

# Exploring Psychological Capital, Dyadic Coping, and Ego Depletion in PCOS Patients and Their Spouses: An Actor–Partner Interdependence Mediation Model

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**Purpose:** This study examined the actor and partner associations between psychological capital and ego depletion among women with polycystic ovary syndrome and their spouses during lifestyle management, and tested the mediating role of dyadic coping using the actor–partner interdependence mediation model.

**Patients and Methods:** This cross-sectional dyadic study included 303 women diagnosed with polycystic ovary syndrome (PCOS) with a body mass index  $\geq 24$  kg/m<sup>2</sup> and their spouses, recruited from two tertiary hospitals in Hebei Province, China, between July and November 2025. Each partner completed self-report questionnaires assessing psychological capital, dyadic coping, and ego depletion. Data were analyzed using SPSS version 25.0 and AMOS version 26.0, with descriptive statistics, Pearson correlation analyses, and an Actor–Partner Interdependence Mediation Model (APIMeM) conducted within a structural equation modeling framework. Bootstrap procedures with 5000 resamples were applied to test indirect effects, and model fit was evaluated using standard indices.

**Results:** The findings suggested actor effects, suggesting that psychological capital in women with PCOS and their spouses was associated with their own dyadic coping and ego depletion. This study found that patients' psychological capital was associated with ego depletion, with patients' and spouses' dyadic coping showing a partial mediating role. Dyadic coping in both couples fully accounted for the association within the model the association between spouses' psychological capital and patients' ego depletion.

**Conclusion:** This study suggests that psychological capital and dyadic coping are important psychosocial factors associated with ego depletion among women with polycystic ovary syndrome and their spouses during lifestyle management. The findings indicate that strengthening psychological capital and dyadic coping may be relevant to supporting lifestyle management and may provide a useful reference for dyad-oriented nursing practice in PCOS care.

**Keywords:** ego depletion, dyadic relationships, psychological resources, lifestyle management, polycystic ovary syndrome, chronic illness management

## Introduction

Polycystic ovary syndrome (PCOS) is one of the most common chronic endocrine-metabolic disorders affecting women across the lifespan, with particularly important implications during the reproductive years.<sup>1</sup> In 2021, it was anticipated that 65.77 million women globally were affected by PCOS, with approximately 1.175 million new cases arising annually. In China, almost 5.6% of women of reproductive age are impacted.<sup>2</sup> Lifestyle management, including dietary modification, regular physical activity, and



weight control, is a cornerstone of PCOS care.<sup>1</sup> However, long-term adherence remains difficult in practice.<sup>3</sup> Because sustained lifestyle change requires ongoing self-regulation, women with PCOS may experience a substantial self-regulatory burden.<sup>4</sup>

According to Baumeister's strength model of self-control, repeated efforts to regulate thoughts, emotions, and behaviors consume limited psychological resources and may gradually lead to self-regulatory fatigue.<sup>5</sup> Evidence from chronic illness populations further suggests that depletion of self-regulatory resources is associated with poorer self-management.<sup>6</sup> In this study, self-control refers to the regulation of thoughts, emotions, and behaviors,<sup>7</sup> whereas self-regulation refers to the broader goal-directed process of monitoring and adjusting these responses.<sup>8</sup> Self-management denotes the implementation of illness-related lifestyle behaviors in daily PCOS care.<sup>9</sup> Ego depletion is defined as a temporary decline in self-regulatory capacity following prolonged self-control demands and is operationalized as self-regulatory fatigue.<sup>10</sup> Throughout the manuscript, ego depletion is used as the primary term, while self-regulatory fatigue is used only when referring to its measurement. Research in chronic illness populations has shown that higher levels of ego depletion are associated with poorer self-management, highlighting its potential relevance to lifestyle management in women with PCOS.<sup>11</sup> Taken together, ego depletion may be an important yet insufficiently studied outcome in PCOS lifestyle management.

Importantly, PCOS management rarely occurs in isolation. Many women with PCOS share daily routines, health behaviors, and fertility-related decisions with their spouses. Interdependence theory suggests that partners' thoughts, emotions, and behaviors are mutually influential over time.<sup>12</sup> Empirical dyadic studies in the contexts of chronic illness and infertility similarly indicate that illness-related burden may affect not only patients themselves but also their partners' cognitive and emotional resources.<sup>13–15</sup> Therefore, examining ego depletion and its correlates from a dyadic perspective may provide a more comprehensive understanding of how couples adapt to lifestyle management in PCOS.

