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Designing a Model of the Tendency Toward Domestic Violence Based on Behavioral Brain Systems with the Mediating Role of Psychological Capital in Women Affected by Marital Infidelity

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ABSTRACT

The present study aimed to design a model of the tendency toward domestic violence based on behavioral brain systems, with the mediating role of psychological capital in women affected by marital infidelity. The research method was descriptive-correlational. The research population included all women dealing with the issue of spousal infidelity who were clients at the Shiva Counseling and Psychology Center in Tehran during 2025. To determine the sample size, based on Kline (2010), 323 participants were selected as the sample using the convenience sampling method. Structural Equation Modeling (SEM) using SPSS22 and Amos23 software was employed for data analysis. Data collection instruments included the Marital Infidelity Questionnaire (Yenisey & Kökdemir, 2006), the Psychological Capital Questionnaire (Luthans, 2007), the Domestic Violence Questionnaire (Tabrizi et al., 2012), and Gray's Behavioral Brain Systems Questionnaire (Gray, 1989). The results showed that the components of behavioral brain systems—Approach ($\beta = -0.39, p \leq .001$), Active Avoidance ($\beta = -0.28, p \leq .001$), Passive Avoidance ($\beta = -0.37, p \leq .001$), Extinction ($\beta = -0.36, p \leq .001$), and Escape ($\beta = -0.44, p \leq .001$)—had a significant negative effect on the tendency toward violence ($p \leq .001$). However, Fight ($\beta = 0.53, p \leq .001$) had a significant direct effect on the tendency toward violence ($p \leq .001$). Further results indicated that behavioral brain systems had a significant indirect effect on the tendency toward violence in women affected by marital infidelity through the mediation of psychological capital ($p \leq .001$). Accordingly, the proposed research model demonstrated a good fit. Empirically, this model provides a structured basis for examining targeted interventions that focus not only on managing behavioral brain system responses but also on restoring psychological capital by fostering resilience and enhancing hope.

Keywords: Marital Infidelity, Tendency Toward Domestic Violence, Behavioral Brain Systems, Psychological Capital

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Introduction

The family unit serves as the fundamental building block of society, relying heavily on the emotional, psychological, and structural stability of the marital bond. However, this foundational stability is profoundly threatened by marital infidelity, a pervasive and highly destructive relational transgression that severely disrupts relationship dynamics and the mental well-being of the individuals involved. Recent systematic

reviews and meta-analyses underscore the growing prevalence of romantic infidelity across various demographic cohorts, highlighting its complex array of predictors and situational moderators (1). Phenomenological explorations into couples experiencing this crisis reveal that infidelity is rarely an isolated, spontaneous event; rather, it is intimately intertwined with deep-seated relational dissatisfaction, communication breakdowns, and individual psychological vulnerabilities (2). Engaging in or coping with extramarital affairs often fosters a toxic environment characterized by the emergence of dark triad personality traits, severe moral disengagement, and profound, chronic marital dissatisfaction (3). The traumatic discovery of a partner's infidelity shatters foundational trust, leading to severe ethical and emotional dilemmas that necessitate complex psychological interventions to mitigate the subsequent tendency toward divorce (4). To accurately capture and quantify the multifaceted psychological footprint of this betrayal, researchers have continuously focused on validating specialized psychometric instruments, such as the Marital Infidelity Questionnaire, to better understand its etiology (5). Beyond the immediate emotional devastation and cognitive dissonance, infidelity is critically recognized in contemporary literature as a primary catalyst for escalating interpersonal conflict, often culminating in severe instances of domestic violence between spouses (6). Mixed-methods systematic reviews have consistently demonstrated that the intense romantic jealousy and perceived betrayal stemming from infidelity are among the strongest predictors of subsequent intimate partner violence directed against women (7).

Domestic violence, or intimate partner violence against women, remains a deeply entrenched global public health crisis with devastating physical, psychological, and societal long-term consequences (8). The manifestation, severity, and reporting of such violence are heavily influenced by complex cultural contexts and societal norms, necessitating highly culturally sensitive approaches to understanding and mitigating violence against women (9). Sociological studies emphasize that structural disparities, particularly imbalances in economic and cultural capital within the household, often mediate the prevalence and intensity of domestic abuse (10). This phenomenon is not only a rigid clinical and sociological concern but is also deeply reflected in cultural narratives and feminist literature, which poignantly illustrate the multifarious forms of psychological, physical, economic, and sexual violence that women endure behind closed doors (11). Furthermore, examining the issue from diverse religious and regional perspectives, such as an Islamic perspective observed in recent Indonesian demographic analyses, reveals that the unchecked escalation of domestic violence has become a primary driver of rising national divorce rates (12). The roots of such violence are often deeply structural and intergenerational. For instance, macro-level socio-economic interventions, such as the implementation of long-term education stipend programs, have demonstrated substantial efficacy in empowering women and significantly reducing domestic violence rates over extended periods (13). Conversely, early exposure to systemic, catastrophic trauma, such as childhood exposure to war and localized conflicts, exerts a long-term, insidious neurodevelopmental effect, severely increasing the likelihood of individuals becoming either perpetrators or victims of domestic violence in adulthood (14).

