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Research Article

The Association Couple Burnout and Sexual Function in Primiparous Women During One Year After Childbirth: A Cross-Sectional Study Using Structural Equation Model Analysis

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Abstract

Background: Identifying factors leading to couple burnout is crucial, especially considering the high prevalence of sexual dysfunction within the first year postpartum. This study addresses the relationship between couple burnout and sexual function.

Objectives: The present study aimed to examine the association between couple burnout domains and female sexual function domains within one year after childbirth using structural equation model analysis.

Methods: This cross-sectional study utilized a structural equation model for analysis. A total of 352 primiparous mothers, with infants aged two to twelve months, participated. Health centers affiliated with Iran University of Medical Sciences, Tehran, Iran were listed, and 14 centers were randomly selected as recruitment sites. Sampling was conducted through convenience sampling. Data collection included a demographic characteristics form, the Pines Couple Burnout Measure (comprising physical, emotional, and mental exhaustion domains), and the Rosen Female Sexual Function Index (comprising desire, arousal, vaginal lubrication, orgasm, satisfaction, and pain domains). Descriptive analysis, including mean, standard deviation, frequency, and percentage, was performed using SPSS 16. Inferential statistics were conducted using Smart PLS version 8, employing confirmatory factor analysis with a significance level set at 0.05.

Results: A significant inverse correlation was observed between arousal and physical (β = -2.13, P = 0.03) and emotional exhaustion (β = -0.16, P = 0.003), but no correlation was found with mental exhaustion. Additionally, a significant correlation was found between pain and emotional (β = 0.26, P < 0.001), mental (β = 0.31, P < 0.001), and physical exhaustion (β = 0.27, P < 0.001). Desire, lubrication, satisfaction, and orgasm were not associated with any domains of couple burnout.

Conclusions: Two sexual function domains, pain and arousal, emerged as predictors of couple burnout during the first two to twelve months postpartum in primiparous mothers. Pain during sexual intercourse was associated with emotional, physical, and mental exhaustion. Low arousal following sexual contact led to high physical and emotional exhaustion. Healthcare providers should prioritize assessing and addressing women's sexual well-being postpartum.

Keywords: Couple Burnout, Female Sexual Function, Postpartum, Structural Equation Model

1. Background

Couple burnout can occur with the gradual weakening of sexual intimacy and commitment in a couple's relationship, often caused by incompatible sexual expectations and daily life realities (1). It can manifest as physical, mental, and emotional exhaustion (2), leading to feelings of frustration, fatigue, and potentially resulting in divorce or separation (3). Statistics indicate that approximately 50% of married

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couples worldwide experience varying degrees of marital burnout (4), with a higher prevalence in women than men (5). Factors related to couple burnout include age, unwanted marriage, length of marriage, marital dissatisfaction, and sexual function problems (6).

Sexual function problems are common postpartum (7), influenced by hormonal, psychological, and social changes (8). The prevalence of sexual dysfunction varies within the first year after delivery, reported at approximately 80% at three months, 64% at six months, and 38% of women not returning to pre-pregnancy levels (9, 10). Evidence shows low sexual pleasure persists beyond 18 months postpartum (11), with 70.5% of women experiencing sexual dissatisfaction in the first year after childbirth (12). The postpartum period is associated with increased marital conflicts (13). Sexual dysfunction encompasses disorders such as decreased sexual desire, orgasm difficulties, arousal problems, vaginal dryness, dyspareunia, and sexual dissatisfaction, which increase postpartum (14). A systematic review highlighted a significant relationship between postpartum sexual dysfunction and childbirth modes, perineal trauma, and breastfeeding (15). These disorders negatively impact quality of life (16), reducing self-confidence, self-efficacy in relationships, and overall family well-being (17). In Iran, sexual dissatisfaction is a primary factor for divorce or separation (18).

The postpartum period begins immediately after birth and typically lasts 6 to 8 weeks (19). Approximately 89% of women resume sexual activity within six months postpartum (20). Due to discharge or vaginal bleeding, most women abstain from sexual activity during the first two months postpartum. Therefore, research on marital satisfaction, couple burnout, and influential factors after two months postpartum is essential. This period offers a unique opportunity to examine the association between sexual function domains and couple burnout, particularly in Iran, where marital dissatisfaction prevalence is reportedly 66.5% (21). While most individuals giving birth are cisgender women, the need for gender inclusivity is acknowledged (22). Dissatisfaction with one's sex life plays a crucial role in causing couple burnout (23).

