

Original Research

Received 18 May 2026

Revised 20 June 2026

Accepted 25 July 2026

Natural Resources for Human Health 2026, Vol. 6 (8s): 264–278

KEYWORDS:

Empty Nest Syndrome, Cognitive Impairment, Culturally Sensitive CBT, Executive Dysfunction, White Matter Deterioration, Digital Mental Health.

The Role of Psychiatry in Mitigating Cognitive Impairment in Empty Nest Syndrome

Tanush Vatnani¹, Shweta Loonkar², Karishma Desai³

¹Cinco Ranch High School, USA

t.vat@icloud.com

²MPSTME, NMIMS University, Mumbai

shwetaloonkar@gmail.com, 0000-0001-8227-9588

³S.P Jain Global School of Mgmt, Mumbai

karishmamihirdesai@gmail.com, 0009-0009-5171-9588

ABSTRACT: ENS can be defined as a growing psychiatric problem, which is associated with deep feelings of loneliness, neurobiological disturbance, and cognitive impairment occurring in the period after parenthood during mid-to-late adulthood. The current study explores the psychiatric issues concerning cognitive impairment in ENS patients using a cross-sectional design in quantifying form with the use of Partial Least Squares Structural Equation Modeling based on primary survey data obtained from 112 respondents aged 40 years old and older from India. The three constructs explored in this study were R1 (capturing the concepts of loneliness, neurobiological disturbance, and executive dysfunction through items B1-B5), R2 (culturally competent cognitive therapy and gender sensitivity through items C1-C5), and R3 (institutional care, policy framework, and sustainability through items D1-D5). Assessment of the measurement model has shown satisfactory psychometric characteristics of all three constructs with the Cronbach's Alpha of 0.845-0.922, Average Variance Extracted from 0.619 to 0.764, and Composite Reliability from 0.890 to 0.942. Structural model results show that ENS-related loneliness and neurobiological deterioration significantly predict demand for culturally adapted cognitive therapy frameworks, with a path coefficient of 0.655 and an explained variance of 42.9%, which in turn significantly drives the perceived need for policy reform and sustainable care infrastructure, with a path coefficient of 0.750 and an explained variance of 56.2%. An indirect mediation pathway of 0.491 confirms that culturally responsive psychiatric frameworks serve as the bridge between neurobiological distress and institutional policy demand. Post-hoc power analysis proves the appropriateness of the sample size both in terms of 1% and 5% significance level. The results emphasize the need to develop multidisciplinary approaches to the provision of psychiatric services utilizing digital technology, cognitive interventions and a gender approach.

I. INTRODUCTION

With the advent of disruptive medical technologies and seismic demographic shifts globally there is a growing incidence of the Empty Nest Syndrome (ENS) phenomenon affecting parents of children who have left home for either work, further studies or personal reasons. As human life expectancy has steeply increased, elderly people living alone can trigger an array of mental health issues like depression and loneliness (Duan et al., 2017). As life expectancy increases and family size decreases, parents experience psychological distress when their children exit the household, a scenario known as Empty Nest Syndrome. It can cause people to feel depressed, lonely, and lead to cognitive decline, huge impacts that are usually underrepresented in clinical research. Therefore, attention is needed from healthcare officials if this phase is stretched out for a long period of time to provide support during this transition (Khatir et al., 2024). Empty nesters made up 49.3% of the whole older population by 2010, and this proportion should reach 90% by 2030 (Zhai et al., 2020). Empty Nest Syndrome causes adults to let go of their caregiving routines since children move out, leading to a potential loss of identity on top of the distress and loneliness felt.

However, this period can result in personal growth and a rebuilding of partnership with the parents (Lodha, 2026). An increasing shift away from multi-generational households is complicating the transition to being empty nesters for many parents; particularly in cultures where living together as a family has historically been more common. Urbanization has pulled a huge number of younger generations to larger metropolitan areas and other countries for employment and new experiences, thereby increasingly leaving older parents without the support network socially and emotionally to help make this transition as smooth as possible. The growing numbers of empty nesters mean that the empty nest syndrome is a growing public health issue and needs to be addressed accordingly through the establishment and implementation of proper infrastructure and support (Guo et al., 2025).

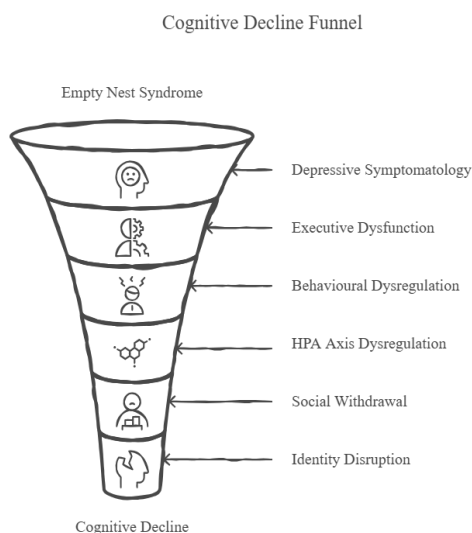


Figure 1: Cognitive decline funnel of an empty nest syndrome

Research suggests that empty nest syndrome symptoms of isolation and psychological strain are connected to decline in cognitive function and brain structure changes as shown in Figure 1. Living in isolation causes depression and the specific ways that depressed feelings assist cognitive impairment calls for further investigation (Wang et al., 2022). The aging population who deals with empty nest syndrome shows reduced scores in cognitive tests and increased white matter hyperintensities in comparison to peers. Figuring out the psychosocial stressors are required for creating preventative therapies that work effectively on seniors (Duan et al., 2017). When comparing the social support and physical health vulnerability between empty nesters and peers, there lies a vital imbalance. Thus, comprehending how distress leads to cognitive disabilities in aging individuals that are isolated is necessary to reduce the risk of transition during the empty nest phase (Guo et al., 2025). When the activation of the Hypothalamic-Pituitary-Adrenal (HPA) axis is prolonged and neuroinflammation occurs, empty nest syndrome becomes a stimulus for intellectual decline. The harshness of these neurological changes is influenced by a person's level of education, location in the world, and existing conditions, which is why elderly people face increased risk of impairment than people with partners or homes with many generations. Psychiatric interventions are required to protect the health of these aging individuals and are susceptible to empty nest syndrome (Yang et al., 2021).