To cope effectively with the challenges of PCOS and the risk of ego depletion, both relational and personal resources may be important. At the relational level, dyadic coping reflects how partners communicate about stress and work together to manage shared challenges.<sup>16,17</sup> Positive dyadic coping, such as supportive communication, shared responsibility, and coordinated health behaviors, may help reduce the burden of prolonged self-regulation.<sup>11,18</sup> At the personal level, psychological capital (PsyCap), comprising hope, resilience, optimism, and self-efficacy, is a key personal resource for adaptation under stress.<sup>19,20</sup> Higher PsyCap may help individuals cope more effectively with ongoing illness-related demands and reduce their susceptibility to ego depletion.<sup>21,22</sup> In addition, individuals with greater PsyCap may be more likely to adopt constructive interpersonal strategies and engage in supportive dyadic coping with their partners.<sup>23</sup> Taken together, these findings suggest that PsyCap may be associated with ego depletion both directly and indirectly through dyadic coping.

This potential mechanism can be understood through conservation of resources (COR) theory and the theory of dyadic illness management (TDIM). COR theory proposes that stress arises from actual or threatened resource loss, whereas personal resources help individuals resist such loss.<sup>24</sup> TDIM extends this perspective to couples by emphasizing that chronic illness is appraised and managed as a shared stressor through both individual and dyadic processes.<sup>25</sup> Accordingly, PsyCap may function as a personal resource, dyadic coping as a relational resource, and ego depletion as an indicator of diminished self-regulatory resources within couples coping with PCOS.

However, previous studies have largely been limited to women with PCOS at the individual level, with insufficient attention to dyadic interaction processes within couples.<sup>26</sup> Although significant associations among PsyCap, dyadic coping, and ego depletion have been reported,<sup>11,18,21–23</sup> dyadic effects and the underlying mechanisms within patient-spouse dyads have not been adequately examined. Therefore, previous research has not fully addressed the interdependence between women with PCOS and their spouses within a distinguishable dyadic relationship. To address these limitations, the present study used the actor-partner interdependence mediation model (APIMeM) to examine the mediating role of dyadic coping in the association between PsyCap and ego depletion, as well as the actor and partner effects between women with PCOS and their spouses. To accomplish the study aims, the following hypotheses were formulated:

H1: Higher PsyCap in each partner would be positively associated with (i) their own dyadic coping (actor effects) and (ii) their partner's dyadic coping (partner effects).

H2: Higher dyadic coping in each partner would be negatively associated with (i) their own ego depletion (actor effects) and (ii) their partner's ego depletion (partner effects).

H3: Higher PsyCap in each partner would be negatively associated with (i) their own ego depletion (actor effects) and (ii) their partner's ego depletion (partner effects).

H4: Dyadic coping would mediate the associations between PsyCap and ego depletion through both actor and partner pathways.

## Method

### Design

This cross-sectional study followed the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology for its reporting.<sup>27</sup>

### Participants and Setting

This study was conducted in Shijiazhuang, Hebei Province, China. Using a convenience sampling strategy, eligible women with PCOS and their spouses were recruited from the gynecology and reproductive medicine outpatient clinics of two tertiary hospitals.

The inclusion criteria for patients were (a) a diagnosis of PCOS according to the Rotterdam criteria,<sup>28</sup> (b) a body mass index (BMI)  $\geq 24$  kg/m<sup>2</sup>,<sup>29</sup> (c) aged 20 years and above; and (d) voluntary participation and willingness to sign an informed consent form. The inclusion criteria for spouses were as follows: (a) being legally married and cohabiting with the patient; (b) aged 22 years and above; and (c) identified by the patient as the primary support person. The exclusion criteria for both patients and spouses were (a) experience of a major stressful or negative life event within the preceding six months, such as bereavement, divorce, serious illness, major surgery, job loss, or severe family conflict; (b) a diagnosed severe physical illness; (c) a diagnosed cognitive impairment or mental illness. In addition, women with PCOS were excluded if they were pregnant or breastfeeding.