2. Objectives

Given the above, identifying factors leading to couple burnout early by assessing sexual dysfunction during this period is vital. This study aimed to examine the relationships between couple burnout and sexual function from two to twelve months postpartum in the context of Iran. Based on existing evidence, we formulated the hypotheses presented in Figure 1.

2.1. Study Hypotheses

The study proposes the following hypotheses, as illustrated in Figure 1:

- H1: Sexual desire following childbirth is related to physical, emotional, and mental exhaustion.

- H2: Sexual stimulation following childbirth is related to physical, emotional, and mental exhaustion.

- H3: Vaginal lubrication after childbirth is related to physical, emotional, and mental exhaustion.

- H4: The ability to reach orgasm after childbirth is related to physical, emotional, and mental exhaustion.

- H5: Sexual satisfaction after childbirth is related to physical, emotional, and mental exhaustion.

- H6: Sexual pain (dyspareunia) after childbirth is related to physical, emotional, and mental exhaustion.

3. Methods

3.1. Study Design

The cross-sectional study was conducted from October to December 2021 in Tehran, Iran.

3.2. Study Population

Primiparous cisgender women, considered healthy, were invited to participate during the postnatal period. Eligible participants were mothers aged 18 - 40 years, who had given birth to a baby aged between two and twelve months at the time of data collection, had no history of sexual dysfunction prior to pregnancy, and were cohabiting in a heterosexual relationship with a spouse. Non-inclusion criteria included chronic diseases, mental health problems, divorce, permanent marriage, history of abortion or stillbirth, infertility, instrumental delivery (e.g., forceps or vacuum delivery), and newborn hospitalization. Exclusion criteria were incomplete questionnaire responses.

The sample size (n = 352) was estimated using the online structural equation model sample size calculator, considering a medium effect size (0.2) (24), power of 0.8, and $\alpha = 0.05$, involving 9 latent variables and 40 observed variables. A simple random sampling method was employed. Initially, both west and northwest health

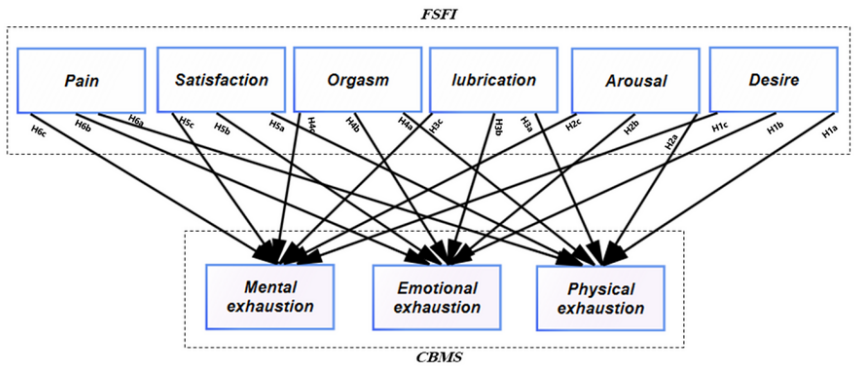

Figure 1. Study hypotheses. FSFI, Female Sexual Function Index; CBMS, couple burnout measure-short

centers affiliated with Iran University of Medical Sciences in Tehran were identified. The west health center encompassed three geographical areas, and the northwest health center encompassed four geographical areas. A list of health centers was created, and two centers from each comprehensive health center were randomly selected as recruitment sites, totaling 14 centers.

After receiving the approval from the Ethics Committee of Iran University of Medical Sciences, recruitment commenced. Participants were invited to read detailed information about the study's procedures, aims, and objectives while attending health centers for infant vaccinations. They were encouraged to ask questions for clarity. Willing participants provided written informed consent, assured of anonymity, and informed they could withdraw from the study at any time without reason or consequence.

3.3. Study Variables

The dependent variable was couple burnout, comprising physical, emotional, and mental exhaustion components. The independent variable was sexual function, comprising desire, arousal, vaginal lubrication, orgasm, satisfaction, and dyspareunia components.