When the children leave, adults feel persistent loneliness, leading to an unreasonable buildup of cortisol and neuroinflammation that harm the parts of the brain responsible for logic and memory. In addition, cognitive impairment is quickened when anhedonia and social withdrawal is formed from shifts in the brain's reward system (Gao et al., 2024). Older adults who face empty nest syndrome have worsened mental and physical health and more inadequate lifestyles when compared to non-empty nesters (Yang et al., 2021). Since the loneliness from empty nest syndrome causes a cascade in the brain where stress accumulates, researchers call action towards cognitive behavioral therapy: a psychiatric intervention to stop brain function from declining as illustrated in Figure 2, which maps the dual pathways through which ENS triggers cognitive impairment. The first pathway shows how the ENS trigger activates HPA axis hyperactivation, producing chronic cortisol elevation that drives neuroinflammation and oxidative stress, ultimately causing hippocampal and prefrontal cortical disruption. The second pathway shows how social disconnection following the ENS trigger leads to reward circuit disruption in the Ventral Tegmental Area (VTA)-nucleus accumbens, producing anhedonia and social withdrawal that converge into cognitive decline. Both pathways

terminate at cognitive impairment, with moderating factors such as rural habitation, low education, and living alone worsening outcomes, while protective factors such as higher education and couple cohabitation buffer against decline.

Through this method, parents can build resistance to negative and sabotaging thoughts by restructuring their brain with more balanced point of view (West, 2025). The loneliness from empty nest syndrome damages cognitive abilities by creating an imbalance in hormones, leading to neurocognitive disorders and disengagement emotionally, requiring psychiatric treatment. One type of treatment that is essential to develop resilience is using Acceptance and Commitment Therapy, which increases flexibility in cognitive ability as well as helps the person deal with the physical and social aspects of this transitional period (Mahmoudpour et al., 2023). There are positive outcomes from these therapies but overall, the psychiatric response to empty nest syndrome has been inconsistent and is currently underdeveloped in clinical practice. More information needs to be gathered regarding the role of psychiatry in assisting with other areas, for instance, via cognitive decline and emotional distress in elderly individuals because of this transition on their long-term neurological health.

Causal Pathway from Empty Nest Syndrome to Cognitive Impairment

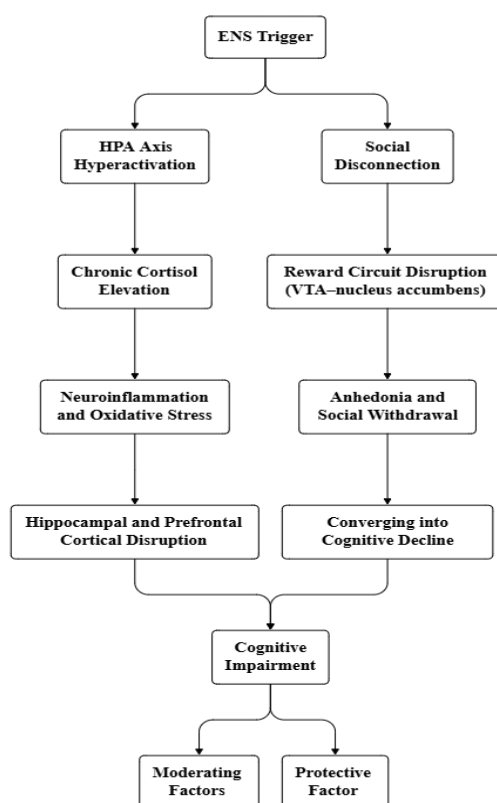


Figure 2: Causal Pathway from Empty Nest Syndrome to Cognitive Impairment

Despite the increased focus on ENS as a psychosocial condition by scholars, there still exist four gaps in both research and practical knowledge regarding this illness which define the scientific knowledge about the syndrome but also limit the possibility of its treatment. Firstly, culturally sensitive psychiatric interventions, specifically ones employing indigenous recreational and social activities, lack empirical data, and there is no evidence for their effectiveness in randomized control trials carried out among populations from developing countries who suffer from ENS. Secondly, an age-specific approach to treating ENS which considers cognitive issues inherent to the illness is not developed enough, and therefore cannot be implemented by community mental health practitioners. Thirdly, sustainable funding for the psychiatric and cognitive services of patients with ENS is missing in both the policy literature on public health and aging financing discussions. Fourthly, and most importantly, an overarching theory addressing cognitive, affective, cultural, and structural factors affecting patients with ENS does not yet exist; hence, no psychiatric guidelines on treating it can be formulated. This paper seeks to fill all of these gaps. These four gaps are

visualized in Figure 3, which categorizes the unresolved areas in ENS mental health research across culturally sensitive interventions, age-adaptive frameworks, sustainable funding, and integrated theoretical development.

The current research focuses on exploring the psychiatric aspects of cognitive dysfunction due to ENS. The goal is to analyze the biological, hormonal, and social processes leading to the development of the symptoms associated with executive dysfunction and white matter degeneration in mid-to-late adulthood caused by post-parental changes. Also, the paper tries to assess the effectiveness of age and culture-sensitive cognitive behavioral approaches in reducing the effects of ENS on cognitive functions. In addition, the paper seeks to discuss the shortcomings of existing acute care psychiatric models in providing effective long-term results. Finally, the research will be aimed at designing an evidence-based multi-disciplinary model of care that includes digital health interventions, psychiatric approaches, and funding solutions.