The broader environmental context in which domestic violence occurs further complicates its psychological and neurobiological impact on the victims. Women living in humanitarian crises and conflict-affected settings face drastically amplified risk factors for gender-based violence, as societal structures designed to protect them inevitably collapse (15). The hidden, secondary casualties of armed conflict almost universally include a stark increase in intimate partner violence within the home, as external societal stress

forcefully fractures family units (16). Extensive research on marginalized and highly vulnerable populations, such as Afghan women, highlights how compounded trauma exposure directly and positively correlates with the frequency and severity of intimate partner violence experienced (17). Consequently, the emotional and psychological profile of women who are chronic victims of domestic violence is often characterized by profound chronic stress, severe clinical depression, and complex post-traumatic stress disorder (18). When confronted with the terrifying reality of ongoing abuse, female victims often resort to diverse, sometimes maladaptive, coping mechanisms; qualitative psychological approaches reveal a broad spectrum of reactions ranging from active physical resistance to passive, dissociative endurance (19). In highly volatile scenarios characterized by bidirectional violence between partners, avoidance coping strategies often play a critical, mediating role, directly linking the initial victimization experience to subsequent, severe mental health deterioration and the onset of substance abuse disorders (20).

Understanding the transition from severe relational trauma—such as the shocking discovery of marital infidelity—to actual physical or psychological violent behavior requires examining the underlying neurobiological and temperamental predispositions of the individuals involved. Gray's Reinforcement Sensitivity Theory, which delineates complex behavioral brain systems, offers a highly robust biopsychological framework for understanding this transition. These neural systems, which generally encompass 6primary components—Approach, Active Avoidance, Passive Avoidance, Extinction, Fight, and Escape—govern an individual's fundamental emotional reactivity, sensitivity to environmental punishment, and complex approach-avoidance behaviors (21). Variations in the functional baseline of these brain-behavioral systems have been shown empirically to significantly influence the overall marital satisfaction and emotional regulation capabilities of married women (22). Furthermore, neurobiological dysregulation within these systems, particularly when coupled with persistent negative affect and intense anger rumination, acts as a primary explanatory variable for a wide range of aggressive and antisocial behaviors (23). The complex interaction between these deeply ingrained neural pathways and external situational triggers, such as the consumption of aggressive pornography or deeply held hostility toward women, differentially predicts the perpetration of intimate partner violence and the cognitive acceptance of aggressive myths (24).

Dysfunctional or highly reactive behavioral brain systems significantly contribute to a propensity for violence across various social and developmental contexts. In educational and developmental settings, the specific interaction between these neurological systems and trait impulsivity (as mapped by the 5-factor model of personality) strongly predicts violent and disruptive behavior among students (25). Similarly, structural and functional differences in these systems, alongside core personality traits, are highly positively correlated with general measures of aggression in young adults (26). The cognitive and emotional manifestations of these biological predispositions are distinctly evident in how individuals process acute conflict; for instance, the prevalence of youth dating violence is frequently mediated by heightened behavioral sensitivity and stark deficits in emotional intelligence (27). Advanced neuroimaging studies utilizing fNIRS hyperscanning technologies have demonstrated that individuals inherently prone to aggression exhibit inhibited neural responses and distinct, maladaptive synchronization patterns during active interpersonal conflict (28). Executive cognitive functioning also plays a remarkably vital role; measurable differences in cognitive control mechanisms can largely dictate whether an individual adopts a

passive victim role or an aggressive perpetrator role in bullying and conflict scenarios (29). When severe emotional dysregulation synergizes with poor inhibitory neurological control, the statistical likelihood of physical aggression toward a partner increases exponentially (30). These underlying neurological vulnerabilities also elucidate why certain individuals, such as chronic alcohol consumers, experience severe physiological difficulties in emotion regulation, leading directly to the commission of violent crimes (31). Even more specifically, behavioral inhibition and activation variables serve as critical, quantifiable moderators in the relationship between persistent anger rumination and the physical perpetration of intimate partner violence (32). Fortunately, targeted therapeutic clinical interventions, such as cognitive-behavioral therapy, have proven highly effective in modifying the dimensions of emotional reactivity and actively modulating these brain-behavioral systems in individuals structurally prone to destructive relational behaviors, including extramarital affairs (33).

While behavioral brain systems largely dictate the biological, automatic predisposition to react aggressively to the trauma of infidelity, an individual's cognitive and psychological resources can act as a crucial, mediating buffer. Psychological capital, extensively defined as a positive, developmental psychological state characterized by 4primary dimensions—self-efficacy, optimism, hope, and resilience—serves as a vital protective mechanism against extreme stress and trauma. In highly demanding, stressful environments, such as acute healthcare settings, robust psychological capital significantly moderates the negative psychosocial impacts of workplace violence, substantially reducing the rates of clinical burnout among nurses (34). Similarly, structured psychological capital training has proven highly effective in mitigating organizational socialization deficits and severe job burnout within high-stress educational sectors (35). In rigorous academic environments, actively fostering psychological capital dramatically reduces the incidence of academic burnout among female students facing chronic performance stress (36). For individuals already exhibiting clinical symptoms of violence or aggressive ideation, targeted cognitive interventions aimed specifically at boosting psychological capital significantly enhance interpersonal empathy and restore a profound sense of meaning in life, acting as a powerful cognitive deterrent to future aggressive outbursts (37).