3.4. Data Collection

Upon confirming informed consent, participants completed the data collection tools by hand in a quiet room at their healthcare center. The data collection process took approximately 15 minutes and included a self-reported demographic and obstetric form (DOF), the couple burnout measure-short form (CBMS), and the Female Sexual Function Index (FSFI).

The DOF included items related to age, length of marriage, infant age, educational status, mode of birth, and infant feeding status. The CBMS is a 21-item scale designed to assess couple burnout, comprising three primary subscales: Physical exhaustion, emotional exhaustion, and mental exhaustion (5). Of the 21 items, 17 feature negative expressions, while the remaining four are positive. Respondents rate these items on a 7-point Likert scale ranging from 1 (never) to 7 (always). Scores from positive items are aggregated initially, followed by the summation of scores from negative items. The sum from the second phase is subtracted from a total of 32, and the result is added to the score from the first phase. The total score from the last stage is divided by 21 to derive the comprehensive burnout score, ranging from 2 to 6. A score below 2 signifies an intimate relationship, while a score between 2 and 5 indicates potential couple burnout. A score of 5 correlates with severe couple burnout. In a study conducted in Iran by Morshedi et al., the reliability of CBMS was assessed using Cronbach's alpha coefficients, ranging from 0.91 to 0.93 (25).

The FSFI is a 19-item questionnaire assessing female sexual function across six domains: Desire, arousal, vaginal lubrication, orgasm, satisfaction, and pain. Each domain is rated on a scale from 0 (or 1) to 5. The total score for each domain is calculated by multiplying the sum of responses by its designated weight. A lower score

Table 1. Characteristics of 352 Women Who Had Two to Twelve Month Old Infants

Variables	No. (%)
Age (y)	
18 - 25	75 (21.3)
26 - 30	105 (29.8)
≥ 31	172 (48.9)
Length of marriage (y)	
1 - 5	208 (59.1)
6 - 10	112 (31.8)
≥ 11	32 (9.1)
Baby's age (mon)	
2 - 5	134 (37)
6 - 8	79 (22.4)
9 - 12	139 (40.6)
Educational status	
High school	49 (13.9)
Diploma	126 (35.8)
Academic	177 (50.3)
Mode of birth	
C-section	228 (64.8)
Vaginal	124 (35.2)
Baby's feeding status	
Human milk feeding (breast/chest)	182 (51.7)
Formula	60 (17)
Mix	110 (31.3)

indicates more pronounced sexual dysfunction (26). Translation and validation of this scale were conducted by Fakhri et al. for the Persian version of FSFI (27).

3.5. Data Analysis

The normality of continuous variables was assessed using the Kolmogorov-Smirnov test. Quantitative data are presented as mean and standard deviation, with median and interquartile range used if the distribution was non-parametric. Qualitative data are reported as frequency and percentage. Structural equation modeling (SEM) was employed to determine associations between the FSFI and CBMS components. The SEM, a multivariate statistical method, assesses several regression analyses for both the outer (measurement) and inner (structural) models. The Kaiser–Meyer–Olkin (KMO) and Bartlett's tests were conducted for confirmatory factor analysis (CFA) to assess sampling adequacy and data sphericity. Initially, CFA was conducted to validate the acceptable fits of both the CBMS and FSFI. A factor loading > 0.5 for each item was considered the most accurate representation of each specific factor, and items with a factor loading below 0.5 were removed (28). All analyses were performed using SPSS v16 and Smart PLS v. 3.2.8 software. Factors such as participant age, infant age, and length of marriage were analyzed in groups. The significance level for all tests was set at $P < 0.05$.

4. Results

A total of 352 participants were included in the analyses. The mean ± SD age of participants was 29.8 ± 5.1 years, the length of marriage was 5.5 ± 3.3 years, and the infant age was 7.03 ± 0.9 months. Half of the women had an academic degree. The majority (64.8%) had a history of cesarean section in the current childbirth, and half of the women breastfed their babies. These variables are presented in Table 1. The mean ± SD scores for the CBMS and FSFI were 2.83 ± 0.99 and 24.98 ± 4.75, respectively. The mean ± SD for pain, libido, orgasm, satisfaction, desire, and arousal were 3.87 ± 0.93, 3.87 ± 1.02, 4.12 ± 1.06, 3.17 ± 0.73, and 3.51 ± 0.93, respectively.