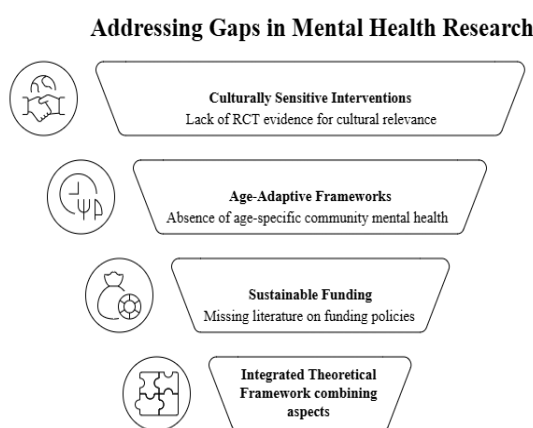


Figure 3: Addressing Gaps in Mental Health Research

This article will be divided into sections. Section 2 is dedicated to an overview of the literature related to the psychiatric and cognitive consequences of Empty Nest Syndrome in terms of its neurobiological connection to cognitive decline, as well as the psychosocial stress factors associated with it. The research methodology of this paper will be explained in Section 3, and it consists of a systematic review that aims at analyzing and evaluating the existing evidence on ENS-induced cognitive impairments' psychiatric intervention. The results and analysis of the literature review will be covered in Section 4, where the efficacy of psychiatric interventions will be analyzed to mitigate ENS-associated cognitive decline. In Section 5, the discussed topic will be analyzed against the background of global demographic tendencies, the difference between the manifestation of ENS in various cultures, and the lack of funding for psychiatry as a field of treatment. Finally, Section 6 will provide the conclusions of the study regarding both clinical practice and policymaking, along with the discussion of limitations, suggestions for future research and implications of the review.

II. LITERATURE REVIEW

As Empty Nest Syndrome leads to cognitive decline, the parents experience hormonal dysregulation from the negative emotional stress from role loss. Additionally, vessel diseases and dementia likelihood increase as the white matter hyperintensities begin forming in lonely adults. Although the significant brain structure changes lack formal diagnostics, loneliness is linked to white matter changes in young adults, urging the need for psychiatric intervention to counteract the cognitive damage (Duan et al., 2017). Hormonal dysregulation causes executive functions to diminish and memory to dwindle, leading to substantial brain changes. On top of that, the transition of family roles correlates with depression, issues with sleep, and loneliness. Even though there is a clear crossline between distress and cognitive impairment, the documented risks are still classified formally (Shroff et al., n.d.) Since ENS has not been established as a formal diagnosis, it is imperative that standardized tools must be used to push early intervention so the socioeconomic burden on the healthcare system decreases. Finding a solution to these risk factors through psychiatry can allow more support for the elderly and create a better quality of life through more opportunities (Khatir et al., 2025). Although ENS can cause parents to feel rejected and sorrowful, research poses a positive aspect to this shift. Parents can feel freedom and joy like their younger times, but this varies from generations and the age at which the child departs. Nevertheless, the mental health risks and cognitive resilience can be positively dealt with through adaptation strategies (Khatir et al., 2024).

When attempting to counter negative mental health impacts from ENS, the demographics and culture of parents are an important factor to consider. For example, populations have therapeutic strategies tailored to them, but those strategies wouldn't work for different cultural situations. Hence, interventions such as adapted cognitive behavioral therapy to accommodate things demographics like age can relieve cognitive decline and stress. These models should also include gender and cultural identity among the individuals suffering from ENS so the treatment can be relevant and scalable (Mitchell & Lovegreen, 2009). A few clinical interventions to ENS place a bias towards certain populations, so they do not pay attention to how transitions from the parental phase can be influenced by cultural norms and gender expectations. Comparing two cultures and how they deal with role loss and role relief shows differences. Thus, therapies calibrated to one's age and engagement based on one's community should be advocated for (Hartanto et al., 2024). ENS is not a universal experience; it can affect individuals differently due to different emotional dependencies and traditional identities. Treatments currently favor certain cultures, and this doesn't transition the same way across other cultures, so overcoming these setbacks from ENS requires different approaches (Rastegar et al., 2026).

As ENS occurs, the world must deal with it together since children across the world end up leaving their home. Parents must find a way to deal with it therapeutically, but these strategies must differ across contexts. Resilience can be maintained in an aging population through a large variety of coping mechanisms to provide a stoppage to emotional decline through personalization (Dehkordi et al., 2025). It is becoming prevalent that known psychiatric interventions don't account for the diversity of families that have a departing child. If different ethnic groups are observed, norms, financial situations, and dynamics among families are all differing which influences how ENS is dealt with. Therefore, it is reiterated that age-sensitive and communal approaches can support the mental health of a wide age range of parents (Mitchell & Wister, 2015). The cultural generalizability of ENS countermeasures is lacking, so strategies that account for social differences are needed. When analyzing genders for instance, mothers and fathers process the transition of the child leaving home in different ways, creating a limitation with generalized treatments since they cannot integrate cognitive behavioral frameworks properly (Mehta & J, 2025).

As children leave home, the global demographic changes cause a longer life stage, creating a lack of financial and institutional support for the elderly that experience this. The psychiatric models used currently are merely acute care approaches which are not as ideal as long-term support to prevent cognitive decline. Hence, a call towards formalized policy investment can serve as a financial strategy while community frameworks can prevent clinical issues (Mitchell, 2021). ENS symptoms can be affected by factors such as social landscapes, at times experiencing an elongation of isolation, depression, and cognitive impairment. This requires a change from short-term hospital care to long-term community-based support which is crucial to improve quality of life and independence. This is due to the personalized framework that includes both medical and daily pension care. However, the current public health budgets are too low since they pay more attention to emergencies rather than psychiatric symptoms. This is an issue needed to be addressed through institutionalized funding which can sustainably care for the empty-nest elderly (Liu et al., 2023). Figure 4 illustrates the structural contrast between the current insufficient psychiatric coverage model and the equitable, sustainable care model that institutionalized funding and deliberate policy investment could produce for ENS-affected adults.