## Variables

### Sociodemographic and Clinical Characteristics

Sociodemographic characteristics for all women with PCOS and their partners, including age, duration of marriage, educational level, employment status, monthly household income (per capita), and parental status, were reported. The clinical characteristics specific to women with PCOS, such as BMI category, duration of management, and PCOS-related comorbidities, were obtained from their outpatient medical records. In this study, PCOS-related comorbidities were defined as clinically diagnosed concurrent conditions documented by a physician, including type 2 diabetes mellitus, hypertension, dyslipidemia, cardiovascular disease, obstructive sleep apnea, and endometrial hyperplasia.

### Ego Depletion

In this study, ego depletion was treated as the key outcome variable. It was operationalized as self-regulatory fatigue and assessed using the 16-item Chinese version of the Self-Regulatory Fatigue Scale. The Chinese version was translated and validated by Wang et al<sup>30</sup> based on the original scale developed by Nes et al<sup>31</sup> For conceptual consistency, the term “ego depletion” is used throughout the manuscript. The scale encompasses three dimensions: cognitive, emotional, and behavioral control (with 6, 5, and 5 items, respectively). Responses were recorded on a 5-point Likert scale from 1 (“strongly disagree”) to 5 (“strongly agree”). The total score (range: 16–80) is derived by summing all items, with higher scores indicating greater self-regulatory fatigue and resource depletion. The Chinese version has shown good content validity and internal consistency ( $\alpha = 0.84$ ) in prior studies. In our sample, it demonstrated excellent reliability, with Cronbach's  $\alpha$  values of 0.857 for women with PCOS and 0.852 for their partners.

### Dyadic Coping

Dyadic coping was evaluated using the Chinese version of the Dyadic Coping Inventory (DCI),<sup>32</sup> originally developed by Bodenmann in 2008. The DCI is a 37-item instrument that assesses several dimensions of dyadic coping, including stress communication, supportive dyadic coping, delegated dyadic coping, negative dyadic coping, and common dyadic coping. Each item is rated on a 5-point Likert scale ranging from 1 (very rarely) to 5 (very frequently). The total score is calculated by summing all items except the two items assessing overall dyadic coping quality and ranges from 35 to 175,

with higher scores indicating better dyadic coping. In the present study, only the total score was used for analysis. Based on established cut-offs, total scores are interpreted as follows: <111 (low dyadic coping), 111–145 (moderate), and >145 (high). In the present sample, the DCI demonstrated excellent internal consistency, with Cronbach's  $\alpha$  values of 0.905 for women with PCOS and 0.929 for their spouses.

### Psychological Capital

PsyCap was measured using the 26-item Positive Psychological Capital Questionnaire (PPQ), developed and validated by Zhang et al<sup>33</sup> in 2010 in a Chinese population. The scale assesses four core components: self-efficacy, optimism, resilience, and hope. Participants indicated their agreement with each statement on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). A total PsyCap score, ranging from 26 to 182, was calculated by summing all item responses, with higher scores denoting a greater level of PsyCap. In this study, the PPQ exhibited excellent internal consistency, with Cronbach's  $\alpha$  values of 0.914 for women with PCOS and 0.934 for their partners.

### Data Collection

Data were collected by two master's-level nursing researchers who had received standardized training in the study protocol, participant recruitment, research ethics, and questionnaire administration. After a diagnosis of PCOS was confirmed in the outpatient clinic, eligible women and their spouses were consecutively approached during clinic visits. Using a standardized script, the investigators explained the study purpose, procedures, and approximate duration; outlined potential risks and benefits; and emphasized the voluntary nature of participation and the right to withdraw at any time without affecting medical care. Both partners then provided written informed consent by signing a paper consent form.

Women with PCOS and their spouses independently completed an electronic questionnaire on the Wenjuanxing platform, which included sociodemographic and clinical items as well as the self-regulatory fatigue scale, the DCI, and the PPQ. To minimize potential data contamination, partners completed the questionnaires in separate areas at the study site. Each questionnaire was labeled with a unique couple identification number to enable dyadic matching while preserving confidentiality. Completion required approximately 20–30 minutes, and the survey system required responses to all items before submission, thereby preventing item-level missing data. For participants who had difficulty understanding specific items, trained investigators provided standardized explanations when needed.

