strength change scores. At the conventional unadjusted significance level, days since childbirth was moderately positively associated with maternal age, $r = .29$, $p = .015$; however, this association did not remain significant after correction for multiple testing. These findings suggested that postpartum timing was unlikely to have substantially influenced the main strength–distress associations, although the limited availability of this variable precluded its inclusion in the primary regression models.

Confirmatory Factor Analysis of the BSS

The hierarchical confirmatory factor analysis conducted in the full prenatal sample ($N = 346$) provided support for the practical use of the four theoretically defined BSS domains. The model specified the 16 first-order strengths as loading on four second-order domains and showed acceptable-to-good global fit, $\chi^2(1058) = 1849.46$, $p < .001$, CFI = .970, TLI = .968, RMSEA = .047, 90% CI [.043, .050], and SRMR = .075. The first-order strengths generally loaded on their theoretically assigned higher-order domains. These findings supported the use of Self-directedness, Self-regulation, Connectedness, and Transcendence as parsimonious indicators of Healthy Adult functioning in the present analyses.

Bivariate Relationships

Postpartum distress was moderately and positively associated with prenatal distress, indicating temporal continuity in psychological distress from pregnancy to the postpartum period.

T2 DASS was negatively associated with all four Healthy Adult strength domains measured both during pregnancy and at postpartum follow-up. Thus, higher levels of Self-directedness, Self-regulation, Connectedness, and Transcendence at both time points were related to lower postpartum distress (medium to large effects). Among these associations, the strongest negative correlation was observed between T2 DASS and T2 Self-regulation (large effect).

Prenatal distress was negatively associated with perceived social support, relationship satisfaction, and all four baseline strength domains. Effect sizes were medium. It was also moderately and negatively associated with each of the four strength domains measured at T2. Perceived social support and relationship satisfaction showed positive associations with several baseline and follow-up strength domains, although not all of these associations remained significant after Bonferroni correction.

The strength change scores were also examined in relation to T2 DASS and the corresponding baseline strength levels. Greater decreases in the four strength domains were generally associated with higher T2 DASS, but these bivariate correlations did not remain significant after correction for multiple testing. Correlations between baseline strength levels and their corresponding change scores were negative and small to moderate in magnitude. After Bonferroni correction, only the association between baseline Self-directedness and change in Self-directedness remained significant (medium effect).

Finally, the four strength change scores were moderately to strongly positively intercorrelated, and all six associations remained significant after correction. This indicates that decreases across the different Healthy Adult domains tended to co-occur. Full correlation coefficients are presented in [Tables 2a](#) and [2b](#).

Table 2a. Bivariate Relationships of Study Variables (Pearson's *r*)

	2	3	4	5	6	7	8	9	10	11	12	13
1. Age (years)	-.17	-.22	.05	-.01	.09	.10	.13	-.02	.09	.11	.17	.05
2. MSPSS	—	.34*	-.41*	-.27	.36*	.40*	.27	.44*	.30	.31	.19	.29
3. RAS		—	-.45*	-.11	.38*	.35*	.24	.46*	.30	.25	.18	.34*
4. T1 DASS			—	.53*	-.36*	-.53*	-.45*	-.48*	-.35*	-.45*	-.42*	-.41*
5. T2 DASS				—	-.35*	-.45*	-.45*	-.46*	-.42*	-.59*	-.51*	-.47*
6. T1 BSS Self-directedness					—	.79*	.56*	.67*	.74*	.61*	.36*	.44*
7. T1 BSS Self-regulation						—	.58*	.67*	.66*	.78*	.45*	.51*
8. T1 BSS Connectedness							—	.65*	.49*	.57*	.76*	.51*
9. T1 BSS Transcendence								—	.62*	.64*	.50*	.76*
10. T2 BSS Self-directedness									—	.79*	.57*	.65*
11. T2 BSS Self-regulation										—	.62*	.67*
12. T2 BSS Connectedness											—	.63*
13. T2 BSS Transcendence												—

Note. *N* = 102. DASS: Depression Anxiety Stress Scale. RAS: Relationship Assessment Scale. MSPSS: Multidimensional Scale of Perceived Social Support. BSS: Bernstein's Strengths Scale. T1: baseline ($\geq$ 12-week pregnancy). T2: follow-up (six weeks to six months postpartum). * $p < .0006$ (after Bonferroni correction $\alpha' = .05/78 = .0006$)

Table 2b. Bivariate Relationships of Study Variables and Difference Scores (Pearson's *r*)

