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FAMILY PROCESS

ORIGINAL ARTICLE

Longitudinal associations between relational and sexual well-being in couples transitioning to parenthood

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Abstract

There is limited understanding of the dynamic between relational and sexual well-being as couples adjust to new parenthood, despite this being a vulnerable period for couples' relationships. This study was aimed at examining the bidirectional links between relationship quality and sexual well-being (i.e., sexual satisfaction, sexual distress) across the transition to parenthood. We assessed new parent couples (N = 257) across four time points (two prenatal) from mid-pregnancy through 6 months postpartum. Parallel dyadic latent growth curve modeling was employed to examine the associations between trajectories of perceived relationship quality, sexual satisfaction, and sexual distress. New parents' declines in relationship quality were associated with declines in own and partners' sexual satisfaction and with increases in own sexual distress. Mothers' prenatal relationship quality and sexual distress predicted subsequent changes in own sexual distress and fathers' relationship quality, respectively. Results indicate that changes to new parents' relational and sexual well-being mutually influence each other over time. Current results indicate that the impact of the transition on couples' relationships is partly determined by own and partners' prenatal factors, to which clinicians and researchers can attend to early on. Cross-domain links between relational and sexual well-being should be considered in research and clinical practice.

The first-author's current address is different from where the work was conducted.

KEYWORDS
dyadic/couple data, postpartum, relationship quality, sexual distress, sexual satisfaction, transition to parenthood

The transition to parenthood represents the period between pregnancy through postpartum and is considered one of the most vulnerable life periods for couples' relationships (Kluwer, 2010; Ramsdell & Brock, 2021). New parents often experience decreased relationship quality (i.e., lower feelings of happiness and higher levels of conflict) and sexual well-being (i.e., lower sexual satisfaction and higher sexual distress; Mitnick et al., 2009; Rosen et al., 2020). Despite relational and sexual well-being being highly interdependent, little is known about the extent to which these dimensions change together across this transition, or the degree to which changes in one dimension are causally linked to changes in the other. Does a poorer overall relationship in pregnancy precede subsequent declines in sexual well-being? Or, conversely, does greater sexual well-being in pregnancy protect couples against decreases in relationship satisfaction? Using a dyadic, longitudinal approach, the current study was aimed at providing answers to these questions.

RELATIONSHIP WELL-BEING ACROSS THE TRANSITION TO PARENTHOOD

After a baby is born, novel challenges such as less time together as a couple, unequal division of household labor and childcare, and navigating new roles and responsibilities have the potential to increase couples' levels of stress and relationship conflict (Doss & Rhoades, 2017; van Anders et al., 2021). This, in turn, can hamper relationship quality—a person's subjective perception that their relationship is relatively good versus bad (Fletcher et al., 2000). The vulnerability of this life stage for couples' relationships is confirmed by a meta-analysis (Mitnick et al., 2009) and a systematic review (Doss & Rhoades, 2017), which noted an average decline in relationship quality across this period. A recent study has also confirmed that, although there is variability in couples' trajectories, 53% of couples experience declines in relationship satisfaction at pregnancy or postpartum, with mothers typically experiencing more significant declines (Leonhardt et al., 2021). Couples who report a better prenatal relationship (e.g., lower conflict, better communication) show smaller declines in relationship quality post-birth (Kluwer, 2010). This is consistent with theoretical models of adaption to stress, such as the vulnerability-stress-adaptation model (Karney & Bradbury, 1995), which state that in the face of a significant stressor, as is this transition, the quality of the interactions between partners helps them cope with relationship stressors, facilitates connection and intimacy, and is thus protective of relationships over time (Karney & Bradbury, 1995). Yet, a better prenatal relationship has also been shown to predict the steepest declines in relationship functioning (Doss & Rhoades, 2017). Although apparently contradictory, these findings suggest that other dimensions of change that concurrently challenge couples' relationships across this period might interact with couples' initial relationship to predict relationship well-being.

SEXUAL WELL-BEING ACROSS THE TRANSITION TO PARENTHOOD

As they transition from partners to parents, new mothers and partners experience marked changes to their sex life, with 36% to 46% of new parents describing themselves as sexually dissatisfied and over 90% endorsing more than 10 (of 20) postpartum sexual concerns, such as

reduced time and energy for sex and larger desire discrepancies between partners (Schlagintweit et al., 2016). The sudden and rapid nature of sexual changes together with the pervasive lack of information on how to deal with them (Barrett et al., 2000; Guerra-Reyes et al., 2017; Heidari et al., 2018) can contribute to sexual experiences being less satisfying and accompanied by sexual distress (i.e., negative emotions about one's sex life such as worry, frustration, guilt) for new parents (Derogatis et al., 2002; Rosen et al., 2020).

Sexual satisfaction and sexual distress represent two central dimensions of sexual well-being (Diamond & Huebner, 2012) and, together, they reflect both positive and negative aspects of one's current sexual life. Studies following couples from pregnancy to up to one-year postpartum have confirmed that, on average, new mothers' and partners' sexual satisfaction significantly declines. Also, mothers' sexual distress significantly increases during pregnancy and then declines at postpartum, whereas partners' sexual distress is stable over time (Rosen et al., 2020; Tutelman et al., 2021). Notably, a positive sexual relationship with one's partner might pose important benefits across this period. Sexual well-being is strongly implicated in overall health and quality of life—including lower anxiety, depression, and stress (Diamond & Huebner, 2012)—and is one of the top five predictors of long-term relationship satisfaction (Joel et al., 2020). Theoretical models of how partners navigate relationship threats, such as the theory of emotional capital (Walsh et al., 2017), suggest that sexual well-being may be especially important for couples across stressful periods because partners who accumulate greater "emotional capital" (i.e., a series of positive, emotionally shared experiences, such as positive sexual interactions) are less reactive to relationship stressors than couples with lower emotional capital. This buffering effect of sexual well-being has been supported by empirical data, with couples with greater sexual well-being coping better with stress, reporting greater intimacy and a stronger bond between partners, including those in the transition to parenthood (Rosen et al., 2017, 2018; Tavares et al., 2019).

