

Intergenerational Psychological Capital, Disability, and Depressive Symptoms in the Shadow of Functional Deprivation Among Middle-Aged and Older Adults in China

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Background: Depression represents a major public health challenge worldwide, especially in middle-aged and older adult populations. Although intergenerational support plays an established role in promoting psychological well-being, the mechanisms underlying this relationship remain inadequately understood. A crucial and frequently neglected element in this dynamic is functional deprivation—defined as the decline in the capacity to perform basic and instrumental activities of daily living (ADL/IADL). This loss substantially undermines autonomy and increases vulnerability to depression. The present study introduces the first-introduced construct of Intergenerational Psychological Capital (IPC) as a protective factor that may mitigate the detrimental mental health effects of functional deprivation.

Objective: This study examines the protective influence of *Intergenerational Psychological Capital* (IPC) on depressive symptoms in middle-aged and older adults. We test a moderated mediation model in which functional autonomy deprivation serves as a mediator, and disability operates as a moderator affecting the pathway between IPC functional autonomy deprivation and depression.

Methods: We analyzed five waves of CHARLS data (2011–2020) comprising 33,369 valid observations using Stata 17.0. A moderated mediation analysis was conducted through hierarchical regression modeling, testing the relationships among intergenerational psychological capital, functional autonomy deprivation, disability, and depression with adjusted standard errors and sociodemographic controls.

Results: IPC was significantly associated with reduced depressive symptoms ($\beta = -0.088$, $p < 0.001$). Functional autonomy deprivation partially mediated this relationship (IPC \rightarrow mediator: $\beta = -0.019$, $p < 0.001$; mediator \rightarrow depression: $\beta = 0.809$, $p < 0.001$). Furthermore, disability significantly moderated this mediated pathway: the buffering effect of IPC on functional autonomy deprivation was more pronounced among adults with disabilities, though its overall protective effect on depression was partially attenuated in this group.

Conclusion: These findings indicate that IPC alleviates depression both directly and indirectly through reducing functional autonomy deprivation. However, the presence of disability constrains the full benefits of IPC, highlighting the need for inclusive mental health interventions that address both functional capacity and intergenerational psychological resources.

Keywords: intergenerational psychological capital, IPC, depressive symptoms, disability, functional autonomy deprivation, restrictive context, moderated mediation model

Introduction

The Global Burden of Depression in Aging Populations

Promoting mental health is fundamental to social prosperity and sustainable development. In recent years, depression has been increasingly recognized as a critical global public health challenge.^{1–4} Characterized by persistent low mood,

diminished interest or pleasure, and significant cognitive impairment,^{5–7} this disorder demonstrates a particularly high prevalence among middle-aged and older adult populations, with notably alarming rates observed in individuals over the age of 45.^{8,9} It is projected that by 2030, major depressive disorder (MDD) will become the leading cause of the global disease burden.¹⁰

Epidemiology and Impact of Depression in China Among Middle-Aged and Older Adults in China

Nationally representative data from China reveal a 12-month prevalence of depressive disorders reaching 4.1% among adults aged 50–64 and 3.8% among those aged 65 and above, establishing depression as one of the most common mental disorders within these demographic groups.¹¹ The condition significantly elevates the risk of developing chronic diseases including cardiovascular disease and diabetes,¹² imposes substantial emotional and economic burdens on families,¹³ and adversely affects broader societal productivity and long-term economic growth.^{1,14,15} Consequently, depression represents not only a formidable threat to individual health but also a serious challenge to public health resources and sustainable economic development.^{2,16}

Psychological Capital as a Protective Framework

Existing research has identified numerous determinants influencing depression risk, including macroeconomic factors, technological accessibility, population dynamics, and environmental conditions.^{1,2,5,6,14,16} In recent years, psychological capital has gained recognition as a key protective factor against depression. Defined by dimensions such as hope, optimism, resilience, and self-efficacy, psychological capital enables individuals to maintain mental well-being and adapt to adverse life conditions.¹⁷ As a malleable personal resource, psychological capital demonstrably improves mental health outcomes and influences work-related attitudes and behaviors.^{18–20} Empirical evidence consistently shows a significant negative correlation between psychological capital and depressive symptoms, indicating that higher levels of this resource are associated with reduced depressive symptomatology.²¹

Expanding the Concept to Intergenerational Psychological Capital

Despite these advances, the extant literature predominantly conceptualizes psychological capital as an internally generated individual attribute,^{18,20,22} largely overlooking its potential construction through dynamic intergenerational relationships, particularly among middle-aged and older adults. To this end, we formally introduce the theory of *Intergenerational Psychological Capital* (IPC) as a novel construct developed to capture these overlooked dynamics. It is first advanced in this research and conceptually framed as: the positive psychological resources that are cultivated, sustained, and enhanced through reciprocal intergenerational relationships and exchanges, encompassing the development of shared hope, collective resilience, mutually reinforced efficacy, and optimized optimism within family systems across generations.

Within the Chinese cultural context where familial ties maintain profound significance, support from adult children—especially financial transfers—transcends mere material fulfillment. As established by Fan and Lei,²³ both objective and subjective financial circumstances are significantly associated with depressive symptoms and overall mental health among Chinese older adults, highlighting the fundamental importance of economic factors in psychological well-being. When perceived by aging parents as embodying filial piety, emotional connection, and familial commitment, such support may facilitate the development of intergenerational psychological capital. This process enhances emotional stability, reinforces a sense of control, and fosters positive future expectations through ongoing relational exchanges and family interactions.^{24,25}

To our knowledge, this represents the first systematic attempt to conceptualize psychological capital as an intergenerationally constructed resource emerging from family relationships, rather than viewing it solely as an individual-level attribute. We humbly propose that this perspective may offer a valuable extension to existing psychological capital theory by emphasizing the relational origins and social embeddedness of these psychological resources.

Such culturally embedded capital may serve as an accessible and effective psychological resource, particularly in contexts where formal mental health support remains limited. Furthermore, psychological capital represents a well-established

protective factor against depression in middle-aged and older adults, offering substantial buffering effects.²⁶ Nevertheless, the specific mechanisms through which intergenerational psychological capital influences depressive symptoms in this population require further theoretical elaboration and empirical investigation.

The Mediating Role of Functional Autonomy Deprivation

The relationship between intergenerational psychological capital and depressive symptoms may be importantly mediated through functional autonomy deprivation. This concept emphasizes that impairments in performing basic and instrumental activities of daily living not only signal declining health but may also trigger loss of self-efficacy, reduced social engagement, and eventual social isolation. As demonstrated by recent research, limitations in activities of daily living (ADL) show significant associations with depressive symptoms among older adults, with those reporting more severe depressive symptoms also experiencing more negative social interactions and diminished sense of belonging.²⁷ Within the specific context of our study focusing on middle-aged and older adults, the relationship with ADL dependence is particularly salient. Advanced age typically accompanies various physical diseases or symptoms that may lead to ADL limitations,²⁸ and the co-occurrence of depression with such conditions often exacerbates physical health problems related to ADL.²⁹ These physical constraints operate through dual mechanisms: they directly restrict individuals' ability to participate in activities, while simultaneously creating psychological barriers that discourage engagement due to concerns about social dignity and self-presentation.

Within such contexts, economic and emotional support from adult children may serve to mitigate these challenges by enhancing living standards, improving quality of life, facilitating emotional communication, and strengthening social connections, thereby collectively supporting the mental health of middle-aged and older adults facing functional autonomy deprivation.

The Moderating Role of Disability Status

This psychological mechanism may be further moderated by individual disability status. Disability extends beyond physiological limitations to represent a form of structural social vulnerability that substantially affects individuals' access to external resources, shapes psychological responses, and influences overall resilience.³⁰ Individuals with physical limitations may experience more profound emotional impacts from declining functional abilities, potentially making intergenerational psychological capital particularly beneficial for this group. Simultaneously, for older adults with disabilities who face limited resource access, the symbolic meaning embedded in children's support—such as the fulfillment of family responsibilities and the reinforcement of emotional bonds—may carry heightened significance, thereby amplifying psychological benefits.³¹ Consequently, disability status may differentially influence the pathway from intergenerational psychological capital through functional autonomy deprivation to depression, warranting careful empirical examination.

