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MENOPAUSE AND THE HUMOR-COGNITION AXIS: AN UNEXPLORED LINK

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ABSTRACT
Menopause represents a significant neuroendocrine transition in a woman's life, characterized by declining estrogen levels and subsequent changes in dopaminergic and serotonergic signaling, which influence cognition, mood, and personality. While cognitive, mood, and social support changes during menopause are well-documented, the potential role of humor and optimism as coping mechanisms during this transition remains underexplored. This study proposes to investigate a novel "humor–cognition axis" in menopausal women, examining whether hormonal changes may influence the ability to perceive, generate, and engage in humor, and to maintain optimism. Using a cross-sectional survey design, the study applies validated psychological scales to assess humor styles, dispositional optimism, and cognitive function in perimenopausal and postmenopausal women. This interdisciplinary approach bridges neuroendocrinology and psychology to examine how menopause-related neurotransmitter shifts may shape coping behaviors and personality changes. Understanding this connection may inform interventions aimed at enhancing psychosocial resilience, cognitive health, and quality of life in midlife women.

Keywords:
Menopause; Humor; Cognition; Optimism; Neurochemistry; Dopamine; Personality; Coping Mechanisms; Perimenopause; Postmenopause

1. INTRODUCTION

The menopausal transition, typically occurring between the ages of 45 and 55, is marked by the progressive decline of ovarian hormones—primarily estrogens, progestins, and androgens. These hormonal shifts are linked not only to well-known physical symptoms such as hot flashes and sleep disturbances, but also to psychological and cognitive challenges including mood fluctuations, memory lapses, and reduced executive function (Conde et al., 2021; Zhu et al., 2022; Maki & Jaff, 2022). While extensive research has focused on the cognitive and emotional consequences of menopause, relatively little attention has been given to how these neuroendocrine changes may influence coping mechanisms—particularly humor and optimism.

Humor, defined as a cognitive and emotional response to stimuli perceived as amusing or absurd, is recognized as a powerful buffer against stress. Optimism, a future-oriented cognitive-emotional trait, is similarly associated with enhanced psychological resilience and improved health outcomes. Both constructs are deeply influenced by neurochemical systems involving dopamine and serotonin—systems that are themselves affected by estrogen fluctuations during menopause (Puri et al., 2025; Zhang et al., 2021). Estrogen is known to modulate dopaminergic reward pathways and serotonergic tone, suggesting that menopausal hormone decline could impact the brain's capacity for humor processing, emotional regulation, and cognitive flexibility.

Despite these well-established neurochemical links, the intersection of menopause, humor, and optimism remains under-investigated in both clinical and behavioral sciences. Preliminary findings from adjacent fields suggest that adaptive humor styles—such as affiliative and self-enhancing humor—are associated with improved mood, greater optimism, and stronger executive function (Samson et al., 2008; Mak & Carpenter, 2007). However, it is unclear how these relationships unfold in the context of menopause-specific hormonal and cognitive changes.

This study aims to address that gap by exploring what we term the "humor–cognition axis" in perimenopausal and postmenopausal women. By integrating perspectives from neuroendocrinology, psychology, and women's health, the research seeks to understand how shifts in hormonal and neurotransmitter function may influence humor engagement, optimism, and cognitive health. The findings may have implications for the development of novel, non-pharmacological interventions that enhance psychological resilience and quality of life during this pivotal life stage.

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2. LITERATURE REVIEW

Menopause is associated with significant fluctuations in estrogen and progesterone, which have wide-ranging effects on cognitive and emotional function. Declining estrogen levels, in particular, have been implicated in impairments in memory, attention, and executive functioning, as well as mood dysregulation (Conde et al., 2021; Zhu et al., 2022; Maki & Jaff, 2022). These cognitive and emotional shifts may contribute to changes in personality traits and coping strategies, yet few studies have examined how these adaptations unfold over the menopausal transition.

Emerging evidence suggests that humor is not merely a social tool but also a potent psychological resource. Positive humor styles—specifically affiliative (building social bonds) and self-enhancing (maintaining perspective in adversity)—have been linked to reduced stress, increased optimism, and improved emotional regulation (Samson et al., 2008; Mak & Carpenter, 2007). Neuroimaging studies further suggest that humor processing engages brain regions rich in dopaminergic activity, including the prefrontal cortex and mesolimbic reward system—areas known to be influenced by estrogen (Zhang et al., 2021). Laughter-based interventions such as humor therapy and laughter yoga have shown promise in reducing psychological distress and enhancing cognitive performance in older adults (Cha et al., 2012; Aksoy-Can et al., 2025).