### Sample Size

We determined the sample size a priori via power analysis for a distinguishable dyad APIMeM. On the basis of power calculations for a distinguishable-dyad APIMeM conducted with APIMPowerR, we assumed a standardized effect size of  $\beta=0.20$  for the main actor or partner effects, a two-sided level of  $\alpha=0.05$ , and 90% power. Under these assumptions, the calculations indicated that approximately 264 dyads were required.<sup>34</sup> To accommodate an estimated 10% attrition and nonresponse, we increased the recruitment target to 294 dyads. Consequently, the final analyses included data from 303 couples.

### Data Analysis

The data were analyzed via SPSS version 25.0 and AMOS version 26.0. All tests were two-tailed, with significance established at  $p < 0.05$ . Categorical variables were summarized using frequencies and percentages, while continuous variables were reported as means and standard deviations. These include sociodemographic and clinical characteristics, as well as scores for PsyCap, dyadic coping, and ego depletion.

Pearson correlation coefficients were calculated to assess associations between PsyCap, dyadic coping, and ego depletion both within and across partners. Before specifying the structural equation models, the normality of continuous variables was examined using skewness, kurtosis, and Kolmogorov–Smirnov tests. In the APIMeM, total scores for PsyCap, dyadic coping, and ego depletion in women with PCOS and their spouses were treated as observed variables. Given the interdependence of the dyadic data, an APIMeM model was specified within a structural equation framework to estimate both actor and partner effects, as well as the indirect effects through dyadic coping in the relationship between PsyCap and ego depletion. A chi-square difference test was conducted to assess whether women with PCOS and their spouses could be treated as distinguishable dyad members.<sup>35</sup> To obtain robust estimates of indirect effects, bias-corrected

bootstrap procedures with 5000 resamples were employed, generating 95% confidence intervals. Model fit was evaluated using the chi-square to degrees-of-freedom ratio ( $\chi^2/df \leq 3$ ), root mean square error of approximation (RMSEA  $\leq 0.08$ ), comparative fit index (CFI), and Tucker–Lewis index (TLI  $\geq 0.90$ ).

## Results

### Sociodemographic and Clinical Characteristics

A total of 303 PCOS patient–spouse dyads were included. Patients were slightly younger than their spouses, and both groups were generally in their early thirties. The mean duration of marriage was approximately 5 years. Overall, around half of both patients and spouses had a college education or above, and most were employed. Among patients, nearly three-quarters had no children, over half reported a per-capita monthly household income of at least 5000 RMB, and most were classified as obese. In addition, the average duration of lifestyle management among patients was less than 4 months and about one-third had PCOS-related comorbidities (Table 1).

**Table 1** Sociodemographic and Clinical Characteristics of Women with PCOS and Their Spouses (n = 303 Dyads)

Variable	Patients (n=303)	Spouses (n=303)
Age (years)	30.81 ± 3.57	32.84 ± 3.69
Duration of marriage (years)	5.03 ± 2.31	
Educational level		
Junior high school or below	67 (22.1)	72 (23.7)
High school/technical secondary school	81 (26.7)	82 (27.1)
College or above	155 (51.2)	149 (49.2)
Employment status		
Employed	228 (75.2)	270 (89.1)
Unemployed/seeking work	75 (24.8)	33 (10.9)
Parental status		
With children	78 (25.7)	
Without children	225 (74.3)	
Monthly household income (per capita)		
< ¥5000	133 (43.9)	
≥ ¥5000	170 (56.1)	
BMI category		
Overweight (24.0–27.9 kg/m <sup>2</sup> )	110 (36.3)	—
Obese (≥ 28.0 kg/m <sup>2</sup> )	193 (63.7)	—
Duration of management (months)	3.78 ± 2.45	—
PCOS-related comorbidities		
Yes	95 (31.4)	—
No	208 (68.6)	—

**Notes:** Data are presented as n (%) or mean ± standard deviation; “—” indicates not applicable.

**Abbreviations:** BMI, body mass index; PCOS, polycystic ovary syndrome.

**Table 2** Bivariate Correlations Among the Study Variables in PCOS Patient–Spouse Dyads (n = 303 Dyads)

Variables	1	2	3	4	5	6
1. Patients' psychological capital	1					
2. Spouses' psychological capital	0.329**	1				
3. Patients' dyadic coping	0.376**	0.382**	1			
4. Spouses' dyadic coping	0.284**	0.402**	0.232**	1		
5. Patients' ego depletion	-0.431**	-0.377**	-0.385**	-0.426**	1	
6. Spouses' ego depletion	-0.223**	-0.488**	-0.268**	-0.376**	0.299**	1

Note: \*\*p < 0.01 (two-tailed).