	14	15	16	17
1. Age (years)	.01	.02	.07	.10
2. MSPSS	-.06	-.11	-.11	-.20
3. RAS	.05	.12	.19	.16
4. T1 DASS	.00	.07	.02	.07
5. T2 DASS	-.11	-.25	-.12	-.04
6. T1 BSS Self-directedness	-.33*	-.23	-.25	-.29
7. T1 BSS Self-regulation	-.17	-.27	-.16	-.19
8. T1 BSS Connectedness	-.08	.03	-.29	-.16
9. T1 BSS Transcendence	-.05	-.01	-.17	-.28
10. T2 BSS Self-directedness	.39*	.25	.15	.09
11. T2 BSS Self-regulation	.27	.39*	.11	.10
12. T2 BSS Connectedness	.30	.30	.40*	.22
13. T2 BSS Transcendence	.30	.28	.21	.41*
14. Δ BSS Self-directedness (T2–T1)	—	.66*	.56*	.52*
15. Δ BSS Self-regulation (T2–T1)		—	.40*	.43*
16. Δ BSS Connectedness (T2–T1)			—	.55*
17. Δ BSS Transcendence (T2–T1)				—

Note. *N* = 102. DASS: Depression Anxiety Stress Scale. RAS: Relationship Assessment Scale. MSPSS: Multidimensional Scale of Perceived Social Support. BSS: Bernstein's Strengths Scale. T1: baseline ($\geq$ 12-week pregnancy). T2: follow-up (six weeks to six months postpartum).

* $p < .0009$ (after Bonferroni correction $\alpha' = .05/58 = .0009$).

The Effect of Time on Study Variables

Paired-samples tests were conducted to examine changes in DASS scores and the four strength domains between T1 and T2. The results indicated a significant decrease in Self-directedness (small effect) and Self-regulation (medium effect). In contrast, the decrease in Connectedness and Transcendence did not reach statistical significance. At the group level, DASS scores did not differ significantly between the two time-points (Table 3).

Table 3. Paired-Samples Tests for T1–T2 Change

Variable	Mean difference (SD)	95% CI	t	df	p	Hedges' g [95% CI]
DASS	0.42 (9.20)	[-1.39, 2.23]	0.46	101	.644	0.05 [-0.15, 0.24]
BSS Self-directedness	-1.95 (6.65)	[-3.26, -0.65]	-2.97	101	.004	-0.29 [-0.49, -0.09]
BSS Self-regulation	-3.38 (5.98)	[-4.56, -2.21]	-5.71	101	< .001	-0.56 [-0.79, -0.35]
BSS Connectedness	-0.91 (4.51)	[-1.80, -0.03]	-2.04	101	.044	-0.20 [-0.40, -0.01]
BSS Transcendence	-0.42 (2.82)	[-0.98, 0.13]	-1.51	101	.134	-0.15 [-0.34, 0.05]

Note. $N = 102$. DASS: Depression Anxiety Stress Scale. BSS: Bernstein's Strengths Scale. Bonferroni-corrected alpha for five paired tests is .010. Mean difference is computed as $T2 - T1$, where T1: baseline (≥ 12 -week pregnancy) and T2: follow-up (six weeks to six months postpartum). Negative values therefore indicate a decrease from T1 to T2.

Results of the Hierarchical Regression Analyses

Regression assumptions were examined before interpreting the models. One case showed a consistent outlying standardized residual across the regression analyses. To apply the same analytical sample across models, this case was excluded from the regression analyses, resulting in a final regression sample of $N = 102$. After exclusion, no further major violations of regression assumptions were detected based on residual plots and standardized residuals. Multicollinearity diagnostics indicated no problematic overlap among the predictors: Across the final regression models, tolerance values ranged from .588 to .955, and VIF values ranged from 1.047 to 1.700. The final models are shown in Table 4.

In all four models, the first step, including T1 DASS, was significant, explaining 28.4% of the variance in T2 DASS, $\beta = .53$, $R^2 = .284$, adjusted $R^2 = .277$, $F(1, 100) = 39.61$, $p < .001$. When age and education were added in Step 2, model fit did not improve substantially in any regression, $\Delta R^2 = .023$, $F_{change}(2, 98) = 1.65$, $p = .198$. In Step 3, adding MSPSS and RAS did not explain additional variance, $\Delta R^2 = .019$, $F_{change}(2, 96) = 1.35$, $p = .263$.

Model 1: Self-Directedness

In the regression including Self-directedness, adding baseline Self-directedness in Step 4 significantly increased explained variance, $\Delta R^2 = .030$, $F_{change}(1, 95) = 4.56$, $p = .035$. Adding the Self-directedness change score in Step 5 significantly improved the model, $\Delta R^2 = .031$, $F_{change}(1, 94) = 4.73$, $p = .032$. In the final model, both baseline Self-directedness and change in Self-directedness were significantly and negatively associated with T2 distress. Higher baseline Self-directedness was associated with lower T2 DASS, $B = -0.295$, $\beta = -.28$, $t = -2.81$, $p = .006$. The Self-directedness change score was also negatively associated with T2 DASS, $B = -0.275$, $\beta = -.19$, $t = -2.17$, $p = .032$. Given the $T2 - T1$ coding of the change score, this indicates that greater decreases in Self-directedness were associated with higher postpartum distress after accounting for baseline distress and baseline Self-directedness. The final model explained 38.7% of the variance in T2 DASS, $R^2 = .387$, adjusted $R^2 = .342$, $F(7, 94) = 8.49$, $p < .001$.