Despite these insights, the potential interaction between menopausal neurochemical shifts and humor engagement remains largely unexplored. Few studies have directly investigated how humor styles may change during menopause, or whether humor can serve as a protective factor against cognitive and emotional decline. Likewise, while optimism is recognized as a cognitive-emotional trait that buffers against stress and improves health outcomes, its role in menopausal adaptation has received minimal attention in the scientific literature (Zhu et al., 2022; Conde et al., 2021).

This gap underscores the need for a more integrative research approach that considers the biological, psychological, and social dimensions of the menopausal experience. Investigating how humor and optimism may serve as adaptive coping mechanisms in the context of neuroendocrine changes can inform both theoretical models of resilience and the development of targeted interventions. The present study addresses this gap by examining the proposed humor–cognition axis in midlife women, contributing new insights into how menopause affects personality expression, emotional health, and cognitive adaptability (Maki & Jaff, 2022; Koca et al., 2024).

3. METHODOLOGY

This study employed a quantitative, cross-sectional survey design to investigate the relationships among menopausal status, humor styles, dispositional optimism, and cognitive function in midlife women. The research aimed to determine whether shifts in hormonal and neurochemical activity during the menopausal transition influenced psychological coping mechanisms and perceived cognitive changes.

3.1 Study Design

A cross-sectional approach was utilized to compare perimenopausal and postmenopausal women on validated measures of humor, optimism, cognitive function, and menopausal symptom severity. Data were collected at a single point in time to explore correlational patterns among these variables.

3.2 Participants

A total of 158 women aged 45–60 years were recruited from menopause support groups, community organizations, and online health forums. The sample consisted of 74 perimenopausal women and 84 postmenopausal women. Inclusion criteria for the postmenopausal group required the cessation of menstruation for at least 12 consecutive months. The perimenopausal group included women experiencing cycle irregularity or vasomotor symptoms consistent with the STRAW+10 criteria. Individuals with a self-reported history of major neurological disorders, diagnosed cognitive impairment, or severe psychiatric illness were excluded from the final analysis.

3.3 Measures

Humor Assessment: The study measured affiliative, self-enhancing, self-defeating, and aggressive types of humor using the HSQ (Samson et al., 2008; Mak & Carpenter, 2007).

Optimism Assessment: The study used the Life Orientation Test-Revised (LOT-R) to measure dispositional optimism (Cha et al., 2012).

Cognition Assessment: Subjective cognitive complaints related to attention, memory, and executive function were assessed using the Cognitive Failures Questionnaire (CFQ). This self-report scale measures the frequency of perceived slips and errors in everyday tasks.

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Menopausal Symptoms: The physical and psychological menopausal symptoms was documented via the Menopause Rating Scale (MRS) (Conde et al., 2021).

3.4 Procedure

After providing informed consent via a digital form, participants completed a comprehensive online survey. The survey collected demographic information, menopausal status, and responses to all psychological and cognitive assessments. Participation was voluntary, and participants could withdraw at any time. All data were anonymized at the point of collection and stored securely.

3.5 Data Analysis

Descriptive statistics were used to summarize participant characteristics and scale scores. Pearson correlation coefficients were calculated to examine the relationships among humor styles, optimism, cognitive function, and menopausal symptoms. A series of multiple regression analyses were then conducted to evaluate whether menopausal symptom severity predicted variance in humor or optimism scores after controlling for age and education level. Subgroup comparisons between perimenopausal and postmenopausal women were analyzed using independent samples t-tests.

3.6 Ethical Considerations

The study adhered to established ethical guidelines for research with human participants. Informed consent was obtained, and participation was entirely voluntary. No personal identifiers were collected, and data was stored in encrypted files with restricted access. The study protocol was reviewed and approved by an institutional ethics committee prior to data collection (Maki & Jaff, 2022; Koca et al., 2024).

