

The relationship between time perspective and parenting concern among Chinese Gynecological cancer patients: the chain mediating role of Self-disclosure and Perceived Partner Responsiveness

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Abstract

Purpose

Gynecological cancer patients with minor children often experience significant parenting concerns. Time perspective, a multidimensional cognitive orientation toward past, present, and future, may influence how patients cope with parenting-related stress. This study examines how different time perspective dimensions (past-negative, past-positive, present-hedonistic, present-fatalistic, future, and deviation from balanced time perspective) relate to parenting concerns, and whether self-disclosure and perceived partner responsiveness serve as sequential mediators.

Methods

A cross-sectional survey was conducted with 266 gynecological cancer patients from three tertiary hospitals in China. Participants completed measures of time perspective, self-disclosure, perceived partner responsiveness, and parenting concerns. Chain mediation analysis was performed using PROCESS.

Results

Effects varied markedly across dimensions. Past-negative showed significant direct effects on all parenting concern dimensions ($\beta = 0.219\text{--}0.371$, $P < 0.01$). Future, present-fatalistic, and deviation from balanced time perspective exerted indirect effects only through the chain path of "perceived partner responsiveness $\rightarrow$ self-disclosure" (total indirect effects = -0.180 , 0.156 , and 0.192). This chain mediation was significant only for concerns about the co-parent (15.9%–19.6% of total indirect effects). Past-positive and present-hedonistic showed no significant associations.

Conclusion

Different time perspective dimensions influence parenting concerns through distinct pathways—some directly, others indirectly via relational processes—with notable specificity for co-parent concerns. These findings highlight the importance of fostering adaptive time perspectives and supportive dyadic communication in psychosocial interventions.

Introduction

Gynecological cancers account for approximately 20% of new cancer cases in females annually^[1], with an estimated 290,000 new cases in China in 2022^[2]. For these mothers, parenting concern—defined as the persistent psychological distress arising from worries about their children's well-being, their own parenting capacity, and their partner's ability to provide support—represents a significant burden^[3]. A survey revealed that parenting concerns among gynecological cancer patients are at a moderate-to-high level, underscoring the clinical significance of this issue^[4]. Parenting concern is robustly associated with higher anxiety, depression, and poorer quality of life^[5,6]. In gynecological cancers, this distress is particularly complex, as the disease directly impacts reproductive function, female identity, and maternal role^[7].

Time perspective (TP) has been increasingly applied in parenting and family research, particularly in understanding mothers' psychological adjustment and parenting behaviors^[8,9]. Time perspective (TP) refers to an individual's relatively stable cognitive bias toward the past, present, and future. According to Zimbardo and Boyd's theory, TP comprises five dimensions: Past-Negative, Past-Positive, Present-Hedonistic, Present-Fatalistic, and Future^[10]. Studies have shown that mothers with a strong future orientation tend to adopt more adaptive parenting strategies, which is associated with lower parenting stress and concerns^[9]. Conversely, mothers dominated by present-oriented perspectives exhibit higher parenting concerns, often struggling with inconsistent discipline and reactive parenting^[8]. Furthermore, mothers' TP has been shown to predict family functioning, parent-child interaction quality, and children's health outcomes^[11,12].

In oncology, TP has gained increasing recognition as an important psychological indicator. Research suggests that a cancer diagnosis profoundly disrupts patients' temporal experience, often leading to an intensified focus on the past or a constricted view of the future, which in turn influences their emotional adjustment and coping behaviors^[7,13]. Although anxiety and depression closely linked to TP—have been empirically confirmed as key predictors of parenting concerns in cancer patients^[5,14] and emerging evidence suggests TP influences parenting-related outcomes^[8,9,12], the direct relationship between specific TP dimensions and parenting concerns remains underexplored.

Previous research has established that self-disclosure and perceived partner responsiveness play crucial roles in shaping parenting concerns among cancer patients^[15,16]. Milbury et al.^[16] found that among cancer patients parenting minor children, open dyadic communication about illness-related worries significantly predicted lower parenting concerns. Manne et al.^[17] further demonstrated that in couple-focused interventions, intimacy-building processes—particularly self-disclosure and perceived partner responsiveness—were associated with better psychological

adjustment. These two constructs are inherently linked: according to the Interpersonal Process Model of Intimacy^[18], self-disclosure promotes intimacy only when met with perceived partner responsiveness, which in turn encourages further disclosure, forming a reciprocal chain.

Some evidence also suggests that time perspective predicts these relational processes. Fife and Nelson^[19] found that time perspectives significantly influence how individuals approach interpersonal communication. Individuals with past-negative or present-fatalistic perspectives tend to adopt withdrawing communication styles, which may inhibit self-disclosure and reduce perceived partner responsiveness. Conversely, future-oriented individuals are more likely to employ constructive, open communication, facilitating disclosure and positive interpretations of partner support^[20].

The three-dimensional structure of parenting concern carries distinct clinical implications: concerns about children reflect mothers' direct assessment of child well-being, whereas concerns about the co-parent involve an indirect evaluation of partner capacity. Based on this structural difference, the activation mechanisms of these two types of concerns may differ fundamentally.