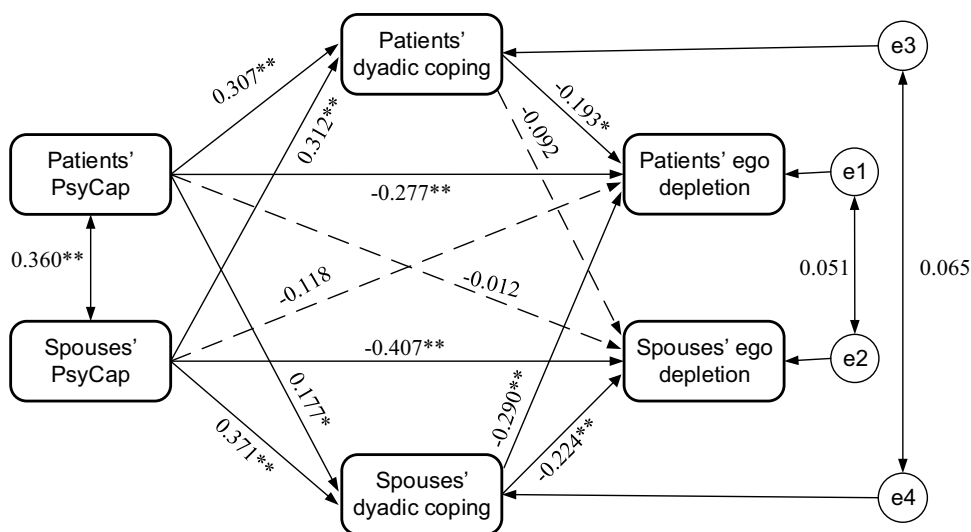
### Correlations Between PsyCap, Dyadic Coping and Ego Depletion

For patients, PsyCap was positively correlated with dyadic coping and negatively correlated with ego depletion. Similar patterns were observed for spouses. Significant cross-partner correlations were also found, such that one partner's PsyCap and dyadic coping were associated with the other partner's dyadic coping and ego depletion. Moreover, patients' ego depletion was positively correlated with spouses' ego depletion (Table 2).

### APIMeM: Direct and Indirect Effects

As shown in Figure 1 and Table 3, significant actor effects were observed for both patients and spouses. Higher PsyCap was associated with greater dyadic coping and lower ego depletion at the individual level. No significant direct cross-partner effects from one partner's PsyCap to the other partner's ego depletion were observed, whereas several indirect partner effects through dyadic coping were identified. Although each partner's PsyCap was positively associated with the other partner's dyadic coping, only spouses' dyadic coping was significantly associated with patients' ego depletion, whereas patients' dyadic coping was not significantly associated with spouses' ego depletion.

In the effect decomposition, patients' PsyCap had a significant total effect on patients' ego depletion ( $B = -0.217, p < 0.001$ ), with significant indirect effects through both patients' and spouses' dyadic coping. Spouses' PsyCap also had a significant total effect on their own ego depletion ( $B = -0.220, p < 0.001$ ), although only the pathway through spouses'



**Figure 1** APIMeM results for psychological capital, dyadic coping, and ego depletion among women with PCOS and their spouses.

Notes: Solid lines indicate significant paths, and dashed lines indicate non-significant paths; \*p < 0.01, \*\*p < 0.001.

Abbreviations: APIMeM, actor-partner interdependence mediation model; PCOS, polycystic ovary syndrome.