The protective, buffering halo of psychological capital extends deeply into intimate family and marital dynamics. A highly supportive relational environment, prominently characterized by strong spousal support and adequate financial satisfaction, naturally bolsters overall marital satisfaction and simultaneously replenishes psychological resilience (38). The observable quality of the parents' marital relationship directly predicts the baseline psychological capital of their developing adolescents, vividly illustrating an intergenerational transmission of emotional resilience and psychological strength (39). In the context of significant medical or relational stress, such as women undergoing complex clinical fertility treatments, constructive and open couple communication patterns directly alleviate physiological stress and fortify the woman's psychological capital (40). Conversely, when facing profound, life-altering transitions or specific environmental stressors—such as an unexpected or high-risk pregnancy—women frequently exhibit significant negative correlations between elevated clinical anxiety, environmental stress sources, and severely depleted psychological capital (41). Therefore, in the catastrophic wake of marital infidelity, a woman's psychological capital is heavily tested; those with higher measured reserves of hope, resilience,

optimism, and self-efficacy are theoretically far better equipped to neurologically and cognitively inhibit the reactive, aggressive impulses generated by their primal behavioral brain systems.

Despite the extensive, multi-disciplinary literature currently available on marital infidelity, domestic violence, neurobiological behavioral systems, and psychological capital, a notable, critical gap exists in understanding the complex, multidimensional structural interplay among these specific variables. Previous empirical studies have predominantly examined these psychological constructs in strict isolation or within simple, dyadic relationships. The specific structural mechanisms through which innate neurological predispositions—specifically the Approach, Active Avoidance, Passive Avoidance, Extinction, Fight, and Escape components of the behavioral brain systems—translate statistically into a heightened tendency toward domestic violence remain severely under-explored in the specific, highly volatile context of women traumatized by spousal betrayal. Furthermore, the potential mediating role of psychological capital in absorbing the initial psychological shock of infidelity and actively dampening biologically driven aggressive impulses offers a highly promising, yet untested, avenue for targeted clinical psychological interventions. By accurately mapping this intricate psychoneurological web, mental health professionals and marital counselors can better understand why some women involuntarily resort to violence when faced with infidelity, while others successfully navigate the trauma through resilience and adaptive cognitive coping. The present study aimed to design and test a structural model of the relationship between behavioral brain systems and the tendency toward domestic violence, with the mediating role of psychological capital, in women affected by marital infidelity.

Methods and Materials

Study Design and Participants

This study employed a descriptive-correlational research design. The population of this research consisted of all women dealing with the issue of spousal infidelity who were clients at the Shiva Counseling and Psychology Center in Tehran during 2025. There are varying opinions regarding the optimal sample size for studies involving structural equation modeling. For instance, Kline (2010) and Lwanga and Lemeshow (1991) suggest that a sample size of less than 100 is inadequate, while sizes above 200 are desirable. Hair et al. (2008) also recommend a sample size between 200 and 400. For compatibility with structural equation models, a sample size greater than 200 should be based on a ratio relative to the number of observed variables (Stevens, 1994). In this research, to determine the sample size, considering the number of observed variables (4 main components and 15 subcomponents) and assigning a ratio of 20 participants for each observed variable, and accounting for the possibility of incomplete questionnaires, 323 individuals were selected as the sample size using the convenience sampling method. Questionnaires were used to collect data and information for analysis.

Data Collection

Marital Infidelity Questionnaire (Yenisey & Kökdemir, 2006): The Marital Infidelity Questionnaire was designed and developed by Yenisey and Kökdemir (2006) to measure emotional and sexual infidelity and consists of 24 items. This questionnaire uses a 5-point Likert scale on which participants rate the importance of each reason for infidelity (e.g., 1= *not at all important*, 5= *very important*). At the

item level, the minimum score is 1and the maximum is 5, corresponding to the Likert scale. Factor scores are typically calculated by summing or averaging the items belonging to each of the six components, thus the minimum for each subscale is the number of items in that factor × 1, and the maximum is the number of items × 5. The minimum score on this questionnaire is 24and the maximum score is 120. The cutoff score for the questionnaire is 65. In the original Turkish university sample, the internal consistency for this questionnaire was reported as acceptable. The reliability coefficient for this instrument in the study by Yenisey and Kökdemir (2006) was found to be 0.78. Existing Iranian studies using the "Marital Infidelity" measure generally report acceptable internal consistency (Cronbach's alpha in the good range) and evidence of construct validity through factor analysis and correlations with related constructs (Karimi et al., 2019). The Cronbach's alpha coefficient calculated in the study by Karimi et al. (2019) for this questionnaire was estimated to be above 0.70.