Concerns about children are primarily influenced by parents' own cognitive-emotional states. Long et al.^[21] found that mothers with cancer worry more about their children's health than fathers do, suggesting that this concern is associated with internal psychological constructs such as maternal identity. Lai et al.'s^[22] qualitative study also confirmed that parents with cancer often experience distress due to "declining parenting capacity" and attempt to cope through "internal adjustment." This aligns with time perspective theory: past-negative is characterized by overgeneralization of past failures^[16]; when mothers immerse themselves in negative self-evaluations, concerns about their children may increase accordingly. Based on this, it can be inferred that there may exist a pathway through which concerns about children are directly influenced by time perspective, without requiring interpersonal mediation.

In contrast, concern about the co-parent is essentially a relational evaluation whose activation may highly depend on the quality of couple interaction. When illness forces mothers to transfer parenting functions, the core question may shift from "Can I do it well?" to "Can he/she do it well?" This shift may originate from perceptions of the partner's ability, willingness, and reliability—perceptions that may need to be formed through interpersonal processes such as self-disclosure and perceived partner responsiveness. Research has found that communication difficulties in families of children with autism can disrupt couple relationships, leading to biased perceptions of partner support, thereby generating strong uncertainty about whether the partner can reliably take over when needed to assume more parenting responsibilities^[23]. Parents' perspective-taking ability moderates the effect of marital satisfaction on family alliance^[24], suggesting that positive perceptions of partners may depend on high-quality interaction. In the cancer context, Milbury et al.^[16] directly confirmed that open communication between couples about parenting concerns is significantly associated with lower co-parent concern—open communication may enable patients to more accurately assess their partner's willingness and ability to provide support, thereby reducing anxiety about "Can he/she take over for me?" This suggests that evaluation of the co-parent may require mediation through interpersonal processes such as self-disclosure and perceived partner responsiveness, rather than being directly triggered by time perspective.

Based on the above analysis, this study proposes the hypothesis that different time perspective dimensions may influence parenting concerns through distinct pathways—past-negative may directly affect child-related concerns, while future orientation and present-fatalistic may indirectly affect co-parent concern through the interpersonal chain path of "perceived partner responsiveness → self-disclosure."

Although previous research has preliminarily revealed associations between time perspective and parenting-related psychological variables, these studies have largely focused on general mother populations or normative parenting contexts. Systematic investigation in gynecological cancer patients is lacking. Cancer disrupts temporal experience, affecting emotional adjustment and coping^[7]. However, the mechanisms through which time perspective influences parenting concerns remain unclear.

To address this gap, we integrate the transactional model of stress and coping^[25], time perspective theory^[10], and the interpersonal process model of intimacy^[18] into the a unified framework. This integrated framework (Fig. 1) posits that time perspective functions as a stable cognitive filter operating at the primary appraisal stage, shaping how individuals perceive and evaluate parenting-related threats.

Following primary appraisal, individuals engage in secondary appraisal—evaluating available resources to cope with the threat. Within the interpersonal context of cancer parenting, perceived partner responsiveness constitutes this secondary appraisal: patients' evaluations of whether their partner is understanding, validating, and caring. This appraisal, in turn, shapes coping efforts: self-disclosure—the behavioral expression of distress and parenting concerns to one's partner—represents a key coping strategy. According to the interpersonal process model^[18], these two constructs form a reciprocal cycle: disclosure promotes intimacy only when met with responsiveness, and perceived responsiveness encourages further disclosure.

This integrated framework is empirically grounded. Time perspective predicts these relational processes: future orientation facilitates open communication and positive interpretations of partner support^[26], whereas past-negative orientation inhibits self-disclosure and reduces perceived partner responsiveness^[19]. As noted above, self-disclosure and perceived partner responsiveness form a reciprocal cycle^[18], and in the context of cancer parenting, open communication about parenting worries, coupled with perceived partner understanding, significantly reduces parenting

concerns^[16, 17]. Thus, within the stress and coping sequence, time perspective (cognitive filter at primary appraisal) shapes secondary appraisal (perceived partner responsiveness) and coping efforts (self-disclosure), which in turn influence parenting concerns (stress outcomes).

Based on this integrated framework, we propose the following hypotheses:

H1

Time perspective dimensions significantly predict parenting concerns. Past-negative and present-fatalistic positively predict concerns; future and past-positive negatively predict concerns.

H2

Perceived partner responsiveness (secondary appraisal) mediates the relationship between time perspective and parenting concerns.

H3

Self-disclosure (coping effort) mediates the relationship between time perspective and parenting concerns.

H4

Perceived partner responsiveness and self-disclosure serve as chain mediators.