4.1. Measurement Model

Table 2. Correlation of Couple Burnout Domains and Female Sexual Function Domains

Domains	1	2	3	4	5	6	7	8	9
1. Arousal	1.000	-	-	-	-	-	-	-	-
2. Desire	0.528	1.000	-	-	-	-	-	-	-
3. Emotional exhaustion	-0.279	-0.226	1.000	-	-	-	-	-	-
4. Lubricant	0.625	0.302	-0.132	1.000	-	-	-	-	-
5. Mentally exhaustion	-0.220	-0.194	0.802	-0.137	1.000	-	-	-	-
6. Orgasm	0.724	0.322	-0.197	0.717	-0.167	1.000	-	-	-
7. Pain	0.077	-0.162	0.242	0.037	0.290	0.095	1.000	-	-
8. Physical exhaustion	-0.200	-0.163	0.802	-0.080	0.725	-0.135	0.249	1.000	-
9. Satisfaction	0.660	0.314	-0.223	0.576	-0.204	0.720	0.110	-0.155	1.000

Table 3. Goodness Fit Value of Latent Variables (Couple Burnout Domains and Female Sexual Function Domains) [a]

Variables	Test Reliability	Test Validity				Quality of Model		
	α	Rh_0-α	CR	AVE	CR > AVE	CVCOM	NFI	SRMR
Physical exhaustion	0.75	0.75	0.83	0.50	✓	0.04		
Emotional exhaustion	0.85	0.86	0.89	0.53	✓	0.10		
Mental exhaustion	0.74	0.76	0.83	0.50	✓	0.10		
Desire	0.74	0.74	0.88	0.79	✓	-		
Arousal	0.87	0.87	0.91	0.72	✓	-	0.723	0.070
Lubrication	0.79	0.80	0.87	0.62	✓	-		
Orgasm	0.81	0.81	0.89	0.72	✓	-		
Satisfaction	0.90	0.90	0.94	0.83	✓	-		
Pain	0.83	0.90	0.90	0.74	✓	-		

Abbreviations: CR, composite reliability; AVE, average variance extracted; CVCOM, cross-validated communality; NFI, Normed Fit Index; SRMR, standardized root mean square residual.

[a] α: Cronbach's alpha; Rho-α: Spearman's rank-order correlation.

The assumptions of the CFA analysis were met by the KMO (> 0.7) and Bartlett's tests (P = 0.001). The domains related to physical, mental, and emotional exhaustion from the CBMS and the domains of pain, satisfaction, arousal, lubrication, orgasm, and desire from the FSFI were entered into the regression model as endogenous and exogenous variables, respectively. All observable variables had a factor loading of more than 0.5 (Appendix 1 in Supplementary File). Correlations of the variables are presented in Table 2. To evaluate the reliability of the model, results from at least three tests [Cronbach's alpha > 0.7, composite reliability (CR), and Spearman's rank-order correlation (rho-A) > 0.7] had to be acceptable. The average variance extracted (AVE) test was used to evaluate the convergence validity of the model, which was > 0.5 for each construct. Moreover, the CR value of each variable was greater than its AVE, indicating good convergent validity, as demonstrated in Table 3. In assessing multicollinearity between latent constructs, Heterotrait-Monotrait (HTMT) values fell below the recommended threshold of 0.9, confirming the model's discriminant validity, as presented in Table 4. The Cross-validated Communality (CV COM) Index was used to assess the quality of the outer (measurement) model in terms of predictive power, with a value greater than 0.35, indicating high predictive quality. The standardized root mean square residual (SRMR) value was less than 0.1, indicating a good fit (28). Therefore, the measurement model had high predictive quality, as highlighted in Table 3.

4.2. Hypothesis Testing

Table 4. Discriminant Validity of the Scale (HTMT) [a]

Variables	1	2	3	4	5	6	7	8
1. Arousal	-	-	-	-	-	-	-	-
2. Desire	0.661	-	-	-	-	-	-	-
3. Emotional exhaustion	0.310	0.279	-	-	-	-	-	-
4. Lubrication	0.750	0.395	0.165	-	-	-	-	-
5. Mentally exhaustion	0.266	0.257	0.919	0.183	-	-	-	-
6. Orgasm	0.857	0.396	0.233	0.890	0.218	-	-	-
7. Pain	0.086	0.186	0.277	0.105	0.348	0.120	-	-
8. Physical exhaustion	0.227	0.206	0.990	0.131	0.937	0.161	0.271	-
9. Satisfaction	0.754	0.387	0.255	0.674	0.259	0.854	0.148	0.182

[a] Heterotrait-Monotrait ratio.