Model 2: Self-Regulation

In the regression including Self-regulation, adding baseline Self-regulation in Step 4 significantly increased explained variance, $\Delta R^2 = .037$, $F_{change}(1, 95) = 5.64$, $p = .020$. Adding the Self-regulation change score in Step 5 yielded the largest improvement among the four models, explaining an additional 10.7% of variance, $\Delta R^2 = .107$, $F_{change}(1, 94) = 18.93$, $p < .001$. In the final model, both baseline Self-regulation and change in Self-regulation were significantly associated with the dependent variable. Higher baseline Self-regulation was related to lower T2 DASS, $B = -0.387$, $\beta = -.35$, $t = -3.64$, $p < .001$. The Self-regulation change score was also negatively associ-

ated with T2 DASS, $B = -0.560$, $\beta = -.35$, $t = -4.35$, $p < .001$, indicating that greater decreases in Self-regulation were associated with higher postpartum distress. The final model explained 47.0% of the variance in T2 DASS, $R^2 = .470$, adjusted $R^2 = .431$, $F(7, 94) = 11.91$, $p < .001$, making this the strongest of the four regression models.

Model 3: Connectedness

In the regression including Connectedness, adding baseline Connectedness in Step 4 significantly improved the model, $\Delta R^2 = .046$, $F_{change}(1, 95) = 7.07$, $p = .009$. Adding the Connectedness change score in Step 5 also explained additional variance, $\Delta R^2 = .039$, $F_{change}(1, 94) = 6.13$, $p = .015$. In the final model, both baseline Connectedness and the Connectedness change score showed significant unique associations with T2 DASS. Higher baseline Connectedness was associated with lower T2 DASS, $B = -0.507$, $\beta = -.33$, $t = -3.39$, $p = .001$. The Connectedness change score was also negatively associated with T2 DASS, $B = -0.452$, $\beta = -.21$, $t = -2.48$, $p = .015$, indicating that greater decreases in Connectedness were associated with higher postpartum distress. The final model explained 41.1% of the variance in T2 DASS, $R^2 = .411$, adjusted $R^2 = .367$, $F(7, 94) = 9.36$, $p < .001$.

Model 4: Transcendence

In the regression including Transcendence, adding baseline Transcendence in Step 4 significantly increased explained variance, $\Delta R^2 = .053$, $F_{change}(1, 95) = 8.25$, $p = .005$. Adding the Transcendence change score in Step 5 did not significantly improve the model, $\Delta R^2 = .018$, $F_{change}(1, 94) = 2.73$, $p = .102$. In the final model, baseline Transcendence remained significantly and negatively related to T2 DASS, $B = -0.789$, $\beta = -.32$, $t = -3.17$, $p = .002$. The Transcendence change score was not significant, $B = -0.485$, $\beta = -.14$, $t = -1.65$, $p = .102$. The final model explained 39.7% of the variance in T2 DASS, $R^2 = .397$, adjusted $R^2 = .352$, $F(7, 94) = 8.84$, $p < .001$.

Table 4. Results of the Hierarchical Regression Analyses (final models)

Model: Self-directedness	<i>B</i>	<i>SE B</i>	95% CI lower	95% CI upper	β	<i>t</i>	<i>p</i>
T1 DASS	0.474	0.096	0.283	0.664	.46	4.93	<.001
Age	-0.004	0.169	-0.341	0.332	.00	-0.03	.979
Education	3.765	2.389	-0.978	8.508		1.58	.118
MSPSS	-0.182	0.163	-0.506	0.142	-.12	-1.12	.266
RAS	0.507	0.275	-0.040	1.054	.19	1.84	.069
T1 BSS Self-directedness	-0.295	0.105	-0.504	-0.087	-.28	-2.81	.006
Δ BSS Self-directedness	-0.275	0.127	-0.527	-0.024	-.19	-2.17	.032
Model summary	<i>R</i> ²	Adjusted <i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i>	ΔR^2 (<i>p</i>) Step 4	ΔR^2 (<i>p</i>) Step 5
	.387	.342	8.49	7, 94	< .001	.030 (.035)	.031 (.032)
Model: Self-regulation	<i>B</i>	<i>SE B</i>	95% CI lower	95% CI upper	β	<i>t</i>	<i>p</i>
T1 DASS	0.401	0.096	0.211	0.591	.39	4.19	<.001
Age	0.036	0.158	-0.278	0.351	.02	0.23	.820
Education	2.584	2.242	-1.868	7.037		1.15	.252
MSPSS	-0.149	0.152	-0.452	0.153	-.10	-0.98	.330
RAS	0.385	0.255	-0.120	0.891	.14	1.51	.133
T1 BSS Self-regulation	-0.387	0.107	-0.599	-0.176	-.35	-3.64	<.001
Δ BSS Self-regulation	-0.560	0.129	-0.816	-0.305	-.35	-4.35	<.001
Model summary	<i>R</i> ²	Adjusted <i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i>	ΔR^2 (<i>p</i>) Step 4	ΔR^2 (<i>p</i>) Step 5
	.470	.431	11.91	7, 94	< .001	.037 (.020)	.107 (<.001)