Methods

Design and Participants

A cross-sectional survey was conducted from August to December 2024. A convenience sample of 266 gynecological cancer patients was recruited from three provincial hospitals in Hunan Province, China. The inclusion criteria were as follows: (1) pathologically confirmed gynecologic malignancy, including cervical cancer, ovarian cancer, endometrial cancer, or related gynecologic cancers; (2) age 18-60 years; (3) currently in a marital or cohabiting relationship, to ensure the applicability of the Perceived Partner Responsiveness Scale; (4) currently parenting at least one minor child (aged < 18 years), to ensure the applicability of the Parenting Concerns Questionnaire; (5) ability to read and communicate fluently in Mandarin Chinese; and (6) awareness of their cancer diagnosis, to avoid ethical issues during psychological assessment. The exclusion criteria were: (1) cognitive impairment that precluded independent completion of the questionnaire; and (2) a history of severe psychiatric disorders.

Variables and Measurements

Personal information questionnaire

A data collection form was developed through team discussions and expert consultations, covering the following content: Basic socio-demographic information was collected, including gender, age, marital status, education, residence, employment status, occupation, medical payment method, medical expenses, monthly income, and type of care. Medical characteristics included cancer stage, time since diagnosis, history of chemotherapy or radiotherapy, treatment method, presence of other chronic diseases, and recurrence or metastasis.

Time perspective

Time perspective was assessed using the Chinese version of the Zimbardo Time Perspective Inventory (ZTPI)^[27]. The scale includes five dimensions: Past Negative (7 items), Past Positive (6 items), Present Hedonistic (4 items), Future (5 items), and Present Fatalistic (3 items), totaling 25 items rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Dimension scores are calculated as the mean of corresponding items. Cronbach's α in this study ranged from 0.66 to 0.78. Deviation from Balanced Time Perspective (DBTP) was calculated using the revised formula. Deviation from Balanced Time Perspective (DBTP) was calculated using the revised formula, with values closer to 0 indicating a more balanced profile.

$$DBTP = \sqrt{(oPN - ePN)^2 + (oPP - ePP)^2 + (oPF - ePF)^2 + (oPH - ePH)^2 + (oF - eF)^2}$$

Distress Disclosure Index (DDI)

Self-Disclosure was measured by Distress Disclosure Index [28]. This study used the Chinese version translated and validated by Li Xinmin et al. The scale retains the original unidimensional structure, consisting of 12 items, 6 of which are reverse-scored (items 2, 4, 5, 8, 9, 10). Items are rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The total score is calculated as the mean of all 12 items, with higher scores indicating a greater tendency to disclose distress. In this sample, Cronbach's α was 0.98, consistent with the original English version ($\alpha = 0.92$).

Perceived Partner Responsiveness Scale (PPRS)

Perceived partner responsiveness was measured using the Chinese version of the Perceived Partner Responsiveness Scale [29, 30]. The unidimensional scale consists of 12 positively worded items rated on a 7-point Likert scale (1 = does not apply at all, 7 = applies completely). The total score is the mean of all items. Cronbach's α was 0.98, consistent with the original English version ($\alpha = 0.93$).

Parenting Concerns Questionnaire (PCQ)

Parenting Concerns Questionnaire (PCQ)

Parenting concerns were assessed using the Chinese version of the Parenting Concerns Questionnaire (PCQ) [31] [32]. The scale includes three dimensions: concerns about emotional impact on children (4 items), practical impact on children (5 items), and concerns about the co-parent (6 items), totaling 15 items rated on a 5-point Likert scale (1 = not at all concerned, 5 = extremely concerned). Dimension and total scores are calculated as means. Cronbach's α was 0.91 for the total scale.

Procedure and Data Collection

Before the survey, researchers contacted the three hospitals for permission. Six trained researchers administered the questionnaires. They received standardized training to ensure consistent data collection. Before the formal survey, each researcher explained the purpose and significance of the study to patients using standardized guidelines to ensure cooperation.

Data analysis

Descriptive statistics were conducted using SPSS 26.0 to summarize demographic and clinical characteristics and to determine mean levels of all variables. Categorical and continuous variables are presented as frequencies, percentages, and means $\pm$ standard deviations (SD). All significance tests were two-tailed, with $p < 0.05$ considered statistically significant. Common method bias was assessed using Harman's single-factor test. Pearson correlation analysis was used to examine the relationships among time perspective, perceived partner responsiveness, self-disclosure, and parenting concern. t-tests and ANOVA were used to identify potential covariates (mainly demographic and clinical variables) for inclusion in the mediation model. In the research model, time perspective dimensions (Past Negative [PN], Past Positive [PP], Present Hedonistic [PH], Present Fatalistic [PF], and Future [F]) were treated as independent variables, parenting concern as the dependent variable, and perceived partner responsiveness and self-disclosure as mediators. A chained mediation model was constructed using the PROCESS macro in SPSS 26.0, with 5000 bootstrap samples to test total, direct, and indirect effects. If the 95% confidence interval did not include zero, the indirect effect was considered significant, indicating mediation. It should be noted that due to the cross-sectional design, all reported direct and indirect effects reflect associations between variables.

Results

Common Method Bias test

As all measures were obtained via self-report, the potential for common method bias was evaluated. Harman's single-factor test yielded 18 factors with eigenvalues greater than 1; the first factor explained 26.70 % of the total variance, below the 40 % threshold. Thus, severe common method bias is unlikely.