After assessing the model's quality, SEM was used to test the study hypotheses at a 5% significance level and 95% confidence interval. Results revealed a significant inverse correlation between arousal and physical (β = -2.13, P = 0.03) and emotional exhaustion (β = -0.16, P = 0.003), but no correlation with mental exhaustion. Additionally, a significant correlation was found between pain and emotional (β = 0.26, P < 0.001), mental (β = 0.31, P < 0.001), and physical exhaustion (β = 0.27, P < 0.001). Desire, lubrication, satisfaction, and orgasm were not associated with any domains of couple burnout (P > 0.05), as presented in Table 5. Therefore, hypotheses H2a, H2b, H6a, H6b, and H6c are accepted, while H1a, H1b, H1c, H2c, H3a, H3b, H3c, H4a, H4b, H4c, H5a, H5b, and H5c are rejected. Arousal significantly impacts physical and emotional exhaustion, while pain significantly impacts physical, emotional, and mental exhaustion. Figure 2 demonstrates the relationship between inner (latent) variables and outer (observed) variables. The outer (observed) model shows factor loading, and the inner (latent) model shows path coefficients and R squared. The FSFI predicted 16%, 15%, and 11% of the variance in emotional, mental, and physical exhaustion, respectively.

5. Discussion

The present study examined the relationships between couple burnout domains and sexual function domains during two to twelve months postpartum using SEM. A majority of participants experienced sexual dysfunction, particularly pain during intercourse. We identified an indirect relationship between sexual arousal and both physical and emotional exhaustion. Previous study has similarly demonstrated that sexual arousal significantly correlates with feelings of fatigue, reduced happiness, and diminished emotional well-being in women, as well as fatigue correlating with depression (29). Our results failed to show an association between the arousal dimension and mental fatigue, adding to this body of literature.

Overall, we examined six domains of sexual function. There was a correlation between pain resulting from sexual intercourse and physical, emotional, and mental exhaustion. Previous studies indicate that dyspareunia occurs during or after sexual intercourse in the first year postpartum (30). Risk factors for pain include changes in pelvic floor muscles during pregnancy (31) and episiotomy, which is common for first-time births in many Iranian communities and often routine practice. Episiotomy can be a negative and painful experience, causing sexual dysfunction (32) and leading to physical burnout (33). Other factors include lack of vaginal lubrication and loss of sexual desire, which significantly increase dyspareunia after delivery (34). Pain may also negatively affect relationships with partners and lead to adverse psychological outcomes (35). This is concerning as sexual function postpartum affects couples' feelings of emotional closeness, empathy, and support for their spouses (36). Pain catastrophizing, pain sensitivity, and fear of pain are associated with early life environmental unpredictability (32), suggesting serious implications for those with stressful childhood experiences.

Vaginal lubrication was not associated with any couple burnout dimensions in this study. Following childbirth, prolactin secretion induces amenorrhea by suppressing estrogen levels, leading to vaginal atrophy and decreased lubrication during sexual activity,

Table 5. Result of Hypothesis Testing

H	Path	β	S.E [a]	*t*	P-Value [b]	Finding
H1a	Desire → physical exhaustion	-0.005	0.06	0.07	0.93	NS
H1b	Desire → emotional exhaustion	-0.03	0.04	0.61	0.54	NS
H1c	Desire → mental exhaustion	-0.02	0.05	0.35	0.72	NS
H2a	Arousal → physical exhaustion	-2.13	0.70	3.007	0.03	Supported
H2b	Arousal → emotional exhaustion	-0.16	0.09	1.66	0.003	Supported
H2c	Arousal → mental exhaustion	-2.25	1.04	2.16	0.09	NS
H3a	Lubrication → physical exhaustion	0.11	0.08	1.26	0.20	NS
H3b	Lubrication → emotional exhaustion	0.11	0.07	1.49	0.13	NS
H3c	Lubrication → mental exhaustion	0.04	0.08	0.49	0.61	NS
H4a	Orgasm → physical exhaustion	-0.01	0.08	0.12	0.90	NS
H4b	Orgasm → emotional exhaustion	-0.01	0.10	0.15	0.87	NS
H4c	Orgasm → mental exhaustion	-0.01	0.08	0.10	0.92	NS
H5a	Satisfaction → physical exhaustion	-0.19	1.16	1.12	0.26	NS
H5b	Satisfaction → emotional exhaustion	-0.12	0.07	1.57	0.11	NS
H5c	Satisfaction → mental exhaustion	-0.15	0.26	1.78	0.07	NS
H6a	Pain → physical exhaustion	0.27	0.05	4.90	0.001	Supported
H6b	Pain → emotional exhaustion	0.26	0.05	4.85	0.001	Supported
H6c	Pain → mental exhaustion	0.31	0.05	6.07	0.001	Supported