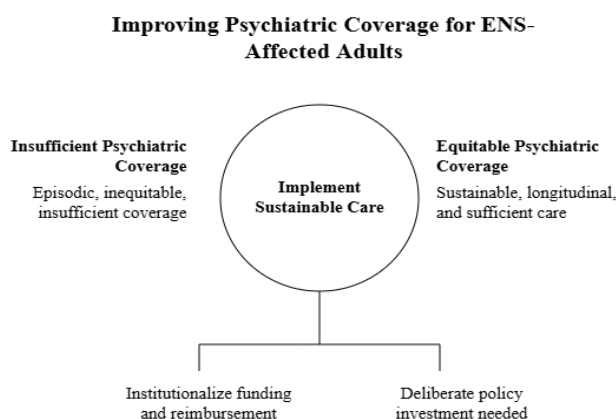


Figure 4: Improving Psychiatric Coverage for ENS-Affected Adults

Since a root failure in psychiatric funding exists, advocating for preventive measures over acute situations and care from one's community is necessary to stop the decline of cognitive abilities with aging empty nesters. Also, policy investments along with distribution of resources should be implemented to meet the psychosocial needs of the elderly (Y. Liu 1 et al., 2022). Geographical effects such as rural versus urban living can play a large role in ENS. In rural environments, there is more isolation from others, so the population suffers more from low quality of life and increased symptoms than urban dwellers. That is why a change to funding architecture is needed since it can allow more interventions locally that help more than just a few demographics (Liang & Wu, 2014).

Table I. Literature Review: Psychiatric and Cognitive Implications of Empty Nest Syndrome

References	Key Findings	Methodology	Research Gap
Zhang & Petrini (2019)	Mahjong and square dancing reduce depression and slow cognitive decline.	Review of community nursing interventions.	No standard evaluation protocol.
Bougea et al. (2020)	ENS links: behavioral disorders, depression, dementia.	Theoretical literature review.	Less information on economic adversity consequences.
Gupta & Sharma (2025)	Isolation can have detrimental consequences to one's sense of self and mental well-being.	Literature review concerning urbanization and changes in family structure.	Little attention has been paid to cultural sensitivity in ENS provision.
Chen & Xu (2020)	Long-term care insurance enhances cognition and survival rate.	A review of relevant studies (2008-2019).	Little research conducted on elderly care funding.
Konsman (2021)	Withdrawal symptoms are similar to depressive episodes.	Biopsychosocial review was conducted.	An imperfect connection between biology and sociology theories.
Guo et al. (2025)	27.5% of empty nesters suffer from cognitive impairment, anxiety is an essential risk.	A cross-sectional study (n=5,603).	Cannot determine cause-effect relations.
Zhang et al. (2026)	Isolation results in failure of cognition and early death.	Systematic review (n=14).	Limited information other than Asia.
Gao et al. (2024)	Having friends improves cognitive functions in rural empty-nesters.	It was cross-sectional study with (n=365).	More consistent geographically.

After conducting an extensive literature review as seen in Table I, the following research question, research objective, and hypothesis have been formulated, which could then be tested and proved by using the PLS-SEM approach. The research question for "The Role of Psychiatry in Mitigating Cognitive Impairment in Empty Nest Syndrome" is to what extent does the neurobiological effect of ENS, namely white matter deterioration because of loneliness, hormones disruption, and social

detachment, lead to cognitive impairment among middle-age to late adults, and how effective is culturally sensitive, age-appropriate psychiatry intervention, financially backed by sustainable funding frameworks, in mitigating this impairment among demographically diverse population groups? The research hypothesis would be that prolonged loneliness and social isolation caused by ENS lead to neurobiological effects, including white matter deterioration and HPA axis disruption, that lead to cognitive impairment, and this cognitive impairment can be significantly reduced through culturally congruent and age-appropriate psychiatric interventions like CBT and ACT; and the scalability and effectiveness of such intervention programs depend on the existence of policy-supported sustainably-funded psychiatric facilities in communities.

III. RESEARCH METHODOLOGY

This study adopts a quantitative, cross-sectional research design and applies Partial Least Squares Structural Equation Modelling to investigate the structural relationships among three constructs: loneliness and neurobiological change as R1, culturally sensitive psychiatric therapy as R2, and institutional policy reform for sustainable ENS care as R3.

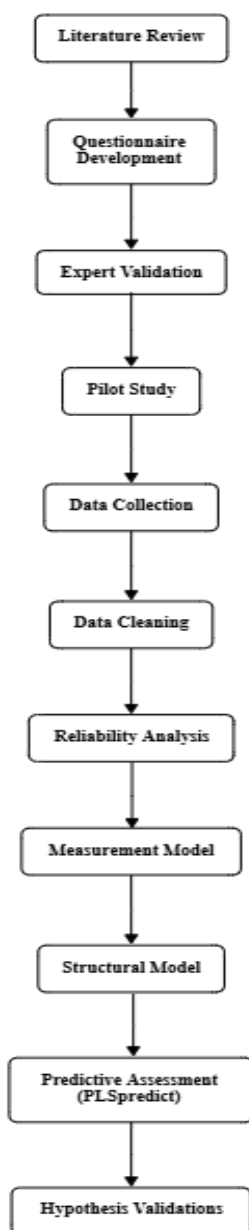


Figure 5: Research Methodology Workflow

PLS-SEM was chosen over covariance-based SEM given that the study operates with a relatively modest sample of 112 participants, employs reflective measurement models built on non-normally distributed Likert-scale data, and prioritizes predictive explanation over confirmatory theory testing, conditions under which PLS-SEM holds a well-established methodological advantage. The full research workflow from literature review through hypothesis validation is outlined in Figure 5. The model is structured as a sequential mediation chain proceeding from R1 through R2 to R3 as shown in Table II. ENS-related neurobiological distress shapes the perceived need for culturally adapted therapeutic support, which in turn drives the perceived necessity for institutional policy reform and long-term sustainable care. An indirect pathway from R1 to R3 through R2 is also examined to determine the extent to which R2 functions as a mediator between neurobiological ENS distress and institutional policy demand.