(continued on the next page)

Table 4. continued

Model: Connectedness	<i>B</i>	<i>SE B</i>	95% CI lower	95% CI upper	β	<i>t</i>	<i>p</i>
T1 DASS	0.400	0.100	0.202	0.599	.39	4.00	<.001
Age	0.048	0.168	−0.285	0.382	.02	0.29	.774
Education	3.256	2.353	−1.416	7.928		1.38	.170
MSPSS	−0.205	0.159	−0.519	0.110	−.13	−1.29	.200
RAS	0.377	0.267	−0.154	0.908	.14	1.41	.162
T1 BSS Connectedness	−0.507	0.149	−0.804	−0.210	−.33	−3.39	.001
Δ BSS Connectedness	−0.452	0.183	−0.815	−0.090	−.21	−2.48	.015
Model summary	<i>R</i> ²	Adjusted <i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i>	ΔR^2 (<i>p</i>) Step 4	ΔR^2 (<i>p</i>) Step 5
	.411	.367	9.36	7, 94	< .001	.046 (.009)	.039 (.015)
Model: Transcendence	<i>B</i>	<i>SE B</i>	95% CI lower	95% CI upper	β	<i>t</i>	<i>p</i>
T1 DASS	0.429	0.099	0.232	0.625	.41	4.33	<.001
Age	−0.031	0.166	−0.361	0.298	−.02	−0.19	.851
Education	3.298	2.404	−1.475	8.071		1.37	.173
MSPSS	−0.160	0.163	−0.484	0.163	−.10	−0.98	.328
RAS	0.486	0.279	−0.068	1.041	.18	1.74	.085
T1 BSS Transcendence	−0.789	0.249	−1.283	−0.295	−.32	−3.17	.002
Δ BSS Transcendence	−0.485	0.294	−1.068	0.098	−.14	−1.65	.102
Model summary	<i>R</i> ²	Adjusted <i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i>	ΔR^2 (<i>p</i>) Step 4	ΔR^2 (<i>p</i>) Step 5
	.397	.352	8.84	7, 94	< .001	.053 (.005)	.018 (.102)

Note. *N* = 102. Dependent: DASS T2 scores. β : standardized regression coefficients. DASS: Depression Anxiety Stress Scale. RAS: Relationship Assessment Scale. MSPSS: Multidimensional Scale of Perceived Social Support. BSS: Bernstein's Strengths Scale. Δ BSS: BSS T2 – BSS T1. T1: baseline ($\geq$ 12-week pregnancy). T2: follow-up (six weeks to six months postpartum).

As a timing-adjusted sensitivity analysis, the regression models were repeated in the subsample with available postpartum timing data (*n* = 69), with the number of days since childbirth entered as an additional covariate together with age and education. Postpartum timing was not a significant predictor of T2 DASS in any of the final models (β s = .03 to .05, *p*s = .677 to .821). The direction of the strength-change associations was broadly similar to that observed in the full sample. The change-score blocks explained an additional 3.6% of variance for Self-directedness, 4.0% for Self-regulation, 5.0% for Connectedness, and 1.8% for Transcendence. The incremental contributions were significant for Self-regulation and Connectedness, at the conventional significance threshold for Self-directedness (*p* = .050), and nonsignificant for Transcendence. In particular, the incremental contribution of Self-regulation was substantially smaller than in the full-sample model. Because these analyses were based on a substantially reduced subsample and yielded less precise estimates, they should be interpreted cautiously as broadly consistent with, rather than as confirming, the robustness of the full-sample findings (Appendix Table 2).