Abbreviation: NS, not supported.

[a] Standard error based on bias corrected and accelerated bootstrapping.

[b] $P < 0.05$ is considered statistically significant.

potentially causing discomfort (37). Fluctuating degrees of difficulty in achieving vaginal moisture have been reported by 84% of women during sexual intercourse postpartum. Parameters affecting vaginal moisture include breastfeeding, mode of delivery, and contraception (38).

In this study, there was no correlation between orgasm and dimensions of couple burnout. Documentation shows that most women experience problems achieving orgasm during the first months postpartum (39). Our study was cross-sectional, so precise orgasm determination was not possible, as it was self-reported by individuals.

Our results showed that sexual desire was not associated with any dimensions of couple burnout. There is a discordance of sexual desire between women and their partners postpartum (40). In some studies, women reported managing their partner's feelings during sexual intercourse despite feeling no desire, sometimes faking an orgasm. These women pretended to feel sexual desire, but it was not genuine (41).

There was no correlation between sexual satisfaction and dimensions of couple burnout in this study. Consistent with this, the postpartum period is reported to bring heightened fatigue for those who have given birth, often due to increased responsibilities, particularly childcare duties and sleep deprivation (37).

Our analyses revealed that 16% of emotional exhaustion and 15% of mental exhaustion were attributed to sexual dysfunction. Much of this exhaustion may be attributed to the burden of breastfeeding. However, spouses often view this time, where infant feeding is demanding on their partners, as positive in terms of sexual function, and those feeding do not necessarily associate this time with sexual dysfunction (20). It is important to explore how couples navigate such exhaustion in their sexual lives or identify where sexual relationships may be enhanced during this period.

5.1. Conclusions

This research is among the first of its kind to examine relationships between couple burnout domains and sexual function domains within two to twelve months after delivery. Pain and arousal of sexual function in this sample emerged as predictors of couple burnout during the first 12 months postpartum. Given the impact of postnatal sexual functioning on couple burnout,