Psychological Capital Questionnaire (PCQ; Luthans, 2007): The Psychological Capital Questionnaire by Luthans et al. (2007) includes 24 items and 4 subscales: hope, resilience, optimism, and self-efficacy, with each subscale comprising 6 items. The respondent answers each item on a 6-point Likert scale (from 1= *Strongly Disagree* to 6= *Strongly Agree*). To obtain the psychological capital score, the score for each subscale was first calculated separately, and then their average was considered the total score for psychological capital. The score range for each subscale varies from 6to 36; the total score for the questionnaire ranges from 24to 144. The cutoff score for the questionnaire is 70. Construct and content validity were confirmed by the developers, and reliability using Cronbach's alpha was reported to be between 0.81and 0.89. In Iran, in a study by Forouhar et al. (2011), construct and content validity were confirmed, and reliability using Cronbach's alpha was reported to be between 0.83and 0.87. Samavatian et al. (2010) validated a Persian version among 1,200 employees and reported Cronbach's alphas of 0.78 – 0.92for the subscales and 0.92overall.

Tendency Toward Domestic Violence Questionnaire (Mohseni Tabrizi et al., 2012): This questionnaire was developed by Mohseni Tabrizi et al. (2012). The questionnaire has 71 items that measure the extent of exposure to domestic violence. Scoring is on a five-point scale from *Strongly Disagree* (0) to *Strongly Agree* (4). For the total score, all scores obtained from the items are summed together. A score between 0and 60indicates low domestic violence against women, a score between 60and 120indicates moderate domestic violence against women, and a score above 120indicates high domestic violence against women. In the study by Tabrizi, to assess the scale's face validity, items were primarily selected from previous research conducted under the supervision of experienced individuals. Additionally, some items were adopted from existing research, and others were newly created by the researchers. The items were then reviewed by professors and social science experts, and following their guidance, the items whose validity was confirmed were ultimately used in the research. After calculation, the overall Cronbach's alpha coefficient was found to be 0.81, which indicates that the reliability of the questionnaire's items and its various scales is sufficient (Tabrizi et al., 2012).

Gray-Wilson Personality Questionnaire (GWPQ; Wilson, 1989): The Gray-Wilson Personality Questionnaire (GWPQ) was designed by Wilson, Barrett, and Gray in 1989. This questionnaire has 120 items, with 20 items allocated to each of Gray's six theoretical components. These six components are: Approach, Active Avoidance, Passive Avoidance, Extinction, Fight, and Escape. In this questionnaire, each question is

scored as Yes, No, or Don't Know. The Gray-Wilson Personality Questionnaire operationalizes Jeffrey Gray's psychobiological model of personality, focusing on three primary systems: the Behavioral Approach System (BAS) for reward sensitivity, the Behavioral Inhibition System (BIS) for punishment and novelty avoidance, and the Fight-Flight System (FFS) for unconditioned aversive responses. It is designed as a self-report questionnaire with true/false or Likert-type items. Items are typically scored dichotomously ($0-1$ for true/false), which are then summed for each subscale after reverse scoring where necessary. Each system subscale ranges from 0(low sensitivity) to 20for some versions, or higher depending on item allocation; the total questionnaire score varies, and clinical cutoffs differ depending on the population. Regarding the validity of this questionnaire, Wilson et al. (1989) obtained Cronbach's alpha coefficients for the components of Approach, Active Avoidance, Passive Avoidance, Extinction, Fight, and Escape as follows: for men, 0.71, 0.61, 0.58, 0.61, 0.65, and 0.65, and for women, 0.68, 0.35, 0.59, 0.63, 0.71, and 0.71, respectively, indicating adequate internal consistency of the test. They also demonstrated the test's convergent validity through the correlation between the questionnaire's components and the Eysenck Personality Questionnaire. This questionnaire was translated into Persian by Azad Fallah (1999) and administered to a group of 211 Iranian students. Additionally, Ashrafi (2006) reported Cronbach's alpha coefficients for the components of Approach, Active Avoidance, Passive Avoidance, Extinction, Fight, and Escape as 0.60, 0.54, 0.61, 0.66, 0.65, and 0.69, respectively, and split-half reliability coefficients as 0.53, 0.57, 0.52, 0.62, 0.64, and 0.64, respectively.

Data Analysis

In this research, the collected data were analyzed using Structural Equation Modeling (SEM). The analysis was performed using SPSS version 22 and Amos version 23 software.

Findings and Results

The results of the demographic analysis of the study showed that among the women participating in the research, 31(9.60%) were under 25years old, 109(33.70%) were 26to 30years old, 115(35.60%) were 31to 35years old, 46(14.30%) were 36to 40years old, and 22(6.80%) were older than 40. Furthermore, among the participating women, 8(2.50%) were illiterate, 15(4.60%) had a primary education, 37(11.50%) had a middle school education, 42(13%) had some high school education, 81(25.10%) held a high school diploma, 30(9.30%) held an associate's degree, 81(25.10%) held a bachelor's degree, and 29(9%) held a master's degree. In addition, 87of the women (26.90%) were homemakers, 67(20.70%) were employed, 127(39.40%) were self-employed, and 42(13%) were university students.