Discussion

The present study examined whether prenatal distress, interpersonal protective factors, baseline Healthy Adult mode strengths, and changes in these strengths were associated with postpartum distress. Prenatal distress remained a robust predictor across all models. Beyond this effect, higher baseline levels of all four strength domains were associated with lower postpartum distress in the final models, while decreases in Self-directedness, Self-regulation, and Connectedness were associated with higher baseline-adjusted postpartum distress over the same T1–T2 interval. Change in Transcendence did not explain significant additional variance. Perceived social support showed a negative bivariate association with postpartum distress, but this association did not remain significant after correction for multiple testing; neither social support nor relationship satisfaction contributed uniquely in the multivariable models. Overall, postpartum distress was related not only to prior symptom burden but also to the baseline level and concurrent change of adaptive resources.

Because the strength domains were assessed during pregnancy, their associations with postpartum distress cannot be reduced to concurrent covariance. Prenatal distress showed substantial temporal continuity and remained a robust predictor of postpartum distress, consistent with previous perinatal research (Dennis & Letourneau, 2007; Lefkovich et al., 2018; Nagy et al., 2011; O'Hara & McCabe, 2013). Nevertheless, each of the four prenatal strength domains explained significant additional variance in postpartum distress when entered into its respective model, beyond prenatal distress, sociodemographic covariates, and interpersonal factors. This suggests that Bernstein's Healthy Adult framework may capture aspects of adaptive functioning that are not fully accounted for by initial symptom burden or interpersonal support, although conceptual and measurement overlap between strengths and distress should be acknowledged (Bernstein, 2021; Miklósi et al., 2024). Notably, the present CFA supported the theoretically proposed four-domain structure, whereas the previous Hungarian validation study identified three rather than four higher-order components, suggesting that the higher-order organization of the BSS may vary across samples and warrants further replication (Miklósi et al., 2024).

Among the four domain-specific models, Self-regulation accounted for the largest proportion of variance, and its change score made the largest incremental contribution in the full sample. This finding is consistent with evidence identifying emotion regulation as a transdiagnostic factor in perinatal depression and anxiety (Verhelst et al., 2024) and with longitudinal research linking cognitive emotion regulation to postpartum depressive symptoms (Haga et al., 2012). The results therefore suggest that maintaining emotional balance and organized self-regulation may be particularly relevant during the transition to motherhood.

The timing-adjusted sensitivity analysis was broadly consistent with this pattern, although the incremental contribution of change in Self-regulation was substantially attenuated in the smaller subsample. Thus, while the association remained statistically significant, its magnitude should be interpreted cautiously and requires replication in larger samples with more homogeneous postpartum assessment timing.

The results for Self-directedness and Connectedness point in a similar direction. Higher baseline Self-directedness and Connectedness were prospectively associated with lower later distress, and greater decreases in these domains also explained additional variance in postpartum distress. This is consistent with self-determination theory-based research showing that competence, autonomy, and relatedness are closely tied to maternal adjustment during the transition to motherhood (Brenning & Soenens, 2017; Gauthier et al., 2010). It is also compatible with earlier findings linking lower social support and lower parental self-efficacy to more severe postpartum depressive symptoms (Dennis & Letourneau, 2007; Leahy-Warren et al., 2012). Importantly, however, Self-directedness and Connectedness retained independent associations with T2 distress even after perceived social support and relational satisfaction were already in the models. This suggests that these strengths are not simply proxies for perceived support or relationship quality.

The pattern for Transcendence was more nuanced. Higher baseline Transcendence was associated with lower later distress, whereas its change score did not explain significant additional variance in the final model. One possibility is that Transcendence is less closely coupled with short-term postpartum variation than the other domains. However, the nonsignificant change-score effect may also reflect limited statistical power, measurement characteristics, or restricted variability. In Bernstein's model, Transcendence includes broader meaning-oriented capacities such as gratitude and wisdom rather than primarily day-to-day regulatory resources (Bernstein, 2021; Miklósi et al., 2024). The present findings do not establish whether Transcendence operates as a more distal or temporally stable adaptive resource. This possibility requires direct examination in studies with more measurement occasions and greater statistical power.

A central interpretive point is that the findings did not provide evidence for a simple adaptive-mobilization account. The observed mean-level pattern did not indicate a general compensatory increase in the measured

strengths across the two time points. Instead, mean levels of Self-regulation and Self-directedness decreased from pregnancy to the postpartum assessment, while greater decreases in Self-directedness, Self-regulation, and Connectedness were associated with higher baseline-adjusted postpartum distress. This pattern is compatible with the possibility that selected adaptive capacities become less available during the transition to early motherhood. However, the present design cannot determine whether reductions in strength scores contributed to distress, whether distress influenced participants' perceptions of their strengths, or whether both reflected shared postpartum demands.