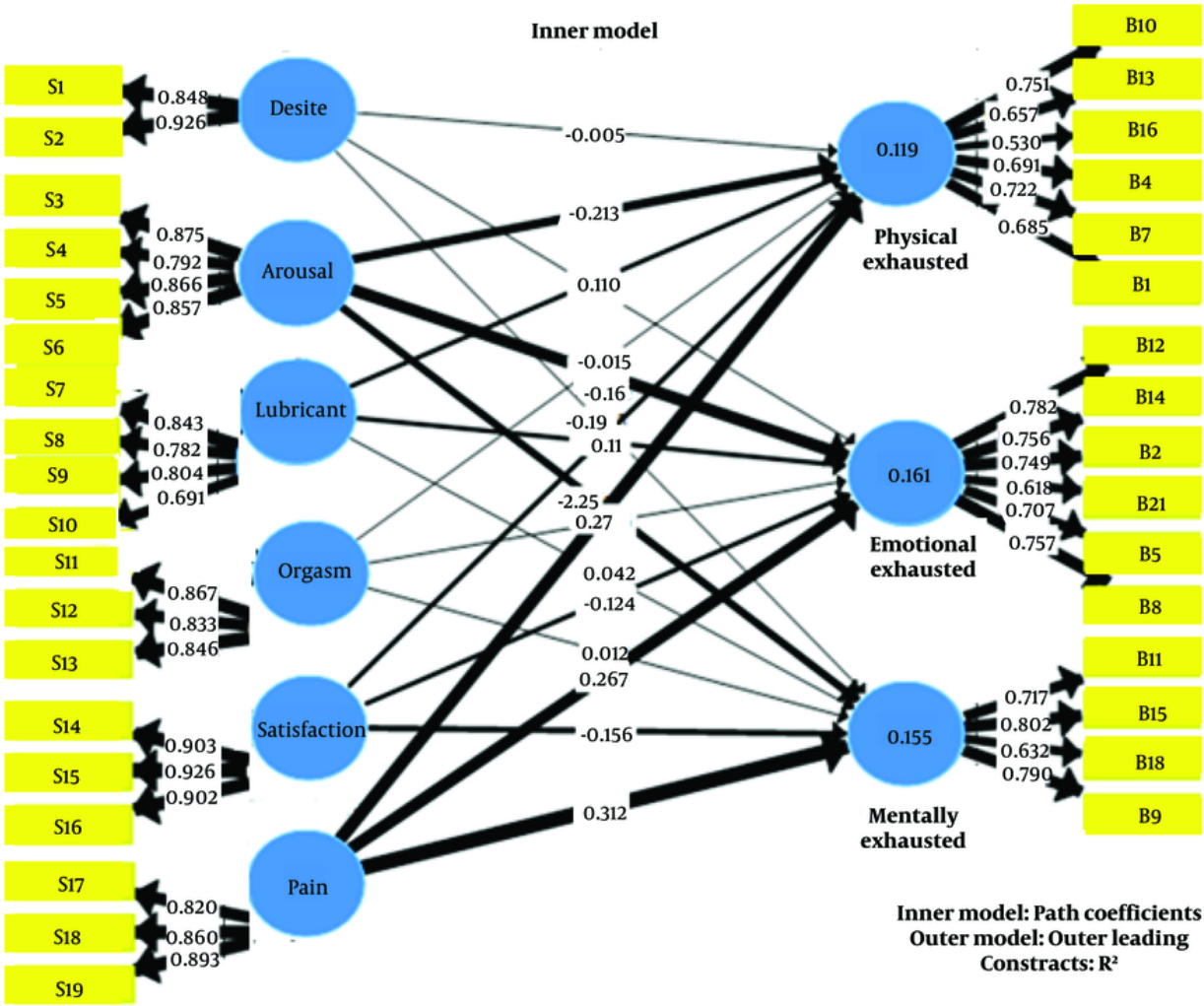

Figure 2. PLS-SEM analysis (couple burnout domains and female sexual function domains). Bold lines represent a statistically significant relationship, a two-sided P-value < 0.05 was considered.

healthcare providers should prioritize assessing and addressing sexual well-being post-pregnancy. These findings may also support future sexual health and couples counseling.

5.2. Strengths and Limitations and Future Directions

A key strength of this study is the inclusion of a relatively large sample size. However, the primary limitation is its cross-sectional design, which precludes establishing a definitive causal relationship due to the absence of chronological sequencing between response and independent variables. Consequently, we have been cautious not to overstate our results. Another limitation is the limited diversity in studies related to the research hypotheses; nevertheless, efforts were made to select the most relevant studies for result comparison. Given the elevated levels of female sexual dysfunction after childbirth, further research is necessary to assess the impact of episiotomy pain from vaginal delivery on couple burnout. Considering the influence of culture and infant feeding, qualitative studies could be devised to explore perceptions regarding the determinants of

mental, physical, and emotional exhaustion. Furthermore, additional studies, particularly with a qualitative approach, are warranted to delve into other predictive factors of couple burnout in conjunction with female sexual function.

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Supplementary Material

Supplementary material(s) is available here [To read supplementary materials, please refer to the journal website and open PDF/HTML].

Footnotes

Authors' Contribution: E. A. and M. J.: Conceptualization; M. J.: Data curation; E. A.: Formal analysis; E. A. and M. J.: Investigation; E. A. and M. J.: Writing – review and editing; S. P.: Supervision, interpretation, writing – review and editing.

Conflict of Interests Statement: The authors declare no conflict of interest.

Data Availability: The datasets generated and analyzed during the present study are not publicly available due to the confidentiality of information, but they can be available through the corresponding author on reasonable request.

Ethical Approval: The present study was approved by the Ethics Committee of Iran University of Medical Sciences (IR.IUMS.REC.1398.265). All methods were performed in accordance with the relevant guidelines and regulations.

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Informed Consent: All participants provided written consent before participation.

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