

Social support, cognition, and mental health among older people in China: A longitudinal life course study

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1. INTRODUCTION

Research suggests that stronger social support systems across life stages facilitate continuous learning and emotional well-being, contributing to better cognition and mental health ¹. However, evidence on the cumulative effect of social support over the life course remains scarce, and even less is known about the impact of broader neighborhood-level social support on individuals’ cognition, a crucial dimension in many countries, where neighborhoods serve as key support units for individuals.

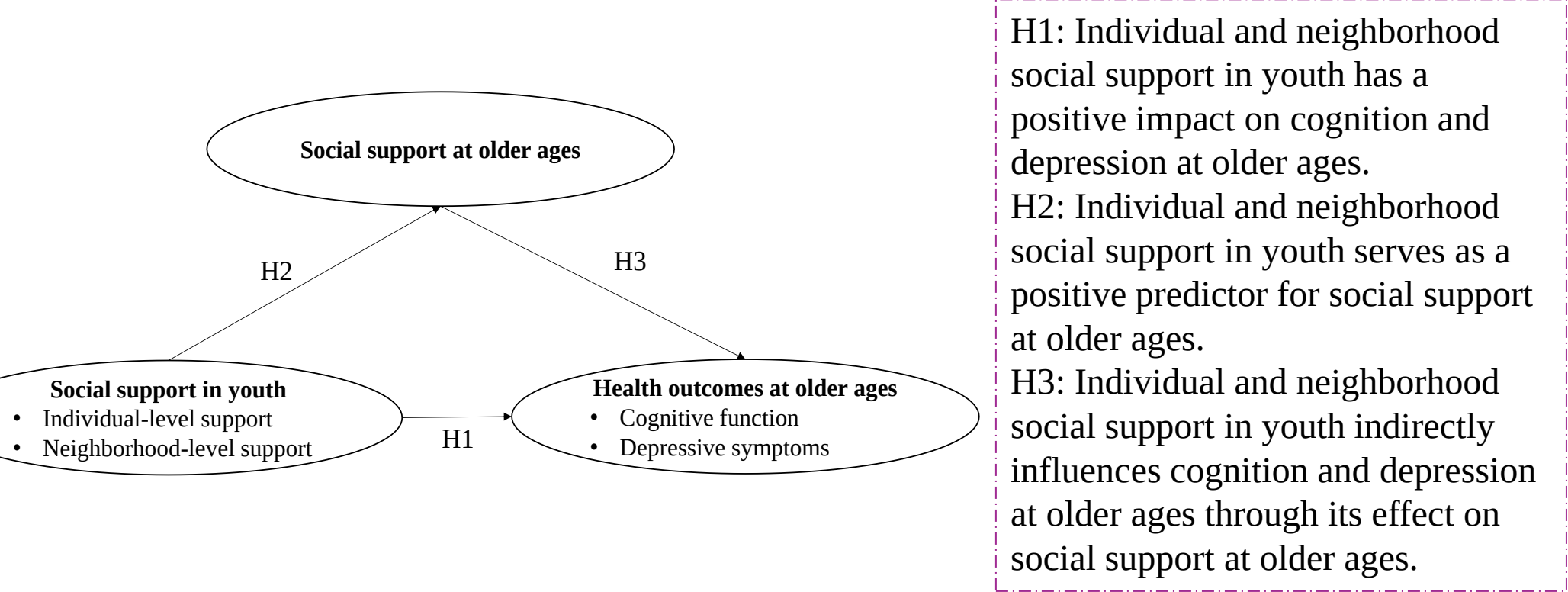
2. RESEARCH OBJECTIVES

To examine whether, and to what extent, individual- and neighborhood-level social support across different life stages contribute to cumulative advantages in cognitive function and fewer depression symptoms at older ages.