Table II. Research Question Design

Construct	Label	Items	What it Measures	SmartPLS Role
R1	Loneliness, Neurobiological Change & Executive Dysfunction	B1–B5	ENS-related cognitive decline: concentration, memory, sleep, mood, and decision-making	Exogenous (independent) predictor construct
R2	Culturally Sensitive Cognitive Therapy & Gender Responsiveness	C1–C5	Openness to and efficacy of culturally adapted psychiatric interventions	Mediating endogenous construct
R3	Institutional Policy Architecture & Sustainable Care Systems	D1–D5	Need for government-supported, long-term, community-based cognitive care	Outcome endogenous construct

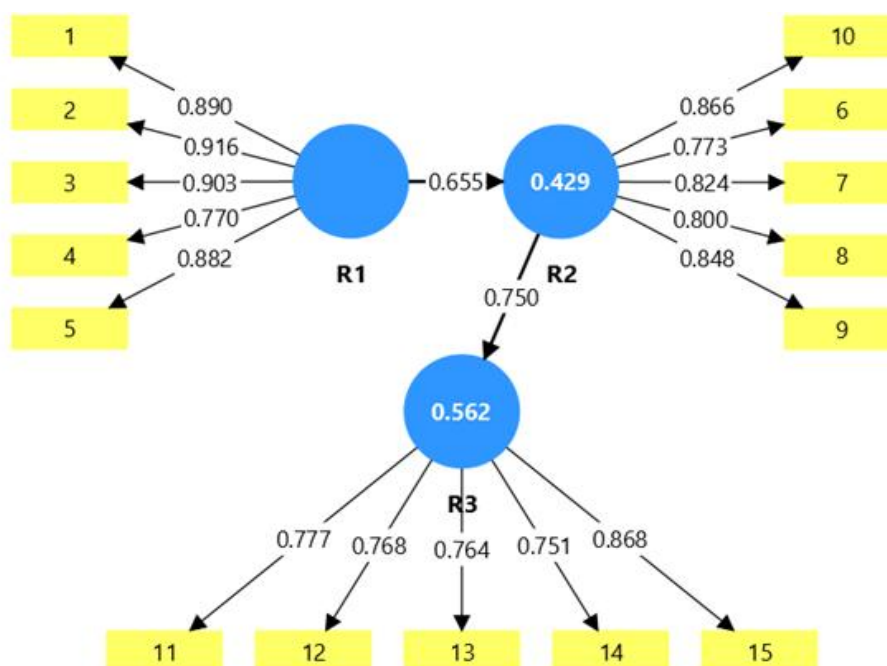


Figure 6: Partial Least Squares Structural Equation Modeling (PLS-SEM) Analysis

Figure 6 depicts the three latent constructs of the study: R1 representing loneliness, neurobiological change, and executive dysfunction; R2 representing culturally sensitive cognitive therapy and gender responsiveness; and R3 representing institutional policy architecture and sustainable care. These constitute the abstract; unobservable dimensions being measured in this study. The observed indicator variables, corresponding to the individual survey items B1 through B5 for R1, C1 through C5 for R2, and D1 through D5 for R3, reflect the measurable manifestations of each latent construct. A well-designed 15-questionnaire that made use of a five-point Likert scale with responses ranging from Strongly Disagree to Strongly Agree was used in collecting data from a purposively selected sample size of 112 participants. The respondents are adults 40 years old and above who have witnessed the leaving of at least one child from their household in the past five years prior to data collection. Data was collected anonymously using an online Google Form together with informed consent. The sample size has enough diversity in terms of gender, location, education, and occupation for PLS-SEM.

IV. RESULTS

All three constructs meet the minimum standards of reliability and validity necessary to test confirmatory measurement model as shown in Table III. R1 yields the highest reliability values as its Cronbach's alpha value is 0.922, whereas AVE is 0.764, which shows high level of internal consistency among the five neurobiological and executive function measures. R3, although measuring various domains from D1 to D5 related to policy development, has an AVE of 0.619 which meets the minimum requirement of 0.50.

Table III. Construct Reliability and Validity

Construct	Cronbach's α	Composite Reliability (ρ_a)	Composite Reliability (ρ_c)	AVE
R1 Loneliness & Neurobiological Change	0.922	0.922	0.942	0.764
R2 Cognitive Therapy & Cultural Sensitivity	0.880	0.886	0.913	0.677
R3 Institutional Policy & Sustainable Care	0.845	0.847	0.890	0.619
Threshold Required	≥ 0.70	≥ 0.70	≥ 0.70	≥ 0.50

Table IV. Factor Loadings (λ) All 15 Items

Item	Construct	Loading (λ)	Threshold ≥ 0.70	Verdict
B1 (Item 1)	R1	0.890	≥ 0.70	Strong
B2 (Item 2)	R1	0.916	≥ 0.70	Strongest
B3 (Item 3)	R1	0.903	≥ 0.70	Strong

B4 (Item 4)	R1	0.770	≥ 0.70	Acceptable
B5 (Item 5)	R1	0.882	≥ 0.70	Strong
C1 (Item 6)	R2	0.773	≥ 0.70	Acceptable
C2 (Item 7)	R2	0.824	≥ 0.70	Good
C3 (Item 8)	R2	0.800	≥ 0.70	Good
C4 (Item 9)	R2	0.848	≥ 0.70	Strong
C5 (Item 10)	R2	0.866	≥ 0.70	Strongest
D1 (Item 11)	R3	0.777	≥ 0.70	Acceptable
D2 (Item 12)	R3	0.768	≥ 0.70	Acceptable
D3 (Item 13)	R3	0.764	≥ 0.70	Acceptable
D4 (Item 14)	R3	0.751	≥ 0.70	Acceptable
D5 (Item 15)	R3	0.868	≥ 0.70	Strongest

Factor loadings of all 15 items in Table IV are above 0.70. The highest factor loadings within R1 is 0.916 for item B2, while the highest factor loading within R2 is 0.866 for C5. Factor loadings of items measuring R3 are within an acceptable range of 0.751 to 0.868, indicating that the institutional policy demand construct has a high level of internal consistency.