**Table 3** Total, Direct, and Specific Indirect Effects of Patients' and Spouses' Psychological Capital on Ego Depletion via Dyadic Coping in the APIMeM (n = 303 Dyads)

Effect		B	95% CI	P	
Actor effect (individual's PsyCap→individual's ego depletion)					
Patients	Total effect	-0.217	-0.293 to -0.147	<0.001	
	Total IE	-0.062	-0.104 to -0.030	<0.001	
	Actor→actor simple IE	Patients' PsyCap→patients' dyadic coping→patients' ego depletion	-0.033	-0.068 to -0.010	0.002
	Partner→partner simple IE	Patients' PsyCap→spouses' dyadic coping→patients' ego depletion	-0.029	-0.059 to -0.010	0.003
	Direct effect	Patients' PsyCap→patients' ego depletion	-0.155	-0.234 to -0.085	<0.001
Spouses	Total effect	-0.220	-0.306 to -0.138	<0.001	
	Total IE	-0.047	-0.088 to -0.020	0.001	
	Actor→actor simple IE	Spouses' PsyCap→spouses' dyadic coping→spouses' ego depletion	-0.035	-0.066 to -0.016	<0.001
	Partner→partner simple IE	Spouses' PsyCap→patients' dyadic coping→spouses' ego depletion	-0.012	-0.040 to 0.005	0.182
	Direct effect	Spouses' PsyCap→spouses' ego depletion	-0.172	-0.251 to -0.099	<0.001
Partner effect (individual's PsyCap→partner's ego depletion)					
Patients	Total effect	-0.195	-0.292 to -0.104	<0.001	
	Total IE	-0.115	-0.179 to -0.067	<0.001	
	Actor→partner simple IE	Spouses' PsyCap→spouses' dyadic coping→patients' ego depletion	-0.073	-0.123 to -0.038	<0.001
	Partner→actor simple IE	Spouses' PsyCap→patients' dyadic coping→patients' ego depletion	-0.041	-0.083 to -0.014	0.001
	Direct effect	Spouses' PsyCap→patients' ego depletion	-0.080	-0.180 to 0.021	0.121
Spouses	Total effect	-0.028	-0.068 to 0.016	0.217	
	Total IE	-0.024	-0.046 to -0.006	0.010	
	Actor→partner simple IE	Patients' PsyCap→patients' dyadic coping→spouses' ego depletion	-0.010	-0.028 to 0.005	0.178
	Partner→actor simple IE	Patients' PsyCap→spouses' dyadic coping→spouses' ego depletion	-0.014	-0.030 to -0.004	0.002
	Direct effect	Patients' PsyCap→spouses' ego depletion	-0.004	-0.049 to 0.044	0.883

**Abbreviations:** APIMeM, actor→partner interdependence mediation model; B, unstandardized coefficient; CI, bias-corrected bootstrap confidence interval; IE, indirect effect; PsyCap, psychological capital.

own dyadic coping was significant. For partner effects, spouses' PsyCap showed a significant total effect on patients' ego depletion ( $B = -0.195$ ,  $p < 0.001$ ), and both specific indirect pathways were significant, whereas the direct effect was not. By contrast, patients' PsyCap showed no significant total effect on spouses' ego depletion ( $B = -0.028$ ,  $p = 0.217$ ), although a significant indirect effect through spouses' dyadic coping was observed. Overall, the findings supported the hypothesized actor effects and several indirect partner pathways, whereas the hypothesized direct partner effects of PsyCap on the other partner's ego depletion were not observed.

## Discussions

This study presents a novel application of the APIMeM to examine the dyadic associations among PsyCap, dyadic coping, and ego depletion in couples facing PCOS during lifestyle management. Three main findings emerged. Overall, the findings supported the hypothesized actor pathways and several indirect partner pathways, whereas the hypothesized direct partner effects of PsyCap on the other partner's ego depletion were not supported. First, higher PsyCap was associated with lower ego depletion at the individual level for both patients and spouses. Second, dyadic coping was

involved in these actor associations, although the mediating pattern differed somewhat between partners. Third, the direct partner paths from one partner's PsyCap to the other partner's ego depletion were not significant, whereas several indirect partner pathways through dyadic coping were significant. In addition, the partner pathways were asymmetric, as spouses' dyadic coping was associated with patients' ego depletion, whereas patients' dyadic coping was not significantly associated with spouses' ego depletion.