BIDIRECTIONAL ASSOCIATIONS BETWEEN RELATIONSHIP AND SEXUAL WELL-BEING IN COUPLES

Several theoretical models of relational and sexual well-being argue for robust causal relationships between these constructs. When applied to relationships, social exchange theories (Rusbult, 1983) posit that one's evaluation of the couples' relationship will be greater to the extent that a relationship provides more rewards (i.e., aspects of the relationship related to pleasure and gratification), fewer costs (i.e., negative factors such as physical or mental effort or pain) and the experiences of the relationship exceed an individual's expectations (i.e., the standard against which one evaluates the overall relationship quality; Rusbult, 1983). As such, the sexual component of one's relationship can be experienced as a reward (i.e., sexual satisfaction) or a cost (i.e., sexual distress), and thus influence one's subsequent evaluation of overall relationship quality. As for the opposite direction of causation, the interpersonal exchange model of sexual satisfaction argues that, similarly, sexual satisfaction results from the rewards and costs associated with the sexual relationship, the perceived balance between both, and the individual's comparison level when evaluating their overall sexual relationship (Lawrance & Byers, 1995). As such, the accumulation of overall positive interactions between the couple can facilitate more positive sexual experiences, in line with the priorly described Emotional Capital Theory.

These proposed links are supported by cross-sectional and longitudinal studies with individuals and couples who are not in the transition to parenthood (Blumenstock & Papp, 2017; Joel et al., 2020). In new parents, cross-sectional studies show that individuals and couples who report an overall more positive relationship in pregnancy or at postpartum also show better indices of sexual well-being at that time-point, with evidence of both individual and dyadic effects (Schlagintweit et al., 2016). Surprisingly, there is little longitudinal research examining how these dimensions influence each other over time and we are unaware of any studies examining this

question in first-time parent couples, who are more vulnerable to changes. Studying such a critical life transition can shed light on this question, as new parents face contextual challenges to both their sexual and relational lives.

Some initial studies have attempted to clarify how sexual and relational well-being relate to each other across the transition to parenthood and have demonstrated a mixed pattern of results. A metacontent analysis of studies has supported longitudinal links between a better sexual relationship in pregnancy and a better overall evaluation of the relationship at 4 months and 3 years after childbirth (Von Sydow, 1999). There is also evidence of links in the other direction, with aspects of the couples' relationship (i.e., satisfaction with the division of labor) at 6 months postpartum predicting greater sexual satisfaction at 12 months postpartum for new mothers and fathers, although this study only examined intraindividual effects (Maas et al., 2018). In a recent longitudinal study with new mothers, greater relationship satisfaction in pregnancy reduced the odds of women having marked sexual functioning problems at 3 months postpartum (Dawson et al., 2020). In contrast, new parent couples with a better prenatal relationship showed a greater decline in sexual frequency across the transition, whereas sexual frequency was unaltered in couples with lower quality relationships (Lorenz et al., 2020). Although this study sampled couples, only intraindividual, and not dyadic effects, were reported. Also, participants were assessed only twice (in pregnancy and at 6 months postpartum), impeding a more nuanced examination of the interpersonal links between relational and sexual dimensions over time. Importantly, these two latter studies assessed specific sexual dimensions (i.e., sexual functioning and sexual frequency) which may not accurately reflect new parents' sexual well-being. For new parents, sexual well-being may expand beyond the *frequency* of sex and the ability to respond sexually, and be more closely related to the overall *quality* of sexual experiences. As such, other indices—such as sexual satisfaction and sexual distress—may be more reliable indicators of new parents' sexual well-being, but are still to be examined.

These unanswered research questions have important theoretical and clinical implications. On the one hand, current conceptualizations of sex and relationship well-being poorly combine both dimensions together, as the integration of insights from both fields is underdeveloped at both the theoretical and empirical levels (Dewitte, 2014; Muise et al., 2018). By providing evidence of bidirectionality between sexual and relationship dimensions across a vulnerable period in the life of couples, this study has the potential to inform the development of more comprehensive theoretical conceptualizations (i.e., that effectively model their bidirectionality). On the other hand, this study may provide necessary answers to clinically relevant questions such as whether a relationship of higher quality helps couples to navigate sexual challenges with greater success across this transition, or whether greater prenatal sexual well-being is beneficial for new parent's postpartum relationship adjustment. The answers to these questions may help clinicians to tailor their interventions to target one dimension or the other, taking into account which and for whom sexual and relationship well-being dimensions matter the most.

THE CURRENT STUDY

Given the evidence reviewed above, bidirectional links between relationship and sexual well-being are to be expected across the transition to parenthood, with these dimensions likely changing together over time. Furthermore, one's own and partners' initial sexual and relationship well-being may interact in such a way that one may alleviate or, conversely, exacerbate changes to the other. Beyond intraindividual effects (i.e., when one's indicator is associated with one's own outcome), dyadic effects (i.e., when one's indicator is associated with the partner's outcome) are put forward by prior research with couples who are not in the transition to parenthood (cross-sectionally and longitudinally) and new parent couples (cross-sectionally), anticipating that dyadic effects can also be expected in a longitudinal assessment of new parents.