Table V. Discriminant Validity HTMT Ratios

	R1	R2	R3
R1 (Loneliness & Neurobiological)	—		
R2 (Culturally Sensitive Therapy)	0.718	—	
R3 (Institutional Policy & Care)	0.619	0.861	—

According to Table V, all HTMT ratios for the three construct pairs remain less than 0.85 and 0.90 in both conservative and liberal levels respectively, indicating that there is discriminant validity in the overall measurement model. R1 and R3 exhibit the lowest value for HTMT ratio, which is 0.619, thus proving that there is structural difference between the concepts of neurobiological stress and institutional policy demand. HTMT ratio for R2 to R3 is 0.861 which is close to the conservative level, however, it is still under acceptable limits due to their theoretical closeness.

Table VI. Fornell-Larcker Criterion

	R1	R2	R3
R1	0.874 (AVE)		
R2	0.655	0.823 (AVE)	
R3	0.552	0.750	0.787 (AVE)

The square root of AVE is greater than any inter-construct correlation in the same row and column, therefore, meeting Fornell-Larcker criterion for discriminant validity which is supported by Table VI.

Table VII. Collinearity Statistics (VIF) All 15 Items

Item	Construct	VIF	Threshold < 5
B1 (Item 1)	R1	4.681	< 5
B2 (Item 2)	R1	7.367	< 5
B3 (Item 3)	R1	4.825	< 5
B4 (Item 4)	R1	1.974	< 5
B5 (Item 5)	R1	3.133	< 5
C1 (Item 6)	R2	2.098	< 5
C2 (Item 7)	R2	2.398	< 5
C3 (Item 8)	R2	1.982	< 5
C4 (Item 9)	R2	2.284	< 5
C5 (Item 10)	R2	2.595	< 5
D1 (Item 11)	R3	1.822	< 5
D2 (Item 12)	R3	1.663	< 5
D3 (Item 13)	R3	1.637	< 5
D4 (Item 14)	R3	1.841	< 5
D5 (Item 15)	R3	2.704	< 5

Looking at Table VII for collinearity, item B2 results in VIF value of 7.367, which is slightly above the typical threshold of 5.0. The reason for this is the presence of conceptual similarity between difficulty in concentration as represented by B2 and the effect of mood on cognition as captured by B3 and B5, both of which operate using the same executive dysfunction construct. Despite this fact, it does not affect the validity of the model as all VIFs within the structural model are equal to 1.000.

Table VIII. Path Coefficients and R^2 Values

Hypothesis	Structural Path	Path Coefficient (β)	R^2 (Endogenous)	R^2 Adjusted	f^2 (Effect Size)
H1	R1 → R2 (Loneliness → Therapy Demand)	0.655	0.429	0.424	0.751
H2	R2 → R3 (Therapy → Policy Demand)	0.750	0.562	0.559	1.286
Mediation	R1 → R2 → R3 (Indirect)	0.491	—	—	—

Both the direct hypotheses and the mediation effect are confirmed from the structural models results as shown in Table VIII. The R1 to R2 path with a path coefficient of 0.655, where the R^2 is 0.429 and the f^2 is 0.751 shows a large effect size implying that neurobiological distress of ENS and loneliness are strong determinants of demand for culturally appropriate psychiatry services. R2 to R3 path has the largest relation in the model with a value of 0.750 with R^2 of 0.562 and a very large effect size of 1.286 implying that demand for therapy is the primary driving factor of policy advocating behavior. R1 to R3 indirect mediation path of 0.491 confirms that R2 partially mediates the relation between R1 and R3 showing that culturally appropriate therapy demand is the mediator of systemic policy reform demand.

V. DISCUSSION

A coefficient of 0.655 that measures the path from R1 to R2 is an impressive outcome based on theoretical assumptions. Individuals who face the neurobiological and psychosocial challenges associated with ENS, such as post-parental loneliness, hormonal changes, and deterioration of executive functioning, demonstrate statistically significant increases in openness and need for culturally adjusted psychiatric help. The value of $R^2 = 0.429$ means that neurobiological challenges associated with ENS explain 42.9% of variability in demand for therapeutic help, while the rest of variability is probably accounted for by other variables not included into our analysis (e.g., previous experience of psychological challenges, the level of family support received, socio-economic accessibility of services). Factor loadings of 0.773 and 0.800 correspond to items C1 and C3, describing comfort with culturally informed psychiatric help and suppression of emotional expression through gender roles, respectively. These results reveal a particular characteristic of our result: individuals affected by ENS do not seek general psychiatric help, but rather treatment that corresponds to the cultural norm of strong, self-sacrificing, and emotionally contained parents. The path from R2 to R3 is the most structurally significant one in the model with a path coefficient of 0.750 and an extremely large effect size of $f^2 = 1.286$. As soon as the ENS-affected person realizes the need for culturally relevant psychiatric services, he or she will see the inadequacy of the existing services and the need to change the system through policy change. This proves the main theoretical hypothesis of this study that there is pressure from below on the care systems caused by unattended psychological problems. The item D5 (which questioned whether there should be health policies recognizing and funding ENS-related psychiatric needs as a unique category of the vulnerable population) had the largest R3 value of 0.868. This means that the participants do not seek better services only but want the ENS problem to be officially recognized as a special public health issue, which correlates with the trajectory of Indian mental health policy development after the 2017 Mental Healthcare Act. Partial mediation is achieved because of the indirect effect of 0.491, demonstrating that culturally sensitive therapy demand acts as the mediator between the neurobiological distress of the ENS and advocacy for policy changes.

Without the mediating effect of culturally sensitive therapy demand, neurobiological distress on its own cannot generate sustained demand for change. It will create personal distress that will not be able to create enough political pressure for change.

VI. CONCLUSION AND FUTURE SCOPE

Taken together, the findings shown in Table IX summarized establish a statistically coherent and theoretically grounded sequential pathway from ENS-induced neurobiological deterioration through culturally responsive psychiatric need to institutional policy advocacy, with all three hypotheses supported at large to very large effect sizes, affirming that the psychiatric consequences of Empty Nest Syndrome are not only measurable and significant at the individual level but carry direct implications for how mental health policy and community care infrastructure must be restructured to address this growing and underserved population.