3. CONCEPTUAL FRAMEWORK

According to the Cumulative Advantage/Disadvantage Theory, initial relative advantage or disadvantage may result in systematic divergence in various life outcomes ². Our study extends the Cumulative Advantage/Disadvantage Theory by incorporating social support, with a particular focus on neighborhood social support, into the framework. It has been found that social networks and support can offer opportunities for continuous learning and knowledge acquisition, which may improve cognitive function ¹. Studies also suggest that social support in youth can have direct effects on mental health in later life through mechanisms such as enhancing psychological resilience ³. Studies frequently cite cumulative advantage as the mechanism through which a favorable relative position generates further gains over time, widening the gap between advantaged and disadvantaged individuals ^{2,4}. This perspective sheds light on the cumulative impact of social support across life stages, as these advantages can build upon each other and shape cognitive and mental health. Thus, we proposed the conceptual framework shown in Figure 1 and the following three hypotheses:

Figure 1. Conceptual model.



4. METHODS

4.1 Study design and population

Data were derived from four waves of the China Health and Retirement Longitudinal Study (CHARLS): 2014 (Life history survey), 2015 (baseline in our sample), 2018 (Wave 2 follow-up), and 2020 (Wave 3 follow-up). CHALRS is the Chinese counterpart of the Health and Retirement Study, a nationally representative longitudinal survey of individuals aged 45 years and older. The study employs a multistage, stratified probability sampling design to collect information. The analytical sample comprised 23,845 observations from 9,050 Chinese adults aged 60 years and above at baseline.

4.2 Measurement

Outcome variables

1st Cognitive function: measured by five cognitive tests: immediate word recall, delayed word recall, serial 7s (correctly subtracting seven from the prior number), date naming (correctly reporting today’s date), and picture drawing 5. In line with prior studies ⁵, we summed all these test results to create a continuous variable: cognitive function, ranging from 0 to 30. A higher value indicates better cognitive function.

2nd Depressive symptoms: measured by the 10-item Centre for Epidemiologic Studies—Depression (CES-D) scale, ranging from 10 (no symptoms) to 40 (severe symptoms).

Independent variables

1st Neighborhood-level support in youth: a continuous variable based on 2 dichotomous variables (a. whether the neighbors were willing to help each other, b. whether very close-knit), ranging from 0 (lowest) to 2 (highest) ⁶.

2nd Individual-level support in youth: 1= received either financial (money) or non-financial support (e.g., mentoring for work, support for interpersonal relationships) in youth, 0 =none ⁷.

Mediator: Social support in old age

1st Neighborhood-level support in youth: a continuous variable based on 2 dichotomous variables (a. whether the neighbors were willing to help each other, b. whether very close-knit), ranging from 0 (lowest) to 2 (highest) ⁸.

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Covariates

Age, gender, education level, marital status, place of residence, living arrangement, number of living children, self-rated health, No. of limitations in activities of daily living, and having frequent pain. In the regressions where the outcome is cognition, we also controlled depressive symptom scores.

4.3 Statistical analyses

Step 1. To test H1, random-effects panel data models were used to examine the relationship between social support in youth, cognition, and depression at older ages.

Step 2. To examine whether receiving social support in youth is associated with better cognitive function and fewer depressive symptoms at older ages among individuals with low parental socioeconomic status and those who did not live in urban areas during youth.

Step 3. To test H2, Sobel tests were used to explore the mediating role of social support at older ages in the relationship between social support in youth, cognition, and depression at older ages.