First, the current study aimed to (1) model mothers' and fathers' average trajectories (i.e., intercepts and slopes) in relationship quality, sexual satisfaction, and sexual distress from pregnancy to 6 months postpartum. Based on prior literature on the transition to parenthood (e.g., Doss & Rhoades, 2017; Rosen et al., 2020, we hypothesized that: H1a) mothers' and fathers' initial levels of relationship quality, sexual satisfaction, and sexual distress (i.e., intercepts would be positively linked; and H1b) over time, mothers' and fathers' relationship quality and sexual satisfaction would significantly decline (i.e., negative slopes), whereas sexual distress would significantly increase (i.e., positive slopes). Second, we aimed to (2) examine these trajectories in parallel, while testing the associations between couples' trajectories based on the Actor-Partner Interdependence Model (APIM). Based on theoretical models that propose directional links between relationship and sexual well-being (Lawrance & Byers, 1995; Rusbult, 1983, we expected that: H2a) mothers' and fathers' initial relationship quality would be positively linked to own and partner's initial sexual satisfaction, and negatively linked to own and partners' initial sexual distress; and that H2b change over time (i.e., slopes) in mothers' and fathers' own relationship quality would be significantly associated with own and partners' change in sexual satisfaction and sexual distress. Finally, we aimed to (3) test each of these variables' intercept (i.e., relationship quality, sexual satisfaction, and sexual distress) as a predictor of the trajectory of the other dimensions (i.e., bidirectionality). Given the exploratory nature of the analyses concerning the direction of these effects, no a priori predictions were made as to whether mothers' and fathers' greater initial relationship quality would predict own and partners' higher vs lower degree of change in sexual satisfaction and distress or the other way around (i.e., whether greater initial levels of sexual satisfaction and distress would predict own and partners' higher vs lower degree of change in relationship quality over time).

METHOD

Participants

First-time parent couples were recruited mid-pregnancy (between 20 and 24 weeks, $M = 22.8$ weeks, $SD = 1.48$). To be eligible, both members of the couple were required to: (1) be at least 18 years of age; (2) be in a committed relationship with each other for at least 6 months; and (3) be fluent in Portuguese. One member of the couple was required to (4) currently have an uncomplicated, singleton pregnancy; and (5) have not given birth previously. Participants who self-reported currently suffering from a severe unmanaged medical or psychiatric illness were excluded. The final sample comprised 257 first-time expectant couples who ranged in age from 19 to 47 years old (mothers: $M = 29.92$, $SD = 4.74$; fathers: $M = 31.61$, $SD = 4.87$). All participants who gave birth self-reported their gender/sex as woman/female and all partners self-identified as man/male; we therefore refer to these participants collectively as "mothers" and "fathers," respectively. Most mothers (93%) and fathers (95%) identified as exclusively heterosexual. Although the study was advertised as inclusive of couples of all genders and identities, all participants were currently in a mixed-gender/sex relationship. Most couples were married or common-law (68%) and 32% of couples were dating. Relationship duration was on average 7 years, ranging from 6 to 255 months ($M = 87.5$ months, $SD = 55.5$ months). Most mothers (61%) and fathers (43%) had some form of higher education (>12 years) and most (49% of mothers, 55% of fathers) reported an household income consistent with Portuguese middle class (1050–2095€). Most couples described their pregnancy as planned (80%). There were no significant differences between participants recruited through passive advertisement and in-person in terms of their sociodemographics or baseline levels of outcome variables. See Figure S1 for a flowchart of recruitment and enrollment, including retention rates.

Procedure

Recruitment occurred either in-person at regularly scheduled clinical appointments to gynecologists in an obstetrics outpatient unit (81%) or via community (i.e., pregnancy-related services, hospital bulletin boards) or online advertisements (19%), as part of a larger study on couples' relationships during the transition to parenthood (Fernandes et al., 2022; Tavares et al., 2021; Tavares, Rosen, et al., 2022, Tavares, Barros, et al., 2022; Tavares et al., 2023). Participants recruited through advertisements completed all materials online. Participants enrolled in the obstetrics outpatient unit were recruited through gynecologists' referral. All individuals provided informed consent online before participating. Data were obtained from both couple members at four time-points: baseline, 20-week pregnancy; T2, 32-week pregnancy; T3, 3-month postpartum; and T4, 6-month postpartum. Mothers and fathers reported on sociodemographic information at baseline; relationship quality, sexual satisfaction, and sexual distress were collected at all time points. After receiving each survey, couple members were given 4 weeks to complete it. To promote couples' longitudinal participation, retention strategies included reminder phone calls and reminder emails. Each couple was compensated with a 10€ gift card at every other time-point and, at the end of the study, all participants received a list of resources related to sexuality and relationships during the transition to parenthood. The study was approved by the ethical review boards at the University of Porto and at the Centro Materno Infantil do Norte.

Measures

Relationship quality

The widely used 14-item Dyadic Adjustment Scale–Revised (DAS-R; Busby et al., 1995; Gomez & Leal, 2008) was used as a self-report measure of global relationship quality. Items are scored using varying response anchors and tap into cognitive, behavioral, and emotional aspects of the relationship, with greater scores indicating greater relationship quality (range 0–69). Whereas specific subscales of the DAS-R can be used, the full-scale scores have demonstrated higher construct and predictive validities and higher reliability (Crane et al., 2000). The DAS-R has been used in pregnant and postpartum samples and has shown good psychometric properties (Grazia et al., 2020; Mott et al., 2011). Total DAS-R scores showed good internal consistency across time points ($\alpha_{mothers}$ = 0.84–0.87, $\alpha_{fathers}$ = 0.79–0.87).