Participant Characteristics

The 266 participants had a mean age of 44.0 years (SD = 22.74). Most had early-stage cancer (Stage I–II: 69.3%), with cervical (57.1%) and ovarian (27.1%) cancers predominating. Detailed characteristics are presented in Table 2.

Table 2 Demographic and clinical characteristics (N = 266)

Variable	Category	Mean ($\pm$ SD) or N (%)
Age		44.0 ($\pm$ 22.74)
Education	Elementary or below	49 (18.4%)
	Junior high school	55 (20.7%)
	Senior high school	52 (19.5%)
	Vocational school/Technical school	38 (14.3%)
	College/Higher vocational	34 (12.8%)
	Bachelor's degree or above	38 (14.3%)
Residence	Urban	104 (39.1%)
	County town	70 (26.3%)
	Township	22 (8.3%)
	Rural	70 (26.3%)
Occupation	Professional technical personnel	52 (19.5%)
	Administrative office staff	27 (10.2%)
	Service industry workers	19 (7.1%)
	Agricultural workers	54 (20.3%)
	Workers	20 (7.5%)
	Freelancers/Individual business owners	47 (17.7%)
	Unemployed/Job-seeking	47 (17.7%)
Employment status	Employed	61 (22.9%)
	On leave	110 (41.4%)
	Resigned	95 (35.7%)
Household income per person (monthly)	<1000 CNY	12 (4.5%)
	1000-3000 CNY	74 (27.8%)
	3001-5000 CNY	90 (33.8%)
	>5000 CNY	90 (33.8%)
Medical insurance type	Urban employee basic medical insurance	113(42.5%)
	Urban/rural resident basic medical insurance	144 (54.1%)
	Self-pay	9 (3.4%)
Disease diagnosis	Cervical cancer	152 (57.1%)
	Ovarian cancer	72 (27.1%)
	Endometrial cancer	24 (9.0%)
	Uterine sarcoma	8 (3.0%)
	Vulvar cancer	2 (0.8%)
	Tubal cancer	2 (0.8%)
	Gestational trophoblastic neoplasia	2 (0.8%)
	Other	4 (1.5%)
Disease stage	Stage I	76 (28.6%)
	Stage II	111 (41.7%)
	Stage III	73 (27.4%)
	Stage IV	6 (2.3%)

Variable	Category	Mean ($\pm$ SD) or N (%)
Current treatment phase	Induction therapy	63 (23.7%)
	Consolidation therapy	114 (42.9%)
	Maintenance therapy	8 (3.0%)
	Salvage therapy	7 (2.6%)
	Supportive care	2 (0.8%)
	Observation period	72 (27.1%)
Number of children		2.0 ($\pm$ 0.37)
Age of youngest child		12.0 ($\pm$ 17.23)
Number of abortions		1.0 ($\pm$ 1.84)

Descriptive Statistics of Parenting Concern Dimensions

The means and standard deviations of parenting concern dimensions are presented in Table 3. Among the subscales, concerns about the practical impact on children scored the highest (2.76 ± 0.81), followed by concerns about emotional impact on children (2.61 ± 0.82), whereas concerns about the co-parent scored the lowest (1.90 ± 0.63). The mean score for overall parenting concern was 2.42 ± 0.65 .

Table 3 Descriptive Statistics of Parenting Concern Dimensions (N = 266)

Dimension	Mean	SD
Parenting Concern (PC)	2.42	0.65
Emotional Impact on Children (PC_emo)	2.61	0.82
Practical Impact on Children (PC_rea)	2.76	0.81
Concerns about Co-parent (PC_par)	1.90	0.63

Table 4 Correlation Analysis of Time Perspective, Parental Concern, Perceived Partner Responsiveness, and Self-Disclosure

Variable	M(SD)	1	2	3	4	5	6	7	8	9	10	11	12
1. PC	2.42(0.64)	1											
2. PC_emo	2.61(0.82)	0.94**	1										
3. PC_rea	2.76(0.81)	0.93**	0.90**	1									
4. PC_par	1.90(0.83)	0.67**	0.42**	0.40**	1								
5. PN	2.85(0.63)	0.29**	0.25**	0.16**	0.37**	1							
6. PP	3.65(0.53)	0.08	0.05	0.06	0.10	0.03	1						
7. PH	2.89(0.78)	-0.03	0.03	-0.04	-0.07	0.31**	0.06	1					
8. PF	3.13(0.79)	0.05	-0.03	0.03	0.75**	0.32**	0.01	-0.25**	1				
9. F	3.62(0.65)	-0.07	-0.02	-0.02	-0.17**	-0.23**	-0.02	-0.49**	-0.60**	1			
10. SD	43.71(12.67)	-0.14*	-0.03	-0.04	-0.34**	-0.33**	-0.06	-0.15*	-0.36**	0.39**	1		
11. PPRS	67.03(13.87)	-0.09	0.05	-0.01	-0.33**	-0.26**	0.09	-0.04	-0.46**	0.39**	0.43**	1	
12. DBTP	4.07(0.30)	0.1	0.06	0.05	0.18**	0.58**	-0.17**	0.67**	0.79**	-0.76**	-0.38**	-0.42**	1