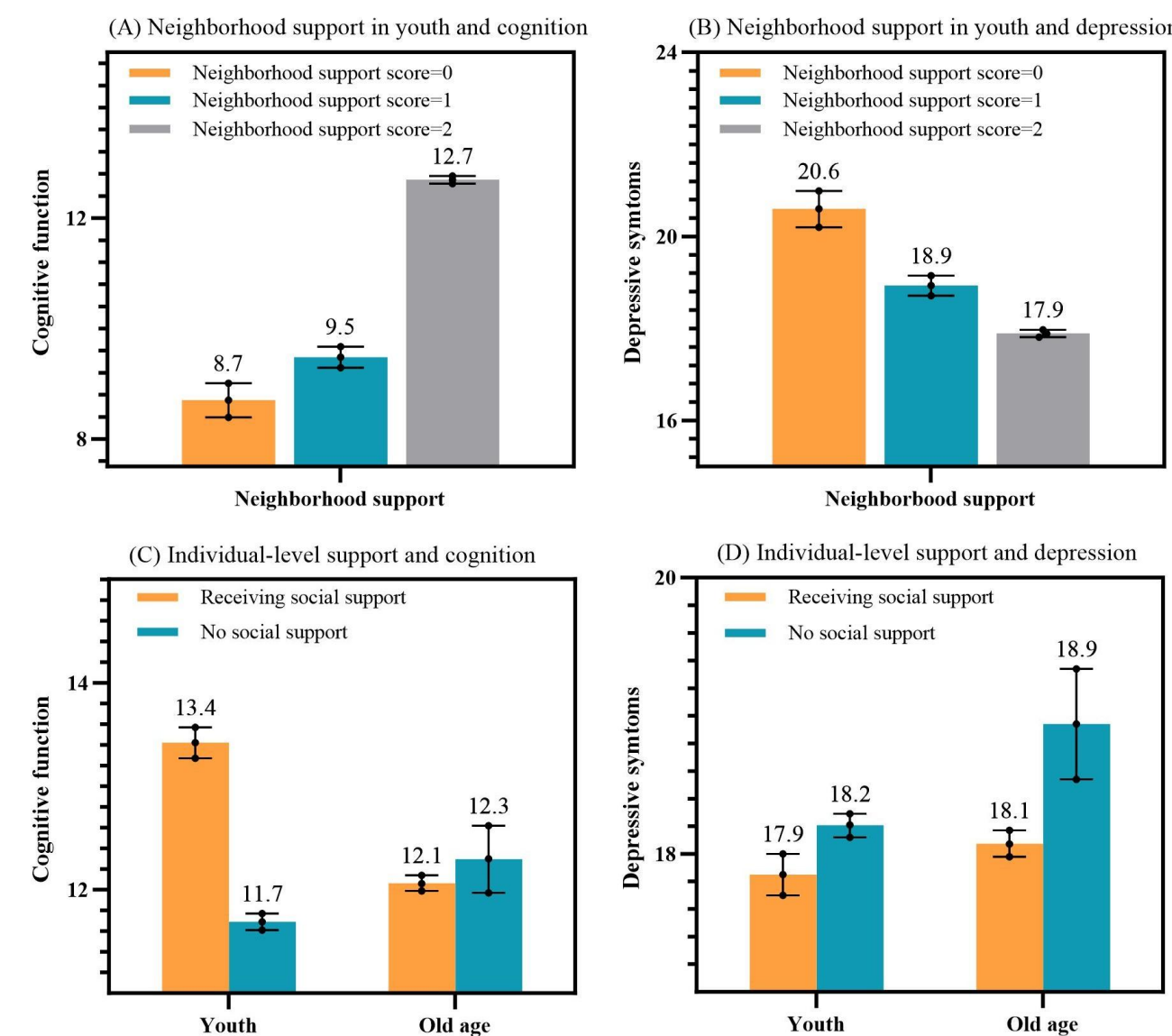
Step 4: Sensitivity analysis: (a)The measure of individual-level support in both youth and old age was modified to exclude financial support, focusing solely on non-financial support. (2) Replacing the continuous control variable in the regressions, 'number of limitations in activities of daily living', with a dichotomous variable.

5. RESULTS

5.1 Overall patterns of cognition and depression

Individuals with higher neighborhood support scores in youth tend to have higher cognitive function (Fig 2.A) and fewer depressive symptoms (Fig 2.B) at older ages. Those who received individual-level support in youth had better cognitive function (Fig 2.C) and fewer depressive symptoms (Fig 2.D) at older ages. Those who received individual-level support at older ages experienced fewer depressive symptoms at older ages (Fig 2.D).