Sexual satisfaction

Sexual satisfaction was assessed using the Global Measure of Sexual Satisfaction (GMSEX), a widely used, valid and reliable self-report measure of sexual satisfaction in relationships (Lawrance & Byers, 1995; Pascoal et al., 2013). Higher scores denote greater sexual satisfaction (range 5 to 35). The GMSEX has been used to assess sexual satisfaction in pregnant and postpartum samples (Rosen et al., 2020). In this study, GMSEX showed excellent internal consistency ($\alpha_{mothers}$ = 0.95–0.96; $\alpha_{fathers}$ = 0.96–0.97).

Sexual distress

The Sexual Distress Scale-Revised (SDS-R) was used to assess distress relative to one's sex life. This 13-item self-report measure is validated for use in women and men (Derogatis et al., 2002;

Santos-Iglesias et al., 2018; Tavares et al., 2022) and has been used in pregnancy and postpartum samples (Rosen et al., 2020). Total scores range from 0 to 52; higher scores signal greater sexual distress. Excellent internal consistency was found in this sample ($\alpha_{mothers}$ = 0.95–0.96; $\alpha_{fathers}$ = 0.94).

Data analysis

To test our first objective of examining mothers' and fathers' trajectories of relationship quality, sexual satisfaction, and sexual distress, we conducted unconditional dyadic latent growth curve models (DLGCMs) within a structural equation model. This approach allows us to examine dyadic patterns of change over time by combining the principles of Growth Mixture Modeling and of the APIM (Jung & Wickrama, 2008; Kenny et al., 2006). The DLGCMs test actor effects (i.e., the link between one's own intercept—the initial level of a variable at baseline—and one's own slope—change over time—controlling for partner effects) and partner effects (i.e., the link between one's own intercept and their partner's slope controlling for actor effects). Dyad members were distinguished based on the person who gave birth (i.e., mother) versus the person who did not gave birth (i.e., fathers). Time frame was weighted across time points with the intercept representing the first time point (0, 3, 8, 11; assessed in months). Thus, the slope value indicates the unit change per month between baseline (mid-pregnancy) and T4 (6 months postpartum). Because each couple member could have a distinct type of trajectory, we tested a series of increasingly complex growth models (i.e., linear, quadratic) and selected the optimal type of trajectory based on evidence of best model fit, as evidenced by several fit indices: a Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) of at least 0.95, a Root Mean Square Error of Approximation (RMSEA) of 0.06 or less, and a statistically non-significant Chi-Square value (Hu & Bentler, 1999). Adequate model fit was indicated by less stringent criteria (e.g., CFI ≥0.90, TLI ≥0.90, and RMSEA ≤0.08; Marsh et al., 2004). Significant differences between mothers' and fathers' intercepts and slopes for each outcome variable were examined within the unconditional DLGCMs using Wald χ^2 tests.

To examine our second and third goals of exploring the bidirectional links between the previously identified trajectories (i.e., relationship quality and each sexual well-being outcome), we estimated parallel DLGCMs (one model each for sexual satisfaction and sexual distress). Because the parallel DLGCM permits the assessment of two dyadic growth trajectories simultaneously, this approach allows the examination of the link between mothers' and fathers' growth parameters (i.e., intercept and slope) across trajectories (Aim 2). The parallel model also provides information on the directionality of effects (e.g., whether initial relationship quality predicts subsequent change in sexual satisfaction and/or sexual distress and vice versa) because the intercepts temporarily precede the slopes (Aim 3). All models were estimated with *MPlus* version 8.6 using the maximum likelihood estimator. Full information maximum likelihood estimation was used within the DLGCMs to estimate missing data due to attrition over time (Enders & Bandalos, 2001). De-identified data and syntax for all analyses are available on the Open Science Framework (https://osf.io/x43vk/).

RESULTS

Descriptive statistics and correlations among study variables are presented in Table S1. The APIM associations between mothers' and fathers' growth parameters are indicated by covariances between couple members' outcomes (reported as correlation coefficients) and are shown in Table 1 (unconditional DLGCMs) and Table 2 (parallel DLGCMs).

TABLE 1 Unconditional DLGCM goodness-of-fit indices, means, variances, and standardized (STDYX) coefficients for APIM relationships among the study variables (N = 257 couples)

	χ^2	*Df*	$\Delta\chi^2$	CFI	TLI	RMSEA	AIC	BIC
Relationship quality								
Linear	37.39*	18	—	0.98	0.97	0.07	10,577	10,669
Quadratic	36.13**	16	1.26	0.98	0.97	0.07	10,580	10,679
Sexual satisfaction								
Linear	37.74**	18	—	0.98	0.96	0.07	9979	10,071
Quadratic for mothers	37.48**	12	0.26	0.97	0.94	0.08	9986	10,099
Sexual distress								
Linear	33.60*	18	—	0.98	0.97	0.06	11,197	11,290
Quadratic	31.17*	16	2.43	0.98	0.97	0.06	11,199	11,298
	Means	Variances			Mothers' intercept	Mothers' slope	Fathers' intercept	Fathers' slope
Relationship quality								
Mothers' intercept	55.21 (0.47)*** [54.29 56.14]	49.11 (5.23)*** [38.87 59.36]			—	−0.19 (0.11) [−0.41 0.04]	0.67 (0.06)*** [0.56 0.78]	0.20 (0.15) [−0.08 0.49]
Mothers' slope	−0.20 (0.04)*** [−0.28–0.12]	0.16 (0.04)*** [0.08 0.25]				—	−0.15 (0.13) [−0.41 0.11]	0.80 (0.21)*** [0.39 1.21]
Fathers' intercept	54.36 (0.43)*** [53.52 55.19]	34.88 (4.64)*** [25.77 43.98]					—	0.26 (0.21) [−0.14 0.69]
Fathers' slope	−0.11 (0.04)* [−0.20–0.02]	0.12 (0.05)** [0.03 0.22]						—
Sexual satisfaction								
Mothers' intercept	30.31 (0.31)*** [29.71 30.91]	21.37 (2.50)*** [16.47 26.27]			—	−0.32 (0.10)** [−0.52–0.12]	0.65 (0.06)*** [0.52 0.77]	0.02 (0.14) [−0.24 0.29]
Mothers' slope	−0.19 (0.03)*** [−0.25–0.13]	0.12 (0.03)*** [0.07 0.17]				—	−0.06 (0.13) [−0.32 0.20]	0.01 (0.19) [−0.37 0.39]
Fathers' intercept	29.41 (0.32)*** [28.77 30.04]	18.81 (2.91)*** [13.11 24.51]					—	−0.05 (0.17) [−0.38 0.28]
Fathers' slope	−0.18 (0.04)*** [−0.25–0.10]	0.11 (0.04)** [0.04 0.18]						—
Sexual distress								
Mothers' intercept	8.26 (0.55)*** [7.18 9.34]	62.51 (7.51)*** [47.49 77.23]			—	−0.29 (0.10)** [−0.48–0.10]	0.44 (0.07)*** [0.29 0.58]	−0.03 (0.15) [−0.33 0.27]
Mothers' slope	0.16 (0.06)** [0.05 0.28]	0.43 (0.09)*** [0.26 0.60]				—	−0.03 (0.11) [−0.25 0.19]	−0.03 (0.15) [−0.38 0.45]