Table IX. Summary of Findings

RQ / Hypothesis	Key Finding	Effect Size	Verdict
RQ1 / H1 Loneliness → Therapy Demand	ENS-related loneliness, hormonal dysregulation, and executive dysfunction strongly predict demand for culturally sensitive cognitive therapy	$R1 \rightarrow R2: \beta = 0.655, R^2 = 0.429, f^2 = 0.751$ (Large)	H1 SUPPORTED
RQ2 / H2 Therapy → Policy Reform	Demand for culturally adapted psychiatric care strongly predicts perceived need for institutional policy reform and sustainable care funding	$R2 \rightarrow R3: \beta = 0.750, R^2 = 0.562, f^2 = 1.286$ (Very Large)	H2 SUPPORTED
RQ3 / H3 Mediation Pathway	Culturally sensitive therapy (R2) mediates the relationship between neurobiological ENS distress (R1) and policy advocacy (R3)	Indirect: $R1 \rightarrow R2 \rightarrow R3 \beta = 0.491$	H3 SUPPORTED

Policy Recommendations:

- Recommendation 1: Develop culturally specific CBT intervention models that will benefit those with ENS within the Indian scenario. The intervention strategies must include cultural considerations like filial obligations, cultural expectations of genders, and emphasis on family identity that have been ignored in Western CBT methods.
- Recommendation 2: Amend the Mental Healthcare Act, 2017 to include ENS as an independent mental health illness that needs constant monitoring and allocation of funds towards the provision of community-based services as opposed to the predominant model of crisis management.
- Recommendation 3: Increase the use of digital health technologies, including telemedicine, AI-based cognitive assessment applications, and online support groups to overcome the logistic and economic barriers to ongoing treatment faced in D2 ($\lambda = 0.768$).

Further research must use a longitudinal study design whereby changes in the cognitive functions of adults suffering from ENS can be measured during a period of 12–24 months. The use of neuroimaging technologies, for example, diffusion tensor imaging (DTI) to measure white matter integrity and hormonal biomarkers, including cortisol and estrogen, will help to confirm the biological basis suggested in R1. Research comparisons in different cultural environments, such as collectivist East Asian Confucian societies, South Asian joint-family structure, and Western individualistic culture, will be able to establish whether the effect of cultural sensitivity mediation (R2) found in the Indian population is generalizable or specific to that culture alone.

Finally, randomized controlled trials involving culturally adapted cognitive behavioral therapy (CBT) and conventional psychiatric therapy will provide strong causal evidence.

REFERENCES

- [1] Bougea, A., Despoti, A., & Vasilopoulos, E. (2020). Empty-nest-related psychosocial stress: Conceptual issues, future directions in economic crisis. *Psychiatriki*, 30(4), 329–338. <https://doi.org/10.22365/jpsych.2019.304.329>
- [2] Chen, L., & Xu, X. (2020). <p>Effect Evaluation of the Long-Term Care Insurance (LTCI) System on the Health Care of the Elderly: A Review</p> *Journal of Multidisciplinary Healthcare*, Volume 13, 863–875. <https://doi.org/10.2147/jmdh.s270454>
- [3] Dehkordi, F. R., Nakhodaeezadeh, M., & Noruzi, S. (2025). The Echo of the Stagnation or Struggle to Rediscover Life: Stories of Positive and Negative Coping Strategies among Older Adult Empty Nesters in Iran. *Research Square*. <https://doi.org/10.21203/rs.3.rs-6427726/v1>
- [4] Duan, D., Dong, Y., Zhang, H. et al. Empty-nest-related psychological distress is associated with progression of brain white matter lesions and cognitive impairment in the elderly. *Sci Rep* 7, 43816 (2017). <https://doi.org/10.1038/srep43816>
- [5] Gao, Q., Wei, X., Lei, C., Wang, X., Yue, A., Hao, R., & Wang, A. (2024). Empty nest but better off? Association between empty nest status and cognitive function among older adults with chronic diseases in rural China. *BMC Geriatrics*, 24(1), 825. <https://doi.org/10.1186/s12877-024-05386-3>
- [6] Guo, J., Yang, Y., Lin, L., Zhang, Y., & Shen, T. (2025). Prevalence and factors influencing disability and cognitive impairment among empty nesters and non-empty nesters in Guangdong, China: a cross-sectional study. *Frontiers in Public Health*, 13, 1545497. <https://doi.org/10.3389/fpubh.2025.1545497>
- [7] Gupta, H., & Sharma, S. (2025). The Silent Epidemic: Understanding empty nest syndrome in a rapidly changing family structure. *International Journal for Multidisciplinary Research*, 7(4). <https://doi.org/10.36948/ijfmr.2025.v07i04.51764>
- [8] Hartanto, A., Sim, L., Lee, D., Majeed, N. M., & Yong, J. C. (2024). Cultural contexts differentially shape parents' loneliness and wellbeing during the empty nest period. *Communications Psychology*, 2(1), 105. <https://doi.org/10.1038/s44271-024-00156-8>
- [9] Khatir, M. A., Modanloo, M., Dadgari, A., Khoddam, H., & Yeganeh, L. T. (2025). Developing and identifying the psychometric properties of empty nest syndrome SCALE. *BMC Psychology*, 13(1), 743. <https://doi.org/10.1186/s40359-025-03064-6>
- [10] Khatir, M. A., Modanloo, M., Dadgari, A., Yeganeh, L. T., & Khoddam, H. (2024). Empty nest syndrome: A concept analysis. *Journal of Education and Health Promotion*, 13(1), 269. https://doi.org/10.4103/jehp.jehp_874_23
- [11] Konsman, J. P. (2021). So many faces, phases, and facets, sickness behavior beyond disciplines. *Frontiers in Psychiatry*, 12, 630331. <https://doi.org/10.3389/fpsyt.2021.630331>
- [12] Liang, Y., & Wu, W. (2014). Exploratory analysis of health-related quality of life among the empty-nest elderly in rural China: An empirical study in three economically developed cities in eastern China. *Health and Quality of Life Outcomes*, 12(1), 59. <https://doi.org/10.1186/1477-7525-12-59>
- [13] Liu, Q., Yu, Y., Wu, X., Sun, Y., Lyu, Y., Cao, K., Wang, Y., & Geng, L. (2023). Demand for Community Medical-Nursing Combined Services among the Empty-Nest Elderly in China: A Qualitative Study. *Health & Social Care in the Community*, 2023, 1–11. <https://doi.org/10.1155/2023/2173057>
- [14] Liu, Y., 1, Li, X., 1, Lin, Y., 1, & Wenzhou Polytechnic. (2022). A care needs assessment of elderlies in empty nest families: the case of Wenzhou, China. In *International Journal of Education and Humanities* (Vol. 4, Issue 3, p. 91). <https://pdfs.semanticscholar.org/8ed6/de34b5991e6838dee94ed6c585d7750caec9.pdf>
- [15] Lodha, P. (2026). Empty Nest Syndrome: Psychosocial Considerations Among Elderly. In *Empty Nest Syndrome: Psychosocial Considerations Among Elderly* (pp. 751–758). https://doi.org/10.1007/978-981-95-2121-0_53