PC Parenting Concern, PC_emo Emotional impact of the illness on children, PC_rea Practical impact of the illness on children, PC_par Concerns about co-parent, PP Past Positive, PN Past Negative, PF Present Fatalistic, PH Present Hedonistic, F Future, SD Self-Disclosure, PPRS Perceived Partner Responsiveness, and DBTP Deviation from the Balanced Time Perspective.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Descriptive Statistics and Correlations Among Key Variables

Pearson correlation analysis was conducted to examine the associations among time perspective dimensions, parenting concern, self-disclosure, perceived partner responsiveness, and DBTP. Means, standard deviations, and the full correlation matrix are presented in Table 4. The mean DBTP score was 4.07 (SD = 0.30). DBTP was significantly positively correlated with present-fatalistic ($r = 0.79$, $p < 0.01$), present-hedonistic ($r = 0.67$, $p < 0.01$), past-negative ($r = 0.58$, $p < 0.01$), and co-parenting concern ($r = 0.18$, $p < 0.01$). Conversely, DBTP was significantly negatively correlated with future orientation ($r = -0.76$, $p < 0.01$), perceived partner responsiveness ($r = -0.42$, $p < 0.01$), self-disclosure ($r = -0.38$, $p < 0.01$), and past-positive ($r = -0.17$, $p < 0.01$).

Regarding specific time perspective dimensions, both past-negative ($r = 0.37$, $p < 0.01$) and present-fatalistic ($r = 0.75$, $p < 0.01$) were positively associated with co-parenting concern. Past-negative ($r = -0.33$, $p < 0.01$), present-fatalistic ($r = -0.36$, $p < 0.01$), and DBTP ($r = -0.38$, $p < 0.01$) were negatively correlated with self-disclosure. Similarly, past-negative ($r = -0.26$, $p < 0.01$) and present-fatalistic ($r = -0.46$, $p < 0.01$) showed negative associations with perceived partner responsiveness.

As detailed in figure 2, path analysis revealed significant predictive relationships among the study variables. Perceived partner responsiveness was positively predicted by future orientation ($\beta = 8.30$, $p < 0.01$) and negatively predicted by past-negative ($\beta = -5.68$, $p < 0.01$), present-fatalistic ($\beta = -8.02$, $p < 0.01$), and DBTP ($\beta = -5.89$, $p < 0.01$).

Past-negative exerted significant direct effects on all parenting concern outcomes, including overall parenting concern ($\beta = 0.28$, $p < 0.001$), emotional-impact concern ($\beta = 0.37$, $p < 0.001$), practical-impact concern ($\beta = 0.22$, $p < 0.001$), and co-parent concern ($\beta = 0.26$, $p < 0.001$).

Self-disclosure was positively predicted by perceived partner responsiveness across all models, with standardized coefficients ranging from 0.30 to 0.34 ($p < 0.01$). Both self-disclosure ($\beta \approx -0.009$ to -0.013 , $p < 0.01$) and perceived partner responsiveness ($\beta \approx -0.009$ to -0.011 , $p < 0.01$) demonstrated significant negative effects on co-parent concern, indicating their protective role in alleviating parenting-related distress.

Mediation Pathways

Past-negative pathways

Past-negative influenced co-parent concern through three indirect routes. First, its effect was transmitted solely via perceived partner responsiveness (effect = 0.048, 45.3% of total indirect effect). Second, it operated through self-disclosure alone (effect = 0.041, 38.8%). Third, a chained sequence from perceived partner responsiveness to self-disclosure accounted for the remaining indirect effect (effect = 0.017, 15.9%). The cumulative indirect effect was 0.105.

Present-fatalistic pathways

Present Fatalistic displayed a comparable pattern. The largest share of its indirect effect flowed through perceived partner responsiveness (effect = 0.086, 54.7%), followed by the pathway involving only self-disclosure (effect = 0.040, 25.7%), and finally the chained route (effect = 0.031, 19.6%). The total indirect effect reached 0.156.

Future-orientation pathways

Future orientation yielded negative indirect effects. Perceived partner responsiveness accounted for approximately half (effect = -0.086, 47.8%), the self-disclosure-only path contributed just over one third (effect = -0.063, 35.1%), and the chained sequence added the remainder (effect = -0.031, 17.1%), producing a total indirect effect of -0.180.

DBTP pathways

In contrast, DBTP generated positive indirect effects. Approximately half was mediated through perceived partner responsiveness (effect = 0.096, 50.1%), about one-third through self-disclosure alone (effect = 0.062, 32.2%), and the remainder through the chained route (effect = 0.034, 17.7%), with a total indirect effect of 0.192.

Discussion

To the best of our knowledge, this is the first study to systematically examine the relationship between time perspective and parenting concerns, as well as its underlying mechanisms, among gynecological cancer patients. This study investigated how time perspective influences parenting concerns in this population, revealing that distinct temporal orientations operate through perceived partner responsiveness and self-disclosure, with notable specificity for concerns related to the co-parent.

The mean parenting concern score (2.42 ± 0.65) was lower than advanced cancer samples^{[32] [33]} but comparable to Park et al^[14] (2.65 ± 0.91), while being comparable to the findings of Park et al. in patients with advanced solid tumors (2.30 ± 0.90).