Table 1. Descriptive findings related to the research variables

Descriptive Indices	Mean	Standard Deviation	Minimum	Maximum
Approach	18.46	4.21	10	28
Active Avoidance	19.06	4.01	9	29
Passive Avoidance	17.74	4.43	8	29
Extinction	17.62	5.09	5	29
Fight	17.35	4.30	8	30
Escape	17.73	4.58	8	29
Psychological Capital	37.87	7.65	27	55
Self-efficacy	9.33	1.97	5	14
Hope	9.37	2.12	5	15

Resilience	9.87	2.10	5	15
Optimism	9.30	2.07	5	14
Tendency to Violence	68.10	12.13	30	93
Physical Violence	16.90	3.20	9	24
Sexual Violence	17.26	3.11	9	24
Psychological Violence	17.66	2.92	10	24
Economic Violence	16.37	3.17	9	23

As observed in Table 1, the mean and (standard deviation) for the variables were obtained as follows: Approach 18.46(4.21), Active Avoidance 19.06(4.01), Passive Avoidance 17.74(4.43), Extinction 17.62(5.09), Fight 17.35(4.30), Escape 17.73(4.58), Psychological Capital 37.87(7.65), and Tendency toward Violence 68.10(12.13).

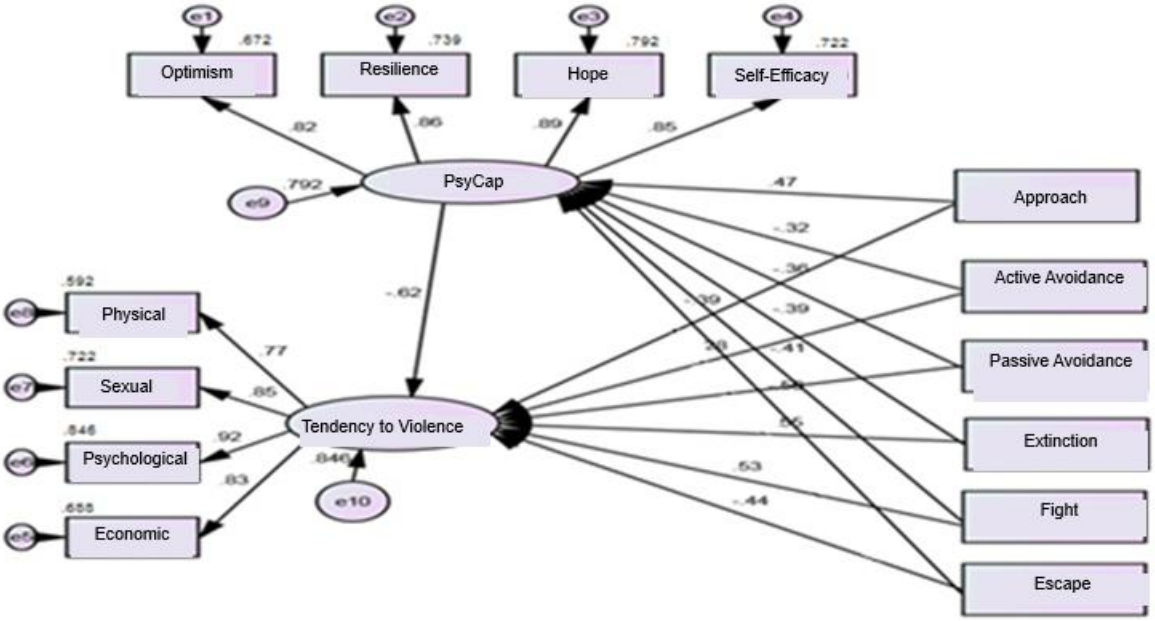

Figure 1. The proposed research model

To evaluate the proposed model, its structural component was examined using goodness-of-fit indices. Table 2 presents the goodness-of-fit indices for the proposed research model.

Table 2. Goodness-of-fit indices of the proposed research model

Fit Indices	Value
Chi-square goodness-of-fit test (χ^2)	76.53
Significance level	$p = .060$
Degrees of freedom (df)	27
Ratio of Chi-square to degrees of freedom (χ^2/df)	2.83
Goodness of Fit Index (GFI)	0.99
Adjusted Goodness of Fit Index (AGFI)	0.97
Normed Fit Index (NFI)	0.99
Comparative Fit Index (CFI)	0.98
Incremental Fit Index (IFI)	0.99
Non-Normed Fit Index (NNFI)	0.98
Root Mean Square Error of Approximation (RMSEA)	0.075

To examine the fit of the factor models, the following indices were used: Chi-square, degrees of freedom, the ratio of Chi-square to degrees of freedom (χ^2/df), Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Comparative

Fit Index (CFI), Incremental Fit Index (IFI), and Non-Normed Fit Index (NNFI), which were 76.53, 27, 2.83, 0.075, 0.99, 0.97, 0.99, 0.98, 0.99, and 0.98, respectively.