The findings concerning perceived social support and relational satisfaction should also be interpreted in this framework. At the bivariate level, perceived social support showed a negative association with postpartum distress, although this association did not remain significant after correction for multiple testing; the association with relationship satisfaction was also nonsignificant after correction. These findings should not be taken to indicate that interpersonal factors are unimportant. A substantial body of research identifies social support and relationship quality as relevant protective factors during the perinatal period (Brandão et al., 2024; Dennis & Letourneau, 2007; O'Hara & McCabe, 2013). In the present multivariable models, however, neither perceived social support nor relationship satisfaction explained significant unique variance once prenatal distress and the other covariates were taken into account. Their effects may therefore be partly shared with baseline distress and broader strengths-related functioning or may have been too small to detect as independent contributions in the present sample. Thus, the current findings are more consistent with overlapping rather than absent interpersonal influences. This interpretation is also compatible with evidence suggesting that the association between low social support and postpartum depressive symptoms may be partly linked to emotion regulation difficulties (Brandão et al., 2024).

Strengths and Limitations

The present study has several strengths. Its longitudinal design made it possible to examine whether strengths assessed during pregnancy were associated with postpartum distress after accounting for prenatal distress. The study also moved beyond a symptom-only approach by examining theoretically derived adaptive strength domains and their changes across the transition from pregnancy to early motherhood.

Several limitations should also be noted. First, the longitudinal sample was modest in size, and attrition from the initial prenatal sample to the postpartum follow-up was substantial. A sensitivity power analysis for the main hierarchical regression models indicated that, with $N = 102$, seven predictors, one tested incremental predictor, $\alpha = .05$, and power = .80, the analyses were powered to detect an incremental effect of approximately $f^2 = .079$. Thus, smaller incremental effects may not have been detected reliably.

Although participants who completed the follow-up did not differ from non-completers on the key baseline study variables, they were older and more highly educated. The final sample was also relatively homogeneous, with highly educated, married women with satisfactory socioeconomic backgrounds being overrepresented. Therefore, the findings may not generalize to younger mothers, mothers with lower educational attainment, single mothers, or mothers facing greater socioeconomic or clinical vulnerability. Moreover, the complete-case analytical approach does not eliminate the possibility of bias if follow-up participation or missingness was related to unobserved characteristics or postpartum outcomes.

Second, baseline gestational timing varied across participants. Recruitment started from the 12th week of pregnancy and extended into later gestation, and among follow-up completers with available data, gestational week ranged from 12 to 40 weeks. Preliminary analyses did not indicate significant associations between gestational week and baseline distress, social support, relationship satisfaction, or BSS domains. However, gestational week was available only for a subset of participants, which limited our ability to examine pregnancy-stage heterogeneity more fully or to include gestational timing as a covariate in the primary regression models.

The postpartum assessment window was relatively broad. Participants completed the T2 assessment between approximately six weeks and six months after childbirth, a period during which recovery, sleep, caregiving demands, and psychological adjustment may change substantially. The timing-adjusted sensitivity analyses were broadly consistent with the direction of the full-sample findings, but they should not be regarded as confirming their robustness. The smaller subsample reduced statistical precision, and the incremental contribution of Self-regulation was notably attenuated. Because postpartum timing data were available only for a subsample, these analyses do not rule out timing-related heterogeneity.

Third, all main constructs were assessed by self-report. This may have inflated associations because of shared method variance and because participants' current affective state may have influenced how they evaluated their

symptoms, strengths, social support, and relationship adjustment. Mothers with higher distress may have perceived not only their symptoms but also their adaptive resources and interpersonal context more negatively. A related measurement issue concerns discriminant validity between the BSS and DASS. The two instruments are not item-level duplicates: The DASS assesses recent distress symptoms, whereas the BSS assesses positively framed adaptive capacities. However, the strongest conceptual overlap is likely between DASS Stress and BSS Self-regulation, as both concern affective arousal, irritability or over-reactivity, frustration tolerance, and emotional control. Therefore, the BSS domains should be interpreted as related to, but not independent from, psychological distress. Importantly, the correlations were moderate rather than redundant, and the BSS domains explained additional variance in postpartum distress after baseline DASS was controlled. Future studies should therefore include clinician-rated, behavioral, partner-reported, or observational indicators of maternal functioning.

Fourth, the change variables were modeled as simple T2 – T1 difference scores. Although this approach allowed us to distinguish baseline strength levels from subsequent changes, simple change scores can be influenced by measurement error, ceiling effects, and regression to the mean. In the present data, correlations between baseline strengths and their corresponding change scores were small to moderate; however, only one of these four associations remained significant after correction for multiple testing. Multicollinearity diagnostics did not indicate problematic overlap between these predictors. Nevertheless, the change-score findings should be interpreted cautiously. Studies with more than two measurement waves and latent change modeling would be better suited to separating true intraindividual change from measurement error.