Research Gaps and Current Contributions

Several significant gaps persist in the current literature: a lack of integrative theoretical models that capture the psychological pathways linking intergenerational dynamics and depression; insufficient attention to effect heterogeneity across different vulnerable groups, particularly individuals with disabilities; and an overreliance on cross-sectional or short-term longitudinal data that limits the generalizability of findings. The present study addresses these limitations by constructing a moderated mediation model utilizing five waves of nationally representative CHARLS data (2011–2020) to investigate how intergenerational psychological capital alleviates depression through reducing functional autonomy deprivation, and how this pathway is moderated by disability status. Our research offers three primary contributions: extending psychological capital research into intergenerational and relational dimensions; reconceptualizing functional autonomy deprivation as a psychological pathway rather than merely a health outcome; and incorporating the critical dimension of structural vulnerability into models examining emotional health disparities among older adults.

Theoretical Framework and Hypotheses

Dual Mechanisms of Intergenerational Psychological Capital: Emotional and Functional Pathways

The concept of “Intergenerational Psychological Capital” (IPC) offers a theoretically nuanced framework for understanding how support from adult children contributes to the psychological well-being of aging parents. Moving beyond perspectives that primarily consider the material utility of financial transfers, IPC directs scholarly attention to the symbolic meanings, relational significance, and positive psychological resources potentially cultivated within intergenerational relationships. Although the specific terminology of IPC is still emerging in the empirical literature, its conceptual foundations are firmly grounded in existing sociological and psychological research, particularly building upon the work of Luthans et al on psychological capital and Cong and Silverstein on intergenerational support.^{22,24,25}

Substantial evidence indicates that financial support from adult children serves dual functions: it addresses practical needs while simultaneously fostering psychological resources such as resilience, self-esteem, and a sense of social embeddedness, which are instrumental in reducing vulnerability to depressive symptomatology.³² Strong empirical support comes from Wu et al³³ and Xia et al³⁴ who demonstrate negative associations between children’s financial support and depressive symptoms among Chinese older adults in both short-term and long-term contexts. Crucially, however, these psychological benefits emerge primarily when financial support is perceived by aging parents as representing emotional investment and familial commitment rather than merely material transfer. Empirical studies consistently report that older adults who receive consistent support interpreted in this manner demonstrate markedly higher levels of psychological well-being,^{31,35,36} and robust evidence links such meaningful intergenerational support to the amelioration of depressive symptoms in later life.³⁷ Within the distinctive context of Chinese society, financial assistance is deeply embedded in the cultural norm of filial piety, and its receipt often signifies to aging parents the fulfillment of culturally prescribed expectations, thereby enhancing subjective happiness.³⁸ The regular provision of resources is frequently interpreted by older adults not merely as monetary aid but as a tangible representation of emotional investment and filial devotion. This perception profoundly reinforces their sense of self-worth and affirms their valued position within the family unit, while also enhancing feelings of belonging and well-being as demonstrated by Liu et al³⁶ and Zhan et al.³¹

Confronting the challenges associated with physical decline and the loss of previous social roles, the positive affective resources engendered by supportive intergenerational exchanges can serve as a critical buffer against feelings of loneliness and helplessness, thereby diminishing the risk of depressive outcomes.²⁴ Moreover, reliable financial assistance bolsters older adults’ perceptions of future security and control,³⁸ which is particularly crucial amidst health declines and economic precarity. This sustained support effectively mitigates existential anxieties and emotional distress. Furthermore, intergenerational support can activate and sustain older adults’ meaning-making systems. When individuals perceive themselves as maintaining significant familial roles, their sense of purpose and existential meaning is powerfully reinforced, acting as a protective factor against depression.³⁹

Consequently, from an IPC perspective, financial support from children transcends its instrumental material function when it is perceived as representing emotional commitment and family solidarity. It operates as a vehicle for social affirmation, emotional connection, and the reaffirmation of self-worth, thereby establishing a multifaceted psychological mechanism that helps mitigate depressive symptoms among the elderly. Grounded in this refined theoretical reasoning and the accompanying empirical evidence, this study posits Hypothesis H1: Financial support from adult children contributes to the formation of Intergenerational Psychological Capital, which in turn alleviates depressive symptoms among middle-aged and older adults.

Mediating Pathway of Functional Autonomy

Within the context of intensifying global population aging, intergenerational support is increasingly recognized as a critical psychosocial resource for older adults’ mental health.⁴⁰ Moving beyond purely economic interpretations, this study introduces Intergenerational Psychological Capital (IPC) as a latent construct encompassing emotional connection, perceived control, and future-oriented optimism derived from intergenerational relationships. Rather than viewing

financial support merely as material transfer, we argue that it serves as a carrier of profound symbolic meaning—affirming dignity, sustaining identity, and strengthening relational bonds.⁴¹

Functional Autonomy Deprivation refers to the experienced loss of capacity to perform activities essential for independent living, encompassing both objectively assessed declines in physical function (as measured by BADL/IADL scales) and the perceived weakening of personal agency and self-efficacy. This construct does not imply external coercion but rather captures the multifaceted loss of autonomy that many older adults face due to age-related physical decline, in a manner consistent with the psychosocial model of disability.

The influence of IPC on depressive symptoms is theorized to operate specifically through the mediating pathway of Functional Autonomy Deprivation. This construct reflects not only objective declines in physical function—as captured by BADL/IADL measures—but also the subjective loss of agency and self-efficacy that often accompanies aging-related disability.^{42,43} Empirical evidence suggests that financial support from adult children may slow this multidimensional functional decline through multiple mechanisms: reducing financial barriers to healthcare, facilitating access to supportive services, reinforcing emotional security, and promoting healthier lifestyles through improved resource pooling within the family.^{44,45}

Given that financial support from adult children can alleviate depressive symptoms through these diverse pathways, it may be conceptualized as a concrete manifestation of Intergenerational Psychological Capital (IPC). Beyond its material utility, such support embodies relational commitment, filial empathy, and generational solidarity, which together enhance the older adults' sense of meaning, belonging, and identity continuity. When internalized as IPC, these resources not only mitigate objective functional decline but also strengthen psychological resilience against the emotional distress associated with loss of autonomy. Thus, IPC serves as a critical psychosocial resource that translates intergenerational support into sustained mental health benefits.

From a life-course perspective, ADL/IADL limitations often serve as early markers of declining mental health.⁴⁶ Such limitations may restrict social activities, intensify feelings of loneliness and helplessness, and trigger negative emotional cycles. According to the “Cumulative Disadvantage Theory”, continuous physical decline accumulates psychological detriments, gradually weakening the effects of external resources.⁴⁷ It can trigger cycles of social isolation, reduced self-worth, and emotional distress—a process consistent with Cumulative Disadvantage Theory⁴⁸. Within this framework, we propose that IPC helps counteract such decline by reinforcing autonomy and meaning even in the face of physical vulnerability.

Therefore, when older adults face BADL/IADL impairments, their psychological capital—such as self-esteem, sense of control, and future expectations—may be eroded, exacerbating the risk of depression. Based on this theoretical framework, this study proposes Hypothesis H2: Functional autonomy (ADL) partially mediates the relationship between IPC and depressive symptoms.

Moderating Effects of Disability: A Three-Pathway Model

Physical disabilities become more common with advancing age.⁴⁸ In middle and old age, physical disability constitutes a critical vulnerability, reflecting not only physiological decline but also reduced capacity in daily activities, social engagement, and emotional regulation. Drawing on Resource Vulnerability Theory,⁴⁹ this study conceptualizes disability as a form of structural constraint that limits access to external resources and profoundly shapes how individuals perceive and utilize those resources.