Fig 2. Weighted average score of cognition and depression.



5.2 Direct association and subgroup disparities

Table 1. The association between social support in youth and cognition and depression at older ages.

	Base case	Subgroup analysis		
	Full sample (1)	Parents without formal education (2)	Being poorer than neighbors in youth (3)	Not living in urban areas during youth (4)
Variables	Cognition (5)	Cognition (6)	Cognition (7)	Cognition (8)
Neighborhood support in youth	1.15*** (0.09)	1.12*** (0.09)	0.93*** (0.12)	1.10*** (0.09)
Individual support in youth (Ref: no)				
yes	0.46*** (0.12)	0.46*** (0.13)	0.64*** (0.18)	0.46*** (0.12)
Variables	Depression (5)	Depression (6)	Depression (7)	Depression (8)
Neighborhood support in youth	-0.54*** (0.12)	-0.48*** (0.12)	-0.41* (0.16)	-0.53*** (0.12)
Individual support in youth (Ref: no)				
yes	0.15 (0.14)	0.13 (0.14)	0.17 (0.22)	0.21 (0.14)

Notes: Cells in models represent the coefficient (cluster standard errors). All models have adjusted for covariates. ***p < 0.001, **p < 0.01, *p < 0.05.

We found that neighborhood social support plays a stronger role in shaping cognitive function and depressive symptoms in old age.

H1 direct association ✓: 1-point increase in the neighborhood support score was linked with a 1.15-point higher cognition score and 0.54-point lower depressive symptoms score at older ages (Table 1, model 1). This association was significant among individuals from lower socioeconomic backgrounds in youth. (Table 1, models 2-4).