- [16] Mahmoudpour, A., Kejani, K. F., Karami, M., Toosi, M., & Ahmadboukani, S. (2023). Cognitive flexibility and emotional self-regulation of the elderly with Empty nest syndrome: Benefits of acceptance and commitment therapy. *Health Science Reports*, 6(7), e1397. <https://doi.org/10.1002/hsr2.1397>
- [17] Mehta, S., & J, E. N. (2025). Transition to an Empty Nest: a phenomenological exploration of homemaker mothers of Out-of-State College students. *Global Social Welfare*. <https://doi.org/10.1007/s40609-025-00405-6>
- [18] Mitchell, B. A. (2021). Empty Nest. In *Encyclopedia of Gerontology and Population Aging* (pp. 1637–1642). https://doi.org/10.1007/978-3-030-22009-9_317
- [19] Mitchell, B. A., & Lovegreen, L. D. (2009). The empty nest syndrome in midlife families. *Journal of Family Issues*, 30(12), 1651–1670. <https://doi.org/10.1177/0192513x09339020>
- [20] Mitchell, B. A., & Wister, A. V. (2015). Midlife challenge or welcome departure? Cultural and Family-Related expectations of Empty nest transitions. *The International Journal of Aging and Human Development*, 81(4), 260–280. <https://doi.org/10.1177/0091415015622790>
- [21] Rastegar, S., Zamanshoar, E., & Kachooei, M. (2026). The Not-So-Empty Nest: Exploring the Lived Experience of Iranian Parents with Adult Children Migrating from Tehran. *The International Journal of Aging and Human Development*, 914150261426023. <https://doi.org/10.1177/00914150261426023>
- [22] Shroff, V. H., Sonar, G. B., R B, S. K., Lakshmi, B. D., C M, V., Dhaveshwar, C., S T, B., B, S., Tejashree, S., Kumari, V. K., S, S., Kumari, V. K., Kengnal, P. R., Karale, P. V., Madival, P. G., Dhaveshwar, C., Kumar, M., Hadpad, V., Jagdale, S., . . . Aniruddha Bansod. (n.d.). South Asian Journal of Participative Development. *South Asian Journal of Participative Development*, 25–25(3). <https://www.southasianjournalpd.org/wp-content/uploads/2026/02/SAJPD-Vol-25-No.-3-Jul-Dec-2025-Conference-Issue-2-1.pdf#page=165>
- [23] Sapokhonov K. S., & Saydaliev S. S. (2026). Competency-Based Medical Education in Pediatric Surgery: The Role of Simulation and Entrusted Clinical Tasks. *International Journal of Education, Society and Policy*, 1(1), 1–4. <https://ijesp.org/index.php/ijesp/article/view/12>
- [24] Swarnakar S., (2026). Analyzing the Impact of Excessive Violence in Indian Cinema on the Mental Health of Audiences in India. *International Journal of Education, Society and Policy*, 1(1), 40-49. <https://ijesp.org/index.php/ijesp/article/view/11>
- [25] Wang, C., Wang, Y., Hu, L., Li, Q., Wang, R., & Wang, Q. (2022). The causal association between empty nest and depressive symptoms with cognitive impairments in China. *Journal of Affective Disorders*, 315, 7–12. <https://doi.org/10.1016/j.jad.2022.07.050>
- [26] West, G. (2025). Psychological and Emotional Transitions in the Empty Nest: A UK Father's Perspective and Michelle Obama's Reflections. *ResearchGate*. <https://doi.org/10.13140/rg.2.2.16401.54889>
- [27] Yang, F., Li, Z., Wang, G., Shi, X., & Fu, C. (2021). Cognitive function and its influencing factors in empty-nest elderly and non-empty-nest elderly adults in China. *Aging*, 13(3), 4552–4563. <https://doi.org/10.18632/aging.202416>
- [28] Zhai, Y., Zhang, T., Li, Q., Lin, J., Wang, X., Li, F., Gu, X., Wu, M., & He, F. (2020). Association of empty nest and group activity with cognitive impairment in Chinese older adults: A cross-sectional study. *Archives of Gerontology and Geriatrics*, 90, 104120. <https://doi.org/10.1016/j.archger.2020.104120>
- [29] Zhang, Y., & Petrini, M. A. (2019). Empty-nest elderly: mahjong and Chinese square dance for improving the cognitive function in the community. *Frontiers of Nursing*, 6(1), 71–76. <https://doi.org/10.2478/fon-2019-0011>
- [30] Zhang, Y., Zhou, X., Wang, Y., Liu, M., Gao, P., & Ju, M. (2026). The impact of social isolation on physical and mental health among empty-nest older adults: an integrative review. *Frontiers in Public Health*, 14, 1789519. <https://doi.org/10.3389/fpubh.2026.1789519>