Fifth, although baseline strengths were assessed before childbirth and can therefore be interpreted as prospective predictors, the change scores reflect changes from T1 to T2 and overlap temporally with changes in distress. Consequently, associations involving strength change scores should not be interpreted as evidence that strength erosion temporally preceded or caused postpartum distress. Rather, they indicate that decreases in selected strengths occurred in parallel with higher baseline-adjusted postpartum distress. Finally, empirical evidence on the psychometric properties of the BSS remains limited. However, the additional CFA conducted in the full T1 sample yielded an acceptable four-domain solution, and the four domain scores also demonstrated good to excellent internal consistency in the present longitudinal sample. These findings support their use as broad indicators of Healthy Adult functioning, although further psychometric evaluation and replication in larger and more diverse samples remain warranted. Longitudinal measurement invariance of the BSS across pregnancy and postpartum was not examined; therefore, it remains uncertain whether the domains were measured equivalently across time. Accordingly, observed change scores should be interpreted cautiously, as they may partly reflect changes in measurement properties rather than true intraindividual change.

Conclusion, Implications and Future Directions

The present findings suggest that broader adaptive capacities may be relevant to understanding psychological adjustment during the perinatal period. In this study, lower baseline levels of Healthy Adult strengths and decreases in selected strength domains were associated with higher baseline-adjusted postpartum distress. However, the potential value of these strengths for clinical assessment remains preliminary. The present findings do not establish the Healthy Adult domains as validated screening markers or demonstrate that their assessment improves the identification of mothers at risk. Replication in larger and more diverse samples is required before strengths-based assessment can be recommended for routine clinical use.

This clinical perspective is also supported by findings suggesting that psychosocial intervention during pregnancy may reduce later postpartum depressive risk, highlighting that perinatal vulnerability is not only identifiable but also potentially modifiable before childbirth (Kozinszky et al., 2012).

From a clinical perspective, the findings are broadly consistent with Bernstein's strengths-based model, which emphasizes the identification and deliberate use of adaptive capacities. Nevertheless, the present observational study does not provide evidence that interventions targeting Healthy Adult strengths reduce postpartum distress or improve maternal functioning. Consequently, specific recommendations concerning strengths-based perinatal assessment or intervention would be premature. The observed associations, particularly those involving Self-regulation, Self-directedness, and Connectedness, should therefore be regarded as hypothesis-generating and require confirmation through replication and intervention studies.

Future research should replicate these findings in larger and more socioeconomically diverse samples, include more than two measurement waves, and apply latent change or growth models to distinguish true intraindividual change from measurement error. It would also be important to examine whether interventions that strengthen

Healthy Adult capacities during pregnancy or early motherhood can reduce later distress or improve maternal functioning.

Until such evidence is available, the present findings should be interpreted as supporting the clinical relevance of assessing adaptive resources alongside symptoms rather than as demonstrating causal effects of strength erosion on postpartum distress.

In conclusion, postpartum distress was associated not only with prenatal distress but also with the baseline levels and changes in adaptive resources across the transition to early motherhood. Baseline levels of all four Healthy Adult domains were prospectively associated with lower postpartum distress, while decreases in Self-directedness, Self-regulation, and Connectedness occurred in parallel with higher baseline-adjusted postpartum distress. These findings suggest that the transition to motherhood may involve not only changes in symptoms but also changes in the availability of adaptive self-regulatory, agentic, and relational capacities.

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Author contribution

Sarolta VASVÁRI: conceptualization, design, methodology, investigation, project administration, data management, formal analysis, interpretation, writing original draft, writing review and editing.

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Declaration of interest statement

The authors declare that they have no conflict of interest.

Ethical statement

This manuscript is the authors' original work.

All participants engaged in the research voluntarily and anonymously. Informed consent was obtained from all participants involved in the study. Their data are stored in coded materials and databases without personal data. The studies involving human participants were reviewed and approved by the Institutional Research Ethics Committee of the Institute of Psychology, Eötvös Loránd University (No. 2023/53-2).

Data availability statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

Declaration on using artificial intelligence in research and manuscript preparation

The authors used AI technologies in the preparation of the manuscript for final language editing and polishing of manuscript text but not in their research. ChatGPT (OpenAI) was used for language editing and formulation. All outputs were reviewed and validated by the authors.