Disability may interfere with the beneficial effects of intergenerational support on mental health through three interrelated mechanisms: first, by reducing the practical effectiveness of such support in restoring functional capacity;⁵⁰ second, by intensifying emotional reactivity to functional loss⁵¹ (eg, ADL impairments); and third, by altering the symbolic meaning of support, thereby modifying the cognitive-emotional pathways through which Intergenerational Psychological Capital (IPC) alleviates depressive symptoms. Building upon the foundational mediation model involving IPC, functional autonomy deprivation, and depressive symptoms, this study introduces physical disability as a key moderating variable. Disability should not be treated merely as a statistical covariate but as a constitutive condition that shapes resource needs, sense of agency, and social self-perception, thereby influencing how intergenerational resources translate into psychological health outcomes.

Consistent with Resource Vulnerability Theory,⁴⁹ individuals with disabilities demonstrate greater reliance on external support and increased sensitivity to the emotional and symbolic dimensions of care.⁵² For disabled older adults, financial and emotional support from their children provides not only material assistance but also conveys profound symbolic meanings—affirming belonging, sustaining personal value, and strengthening emotional bonds. Under these conditions, the protective effect of IPC against feelings of inadequacy and despair becomes particularly pronounced.

Therefore, this study proposes Hypothesis H3a: Disability significantly moderates the pathway from IPC to functional autonomy deprivation.

At the same time, disability often entails chronic pain, mobility limitations, and psychosocial sequelae such as eroded self-efficacy, social isolation, and role marginalization⁴². These experiences can intensify emotional responses to further functional loss, potentially leading to emotional exhaustion and collapse of coping capacity. Consequently, among disabled individuals, declines in ADL functioning may produce a “context-amplified” effect on depressive symptomatology. This study thus proposes Hypothesis H3b: Disability significantly moderates the pathway from functional autonomy deprivation to depressive symptoms.

From a symbolic interactionism perspective,⁴⁴ intergenerational support constitutes not only resource transfer but also, and more importantly, a symbolic process that reaffirms identity and maintains social connectedness. For older adults with disabilities—who often experience eroded functional ability and social roles—support from their children takes on heightened symbolic significance. It serves as a powerful social message: “You are still valued and cared for”. Consequently, individuals with disabilities may be more likely to internalize intergenerational support as psychological capital, thereby enhancing emotional resilience and reducing vulnerability to depression. Hence, Hypothesis H3c is proposed: Disability significantly moderates the direct effect of intergenerational psychological capital on depressive symptoms.

The overall conceptual model is presented in Figure 1.

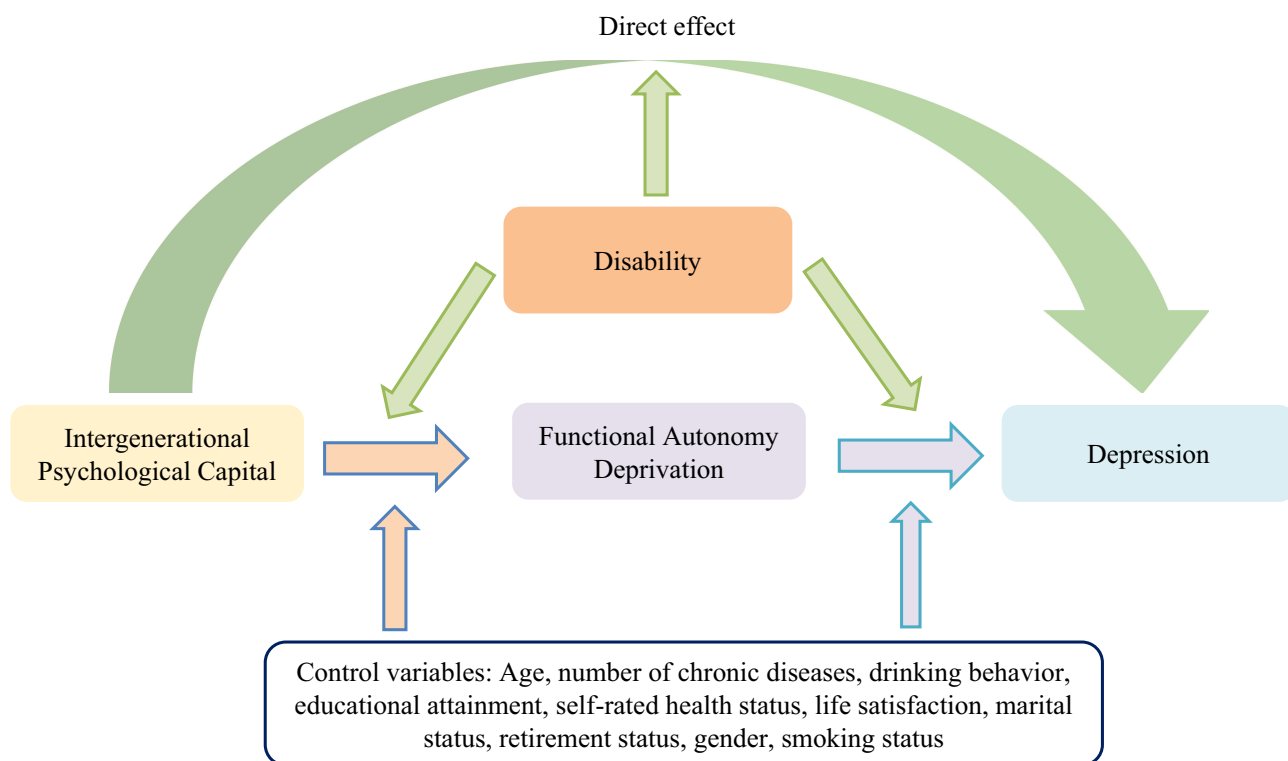


Figure 1 The Pathway Model of Intergenerational Psychological Capital, Functional Autonomy Deprivation, and Depression.

Materials and Methods

Participants

This study utilizes data from the China Health and Retirement Longitudinal Study (CHARLS), a nationally representative, longitudinal survey jointly conducted by Wuhan University and Peking University. Designed to support interdisciplinary research on population aging in China and provide empirical evidence for policymaking, CHARLS collects high-quality micro-level data on Chinese adults aged 45 and above and their households. The baseline survey was launched in 2011 across 28 provinces, municipalities, and autonomous regions (excluding Hong Kong, Macao, Taiwan, Xinjiang, Ningxia, Tibet, and Hainan). Employing a multi-stage stratified sampling strategy, one core respondent was randomly selected from each household. The sample covers approximately 150 counties/districts and 450 villages or urban communities, ensuring broad representation of both urban and rural residents.

This study utilizes five waves of nationally representative data from the China Health and Retirement Longitudinal Study (CHARLS), conducted in 2011, 2013, 2015, 2018, and 2020. After integrating these waves, a pooled cross-sectional dataset was constructed with an initial total of 33,369 observations. To ensure data quality and analytical validity, a rigorous preprocessing procedure was applied. This included cleansing the dataset by excluding records with substantial missing values across key variables of interest. Furthermore, the study specifically focuses on middle-aged and older adults, retaining only individuals aged 45 years and above as the primary study population. All variables were carefully selected and operationalized in accordance with the theoretical framework of this research.

Measures

Dependent Variable

To assess depressive symptoms, we employed the 10-item short form of the Center for Epidemiologic Studies Depression Scale (CES-D), which has been widely used in mental health research. The CHARLS dataset includes responses to this scale, which measures emotional and psychological states over the past week, including feelings of distress, distraction, sadness, lethargy, hope, fear, sleep quality, pleasure, loneliness, and feelings of unspeakable discomfort. Each item is scored from 0 to 3, corresponding to the frequency of occurrence: “rarely or none”, “some”, “occasionally”, and “most of the time”. Positively phrased items (eg, “felt happy”, “felt hopeful”) were reverse-coded. Total scores range from 0 to 30, with higher scores indicating greater depressive symptom severity. The scale has demonstrated strong reliability and validity in both domestic and international studies.^{1,2,5,6,53,54}

Independent Variable

Economic support from children not only signifies material assistance but also conveys emotional recognition, fulfillment of familial obligation, and social endorsement, embodying what is referred to as intergenerational psychological capital.⁵⁵ We operationalized this concept using the variable *childsup*, representing the total monetary value (in RMB) of financial support, including cash and in-kind transfers, received by respondents from their children during the survey period. Data were extracted from the CHARLS module on intergenerational economic transfers. To reduce the influence of outliers and improve the normality of distribution, a logarithmic transformation was applied.