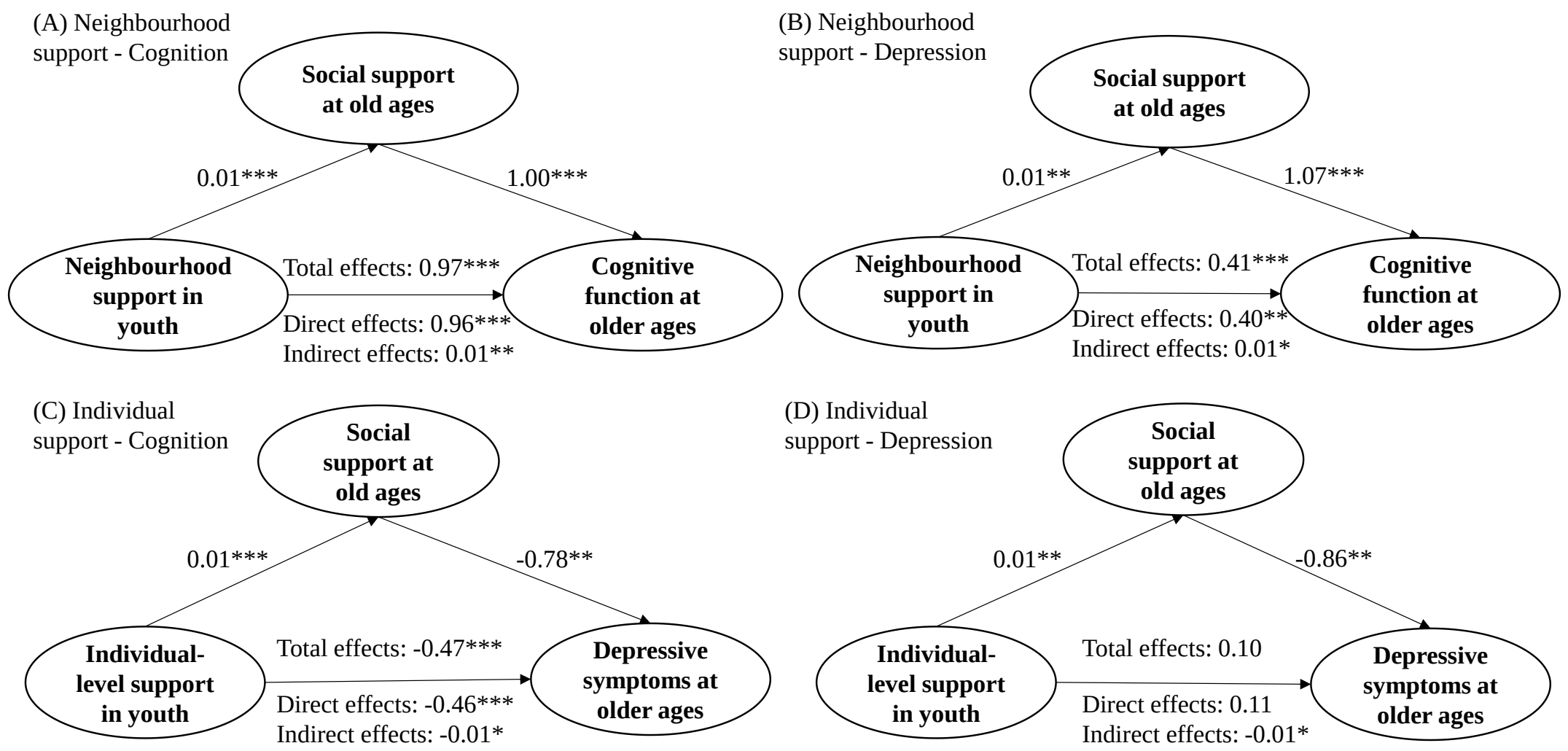
In addition, individuals who received social support in youth were likely to have 0.46 points higher cognition at older ages, but no significant association was found with depression (Table 1, model 5). This association remained consistent among individuals from lower socioeconomic backgrounds in youth (Table 1, models 6-8).

Takeaways:

- Analyze social support across life stages and its effects on cognition/depression.
- Incorporate neighborhood social support in Cumulative Advantage/Disadvantage Theory.
- Neighborhood support in youth plays a more crucial role than individual support.
- The mechanism operates by positively influencing social support at older ages.
- Social support across life stages may help mitigate early-life disadvantages.

H2 indirect association ✓: Both individual and neighborhood social support in youth are directly associated with better cognitive function at older ages and indirectly benefit cognition by helping individuals maintain social support as they age (Fig 2). For depressive symptoms, only neighborhood social support has both direct and indirect effects (via social support in later life). In contrast, individual support does not directly affect depression but has an indirect effect by strengthening social support in old age.

Fig 3. The mediating role of social support at older ages on the relationship between social support in youth and cognition/depression at older ages.



Notes: ***p < 0.001, **p < 0.01, *p < 0.05

5. DISCUSSION

Implications

- Highlights the need for policies that foster supportive social environments at the community level.
- Suggests that social support may serve as a key mechanism to buffer the long-term effects of disadvantage experienced earlier in life.
- Indicates that strengthening social connections in early life, such as through mentorship programs, may generate long-term benefits for health in later adulthood.

Strengths

- Social support may be endogenous to cognition and depression
- Late-life depression may mediate the relationship between accumulated support and cognition
- CHARLS lacks information on neighborhood-level social support in old age
- Measures of social support are based on self-reported answers.

Limitations

- Data availability constrained analyses to a cross-sectional design using the 2018 data.
- Out-of-pocket expenditures were estimated using self-reported data.
- Informal care costs were included only for the Indian sample in the main analyses and excluded in robustness checks.
- Due to inconsistencies in assessment across the datasets, only 27 of 30 the MMSE items were used.
- Survival biases may result in adults with dementia being less likely to survive to the survey stage.

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