Notably, "concern about practical impact on children" was highest (2.75 ± 0.81).

while "concern about co-parent" was lowest (1.90 ± 0.63). This "dimensional reversal" ($\Delta = 0.85$) contrasts with Li et al.^[5] who found co-parent concern highest among cancer mothers. We attribute this discrepancy to sample stage distribution: 69.3% of participants were Stage I–II. Early-stage patients, not yet confronting mortality, focus on concrete child-rearing logistics rather than co-parent capacity. Relevant qualitative results^[7] supports this stage-specific shift: as disease advances, concern transitions from "economic–educational planning" to "co-parent confidence."

Only past-negative demonstrated robust direct effects on all parenting concern dimensions. Future orientation, present-fatalistic, and DBTP exerted effects only indirectly. This "direct–indirect separation" reflects dual cognitive-emotional mechanisms. Cognitively, past-negative functions as a "no-escape lens"^[10]: individuals automatically appraise new stressors through past failures ("I failed before → I cannot cope now → my child will suffer"), bypassing resource evaluation and directly elevating worry.

Emotionally, past-negative simultaneously meets two criteria in Loewenstein's risk-as-emotion model^[34]: perceived loss of control ("I failed before") and immediate threat ("my child is being affected"). This dual activation rapidly triggers emotional systems, bypassing rational appraisal and producing instantaneous spikes in parenting concerns. This cognitive–emotional pattern not only elevates parenting concerns but may also exacerbate anxiety and depression. Therefore, interventions for high past-negative individuals must target both levels. Cognitive restructuring helps identify and challenge automatic negative thoughts, enabling reinterpretation of past events from a more balanced perspective^[35]. Self-compassion training improves emotion regulation and cognitive flexibility, reducing depression, anxiety, and stress^[36–38]. Even for those who "fear self-compassion," brief writing exercises can be effective^[39]. Integrating self-compassion into cognitive restructuring provides a supportive framework for breaking the negative cycle in high past-negative individuals.

The chain mediation effect was significant only for co-parent concern, reflecting the unique family dynamics in gynecological cancer. When illness forces maternal role transfer to partners, patients' attention shifts to the co-parent's ability and performance^[40]. The co-parent dimension captures patients' dual needs for emotional and practical support, with open communication serving as the bridge to meet these needs. Clear articulation of concerns enables partners to provide appropriate responses, and perceived responsiveness enhances security and trust, alleviating co-parent concerns^[41]. This supportive dynamic encourages further disclosure, deepening intimacy and reducing psychological burden^[42,43].

From a time perspective, past-negative indirectly increased co-parent concern by reducing self-disclosure and perceived responsiveness^[19,44,45]. When individuals dwell on past failures, their willingness to communicate declines, limiting opportunities to seek support and express concerns. Present-fatalistic individuals, feeling helpless and resigned toward life events, similarly reduce communication, believing that expressing concerns will not help^[46]. The indirect effect of present-fatalistic on co-parent concern—namely, by reducing self-disclosure and perceived partner responsiveness—leaves patients feeling more isolated and helpless when facing parenting challenges, thereby exacerbating co-parent concern. This mechanism aligns with cancer patients' need for social support during illness coping^[47].

Conversely, future orientation indirectly reduced co-parent concern by enhancing self-disclosure and perceived responsiveness. Future-oriented individuals possess stronger goal orientation and planning skills, prompting them to communicate more positively with partners^[20] and jointly cope with challenges. Open communication and perception of partner responsiveness can effectively relieve patients' anxiety and worries^[19]. Hope therapy's goal-pathway-agency framework^[48] may further facilitate this process. This enhanced communication and support dynamic provides a safe space for patients to express concerns about the co-parent and receive practical and emotional support, thereby effectively reducing worry^[49]. Present-hedonistic showed no effects, likely due to its focus on immediate pleasure and inattention to long-term parenting concerns^[50]. Therefore, present-hedonistic had no significant effect on parenting concerns and did not exhibit significant mediating effects through self-disclosure and perceived partner responsiveness. DBTP exerted positive indirect effects by disrupting healthy communication dynamics: negative thought patterns lead to misinterpretation of partner behavior, undermining partners' ability to provide effective support and reducing perceived responsiveness^[51].

Implications

Past-negative demonstrated robust direct effects on parenting concerns ($\beta = 0.219\text{--}0.371$), supporting its utility as a screening indicator for early identification of high-risk individuals. For these patients, interventions should target both cognitive and emotional levels by integrating cognitive restructuring—which helps identify and challenge automatic negative thoughts^[35] with self-compassion training, which has been shown to improve emotion regulation and reduce psychological distress^[36–39].

The finding that chain mediation was significant only for co-parent concern carries important clinical implications. When gynecological cancer forces partial transfer of maternal functions to the partner, the quality of partner responsiveness becomes a core determinant of psychological adjustment. This suggests a need to shift from traditional individualized support to couple-based communication interventions. Training in emotional validation and active listening can enhance partner responsiveness, thereby promoting patients' disclosure of parenting vulnerabilities and ultimately rebuilding parental role efficacy—a pattern consistent with Milbury et al.^[52].