With respect to actor effects, consistent with H1 and H3, higher PsyCap in both women with PCOS and their spouses was associated with greater own dyadic coping and lower own ego depletion. This pattern is consistent with COR theory, which conceptualizes stress as resulting from the threat or depletion of self-regulatory resources.<sup>25</sup> It is also consistent with previous findings showing that higher PsyCap is associated with lower psychological distress in stroke patient-spouse dyads.<sup>36</sup> PsyCap has been conceptualized as a core personal resource and protective factor in the face of adversity,<sup>37,38</sup> which may help both patients and spouses manage the self-regulatory demands imposed by chronic conditions such as PCOS. For women with PCOS, greater PsyCap may be related to better management of ongoing self-management tasks, including weight control and fertility-related pressures, and thus to lower ego depletion.<sup>39</sup> For spouses, greater PsyCap may likewise be relevant in the caregiving context, where repeated exposure to caregiving responsibilities and emotional strain may gradually erode self-regulatory resources over time.<sup>40,41</sup>

Consistent with H2, higher dyadic coping was associated with lower own ego depletion in both partners. In addition, dyadic coping mediated several actor and partner pathways, partially supporting H4. For patients, the association between PsyCap and their own ego depletion was statistically consistent with indirect pathways through both patients' own dyadic coping and spouses' dyadic coping. For spouses, the corresponding actor association was mainly linked to spouses' own dyadic coping. This pattern is in line with observations in other chronic illness dyads,<sup>16</sup> suggesting that psychological resources are associated with more adaptive and constructive coping strategies. It also accords with COR theory, which conceptualizes PsyCap as a core personal resource that functions both as an internal psychological strength and as a catalyst for positive outward behaviors.<sup>25</sup> In line with this view, a recent systematic review reported that positive dyadic coping was associated with better psychological well-being in both partners.<sup>42</sup> By facilitating the open expression of unmet needs and increasing the likelihood of receiving support, positive dyadic coping may also be associated with lower ego depletion.<sup>43</sup>

Importantly, the hypothesized direct partner effects of PsyCap on the other partner's ego depletion were not supported, whereas several indirect partner pathways through dyadic coping were significant, partially supporting H4. The direct partner paths from one partner's PsyCap to the other partner's ego depletion were not significant. However, significant indirect partner effects were observed through dyadic coping. One plausible explanation is that PsyCap operates mainly intrapersonally, shaping individuals' behaviors and psychological states, while its cross-partner associations are more likely to unfold through interpersonal processes such as dyadic coping.<sup>44</sup> This interpretation is also consistent with the indirect effects observed in the present APIMeM.

Specifically, spouses' PsyCap was associated with patients' ego depletion through both spouses' own dyadic coping and patients' dyadic coping. By contrast, patients' PsyCap was associated with spouses' ego depletion only through spouses' dyadic coping, whereas the indirect pathway through patients' own dyadic coping was not significant. Thus, the cross-partner associations in this study appeared to operate primarily through dyadic coping rather than through direct partner paths. This pattern suggests that dyadic coping may function as an important relational process linking personal psychological resources to partners' ego depletion within PCOS dyads.

PCOS is a lifelong condition that typically requires ongoing, collaborative management.<sup>1</sup> Within this context, spouses are not simply caregivers but also share the stress associated with the illness. When couples communicate openly, set goals together, and participate in shared decision-making, illness management may shift from an exclusively individual burden to a more collaborative process, thereby strengthening their sense of joint responsibility for health outcomes.<sup>45</sup> Evidence from couple-based dyadic interventions in other chronic illnesses indicates that structured programs combining psychoeducation, communication and stress-management skills, shared lifestyle changes, and joint planning for daily and social activities can enhance dyadic coping and improve psychological well-being.<sup>46–48</sup> Although these intervention findings cannot be directly inferred from the present cross-sectional design, they provide a useful context for understanding why dyadic coping may be an important relational pathway during lifestyle management for PCOS.