Mediating Variable

Functional autonomy was assessed using the Activities of Daily Living (ADL) index, a composite measure of the ability to perform both basic and instrumental daily tasks. The index includes two dimensions: Basic ADL (BADL)—such as dressing, toileting, bathing, eating, getting in and out of bed, and walking—and Instrumental ADL (IADL)—including cooking, shopping, telephone use, medication management, financial management, and household chores.^{56,57} Based on CHARLS data, we constructed an 11-item ADL score ranging from 0 to 11, with higher scores indicating greater functional impairment and reduced self-care capacity. This measure has been validated in numerous aging and health studies as a reliable predictor of psychological well-being.⁵⁸

Moderating Variable

Disability status was coded as a binary variable based on CHARLS data: individuals with a disability were coded as 1, and those without a disability as 0. This allowed for empirical testing of the moderating role of disability in the proposed model.

Control Variables

To enhance the validity of our model estimates, we included a set of control variables capturing demographic characteristics, health status, and subjective evaluations, all drawn from CHARLS.

Age (age): Chronological age based on birth date. Prior research has found a positive association between age and depression risk.¹

Number of Chronic Conditions (chronic): Includes 14 common chronic diseases such as hypertension, dyslipidemia, diabetes, cancer, chronic lung disease, liver disease, heart disease, stroke, kidney disease, gastrointestinal disorders, emotional or psychological issues, memory problems, arthritis, and asthma (range: 0–14).²⁹

Alcohol Consumption (drink): Binary variable coded 1 if the respondent has ever consumed alcohol, 0 otherwise; alcohol use is significantly linked to depression.⁵⁹

Education Level (educ): Categorized into four levels: 0 = no schooling or incomplete primary, 1 = primary school, 2 = secondary school, 3 = high school or above. Higher education is associated with greater coping ability.^{60,61}

Self-Rated Health (health): A five-point scale measuring perceived health status, with higher scores indicating better perceived health. Negatively correlated with depression.⁶²

Life Satisfaction (life): Measured on a five-point scale reflecting overall satisfaction with current life, known to positively impact mental health.⁶³

Marital Status (married): Coded 1 if married, 0 if unmarried, divorced, or widowed. Marriage is a key source of social support.⁶⁴

Retirement Status (retire): Coded 1 if retired, 0 otherwise. Retirement entails role transitions that can influence mental well-being and social networks.⁶⁵

Gender (sex): Coded 0 for male and 1 for female; women are generally more vulnerable to depressive symptoms.¹

Smoking History (smoke): Coded 1 if the respondent has ever smoked, 0 otherwise. Smoking has a documented positive association with depression risk.⁶⁶

In sum, the inclusion of these covariates helps reduce estimation bias and provides a more rigorous foundation for identifying the determinants of depressive symptoms among older adults in China.

Procedure

Baseline Model

This study investigates the effect of intergenerational psychological capital on depressive symptoms at the individual level. Based on our theoretical assumptions, we posit a linear relationship among the variables and thus employ a baseline linear regression model to examine these associations:

$$CESD_i = a_0 + a_1 \text{childsup}_i + a_2 \sum \text{control}_i + \varepsilon_i, \quad (1)$$

Where $CESD_i$ denotes the depressive symptoms of individual, childsup_i represents the intergenerational psychological capital, control_i includes a vector of control variables, and ε_i is the error term. A statistically significant a_1 would indicate that intergenerational psychological capital is significantly associated with depressive symptoms, thus supporting the hypothesized main effect.

Mediation Model

Following the mediation analysis framework proposed by Wen and Ye,⁶⁷ we examine whether functional autonomy mediates the relationship between intergenerational psychological capital and depressive symptoms. The mediation model is specified as follows:

$$ADL_i = b_0 + b_1 \text{childsup}_i + b_2 \sum \text{control}_i + \varepsilon_i, \quad (2)$$

$$CESD_i = c_0 + c_1 \text{childsup}_i + c_2 \text{ADL}_i + c_3 \sum \text{control}_i + \varepsilon_i, \quad (3)$$

Where ADL_i indicates the level of functional autonomy of individual i . Equation (2) assesses the effect of intergenerational psychological capital on functional autonomy, while equation (3) includes both predictors to evaluate the mediating role. If c_2 in equation (3) is statistically significant, mediation is supported. If both c_1, c_2 are significant, this implies a partial mediation effect. To strengthen the robustness of the mediation findings, we also conduct a Sobel test.⁶⁸

Moderated Mediation Model

Drawing on the moderated mediation framework proposed by Wen and Ye,⁶⁹ we further examine whether structural functional disability moderates the mechanisms through which intergenerational psychological capital influences depressive symptoms. Specifically, we estimate regression models (4), (5), and (6) to assess the potential moderating role of physical disability in three key pathways.

If the interaction term in model (4) is statistically significant, it indicates that physical disability moderates the relationship between intergenerational psychological capital and functional autonomy deprivation. If the interaction term in model (5) is significant, it suggests that physical disability moderates the association between functional autonomy deprivation and depressive symptoms. Likewise, a significant interaction effect in model (6) would imply that physical disability moderates the direct link between intergenerational psychological capital and depressive symptoms.

$$ADL_i = d_0 + d_1 \text{childsup}_i + d_2 \text{disable}_i + d_3 \text{childsup}_i \times \text{disable}_i + d_4 \sum \text{control}_i + \varepsilon_i, \quad (4)$$

$$CESD_i = e_0 + e_1 \text{childsup}_i + e_2 \text{ADL}_i + e_3 \text{ADL}_i \times \text{disable}_i + e_4 \text{disable}_i + e_5 \sum \text{control}_i + \varepsilon_i, \quad (5)$$

$$CESD_i = f_0 + f_1 \text{childsup}_i + f_2 \text{disable}_i + f_3 \text{childsup}_i \times \text{disable}_i + f_4 \sum \text{control}_i + \varepsilon_i, \quad (6)$$

Empirical Results and Analysis

Baseline Regression

To comprehensively understand the sample characteristics, we conducted descriptive statistical analyses of the primary variables, as presented in Table 1. Utilizing data from five waves (2011, 2013, 2015, 2018, and 2020) of the China Health and Retirement Longitudinal Study (CHARLS), our study encompasses 82,802 individual observations. After data cleaning, the final analytical sample comprised 33,369 observations.

The dependent variable is the CES-D depression score, with a sample mean of 8.210 (SD = 6.282) and a maximum value of 30, indicating substantial individual differences in depressive symptoms among participants.

The key independent variable, intergenerational psychological capital, is operationalized through financial support provided by children (childsup). Among 33,647 valid observations, the average support score is 7.643 (SD = 1.893), suggesting a moderate concentration of support levels within the sample.

Functional autonomy deprivation is measured via the Activities of Daily Living (ADL) index, encompassing both Basic (BADL) and Instrumental (IADL) components, with scores ranging from 0 to 11. The sample mean is 0.751 (SD = 1.721), where higher scores denote greater functional impairment. This indicates that while most middle-aged and older adults maintain a degree of independence, functional decline remains a pertinent concern.

Structural functional disability (SFD) is represented by a binary variable indicating disability status. Approximately 19.5% of the sample reports having a disability, highlighting that nearly one-fifth of middle-aged and older adults experience significant functional limitations or major health issues.

Regarding control variables, the average age is 60.62 years, with a maximum of 110 years, reflecting considerable age diversity. Chronic conditions are prevalent, with individuals reporting an average of 1.814 diseases. Health behaviors reveal that 55.8% of participants consume alcohol, and 42.4% smoke. Educational attainment is relatively low, averaging 1.042 on a scale corresponding to primary to junior high school education. Marital status shows that 87.1% are married, and only 14.7% are retired. Gender distribution is nearly balanced, with males comprising 51.8% of the sample.