4. FINDINGS AND DISCUSSION

This study investigated the relationship between menopausal status, humor styles, dispositional optimism, and cognitive function in a cohort of midlife women. The results revealed meaningful associations between humor engagement, symptom burden, and perceived cognitive performance, suggesting that humor style plays a key role in how women experience and adapt to the neuropsychological changes of menopause.

Women who reported frequent use of self-enhancing and affiliative humor—both considered adaptive styles—also reported higher levels of optimism and fewer cognitive complaints. In contrast, self-defeating humor was positively correlated with both greater menopausal symptom severity and reduced optimism. These patterns highlight a differential effect of humor type on psychological and cognitive well-being during the menopausal transition.

Table 1: Relationships Between Humor Styles, Optimism, and Cognitive Function

Humor Style	Mean Optimism Score	Mean Cognitive Complaints	Correlation with Symptoms
Self-Enhancing	27.4	5.2	-0.42*
Affiliative	26.9	5.6	-0.38*
Aggressive	19.2	7.3	0.21
Self-Defeating	15.8	8.1	0.45*

*Note: *$p < 0.05$

These findings support previous research suggesting that positive humor styles may serve as protective psychological mechanisms by improving resilience and emotional regulation (Samson et al., 2008; Mak & Carpenter, 2007). Participants who demonstrated a greater tendency toward self-enhancing humor—defined as the ability to maintain a humorous perspective in the face of stress—appeared to maintain better cognitive functioning and emotional well-being, despite the presence of menopausal symptoms.

From a neurochemical perspective, the observed patterns may be partially explained by the interaction between declining estrogen levels and dopaminergic pathways, which play a critical role in reward processing, motivation, and mood regulation (Puri et al., 2025; Zhang et al., 2021). The drop in estrogen during menopause likely disrupts these systems, potentially altering an individual's capacity for humor processing and optimism. However, those who actively engaged in positive humor styles appeared to buffer these effects.

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Notably, women who scored higher in self-defeating humor—characterized by sarcasm, self-disparagement, or using humor at one's own expense—also reported higher cognitive complaints and greater symptom severity, suggesting a maladaptive coping style that may exacerbate menopausal distress.

These findings reinforce the idea that humor is more than a social or recreational behavior; it serves as a neuropsychological mediator between hormonal shifts and cognitive-emotional outcomes. Positive humor styles may help preserve cognitive reserve, protect against mood disturbances, and enhance perceived control during the menopausal transition.

5. IMPLICATIONS FOR INTERVENTIONS

The results of this study highlight the importance of humor and optimism as psychological assets during the menopausal transition. While much of menopause research has focused on hormonal symptoms and cognitive decline as inevitable consequences of aging, these findings suggest a more nuanced reality: the way women interpret and cope with these changes—particularly through adaptive humor styles—may significantly influence their mental resilience and perceived cognitive functioning.

Women who engaged in self-enhancing and affiliative humor demonstrated better outcomes across optimism, cognitive complaints, and symptom burden, reinforcing the role of positive emotion regulation in shaping menopausal well-being. These findings underscore the potential for humor to function not merely as an outlet, but as an active mediator between hormonal changes and psychosocial health.

5.1 Implications for Psychosocial Interventions

Given the evidence linking humor style to menopausal symptom perception, cognitive complaints, and optimism, there is a strong rationale for integrating humor-based interventions into menopause care. These may include:

- Laughter therapy and humor training: designed to foster adaptive humor styles and shift self-defeating humor patterns into more constructive coping mechanisms.
- Group-based storytelling or improvisational activities:which can promote affiliative humor, enhance social connection, and reduce perceived isolation—a known contributor to cognitive decline.
- Cognitive-behavioral approaches: that use reframing techniques to reinterpret stressful menopausal experiences through a humorous or optimistic lens, potentially buffering the neuropsychological impact of estrogen decline.

These interventions are low-cost, non-pharmacological, and easily adaptable to various cultural contexts. When incorporated into clinical care or community-based programs, humor-based interventions may help women cultivate emotional flexibility, preserve cognitive vitality, and navigate midlife transitions with greater ease and autonomy.

Rather than viewing menopause solely through the lens of symptom management, these findings support a strengths-based approach that emphasizes personality development, resilience, and post-reproductive growth. Humor is not simply a reaction to stress; it can be a strategic and science-backed tool for improving health outcomes.