In assessing the model's fitness using the aforementioned indices, the fit and validity of the instrument were tested and evaluated. A value of less than 3for the ratio of chi-square to degrees of freedom is considered desirable. Furthermore, when the Root Mean Square Error of Approximation (RMSEA) is less than 0.1, the analysis reports an acceptable model fit (Kline, 2015). The closer the GFI, AGFI, NFI, CFI, and NNFI indices are to 1, the more optimal the model's fit. Based on the indices obtained in the table above, the ratio of chi-square to degrees of freedom is 2.83, and the values of the GFI, AGFI, NFI, CFI, and NNFI fit indices fall within the range of .90to 1, indicating that these indices have achieved the necessary standards. Therefore, it can be concluded that the model had a good fit, and the proposed model is confirmed in this study.

Table 3. Measurement parameters of the direct relationships between behavioral brain systems and the tendency toward violence

Path	Standardized Estimate	Unstandardized Estimate	Standard Error	Critical Ratio	Significance Level (p)
Approach to Tendency to Violence	−0.39	−2.23	0.08	−27.87	$p = .001$
Active Avoidance to Tendency to Violence	−0.28	−2.12	0.12	−17.66	$p = .001$
Passive Avoidance to Tendency to Violence	−0.37	−2.18	0.09	−24.22	$p = .001$
Extinction to Tendency to Violence	−0.36	−2.15	0.10	−21.50	$p = .001$
Fight to Tendency to Violence	0.53	2.45	0.06	40.83	$p = .001$
Escape to Tendency to Violence	−0.44	−2.37	0.08	−29.62	$p = .001$

The contents of the table above indicate that Approach ($\beta = -0.39, p \leq .001$), Active Avoidance ($\beta = -0.28, p \leq .001$), Passive Avoidance ($\beta = -0.37, p \leq .001$), Extinction ($\beta = -0.36, p \leq .001$), and Escape ($\beta = -0.44, p \leq .001$) had a significant inverse effect on the tendency toward violence ($p \leq .001$); meaning that as they increase, the tendency toward violence decreases. However, Fight had a significant direct effect on the tendency toward violence ($\beta = 0.53, p \leq .001$), meaning that with an increase in Fight, the tendency toward violence also increases in women affected by marital infidelity.

As shown in Figure 1, in the mediation model, there is an indirect relationship between behavioral brain systems and the tendency toward violence, mediated by psychological capital. To test this, the bootstrap method provided in Amos software was used. The contents of Table 4 show the results of the mediation path parameters.

Table 4. Bootstrap results related to the indirect relationship in the research mediation model

Path	Upper Bound	Lower Bound	Significance Level (p)
Approach to Tendency to Violence through Psychological Capital	−0.358	−0.366	$p \leq .001$
Active Avoidance to Tendency to Violence through Psychological Capital	−0.324	−0.332	$p \leq .001$
Passive Avoidance to Tendency to Violence through Psychological Capital	−0.398	−0.406	$p \leq .001$
Extinction to Tendency to Violence through Psychological Capital	−0.305	−0.323	$p \leq .001$
Fight to Tendency to Violence through Psychological Capital	0.425	0.416	$p \leq .001$
Escape to Tendency to Violence through Psychological Capital	−0.345	−0.360	$p \leq .001$

According to the results presented in Table 4, it is evident that zero does not fall within the range between the upper and lower bounds; therefore, it can be stated that the indirect relationship between behavioral brain systems and the tendency toward violence through psychological capital is significant at the $p \leq .001$level. Thus, this hypothesis of the research is confirmed, and it can be concluded that behavioral brain systems, mediated by psychological capital, have an indirect effect on the tendency toward violence in women affected by marital infidelity.

Table 5 shows the direct and indirect effects of behavioral brain systems on the tendency toward violence through psychological capital.

Table 5. Estimation of standardized coefficients for the direct, indirect, and total effects of the model

Path	Direct Effect	Indirect Effect	Total Effect
Approach →Tendency to Violence	-0.39^{**}		-0.39^{**}
Approach →Psychological Capital	0.47^{**}		0.47^{**}
Psychological Capital →Tendency to Violence	-0.62^{**}		-0.62^{**}
Approach →Psychological Capital →Tendency to Violence	0.47^{**}	-0.29^{**}	0.18^{**}
Active Avoidance →Tendency to Violence	-0.28^{**}		-0.28^{**}
Active Avoidance →Psychological Capital	-0.32^{**}		-0.32^{**}
Active Avoidance →Psychological Capital →Tendency to Violence	-0.32^{**}	0.19^{*}	-0.12^{*}
Passive Avoidance →Tendency to Violence	-0.37^{**}		-0.37^{**}
Passive Avoidance →Psychological Capital	-0.36^{**}		-0.36^{**}
Passive Avoidance →Psychological Capital →Tendency to Violence	-0.36^{**}	0.22^{*}	-0.14^{*}
Extinction →Tendency to Violence	-0.36^{**}		-0.36^{**}
Extinction →Psychological Capital	-0.39^{**}		-0.39^{**}
Extinction →Psychological Capital →Tendency to Violence	-0.39^{**}	0.24^{**}	-0.15^{*}
Fight →Tendency to Violence	-0.53^{**}		-0.53^{**}
Fight →Psychological Capital	-0.41^{**}		-0.16^{*}
Fight →Psychological Capital →Tendency to Violence	-0.41^{**}	0.25^{**}	-0.16^{*}
Escape →Tendency to Violence	-0.44^{**}		-0.44^{**}
Escape →Psychological Capital	-0.50^{**}		-0.50^{**}
Escape →Psychological Capital →Tendency to Violence	-0.50^{**}	0.31^{**}	-0.19^{**}