Table 1 Descriptive Statistical Analysis of Variables

| Variables | Sample Size | Mean | Deviation | Minimum | Maximum |
|----------------------------------|-------------|--------|-----------|---------|---------|
| Explanatory variable CES-D | 82,802 | 8.210 | 6.282 | 0 | 30 |
| Explanatory variable Childsup | 33,647 | 7.643 | 1.893 | 0 | 14.51 |
| Intermediary variable ADL | 82,802 | 0.751 | 1.721 | 0 | 11 |
| Moderator variable Disable | 82,802 | 0.195 | 0.396 | 0 | 1 |
| Control variables | | | | | |
| Age | 82,637 | 60.623 | 9.594 | 45 | 110 |
| Chronic | 82,802 | 1.814 | 1.745 | 0 | 14 |
| Drink | 82,802 | 0.558 | 0.497 | 0 | 1 |
| Educ | 82,802 | 1.042 | 1.057 | 0 | 3 |
| Health | 82,802 | 3.051 | 0.981 | 1 | 5 |
| Life | 80,964 | 3.229 | 0.775 | 1 | 5 |
| Married | 82,802 | 0.871 | 0.336 | 0 | 1 |
| Retire | 82,802 | 0.147 | 0.355 | 0 | 1 |
| Sex | 82,802 | 0.518 | 0.500 | 0 | 1 |
| Smoke | 82,802 | 0.424 | 0.494 | 0 | 1 |

Overall, the sample exhibits typical characteristics of China's middle-aged and elderly population: advanced age, significant health risks, and a high degree of economic dependency. These features provide a robust foundation for subsequent analyses of depressive symptom mechanisms and offer broad generalizability.

Pearson correlation analyses among all variables are detailed in Table 2. All correlation coefficients are below 0.4, and the average Variance Inflation Factor (VIF) is 1.43, mitigating concerns of multicollinearity. Most variables show significant correlations with depression levels, justifying their inclusion in regression models. Specifically, CES-D scores are significantly negatively correlated with intergenerational psychological capital ($\beta=-0.128$, $p<0.001$), providing preliminary support for Hypothesis H1. Further analysis indicates that intergenerational psychological capital is negatively correlated with functional autonomy deprivation (ADL), while depression levels are positively correlated with ADL, suggesting a potential mediating role of functional autonomy deprivation between intergenerational psychological capital and depression.

Building upon these correlations, we constructed multiple regression models to explore the mechanisms through which intergenerational psychological capital, functional autonomy deprivation, and structural functional disability influence depression levels. Detailed regression results are presented in Table 3, with key findings summarized as follows:

1. Intergenerational Psychological Capital Alleviates Depressive Symptoms

Model 1 in Table 3 examines the relationship between intergenerational psychological capital and depressive symptoms. The regression results indicate that higher levels of intergenerational psychological capital are associated with lower depressive symptom ($\beta=-0.088$, $p<0.001$), providing strong support for Hypothesis H1.

2. Functional Autonomy Deprivation Partially Mediates the Relationship Between Intergenerational Psychological Capital and Depression

To elucidate the pathway through which intergenerational psychological capital affects depressive symptoms among middle-aged and older adults, we introduced functional autonomy deprivation as a mediating variable. Utilizing baseline regression and Bootstrap methods, we tested the significance of the mediating effect. The analysis reveals that intergenerational psychological capital has a significant negative impact on depressive symptoms ($\beta=-0.088$, $p<0.001$), consistent with Model 1.

Table 2 Correlation Analysis of Key Variables

| | CES-D | Childsup | ADL | Disable | Age | Chronic | Drink | Educ | Health | Life | Married | Retire | Sex | Smoke |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| CES-D | 1 | | | | | | | | | | | | | |
| Childsup | -0.128*** | 1 | | | | | | | | | | | | |
| ADL | 0.366*** | -0.131*** | 1 | | | | | | | | | | | |
| Disable | 0.158*** | -0.083*** | 0.241*** | 1 | | | | | | | | | | |
| Age | 0.076*** | -0.265*** | 0.234*** | 0.174*** | 1 | | | | | | | | | |
| Chronic | 0.271*** | -0.069*** | 0.281*** | 0.171*** | 0.234*** | 1 | | | | | | | | |
| Drink | -0.053*** | 0.026*** | -0.034*** | -0.076*** | 0.040*** | 0.041*** | 1 | | | | | | | |
| Educ | -0.208*** | 0.265*** | -0.175*** | -0.120*** | -0.226*** | -0.042*** | 0.135*** | 1 | | | | | | |
| Health | -0.398*** | 0.121*** | -0.338*** | -0.162*** | -0.113*** | -0.376*** | 0.061*** | 0.120*** | 1 | | | | | |
| Life | -0.351*** | 0.041*** | -0.135*** | -0.027*** | 0.062*** | -0.086*** | 0.027*** | -0.004 | 0.258*** | 1 | | | | |
| Married | -0.119*** | 0.118*** | -0.115*** | -0.085*** | -0.295*** | -0.074*** | 0.036*** | 0.134*** | 0.054*** | 0.029*** | 1 | | | |
| Retire | -0.123*** | 0.161*** | -0.048*** | -0.031*** | 0.210*** | 0.097*** | 0.048*** | 0.296*** | 0.045*** | 0.034*** | -0.005 | 1 | | |
| Sex | 0.167*** | -0.030*** | 0.085*** | -0.025*** | -0.050*** | 0.051*** | -0.415*** | -0.240*** | -0.082*** | -0.028*** | -0.106*** | -0.045*** | 1 | |
| Smoke | -0.090*** | -0.006 | -0.037*** | 0.043*** | 0.074*** | -0.001 | 0.351*** | 0.129*** | 0.033*** | 0.014*** | 0.046*** | 0.014*** | -0.721*** | 1 |

Note: ***Represents statistical significance at the 1% level.

Table 3 Baseline Regression Results

| Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | |
|------------------|-------------------|---------|------------------|---------|------------------|---------|------------------|---------|------------------|---------|------------------|---------|
| | CES-D | | ADL | | CES-D | | ADL | | CES-D | | CES-D | |
| | Coefficient (SE) | P value | Coefficient (SE) | P value | Coefficient (SE) | P value | Coefficient (SE) | P value | Coefficient (SE) | P value | Coefficient (SE) | P value |
| Constant | 20.263(0.348) | <0.001 | 0.895(0.092) | <0.001 | 19.539(0.341) | <0.001 | 0.895(0.092) | <0.001 | 19.421(0.340) | <0.001 | 20.035(0.348) | <0.001 |
| Age | -0.005(0.004) | 0.016 | 0.021(0.001) | <0.001 | -0.022(0.004) | 0.016 | 0.019(0.001) | <0.001 | -0.024(0.004) | <0.001 | -0.008(0.004) | 0.023 |
| Chronic | 0.489(0.018) | <0.001 | 0.140(0.005) | <0.001 | 0.375(0.018) | <0.001 | 0.128(0.005) | <0.001 | 0.361(0.018) | <0.001 | 0.464(0.018) | <0.001 |
| Drink | 0.365(0.065) | <0.001 | -0.002(0.017) | 0.895 | 0.367(0.063) | <0.001 | 0.057(0.017) | 0.001 | 0.432(0.064) | <0.001 | 0.485(0.065) | <0.001 |
| Educ | -0.707(0.031) | <0.001 | -0.111(0.008) | <0.001 | -0.616(0.030) | <0.001 | -0.100(0.008) | <0.001 | -0.600(0.030) | <0.001 | -0.681(0.031) | <0.001 |
| Health | -1.474(0.033) | <0.001 | -0.348(0.009) | <0.001 | -1.192(0.033) | <0.001 | -0.333(0.009) | <0.001 | -1.173(0.033) | <0.001 | -1.440(0.033) | <0.001 |
| Life | -2.097(0.039) | <0.001 | -0.127(0.010) | <0.001 | -1.994(0.038) | <0.001 | -0.128(0.010) | <0.001 | -1.996(0.038) | <0.001 | -2.099(0.039) | <0.001 |
| Married | -1.033(0.103) | <0.001 | -0.064(0.027) | 0.019 | -0.981(0.101) | <0.001 | -0.049(0.027) | 0.069 | -0.965(0.101) | <0.001 | -1.006(0.103) | <0.001 |
| Retire | -1.291(0.087) | <0.001 | -0.213(0.023) | <0.001 | -1.119(0.085) | <0.001 | -0.201(0.023) | <0.001 | -1.110(0.085) | <0.001 | -1.275(0.087) | <0.001 |
| Sex | 1.564(0.090) | <0.001 | 0.186(0.024) | <0.001 | 1.413(0.088) | <0.001 | 0.214(0.024) | <0.001 | 1.446(0.088) | <0.001 | 1.623(0.090) | <0.001 |
| Smoke | 0.302(0.086) | <0.001 | 0.043(0.023) | 0.061 | 0.268(0.084) | 0.001 | 0.031(0.023) | 0.171 | 0.249(0.084) | 0.003 | 0.273(0.086) | 0.001 |
| Childsup | -0.088(0.017) | <0.001 | -0.019(0.004) | <0.001 | -0.072(0.016) | <0.001 | -0.019(0.004) | <0.001 | -0.070(0.016) | <0.001 | -0.083(0.017) | <0.001 |
| ADL | | | | | 0.809(0.020) | <0.001 | | | 0.821(0.022) | <0.001 | | |
| Disable | | | | | | | 0.480(0.021) | <0.001 | 0.686(0.078) | <0.001 | 1.046(0.079) | <0.001 |
| Childsup×disable | | | | | | | -0.050(0.010) | <0.001 | | | 0.086(0.040) | 0.030 |
| ADL×disable | | | | | | | | | -0.181(0.039) | <0.001 | | |
| N | 33369 | | 33369 | | 33369 | | 33369 | | 33369 | | 33369 | |
| R ² | 0.2792 | | 0.1787 | | 0.3124 | | 0.1931 | | 0.3143 | | 0.2830 | |
| Sobel | Z=-4.374, p<0.001 | | | | | | | | | | | |