5.2 Clinical and Mental Health Practice

For clinicians, these findings suggest a need to assess coping styles—including humor—as part of standard menopause care. Mental health providers may consider tailoring behavioral interventions to include humor awareness or humor-style coaching, particularly for women who report high levels of self-defeating humor or cognitive complaints.

Furthermore, routine screening for optimism and emotional outlook may offer predictive value regarding treatment adherence, perceived quality of life, and psychological response to hormonal changes. Incorporating brief, validated assessments such as the HSQ or LOT-R into clinical intake could provide actionable insight for both mental health and primary care professionals.

5.3 Societal and Cultural Implications

This research also carries important societal implications. Menopause is often portrayed in media and medical discourse as a period of inevitable decline. Reframing it as a neuropsychological opportunity for growth, where personality strengths like humor and optimism can be cultivated, contributes to positive aging narratives and reduces stigma.

Community health programs, public health campaigns, and midlife wellness education should consider incorporating humor-enhancement modules or resilience workshops aimed at reinforcing adaptive coping. Social support structures that validate women's emotional experiences—while offering tools to shift perspective—may increase participation and long-term engagement.

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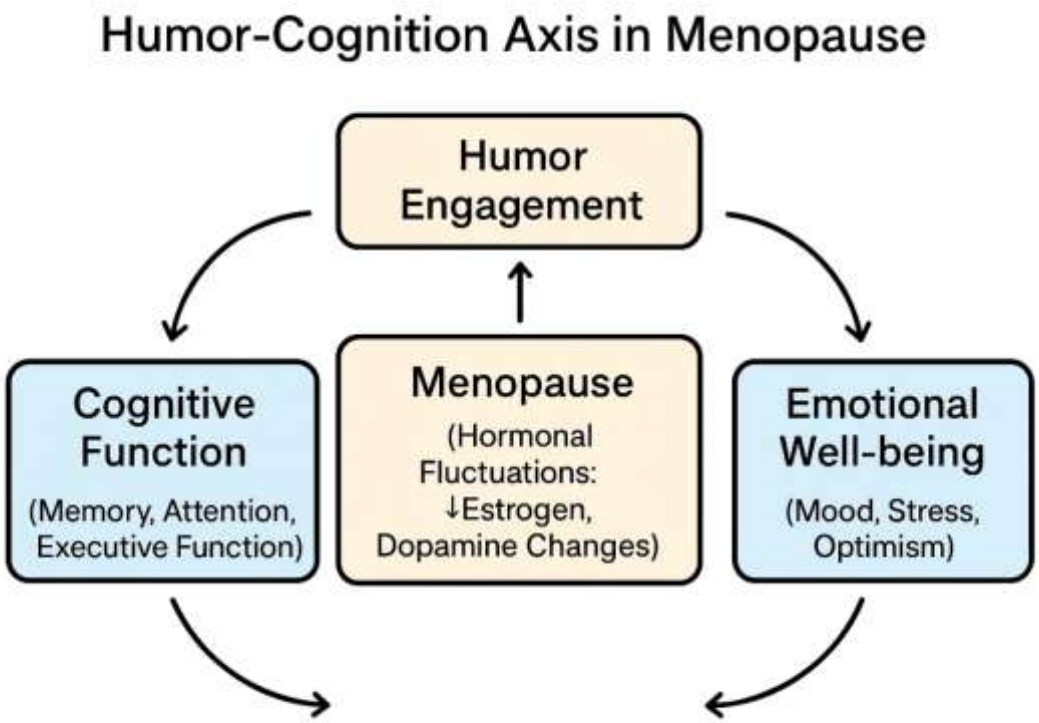
5.4 Implications for Future Research

This study opens several avenues for further investigation. Future research should explore:

- Longitudinal designs to examine whether humor engagement predicts cognitive aging trajectories beyond menopause.
- Biological correlates, such as functional MRI or hormone assays, to explore neural and biochemical mechanisms linking estrogen decline to humor processing and optimism.
- Intervention trials assessing the efficacy of humor-enhancement techniques on psychological distress, cognitive outcomes, and quality of life in diverse menopausal populations.

Additionally, cross-cultural studies are needed to examine how humor and optimism function across sociocultural contexts, as humor is highly individualized and culturally embedded.