(Continues)

TABLE 1 (Continued)

	χ^2	*Df*	$\Delta\chi^2$	CFI	TLI	RMSEA	AIC	BIC
Fathers' intercept	5.92 (0.42)*** [5.10 6.74]	32.26 (4.23)*** [23.97 40.55]					—	−0.02 (0.18) [−0.36 0.33]
Fathers' slope	0.08 (0.04)* [0.00 0.16]	0.10 (0.04)* [0.02 0.18]						—

Note: We depict 95% confidence intervals in brackets. For sexual satisfaction, the unconditional DLGCM with quadratic terms for mothers and fathers did not converge; we present the best-fitting quadratic solution, which included a quadratic term for mothers only.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 2 Parallel DLGCM goodness-of-fit indices and standardized (STDYX) coefficients for APIM relationships among the study variables ($N = 257$ couples)

	χ^2	*Df*	CFI	TLI	RMSEA
RQ and SS	115.11**	76	0.98	0.97	0.05
RQ and SD	109.80**	76	0.98	0.98	0.04
	SS Mothers' intercept	SS Mothers' slope	SS Fathers' intercept	SS Fathers' slope	
RQ and SS					
RQ Mothers' intercept	0.55 (0.06)***	0.00 (0.11)	0.37 (0.07)***	0.07 (0.12)	
RQ Mothers' slope	−0.10 (0.12)	0.62 (0.15)***	−0.10 (0.12)	0.35 (0.17)*	
SS Mothers' intercept	–	–	–	–	
SS Mothers' slope	–	–	–	–	
RQ Fathers' intercept	0.41 (0.07)***	0.00 (0.11)	0.54 (0.08)***	−0.01 (0.15)	
RQ Fathers' slope	0.14 (0.14)	0.39 (0.19)*	0.31 (0.19)	0.59 (0.20)**	
SS Fathers' intercept	–	–	–	–	
SS Fathers' slope	–	–	–	–	
	SD Mothers' intercept	SD Mothers' slope	SD Fathers' intercept	SD Fathers' slope	
RQ and SD					
RQ Mothers' intercept	−0.47 (0.06)***	0.21 (0.10)*	−0.28 (0.07)***	−0.15 (0.14)	
RQ Mothers' slope	−0.14 (0.13)	−0.39 (0.16)*	−0.11 (0.12)	−0.13 (0.19)	
SD Mothers' intercept	–	–	–	–	
SD Mothers' slope	–	–	–	–	
RQ Fathers' intercept	−0.33 (0.07)***	0.05 (0.10)	−0.51 (0.07)***	−0.04 (0.16)	
RQ Fathers' slope	−0.32 (0.14)*	−0.20 (0.17)	−0.26 (0.17)	−0.76 (0.25)**	
SD Fathers' intercept	–	–	–	–	
SD Fathers' slope	–	–	–	–	

Abbreviations: RQ = relationship quality, SS = sexual satisfaction, SD = sexual distress.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Changes in relationship quality from pregnancy to postpartum (H1a & H1b)

In addressing our first aim, which was to describe the trajectories of relational and sexual well-being from mid-pregnancy to 6 months postpartum, the unconditional linear DLGCM for relationship quality provided good fit indices. A comparison between models revealed no significant improvement in model fit upon inclusion of the quadratic term, favoring the linear model (see Table 1). In line with H1a, mothers' and fathers' intercepts were positively associated, indicating that mothers with higher relationship quality in pregnancy were likely to have partners

who also reported higher relationship quality in pregnancy. At baseline, mothers' perceived relationship quality was significantly higher than fathers', Wald $\chi^2(1) = 4.14$, $p = 0.042$. Supporting H1b, relationship quality decreased over time for mothers' and fathers' (see Figure 1a) at a similar rate between partners, Wald $\chi^2(1) = 3.27$, $p = 0.071$. Mothers' and fathers' rate of change in relationship quality were not related to their own nor to their partners' intercept at baseline, indicating that the longitudinal declines were not dependent on own nor partners' initial levels. Over time, mothers' and fathers' rate of change were significantly associated with each other, indicating that partners' levels of relationship quality were changing together over time.