An additional finding was the asymmetry between partners. Spouses' dyadic coping was significantly associated with patients' ego depletion, whereas patients' dyadic coping was not significantly associated with spouses' ego depletion. This pattern adds to prior APIMeM evidence suggesting that dyadic coping may not operate symmetrically between partners.<sup>49</sup> One possible explanation is that women with PCOS may be more directly affected by the quality of spousal support because they face the immediate physical, reproductive, and psychosocial burden of the condition.<sup>50–52</sup> In contrast, spouses' ego depletion may be more closely related to caregiving strain, responsibility, and concern about the patient's long-term health than to the patient's own coping behaviors alone.<sup>53</sup> Although this interpretation remains tentative, the observed asymmetry suggests that the role of dyadic coping may differ by partner within PCOS-related lifestyle management.

## Clinical Implications

This study provides a dyadic perspective for understanding ego depletion in couples engaged in lifestyle management for PCOS. The findings suggest that, beyond individual psychological resources, dyadic coping may be a clinically relevant relational process in patient–spouse dyads.

From a clinical perspective, psychosocial assessment in PCOS management may benefit from extending beyond the individual patient to include the spouse. In addition to attending to patients' psychological capital, healthcare professionals may also consider assessing spouses' psychological resources, dyadic coping, and ego depletion, particularly in couples facing sustained lifestyle-management demands.

The findings also highlight the potential relevance of couple-oriented supportive care in PCOS management.<sup>5</sup> Rather than focusing exclusively on each individual's psychological capital, clinicians may consider supportive strategies that encourage shared appraisal, open communication, and coordinated coping within the couple. Brief approaches involving both partners, such as psychoeducation, communication training, mindfulness-based stress management, and guided problem-solving, may be incorporated into supportive care to facilitate positive dyadic coping during long-term lifestyle management.<sup>44–46</sup>

## Limitations and Recommendations

Several limitations should be noted. First, couples were recruited by convenience sampling from two tertiary hospitals in one province of mainland China. This may have introduced selection bias and limited sample representativeness. Couples who attended specialist services and were both willing to participate may have had better relationship functioning and health engagement than other couples. Therefore, the generalizability of the findings is limited.

Second, all key variables were measured using self-report questionnaires at a single time point. This may have introduced recall bias, social desirability bias, and common method variance. In addition, we did not examine whether patients and spouses interpreted the measures in the same way. Future studies should combine self-report data with clinician ratings and behavioral or clinical indicators.

Third, the cross-sectional dyadic design within an APIMeM framework does not support causal inference. The observed actor, partner, and indirect effects should therefore be interpreted as associations. These associations may also have been influenced by unmeasured factors, such as personality, prior mental health, or marital quality. Longitudinal dyadic studies are needed to further examine these patterns.

Finally, the findings should be interpreted within the cultural context of contemporary China. Collectivistic values and strong expectations regarding marriage and childbearing may shape how couples appraise PCOS, share responsibilities, and cope together. Similar models should therefore be tested in more diverse Chinese and international samples to examine the transferability of the findings.

## Conclusion

The present cross-sectional findings suggest that higher PsyCap was associated with lower ego depletion in both women with PCOS and their spouses. Dyadic coping was involved in the associations between PsyCap and their own ego depletion for both partners, as well as in the association between spouses' PsyCap and patients' ego depletion. These findings indicate that dyadic processes during PCOS lifestyle management were not entirely symmetrical between partners and suggest that spouses' psychological resources and dyadic coping may be relevant correlates of patient adjustment. Overall, the results suggest that a dyadic perspective may be relevant when considering psychosocial support for PCOS patient–spouse dyads.

## Abbreviations

APIMeM, actor–partner interdependence mediation model; BMI, body mass index; COR, conservation of resources; DCI, dyadic coping inventory; PCOS, polycystic ovary syndrome; PPQ, positive psychological capital questionnaire; PsyCap, psychological capital; TDIM, theory of dyadic illness management.

## Data Sharing Statement

The datasets used and analyzed during this study are available from the corresponding author, Jun Ge, upon reasonable request.

## Ethics Approval and Consent to Participate

This study received ethical approval from the Ethics Committee of Shijiazhuang Fourth Hospital (Approval No. 20250073) on 11 March 2025 and was registered at the Chinese Clinical Trial Registry (ChiCTR2500105729) on 9 July 2025, prior to recruitment. All procedures complied with the Declaration of Helsinki and national ethical standards. All participants provided written informed consent before enrollment, and all data were handled confidentially and analyzed in anonymized form.

## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors declare no competing interests.

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