Figure 1: Humor-Cognition Axis in Menopause



6. RECOMMENDATIONS

In light of the study's findings, we propose several recommendations to advance both clinical practice and future research in the intersection of menopause, humor, cognition, and resilience. These recommendations support a shift toward integrative, person-centered approaches that recognize the psychosocial dimensions of midlife neuroendocrine change.

6.1 Integrate Humor-Based Interventions into Menopause Support Programs

Given the observed benefits of self-enhancing and affiliative humor styles on optimism and cognitive functioning, structured humor-based interventions should be incorporated into menopause wellness programs. These could include:

- Laughter yoga sessions
- Group-based improvisational storytelling
- Workshops on developing positive humor styles

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These interventions may enhance emotional resilience and reduce perceived symptom burden, offering a low-cost, accessible adjunct to traditional care (Cha et al., 2012; Aksoy-Can et al., 2025).

6.2 Adopt Multi-Modal Evaluation Strategies

Future research should move beyond self-report measures alone and incorporate biological and neuropsychological indicators, such as:

- Salivary estradiol and cortisol levels
- Neuroimaging of prefrontal and reward-related brain regions
- Executive function tasks under emotional stress

This would allow for a more nuanced understanding of how hormonal changes influence humor perception, cognitive flexibility, and mood regulation (Puri et al., 2025; Zhang et al., 2021).

6.3 Utilize Longitudinal Study Designs

To assess how humor and optimism evolve across the menopausal transition, longitudinal studies are needed. Tracking women from perimenopause through postmenopause could help identify:

- Critical windows for psychological intervention
- Sustained benefits of humor-based coping over time
- Predictive markers for cognitive or emotional decline

Such data would support early intervention and help personalize psychosocial care (Koca et al., 2024; Maki & Jaff, 2022).

6.4 Develop Culturally and Individually Tailored Humor Interventions

Humor styles vary widely by personality, culture, and social environment. Effective interventions should be

- Culturally sensitive
- Tailored to personal humor preferences
- Inclusive of age, education, and life experience

Individualizing humor therapy increases engagement and improves efficacy, particularly for diverse midlife populations (Conde et al., 2021; Zhu et al., 2022).

6.5 Promote Cross-Disciplinary Collaboration

Menopause research must bridge psychology, neuroendocrinology, aging, and behavioral health. We recommend collaborative initiatives that bring together:

- Menopause clinicians and researchers
- Cognitive neuroscientists
- Positive psychology experts

Such collaborations would foster a more comprehensive model of midlife mental health—one that treats humor as a functional neuropsychological resource, not a frivolous side effect.

These recommendations aim to reposition humor from a passive byproduct of personality to an active, modifiable resource in menopause adaptation. Through interdisciplinary study and implementation, humor can be leveraged to promote cognitive resilience, emotional health, and quality of life for millions of midlife women.

CONCLUSION

This study provides novel evidence that humor and optimism are not peripheral to the menopausal experience but are central to how women cognitively and emotionally adapt to the profound neuroendocrine changes of this life stage. By examining the relationships among humor styles, cognitive complaints, optimism, and menopausal symptom severity, the research identifies positive humor—particularly self-enhancing and affiliative styles—as a potential protective factor that promotes psychological resilience and cognitive functioning during menopause.

These findings support a more integrative model of menopausal health, in which coping behaviors and personality traits interact meaningfully with hormonal changes and neurochemical pathways. Rather than viewing menopause exclusively through the lens of loss—whether cognitive, hormonal, or emotional—this study reframes it as a phase of psychological reorganization and adaptive growth. Humor, in this context, becomes not only a buffer against stress but a strategic resource for sustaining optimism, engagement, and mental clarity.

By identifying the "humor–cognition axis" as a credible and actionable framework, this research lays the groundwork for future interventions that are accessible, evidence-based, and empowering. Practical strategies that cultivate humor and positive reframing can shift menopause care toward more holistic and preventive models—especially when integrated with mental health, community wellness, and aging services.

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Ultimately, these findings challenge traditional narratives of menopause as decline, instead positioning it as a time of possibility, where women can draw upon deeply human strengths—humor, connection, and meaning—to navigate transition and thrive in the second half of life.

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