Changes in sexual satisfaction from pregnancy to postpartum (H1a & H1b)

The linear DLGCM for sexual satisfaction demonstrated good fit to the data. The comparison between models favored the linear model (see Table 1). At baseline, mothers' sexual satisfaction was positively linked to fathers' sexual satisfaction, such that mothers with greater initial sexual satisfaction had partners who also reported higher initial sexual satisfaction, supporting H1a. Mothers' sexual satisfaction at baseline was significantly higher than fathers', Wald $\chi^2(1) = 9.19$, $p = 0.002$. Consistent with H1b, both mothers' and fathers' sexual satisfaction decreased significantly from pregnancy to postpartum (see Figure 1b) at a similar rate between partners, Wald $\chi^2(1) = 0.06$, $p = 0.805$. Mothers' rate of change in sexual satisfaction over time was negatively linked to their own initial sexual satisfaction, meaning that mothers who were more sexually satisfied at baseline showed a faster decrease in sexual satisfaction, and was not linked to fathers' initial sexual satisfaction nor fathers' rate of change. Fathers' rate of change in sexual satisfaction over time was not associated with their own or mothers' initial levels of sexual satisfaction in pregnancy or with mothers' rate of change over time.

Changes in sexual distress from pregnancy to postpartum (H1a & H1b)

Both unconditional linear and quadratic DLGCMs for sexual distress showed good fit to the data. As the comparison between models showed no significant improvement in model fit upon introduction of the quadratic term, we selected the most parsimonious solution—the unconditional linear DLGCM (see Table 1). Initial levels of sexual distress were positively associated between couple members, such that mothers with greater levels of sexual distress at baseline were likely to have partners who also reported greater initial sexual distress, supporting H1a. Mothers' sexual distress at baseline was significantly higher than fathers', Wald $\chi^2(1) = 17.88$, $p < 0.001$. In line with H1b, mothers' and fathers' sexual distress increased significantly from pregnancy to postpartum (see Figure 1c) at a similar rate between partners, Wald $\chi^2(1) = 1.39$, $p = 0.239$.

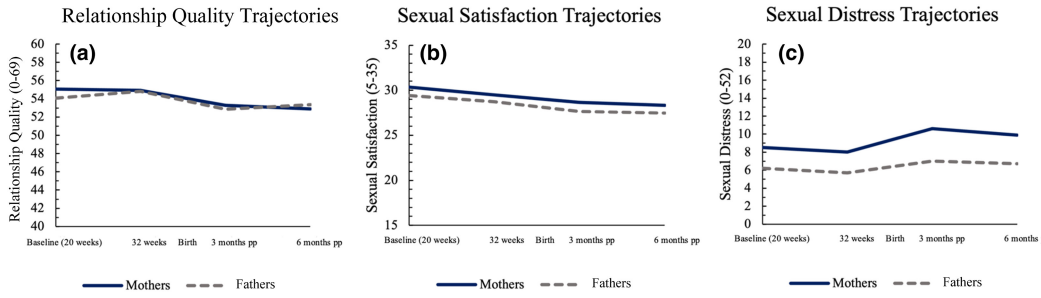

FIGURE 1 (a–c). Trajectories of relationship satisfaction (a), sexual satisfaction (b), and sexual distress (c), from mid-pregnancy to 6 months postpartum for mothers and fathers.

Mothers' rate of change over time was negatively linked to their initial sexual distress, such that mothers with greater sexual distress at baseline showed slower increases in sexual distress from pregnancy to postpartum. Actor effects for fathers and all other partner effects were not significant, indicating that one's own level of sexual distress at baseline was not related to own rate of change (for fathers only) nor to partners' rate of change in sexual distress over time (for both mothers and fathers).

Bidirectionality of changes in relationship quality and sexual satisfaction (H2a & H2b)

After identifying the best-fitting growth curve for each outcome for mothers and fathers, we estimated parallel DLGCMs to assess co-occurrence (Aim 2) and bidirectionality (Aim 3) between trajectories. The parallel model for relationship quality and sexual satisfaction demonstrated good fit indices (see Table 2). We only describe here the APIM associations between relationship quality and sexual satisfaction; all other APIM effects are described in the unconditional models above. Supporting H2a, mothers' and fathers' initial relationship quality in pregnancy was positively associated with their own and with their partners' initial levels of sexual satisfaction (actor and partner effects). We then examined whether mothers' and fathers' relationship quality and sexual satisfaction slopes were occurring in parallel. The degree to which mothers' and fathers' relationship quality decreased over time was significantly and positively associated with the degree to which their own and their partners' sexual satisfaction also decreased over time (actor and partner effects). These results support H2b by indicating that, for both mothers and fathers, changes to relationship quality and to sexual satisfaction over time are positively linked at the individual and at the couple level.

Finally, to address Aim 3, which was to test for bidirectionality, we examined whether relationship quality in pregnancy predicted the rate of change in sexual satisfaction from pregnancy to postpartum. Initial relationship quality did not significantly predict how mothers' and fathers' sexual satisfaction changed over time. Regarding the other direction of associations (i.e., whether sexual satisfaction at baseline predicted changes in relationship quality over time) we found that, likewise, initial levels of sexual satisfaction did not significantly predict mothers' and fathers' rate of change in relationship quality.

Bidirectionality of changes in relationship quality and sexual distress (H2a & H2b)

The parallel DLGCM for relationship quality and sexual distress provided good fit indices (See Table 2). Concerning the associations between relationship quality and sexual distress at baseline, we found that mothers' and fathers' initial relationship quality were significantly and negatively linked to their own and to their partners' initial sexual distress (actor and partner effects), supporting H2a. We then assessed whether changes in relationship quality were occurring in parallel with changes in sexual distress. The degree to which mothers' and fathers' relationship quality decreased over time was significantly associated with the degree to which their sexual distress increased over time (actor effects) but was not significantly related to how their partners' sexual distress changed over time (*ns* partner effects). These results partially corroborate H2b by showing evidence of actor, but not partner effects.