As observed in Table 5, there is an indirect relationship between Approach and the tendency toward violence through psychological capital ($\beta = -0.29, t = -7.23$), between Active Avoidance and the tendency toward violence through psychological capital ($\beta = 0.19, t = 5.02$), between Passive Avoidance and the tendency toward violence through psychological capital ($\beta = 0.22, t = 6.16$), between Extinction and the tendency toward violence through psychological capital ($\beta = 0.24, t = 6.85$), between Fight and the tendency toward violence through psychological capital ($\beta = 0.25, t = 6.92$), and between Escape and the tendency toward violence through psychological capital ($\beta = 0.31, t = 7.48$).

Discussion and Conclusion

The present study aimed to design and evaluate a structural model exploring the relationship between behavioral brain systems and the tendency toward domestic violence, emphasizing the mediating role of psychological capital among women affected by marital infidelity. The results of the structural equation modeling indicated that the proposed model possessed an excellent fit, confirming the complex interplay between neurological predispositions, cognitive resources, and violent behavioral outcomes.

The first major finding of the study revealed significant direct effects of the six behavioral brain system components on the tendency toward violence. Specifically, Approach ($\beta = -0.39$), Active Avoidance ($\beta = -0.28$), Passive Avoidance ($\beta = -0.37$), Extinction ($\beta = -0.36$), and Escape ($\beta = -0.44$) demonstrated a significant negative predictive relationship with the tendency toward domestic violence. Conversely, the Fight component had a significant positive direct effect on the tendency toward violence ($\beta = 0.53$). This indicates that as the activation of the Fight system increases, the propensity to engage in violent behavior concurrently rises among women who have experienced the trauma of spousal infidelity.

These findings align closely with the foundational tenets of the reinforcement sensitivity theory and contemporary neurobiological research on aggression. The Fight component of the behavioral brain systems is inherently responsive to unconditioned aversive stimuli and frustration, triggering defensive aggression and rage (21). The discovery of marital infidelity is a profound psychological and relational trauma that fundamentally shatters trust and induces severe emotional dissonance (1). In this highly aversive context, an overactive Fight system naturally predisposes an individual to translate feelings of betrayal into outward aggression. This is consistent with studies demonstrating that neurobiological dysregulation, when combined with intense negative affect and anger rumination, acts as a primary explanatory variable for aggressive and antisocial behaviors (23). Furthermore, the synergistic effect of emotion dysregulation and poor inhibitory cognitive control exponentially increases the likelihood of physical aggression (30). The pronounced positive link between the Fight system and violence is also corroborated by research indicating that trait impulsivity and specific functional differences in brain-behavioral systems strongly predict violent behavior and general aggression (25, 26).

Conversely, the negative relationships observed between the other behavioral systems (Approach, Active/Passive Avoidance, Extinction, Escape) and the tendency toward violence suggest that these neurological pathways may promote alternative coping mechanisms. For instance, heightened sensitivity in the avoidance systems (historically linked to the Behavioral Inhibition System) is typically associated with anxiety, fear, and withdrawal in the face of punishment or threat. Consequently, women with highly active avoidance systems may be more likely to internalize the trauma of infidelity, resorting to passive endurance, depressive symptoms, or dissociative avoidance coping rather than active, outward physical or psychological violence (19, 20). This passive internalization often shapes the emotional profile of chronic victims of domestic violence, where ongoing abuse and betrayal lead to complex emotional withdrawal rather than retaliatory aggression (18). Similarly, a highly active Approach system (linked to the Behavioral Activation System) is driven by reward-seeking and positive affect (21). Women with higher Approach sensitivity may actively seek alternative, non-violent resolutions or alternative sources of positive reinforcement to cope with the severe marital dissatisfaction caused by infidelity (2, 3). This aligns with literature suggesting that behavioral activation and inhibition variables differentially moderate intimate partner violence and the acceptance of aggressive myths (24, 32).

The second and perhaps most crucial finding of this research is the significant mediating role of psychological capital. The bootstrap analysis confirmed that the indirect effects of all six behavioral brain system components on the tendency toward violence, through the mediation of psychological capital, were statistically significant ($p \leq .001$). Psychological capital itself had a strong, significant negative direct effect on the tendency toward violence ($\beta = -0.62$). This implies that psychological capital—comprising resilience,

hope, optimism, and self-efficacy—acts as a powerful cognitive buffer. When women affected by marital infidelity possess high levels of psychological capital, they are significantly less likely to resort to domestic violence, despite the biological impulses generated by their behavioral brain systems.