Further, as shown in Model 3 of Table 3, incorporating functional autonomy deprivation reduces the regression coefficient of intergenerational psychological capital from -0.088 to -0.072 ($p < 0.001$), indicating a partial mediation effect. Intergenerational psychological capital is significantly negatively associated with functional autonomy deprivation ($\beta = -0.019$, $p < 0.001$), while functional autonomy deprivation significantly predicts higher depression levels ($\beta = 0.809$, $p < 0.001$). The Bootstrap method (5000 resamples) yields a 95% confidence interval for the indirect effect of $[-0.023, -0.009]$, excluding zero and confirming the significance of the mediation effect. These findings collectively support Hypothesis H2.

The empirical results endorse the “intergenerational psychological capital—functional perception—mental health” pathway, suggesting that the alleviating effect of intergenerational psychological capital on depression is partially mediated by enhanced life control and autonomy. In other words, support from children not only provides emotional comfort but also promotes daily functioning, stabilizes emotional well-being, reinforces a sense of competence, reduces dependency, and mitigates feelings of helplessness.

This aligns with the theoretical expectations of the “resource conversion model”,⁷⁰ which posits that the utility of resources is often realized through intermediary mechanisms within the individual’s capability system. Additionally, our study addresses the chain reaction between functional loss and psychological distress, highlighting that in the context of population aging and evolving family structures, children’s support serves as an embedded capability buffer, offering both emotional and functional protection.

In summary, functional autonomy deprivation partially mediates the relationship between intergenerational psychological capital and depressive symptoms, underscoring the importance of both emotional support and functional independence in maintaining mental health among the elderly. This provides new empirical evidence for understanding the complex interplay between support, function, and psychological well-being.

The Moderating Effect of Disability Status

To further investigate the mechanisms through which intergenerational psychological capital influences depressive symptoms, we introduced disability status as a moderating variable, focusing on its role within the “intergenerational psychological capital—functional autonomy deprivation—depressive symptoms” pathway. Drawing on the theoretical framework of “restrictive vulnerability context”,^{30,70} we posit that disability represents not only a physiological limitation but also a critical social context influencing resource reception, transformation, and psychological responses.

1. Moderating Effect of Disability on the Relationship Between Intergenerational Psychological Capital and Functional Autonomy Deprivation

As illustrated in Model 4 of Table 3, disability status significantly negatively moderates the impact of intergenerational psychological capital on functional autonomy, with an interaction term coefficient of $\beta = -0.050$ ($p < 0.001$). The moderation effect is depicted in Figure 2, where the solid line represents non-disabled individuals and the dashed line represents disabled individuals. The effect is more pronounced among the disabled group, indicating that financial support from children more effectively mitigates functional autonomy impairment in this population. These findings suggest that in the context of restrictive vulnerability, the marginal benefits of intergenerational psychological capital are amplified, potentially due to enhanced feelings of control and emotional support among disabled individuals.

2. Moderating Effect of Disability on the Relationship Between Functional Autonomy Deprivation and Depressive Symptoms

In examining the pathway from functional autonomy deprivation to depressive symptoms, disability status again exhibits a significant moderating effect, with an interaction term coefficient of $\beta = -0.181$ ($p < 0.001$). As shown in Figure 3, the increase in depression levels associated with declining functional autonomy is less steep among disabled individuals compared to their non-disabled counterparts. This finding deviates from traditional views that disability and functional loss jointly exacerbate mental health risks. However, from the perspective of “constraint-based vulnerability”, individuals living with long-term functional limitations may develop stronger psychological adaptation mechanisms, including anticipatory adjustments, self-perception recalibration, and social rationalization of dependency.⁴² These mechanisms may attenuate the emotional response to further functional decline.

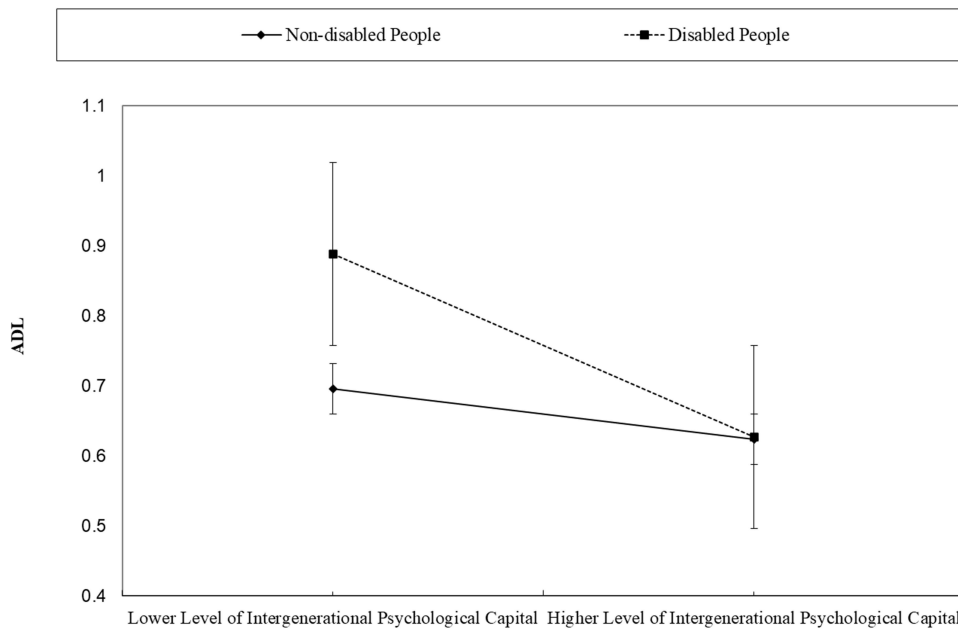


Figure 2 Moderating Effect of Disability on the Pathway from Intergenerational Psychological Capital to Functional Autonomy Deprivation.