Furthermore, the protective indirect effects of future orientation support integrating time perspective therapy with hope therapy's goal-pathway-agency framework^[53]. Clinicians can guide patients to formulate stage-specific parenting plans: early-stage patients focusing on economic–educational security, and advanced-stage patients focusing on co-parent confidence transfer. Such concrete planning translates abstract future orientation into actionable steps, alleviating parenting concerns^[53].

Research limitations

This study has several limitations. First, the cross-sectional design precludes establishing causal relationships among variables; longitudinal studies are needed to confirm temporal sequences. Second, the sample was recruited from three tertiary hospitals in Hunan Province, resulting in high homogeneity (96.2% insured, 69.3% early-stage), which limits generalizability to advanced-stage patients and other regions or healthcare systems. Third, this study focused specifically on gynecological cancers; given the unique impact on reproductive function and female identity, findings may not generalize to other cancer populations, warranting cross-cancer comparative research. Fourth, self-report measures may introduce common method bias, and the reliability of several ZTPI dimensions was suboptimal ($\alpha = 0.66\text{--}0.78$), potentially affecting estimate stability. Future research should employ longitudinal designs, diverse samples, and multi-source data including partner ratings and behavioral observations to enhance objectivity.

Conclusion

This study provides the first empirical evidence linking time perspective to parenting concerns among gynecological cancer patients, revealing distinct pathways across temporal orientations. Past-negative exerted direct effects on all parenting concern domains, functioning as a cognitive–emotional filter that amplifies worry without requiring interpersonal mediation. In contrast, future orientation, present-fatalistic, and deviation from balanced time perspective influenced parenting concerns only indirectly through perceived partner responsiveness and self-disclosure. Notably, chain mediation was significant exclusively for concerns about the co-parent, highlighting the relational nature of this dimension: when illness necessitates transfer of maternal functions, patients' appraisal of partner responsiveness becomes critical, and dyadic communication serves as the key mechanism.

Clinically, past-negative may serve as a screening indicator for at-risk mothers, who could benefit from cognitive restructuring and self-compassion training. The specificity of chain mediation for co-parent concern underscores the need for couple-based communication interventions. The protective effects of future orientation support integrating hope therapy techniques to facilitate stage-specific parenting plans.

Despite limitations including cross-sectional design and sample homogeneity, this study advances understanding of how temporal frames shape parenting distress in cancer contexts. Future longitudinal research with partner-reported data is warranted to validate causal pathways and inform targeted interventions.

Declarations

Author Contributions Note

C.G. and Y.S. contributed equally as corresponding authors.

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Author contributions

Q.M. Ding: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft. G.Y. Ma: Conceptualization, Supervision, Writing – review & editing. C.D.: Methodology, Investigation, Formal analysis, Data curation. Z.X. Huang: Investigation. Y.Y.: Investigation. C.G.: conceptualization, writing – reviewing & editing, supervision, funding acquisition. Y. S.: Conceptualization, Writing – review & editing, Supervision. All authors read and approved of the final manuscript.

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Competing interests

The authors declare that they have no competing interest.

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Figures

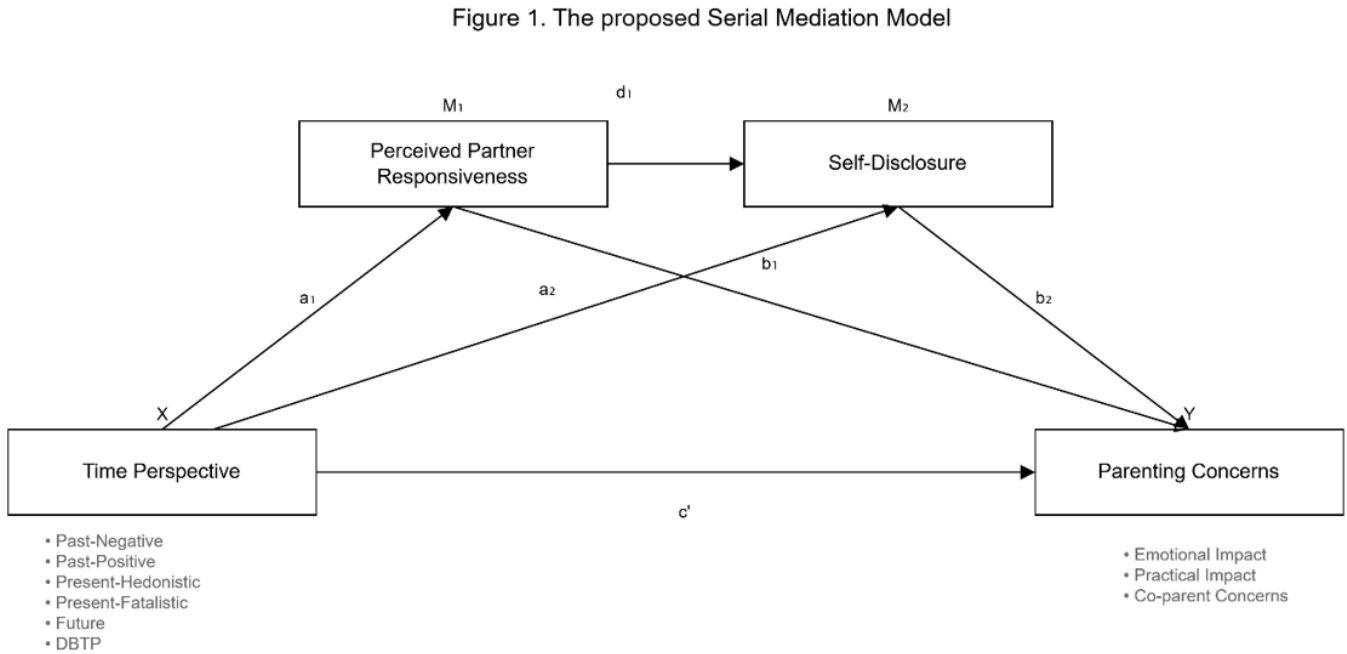
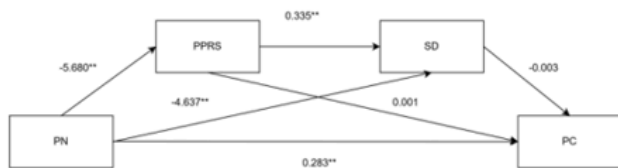
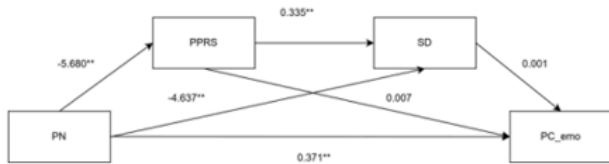