Finally, to examine bidirectionality (Aim 3), we assessed whether initial levels of relationship quality were related to change in sexual distress from pregnancy to postpartum. A steeper rate of change in mothers' sexual distress over time was linked to mothers' own greater initial relationship quality but was not linked to fathers' initial relationship quality. These results denote that,

for mothers, higher levels of relationship quality in pregnancy predicted greater rates of change (i.e., faster increases) in sexual distress over time. Fathers' rate of change in sexual distress over time was not associated with own nor mothers' relationship quality at baseline. As for the reverse direction of associations (i.e., between levels of sexual distress at baseline and change in relationship quality over time), mothers' change in relationship quality was not significantly related to their own nor to fathers' baseline levels of sexual distress. Fathers' change in relationship quality over time was not related to their own but was negatively related to mothers' baseline levels of sexual distress. These results indicate that, for mothers and fathers alike, changes to relationship quality over time were not dependent on their own initial levels of sexual distress in pregnancy. In terms of partner effects, mothers' higher sexual distress in pregnancy predicted faster decreases in fathers' relationship quality over time.

DISCUSSION

This study is the first to our knowledge to examine the longitudinal associations between new parents' relationship quality, sexual satisfaction, and sexual distress across the transition to parenthood. Mothers' and fathers' average relationship quality and sexual satisfaction declined, whereas sexual distress increased. We also found that changes to new parents' relationship and sexual well-being dimensions were occurring together (i.e., they were influencing each other over time) and that relationship quality and sexual distress trajectories could be predicted by initial prenatal levels of each other, with distinct predictors being relevant for each couple member. These findings support the idea that the impact of the transition is partly determined by prenatal relational factors, to which clinicians and researchers can attend to early on.

In pregnancy, and for both couple members, better relationship quality showed robust links to own and partners' higher sexual satisfaction and lower sexual distress. This finding reinforces the connection between a relationship of greater quality and greater sexual well-being, particularly during a period when couples face a range of common but potentially distressing changes to their sexual and relational experiences (Mitnick et al., 2009; Rosen et al., 2020). When examining the course of change in couples' relationship and sexual dimensions in isolation, our findings are in line with prior research by evidencing average declines in relationship quality and sexual satisfaction and increases in sexual distress, highlighting the potential vulnerability of this period for new parents' relationships (Mitnick et al., 2009; Rosen et al., 2020). Yet, counter to some previous studies (Dawson et al., 2021; Rosen et al., 2020), we found that partners' sexual distress also increased over time, which could be related to the differences in the times in which the data were collected in the current study and prior studies (i.e., other studies have included longer assessment periods). The observed trajectories may be explained by the range of novel changes couples experience, such as less time together as a couple, changes in roles in the relationship (e.g., balancing the parental and sexual parts of the self), as well as reduced availability for sex (e.g., lack of time, energy, and privacy).

Still, the direction of influence between these dimensions over time is a largely unanswered question until now, particularly for new parent couples. As anticipated, we found that the degree to which mothers' and fathers' relationship quality decreased from pregnancy to 6 months postpartum was being reciprocally influenced by the degree to which their own and their partners' sexual satisfaction also decreased over time, as well as by the degree to which their own (but not their partners') sexual distress increased over time. These findings denote that the interpersonal dynamics occurring in new parents' sexual and relational dimensions importantly contribute to how each other vary across this transition, with changes in one dimension potentiating changes to the other. In terms of clinical implications, these findings suggest that promoting either sexual satisfaction or relationship quality will likely result in beneficial effects for both dimensions. Furthermore, targeting individual sources of sexual distress across pregnancy and postpartum

(e.g., sexual concerns such as mismatches in sexual desire, or how to show affection when sexual intercourse is difficult at postpartum) might be an effective way of promoting both sexual and relationship well-being of new parents.

We further tested the previously unexplored question of whether prenatal levels of sexual and relational well-being were predictive of own and partners' subsequent pattern of changes. Overall, the pace at which relationship quality decreased from pregnancy to 6 months postpartum was not dependent on own or partners' initial levels of sexual satisfaction. Likewise, declines in sexual satisfaction were not dependent on own nor partners' prenatal perceived quality of their relationship. Although relational and sexual quality interrelate proximately over time, as described above, longitudinal changes to these dimensions do not seem to depend on prenatal levels of each other. Rather, situational challenges which are more prominent after mid-pregnancy and which challenge new parents' relational and sexual adjustment (e.g., division of household labor and childcare, navigating their new roles in the relationship, or lack of time and energy for sex at postpartum) may be more important contributors to the co-occurring declines. Still, women who were more sexually satisfied prenatally showed stronger declines in sexual satisfaction over time. This effect indicates that mothers who are used to highly satisfied sexual relationships have a harder time to adjust to subsequent changes across the transition, as they might hold high, but unrealistic sexual expectations for the transition. Indeed, recent evidence shows that new mothers' whose prenatal expectations were unmet at postpartum also report lower sexual satisfaction (Rosen et al., 2022).