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Appendix

Appendix Table 1. Attrition Analyses Comparing Follow-Up Completers and Non-Completers

Panel A. Continuous Baseline Variables

Variable	Non-completers (<i>n</i> = 243) <i>M</i> (<i>SD</i>)	Follow-up completers (<i>n</i> = 103) <i>M</i> (<i>SD</i>)	Levene <i>F</i> (<i>p</i>)	<i>t</i> (<i>df</i>)	<i>p</i>	Hedges' <i>g</i> [95% CI]
Age	31.72 (4.47)	33.42 (4.84)	1.91 (.168)	−3.15 (344)	.002	−0.37 [−0.60, −0.14]
Perceived social support (MSPSS)	43.56 (6.51)	43.10 (6.20)	0.75 (.386)	0.61 (344)	.540	0.07 [−0.16, 0.30]
Relationship satisfaction (RAS)	31.47 (4.35)	31.95 (3.55)	2.95 (.087)	−0.99 (344)	.321	−0.12 [−0.35, 0.11]
Prenatal distress (DASS)	14.59 (9.86)	14.28 (9.37)	0.04 (.848)	0.27 (344)	.786	0.03 [−0.20, 0.26]
BSS Self-directedness	53.70 (8.29)	53.71 (8.93)	1.09 (.296)	0.01 (344)	.996	0.00 [−0.23, 0.23]
BSS Self-regulation	53.73 (8.41)	53.66 (8.68)	0.56 (.456)	0.07 (344)	.946	0.01 [−0.22, 0.24]
BSS Connectedness	51.86 (5.63)	50.25 (6.21)	1.97 (.162)	2.35 (344)	.019	0.28 [0.05, 0.51]
BSS Transcendence	26.00 (3.21)	25.01 (3.97)	8.75 (.003)	2.25 (161.38)	.026	0.29 [0.06, 0.52]

Note. DASS: Depression Anxiety Stress Scale. RAS: Relationship Assessment Scale. MSPSS: Multidimensional Scale of Perceived Social Support. BSS: Bernstein's Strengths Scale. For BSS Transcendence, Levene's test indicated unequal variances; therefore, Welch's *t*-test is reported. Bonferroni-adjusted alpha was .006 (.05/8).

Panel B. Categorical Demographic Variables

Variable	Non-completers (<i>n</i> = 243) <i>n</i> (%)	Follow-up completers (<i>n</i> = 103) <i>n</i> (%)	χ^2 (<i>df</i>)	<i>p</i>	Cramer's <i>V</i>
High educational level	168 (69.1)	90 (87.4)	12.69 (1)	<.001	0.19
Living in the capital	155 (63.8)	65 (63.1)	0.01 (1)	.904	0.01
Working	121 (49.8)	57 (55.3)	0.89 (1)	.345	0.05
Satisfactory financial status	215 (88.5)	91 (88.3)	0.01 (1)	.973	0.01
First child	156 (64.2)	71 (68.9)	1.05 (1)	.306	0.06
Married	214 (88.1)	94 (91.3)	0.76 (1)	.385	0.05

Note. DASS = Depression Anxiety Stress Scale; RAS = Relationship Assessment Scale; MSPSS = Multidimensional Scale of Perceived Social Support; BSS = Bernstein's Strengths Scale. Bonferroni-adjusted alpha was .008 (.05/6). Percentages are within completion-status groups.

Appendix

Appendix Table 2. Postpartum Timing-Adjusted Sensitivity Analyses

	Timing in final model			Baseline strength		Change-score block			Change score in final model					Final model			
	B	β	ρ	ΔR^2	ρ	ΔR^2	F_{change}	ρ	B (SE)	β	95% CI	ρ	R^2	Adjusted R^2	F(8, 60)	p	
Domain																	
Self-directedness	.012	.05	.677	.024	.121	.036	3.988	.050	-.308 (.154)	-.20	[-.617, .000]	.050	.453	.381	6.22	< .001	
Self-regulation	.007	.03	.817	.028	.091	.040	4.418	.040	-.383 (.182)	-.22	[-.748, -.019]	.040	.461	.389	6.42	< .001	
Connectedness	.011	.04	.707	.001	.739	.050	5.359	.024	-.546 (.236)	-.24	[-1.017, -.074]	.024	.444	.370	6.00	< .001	
Transcendence	.007	.03	.821	.018	.181	.018	1.860	.178	-.517 (.379)	-.14	[-1.276, .241]	.178	.429	.353	5.63	< .001	

Note. $N = 69$. The models were estimated in the subsample with available postpartum assessment timing. T1 DASS was entered in Step 1; age, education, and days since childbirth in Step 2; MSPSS and RAS in Step 3; baseline strength in Step 4; and the corresponding T2 – T1 strength change score in Step 5. Negative change-score coefficients indicate that greater decreases in strengths were associated with higher baseline-adjusted T2 distress. Days since childbirth was not significant in any final model. The change-score blocks were significant for Self-regulation and Connectedness, at the conventional significance threshold for Self-directedness, and nonsignificant for Transcendence. Compared with the full-sample analyses, the Self-regulation change-block contribution was attenuated, whereas the Connectedness contribution was somewhat larger. Because these analyses were based on a reduced subsample, they should be interpreted as sensitivity analyses rather than as evidence that postpartum timing had no influence on the main findings.