Figure 1

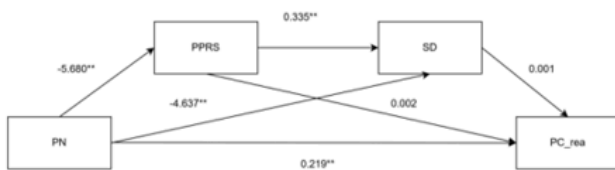
The proposed serial mediation model. Time perspective (X) comprises six dimensions: past-negative, past-positive, present-hedonistic, present-fatalistic, future, and deviation from balanced time perspective (DBTP). Perceived partner responsiveness (M₁) and self-disclosure (M₂) serve as sequential mediators. Parenting concerns (Y) consist of three dimensions: emotional impact, practical impact, and concerns about the co-parent. Path coefficients: a_1 = effect of X on M₁; a_2 = effect of X on M₂; d_1 = effect of M₁ on M₂; b_1 = effect of M₁ on Y; b_2 = effect of M₂ on Y; c' = direct effect of X on Y. The serial mediation effect is calculated as $a_1 \times d_1 \times b_2$.



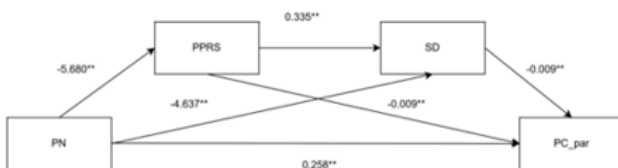
Model B: PN → PC_emo



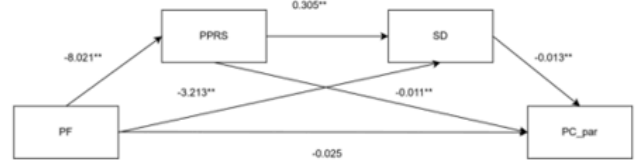
Model C: PN → PC_rea



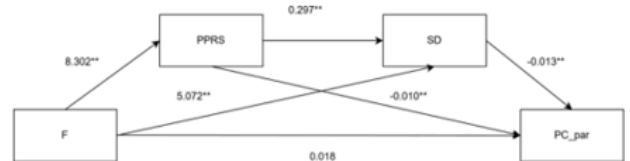
Model D: PN → PC_par



Model E: PF → PC_par



Model F: F → PC_par



Model G: DBTP → PC_par

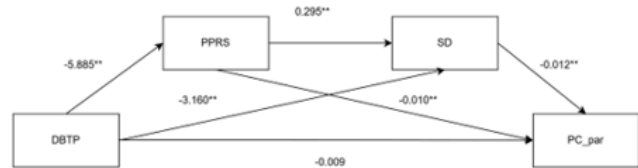


Figure 2

Chain Mediation Model of Self-Disclosure and Perceived Partner Responsiveness in the Relationship Between Time Perspective and Parenting Concern

Note: PN = Past Negative, PP = Past Positive, PF = Present Fatalistic, PH = Present Hedonistic, F = Future, DBTP =

Deviation from the Balanced Time Perspective, SD = Self-Disclosure, PPRS = Perceived Partner Responsiveness, PC-par = Concerns about Co-parent, PC = Parenting Concern, PC_emo = Emotional impact of the illness on children, PC_rea = Practical impact of the illness on children. * $p < 0.05$, ** $p < 0.01$. Path values represent completely standardized coefficients.