This mediating mechanism is strongly supported by recent literature highlighting the protective nature of psychological capital in high-stress and traumatic environments. For example, structured psychological capital training has been empirically proven to enhance interpersonal empathy and directly reduce clinical symptoms of violence in individuals prone to aggressive outbursts (37). In highly demanding environments, robust psychological capital significantly moderates negative psychosocial impacts, buffering individuals against burnout and severe psychological stress (34-36). The context of marital infidelity is a prime catalyst for intense interpersonal conflict and subsequent domestic violence (6, 7). However, psychological capital enables individuals to cognitively reappraise this profound environmental stressor, maintaining emotional regulation (41). The cognitive resources inherent in psychological capital effectively provide "top-down" regulation of the "bottom-up" emotional reactivity driven by the brain's raw behavioral systems. This regulatory capacity is consistent with findings that cognitive-behavioral interventions can successfully modify emotional reactivity dimensions and actively modulate brain-behavioral systems in individuals structurally prone to destructive relational behaviors (33).

Furthermore, the relationship between the Fight system and psychological capital in the mediation model was negative ($\beta = -0.41$), whereas the relationships between the other brain systems and psychological capital were positive or differently nuanced, fundamentally altering the total effect on violence. An overactive Fight system actively depletes a woman's psychological capital, leaving her more vulnerable to the violent impulses triggered by marital betrayal. In contrast, constructive communication patterns and supportive environments that foster marital satisfaction serve to replenish and maintain psychological capital, significantly alleviating physiological and psychological stress (38, 40). The presence of deep-seated trauma, such as early exposure to conflict or ongoing environmental stress, inherently compromises these protective cognitive reserves, increasing the likelihood of engaging in or falling victim to domestic violence (14, 17). Furthermore, sociological and cultural factors, including disparities in economic and cultural capital within the home, mediate the severity of domestic abuse, emphasizing that psychological resilience does not exist in a vacuum but is heavily influenced by systemic household dynamics (9, 10). In the specific catastrophic wake of infidelity, a woman's psychological capital is heavily tested; those with measured reserves of hope and self-efficacy are theoretically and statistically far better equipped to neurologically inhibit the reactive, aggressive impulses generated by the Fight system (4, 5). This complex dynamic highlights the necessity of treating the psychological symptoms of violence and infidelity not merely as isolated behavioral issues, but as manifestations of a profound neuro-cognitive struggle exacerbated by external trauma (8, 11, 16, 27, 31).

Despite the robust findings, this study is subject to several methodological limitations that must be acknowledged. First, the research utilized a cross-sectional design, which inherently limits the ability to draw definitive causal inferences between behavioral brain systems, psychological capital, and the tendency toward domestic violence; the relationships observed are purely predictive and structural at a single point in time. Second, the reliance on self-report questionnaires introduces the potential for response biases, particularly social desirability bias. Given the highly sensitive and culturally stigmatized nature of both

marital infidelity and domestic violence perpetration, participants may have underreported their violent tendencies or altered their responses regarding their psychological states to align with perceived societal norms. Finally, the sample was restricted to women seeking services at specific counseling centers in Tehran during a single year. This specific demographic, geographic, and temporal constraint limits the generalizability of the findings to men, to couples not actively seeking clinical help, or to populations in differing socio-economic or broader cultural contexts.

To address these limitations and expand upon the current findings, future research should prioritize longitudinal study designs. Tracking couples over an extended period following the discovery of infidelity would allow researchers to observe the dynamic fluctuations in psychological capital and the actual, real-world manifestation of violent tendencies over time, thereby establishing clearer causal pathways. Additionally, future studies must incorporate dyadic data by including the male partners in the research. Because infidelity and domestic violence are fundamentally relational phenomena, analyzing the interacting behavioral brain systems and psychological capital of both spouses simultaneously would provide a much more comprehensive understanding of conflict escalation. Furthermore, integrating qualitative or mixed-methods approaches—such as in-depth phenomenological interviews—alongside neuroimaging techniques could yield profound insights into the lived experiences of these women and the precise biological mechanisms driving the "Fight" response during acute marital crises. Testing this structural model across diverse cultural, religious, and socio-economic demographics is also highly recommended to ascertain the universal applicability of the findings.

The insights generated by this structural model have profound and highly practical implications for clinical psychology, marital counseling, and domestic violence prevention programs. Recognizing that an overactive "Fight" brain system significantly predisposes women traumatized by infidelity to engage in violent behavior allows clinicians to utilize targeted neurological and temperamental screening early in the therapeutic process. By identifying individuals with high biological reactivity, practitioners can proactively implement specialized emotion-regulation strategies and anger-management protocols before conflicts escalate to physical or severe psychological abuse. More importantly, the confirmation that psychological capital acts as a powerful mediator and buffer provides a direct, actionable target for therapeutic intervention. Counselors working with couples navigating the devastating aftermath of extramarital affairs should prioritize structural interventions designed to actively rebuild the victim's psychological capital. By systematically fostering resilience, instilling realistic hope, nurturing optimism, and enhancing self-efficacy through cognitive-behavioral techniques, therapists can empower individuals to cognitively override their innate, biologically driven aggressive impulses, thereby breaking the cycle of trauma and preventing the transition from marital betrayal to domestic violence.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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