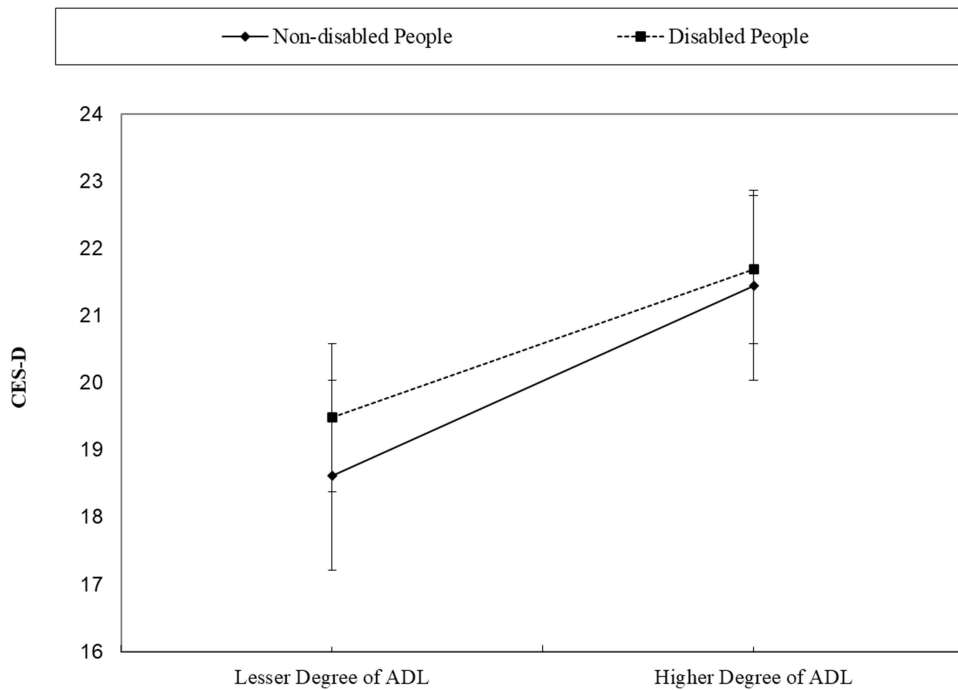


Figure 3 Moderating Effect of Disability on the Relationship Between Functional Autonomy Deprivation and Depressive Symptoms.

Moreover, disabled individuals often have higher expectations of social support,⁷¹ lower subjective social comparison benchmarks, and may benefit from institutionalized care mechanisms, all of which can alleviate the psychological impact of functional loss. Consequently, in our sample, the marginal effect of functional deprivation on depression is more pronounced among non-disabled individuals, explaining the significant negative interaction term. This highlights the heterogeneity in depression mechanisms across different health statuses and emphasizes the need for tailored policy and psychological interventions that consider varying emotional vulnerabilities to functional loss.

3. The Moderating Role of Disability in the Relationship Between Intergenerational Psychological Capital and Depressive Symptoms

To further examine the differential processes of resource conversion under conditions of constrained vulnerability, this study investigates the moderating effect of physical disability on the relationship between intergenerational psychological capital and depressive symptoms. Results from the moderated regression analysis indicate that intergenerational psychological capital significantly predicts lower levels of depressive symptoms ($\beta=-0.181$, $p<0.001$). However, this effect varies significantly by disability status, as evidenced by a positive interaction term (childsup \times disable: $\beta=0.086$, $p=0.030$), suggesting that disability status positively moderates this relationship.

Specifically, as illustrated in Figure 4, the mitigating effect of intergenerational psychological capital on depressive symptoms is more pronounced among non-disabled individuals, whereas this psychological buffering effect is notably attenuated among those with disabilities. Although individuals with disabilities also benefit from support provided by their children, the restrictive and vulnerable contexts they face impose greater constraints on the internalization of intergenerational resources, thereby diminishing the marginal benefits for emotional improvement.

This finding deviates from the initial hypothesis that high-risk groups are more reliant on external support, indicating that physical disability not only constitutes an objective functional impairment but may also influence the perception and reception of social resources through subjective pathways. Individuals with disabilities, when confronted with chronic health issues, physical dependence, and social isolation, may exhibit more stable and defensive emotional responses, rendering them less susceptible to modulation by external support. This phenomenon, termed the “resource-blunting effect”, highlights potential limitations within the psychosocial support mechanisms for health-vulnerable populations.

Consequently, it is imperative to reassess the conditions under which intergenerational psychological capital operates, particularly concerning the obstacles in resource conversion and the diminished sense of subjective efficacy within disabled contexts. This insight not only enriches the theoretical framework concerning the pathways through which psychological capital influences depressive symptoms but also underscores the necessity of incorporating heterogeneous moderating mechanisms of structural health vulnerabilities in mental health interventions.

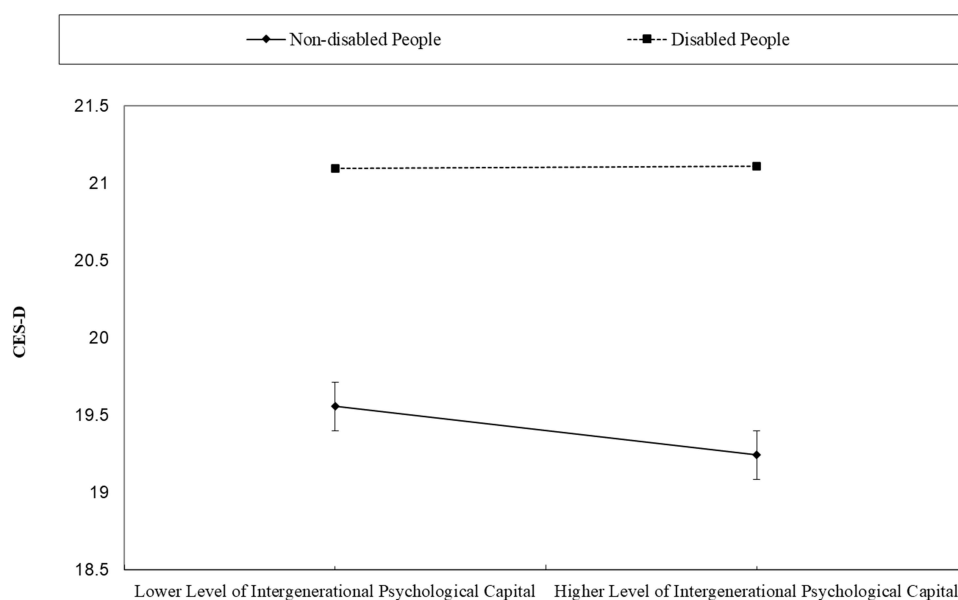


Figure 4 Interaction Plot of the Moderating Effect of Disability on the Relationship Between Intergenerational Psychological Support and Depressive Symptoms.

Conclusions and Discussion

Utilizing data from five waves (2011, 2013, 2015, 2018, and 2020) of the China Health and Retirement Longitudinal Study (CHARLS), this study systematically examines the mechanisms through which intergenerational psychological capital influences depressive symptoms among middle-aged and older adults in China, with particular emphasis on the mediating role of functional autonomy deprivation and the moderating effect of physical disability. The findings provide substantial theoretical and empirical insights that extend current understandings of the relationship between intergenerational support and psychological well-being, while also prompting critical reflection on the socio-cultural specificities of filial piety within contemporary Chinese society, including its evolving manifestations in the context of rapid urbanization and changing family structures.

This study provides evidence that financial support from adult children serves as a form of intergenerational psychological capital, which is associated with reduced depressive symptoms among middle-aged and older adults in China. This relationship is partially mediated through the preservation of functional autonomy and is further moderated by disability status. Rather than making generalizable claims about dignity or moral outcomes, we emphasize that support perceived as embedded with emotional meaning can strengthen psychosocial resources such as self-worth and autonomy, which in turn buffer against depression. These findings underscore the importance of culturally informed support mechanisms within families, particularly in contexts of health vulnerability. The following is a thorough discussion of the conclusion section.