Women who reported greater sexual distress prenatally showed a smaller rate of increase in their own sexual distress over time, a finding that can reflect a ceiling effect such that women who start pregnancy with an already high level of distress have less room to increase over time. These findings also speak to the notion that the experience of *some* amount of sexual distress—but still at non-clinical levels—might serve to protect women against marked increases in own sexual distress later on. It might be that demonstrating some worries and concerns about sexuality during pregnancy reflects a greater value placed by women on their sexual lives, which may prompt women to put more effort into actively managing the normative sexual changes of the transition, ultimately resulting in lower sexual distress at postpartum. Yet, fathers whose partners reported greater prenatal sexual distress showed faster rates of decline in their own relational quality, suggesting that fathers may still interpret mothers' concerns and worries about sexuality negatively (e.g., as a sign that something is wrong in their relationship). Clinically, this finding is relevant as professionals might provide couples with psychoeducation about expected changes to their sexuality so that, if they encounter them, they are less likely to interpret these changes as a sign of poor personal or relationship well-being. Still, our sample showed, on average, good levels of relationship and sexual satisfaction, with sexual distress below clinical levels over time. It is possible that, in higher-risk couples, the direction of these effects might change and potentially be moderated by other dimensions (e.g., frequency of sexual difficulties, perceived partner responsiveness), which may predispose them for more severe sexual and relational problems.

Interestingly, we found that mothers who reported higher relationship quality prenatally were more likely to show greater increases in sexual distress over time. In other words, sexual changes occurring through 6 months postpartum were perceived as being more concerning for women who started the transition perceiving their relationships as being of higher quality than for women who perceived their relationships as being of lower quality—but still at satisfying ranges—for whom sexual changes were not as distressing. Similarly to what we found regarding mothers' sexual satisfaction trajectories, one possible explanation as to why these women may have interpreted sexual changes as more concerning relates to the fact that these women may have been used to very satisfying sexual relationships, as corroborated by the cross-sectional findings reporting positive links between relational and sexual quality (Byers, 2005; Joel et al., 2020). As such, these women may hold overly positive expectations for their ability to navigate the challenges occurring during the transition, including sexual ones (e.g., expecting that their sexual

lives will quickly return to what they were before). Indeed, most couples hold positive expectations regarding the impacts of the transition to their relationships (Lawrence et al., 2007) and very few (18%) expectant or new parents receive information regarding possible changes to their sexual lives following childbirth (Barrett et al., 2000; Guerra-Reyes et al., 2017). When faced with unexpected and novel sexual experiences (e.g., mismatches in sexual desire, persistent changes to own sexual function), women who hold more positive prenatal evaluations of their relationships may feel unprepared to deal with them and may resort to negative attributions as to why they are experiencing such changes, such as stable (e.g., "This problem will never go away") or partner (e.g., "This is *his* fault") attributions (Vannier et al., 2018). As anticipated by theories of unmet expectations and of sexual well-being in relationships, this experience would lead to heightened levels of bother and concern (Lawrance & Byers, 1995; Lawrence et al., 2007). A recent study corroborates this idea, by showing that mothers whose sexual expectations were unmet across the transition to parenthood report lower sexual and relational satisfaction at postpartum (Rosen et al., 2022). As such, one path for intervention might be targeting prenatal relationship indicators (e.g., women's unrealistic prenatal sexual and relationship expectations) as to prevent later sexual distress for women.

Strengths and limitations

Strengths of this study include the large sample size, the prospective longitudinal design, sampling both couple members during a critical life period such as the transition to parenthood. Despite its contribution, findings should be interpreted considering some limitations. The current sample was representative of the demography of the Portuguese population having a first child, namely regarding age range, marital status, and socioeconomic status (INE, 2011), but all couples were in mixed-sex/gender relationships despite the diversity of recruitment methods, which were inclusive in terms of diversity in gender/sex. Also, this was largely a low-risk sample, with parents being mostly satisfied with their relationships and with their sexual experiences, and generally not distressed at clinical levels. We might expect rate of change over time to be larger and the bidirectional influence between relational and sexual domains to be stronger in samples including a greater proportion of high-risk couples. Relatedly, it is possible that our sample was affected by a self-selection bias, such that couples who have more positive attitudes toward sex (Dawson et al., 2019) or who are more sexually and/or relationally satisfied may be more likely to participate in studies such as this one, which limits the generalizability of our findings. We focused on outcomes that reflect the quality of couples' sexual interactions across this period (satisfaction, distress), yet we recognize that changes to sexual frequency also occur across this period and are linked with new parents' relationship well-being (e.g., Lorenz et al., 2020). Whether changes to sexual frequency exert gendered effects on relational and sexual well-being of new parents was not assessed but, if so, these gendered differences might interact with the observed outcomes; examining this question could be a focus of future research. Finally, there was significant variability in changes to relationship and sexual well-being over time for mothers and fathers, in line with prior research (Rosen et al., 2020). This indicates that not all partners experienced the same trajectory and magnitude of change. Thus, future research may use group-based modeling to further capture the ability of relationship and/or sexual prenatal factors to predict trajectories of improving, worsening, and stable change in mothers' and fathers' outcomes.

CONCLUSIONS

In conclusion, we found that relationship and sexual changes are strongly interconnected from pregnancy to 6 months postpartum, which is typically the most critical period for couples. Most

practitioners intervening with couples are likely to encounter those with coexisting sexual and relationship concerns, making it highly relevant that interventions focus on the link between relational and sexual processes. Mothers' prenatal relationship quality and sexual distress predicted subsequent changes in own sexual distress and fathers' relationship quality, respectively. As such, clinical and research efforts may benefit from focusing on the identified predictors of change to better understand new parents' negative outcomes and adaptation processes across this period. For instance, an increased prenatal awareness of potential postpartum sexual challenges (but not at clinical levels) might trigger more concern about the sexual relationship early on, but also normalize these changes when they occur, which may have subsequent benefits for couples' ability to navigate challenges when they arise. By identifying factors that predict new parent couples' adjustment in a critical period as the transition to parenthood, the current work contributes to a much-needed body of research on the promotion of the well-being of the couple and of the family as a whole.

CONFLICT OF INTEREST

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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