First, this study contributes to the theoretical literature by reconceptualizing financial transfers from adult children not merely as material support, but as a form of intergenerational psychological capital that operates through multidimensional pathways. Building upon and extending classical intergenerational solidarity theory,⁷² the proposed framework emphasizes three interconnected mechanisms through which economic support acquires psychological significance. First, it functions as an emotional signal, tangibly embodying filial care and responsibility while affirming the continuity of intergenerational bonds. Second, it reinforces socially valued older adult identities by validating the role of the recipient within the family hierarchy, thereby enhancing perceived social worth. Third, it serves as a proxy for bundled support, in which monetary transfers often carry embedded emotional concern and symbolic attention to the parents' overall well-being, reflecting the multiplex nature of intergenerational relationships in real-world contexts.

As a tangible form of intergenerational emotional expression and responsibility fulfillment, children's financial assistance significantly alleviates social loneliness and psychological distress among the elderly.⁴⁴ It reduces anxiety related to "aging without support" and economic insecurity, strengthens the sense of being needed, and thereby enhances life satisfaction and psychological stability.⁷³ Empirical studies have also found that material assistance is often interpreted by the elderly as an "expression of love", playing an unexpected role in maintaining psychological balance and emotional regulation.³⁸

Second, beyond emotional care and resource transfer, children's economic support constitutes an external source of "psychological capital". While some studies suggest that high levels of adult children's support may be detrimental or have minimal impact on the well-being of the elderly,^{55,74} this study provides evidence that intergenerational psychological capital significantly alleviates depressive symptoms among middle-aged and elderly individuals. Through economic and emotional support from children, individuals can acquire stronger psychological resources, significantly reducing negative emotional experiences and the risk of psychological distress. As a crucial dimension of social capital, intergenerational support plays a central role in protecting the mental health of middle-aged and elderly individuals. Children's support not only mitigates anxiety caused by economic pressures but also enhances their sense of life control and social value, thereby significantly reducing the risk of depression. This study extends the theoretical boundaries of positive psychology concerning the composition and formation pathways of psychological capital.

Third, the analysis indicates that the deprivation of functional autonomy may partially mediate the relationship between intergenerational psychological capital and depressive symptoms. This suggests that the beneficial effect of intergenerational support is not confined to direct material or emotional provision but may also operate indirectly through mitigating losses in daily autonomy and self-efficacy. In particular, when older adults experience declines in functional capacity, sustained support from adult children can help counteract perceptions of incompetence or dependency, thereby lowering the likelihood of depression associated with diminished personal control. This finding resonates with the

emphasis on autonomy within Self-Determination Theory,⁷⁵ which highlights the centrality of agency and self-determination to psychological well-being in later life. In this sense, intergenerational psychological capital appears to function both as a direct buffer against distress and as an indirect reinforcement of competence and autonomy. This mechanism aligns with the “resource conversion model”, which posits that the translation of social resources into psychological health is contingent on intermediate capacities and contextual conditions.

Fourth, physical disability significantly moderates these mediating pathways. The analysis suggests that intergenerational psychological capital has a stronger alleviating effect on depressive symptoms among non-disabled individuals, likely reflecting their greater reliance on familial support. Under such circumstances, both tangible transfers and symbolic recognition from children may generate comparatively larger psychological and social-value benefits. At the same time, disability seems to weaken the mediating pathway from functional autonomy deprivation to depressive symptoms, implying that disabled older adults may show attenuated affective reactivity to functional decline. Moreover, the direct effect of intergenerational psychological capital on depressive symptoms appears less pronounced in this subgroup, which may reflect constraints imposed by reduced self-efficacy and weaker perceptions of available social resources.

However, in the pathway from functional autonomy deprivation to depressive symptoms, the affective reactivity of disabled individuals appears attenuated, implying relatively reduced psychological sensitivity to functional loss. More complex still, the direct effect of intergenerational psychological capital on depressive symptoms is significantly weaker among the disabled (as indicated by a positive interaction term). This suggests that the psychological benefits of support may be constrained by impaired self-efficacy and reduced perception of social resources among disabled older adults.

These results not only validate the chained mediation model involving intergenerational psychological capital, functional autonomy deprivation, and depression but also reveal the crucial moderating role of health vulnerability in the resource conversion process. The positive function of intergenerational psychological capital as a key family-level psychological resource is thus contingent on individuals’ functional status and sense of autonomy. Among those with poor health or functional limitations, there appears to be a “conversion barrier” that limits the assimilation of external support into psychological well-being. Consequently, policy interventions should aim not only to provide external support but also to enhance subjective efficacy and functional adaptation mechanisms to facilitate internalization of social resources. This finding underscores the need for targeted social policies that address the heightened vulnerability of disabled older adults, employing precise mechanisms to mitigate their psychological distress. Overall, the pattern offers partial support for the “social dependency-psychological recuperation” vulnerability hypothesis,⁷⁰ while also highlighting the need for more nuanced theoretical and empirical attention to the complex interplay between disability, support, and mental health.

Limitations and Future Research Directions

First, although this study draws on multi-wave data, its observational design limits the ability to infer causality. Future research could employ strategies such as instrumental variables, propensity score matching, or quasi-experimental methods to enhance causal identification.

Second, the operationalization of intergenerational psychological capital (IPC) is primarily based on children’s financial support. While financial transfers provide a tangible and convenient proxy for familial resources, they cannot fully capture the interpretive and emotional dimensions of intergenerational relations. In reality, financial support often carries symbolic meanings—such as care, respect, or family solidarity—that contribute to psychological capital, yet these meanings were not directly measured. Moreover, non-material support, including emotional sustenance, companionship quality, and relational recognition, was omitted. This conceptual and methodological limitation suggests that future research should adopt multi-dimensional and mixed-methods approaches, integrating quantitative indicators with qualitative tools such as validated scales of perceived emotional support, in-depth interviews, or narrative analysis, to more accurately assess how older adults interpret and internalize intergenerational support as psychological resources.

Third, this study does not address the potential heterogeneous effects of intergenerational support. Factors such as children’s gender, marital status, living arrangements, or emotional intimacy with parents may condition both the formation of IPC and its effects on mental health. Future work should investigate these moderating mechanisms to provide a more nuanced understanding of family dynamics.

Fourth, while our models controlled for key demographic and health characteristics, we acknowledge, as rightly pointed out by reviewers, that they did not include more nuanced measures of social network structure and engagement, such as frequency of contact with children, co-residence status, or participation in community activities. The absence of these variables could potentially lead to an overestimation of the effect of intergenerational psychological capital by omitting confounding factors related to social embeddedness. Future research would greatly benefit from incorporating these sophisticated measures of social connectivity to obtain more precise estimates of the unique contribution of psychological resources derived from family relationships.

Fifth, the measurement of functional autonomy relies exclusively on ADL/IADL scales. Although widely used and objective, these scales do not capture subjective aspects such as perceived autonomy, dignity, or role identity. Employing validated psychosocial measures of autonomy would strengthen future investigations of how functional limitations influence psychological outcomes.

In summary, this study underscores that intergenerational psychological capital—conceptualized as resources derived from familial support—constitutes an important mechanism shaping mental health disparities among middle-aged and older adults in China. Functional autonomy emerges as a critical mediator, revealing the micro-level processes through which family structures affect psychological well-being. In the context of rapid population aging and evolving family arrangements, policymakers should not only strengthen public support systems but also foster collaborative, multi-dimensional mental health protection strategies involving families, communities, and societal institutions. Particular emphasis should be placed on functional compensation mechanisms and social integration initiatives that help older adults preserve autonomy and purpose in later life.

Data Sharing Statement

The datasets generated and analyzed during the current study are available in the CHARLS repository.

Ethics Statement

The data utilized in this study were obtained from the China Health and Retirement Longitudinal Study (CHARLS). Each wave of the CHARLS survey has received ethical approval from the *Biomedical Ethics Committee of Peking University*. The field implementation of this particular wave of the household survey was approved under the ethical review approval number: IRB00001052-11015. All participants provided written informed consent prior to their participation. According to Article 32, Items 1 and 2 of the Ethical Review Measures for Life Science and Medical Research Involving Human Subjects (issued on February 18, 2023, in China), studies using publicly available and de-identified data that comply with the scope of the original informed consent may be exempt from additional ethical review. Therefore, the present study meets these criteria and is exempt from further ethical approval.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically

reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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