Disability Transitions and Depressive Symptoms Among Chinese Older Adults: Evidence from CHARLS

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Abstract: (1) Background: The issue of disability among older adults demands greater attention, and addressing their physical and mental health is of significant practical importance. Previous research has primarily focused on the static disability status, with insufficient attention paid to dynamic disability transitions. Therefore, this study aimed to explore the relationship between disability transitions and depressive symptoms among Chinese older adults using longitudinal data. (2) Methods: Data were obtained from the China Health and Retirement Longitudinal Study (CHARLS) conducted in 2013, 2015, and 2018. Ordinary least squares (OLS) regression models and longitudinal one-period lagged OLS regression models were employed to examine the relationship between disability transitions and depressive symptoms among older adults. (3) Results: There was a significant positive correlation between disability status and depressive symptoms among Chinese older adults (mild disability, $\beta=2.012$, $p<0.001$; moderate disability, $\beta=3.881$, $p<0.001$; severe disability, $\beta=4.766$, $p<0.001$). There was also a significant correlation between disability transitions and depressive symptoms among Chinese older adults (deterioration of disability status: non-disability → mild disability, $\beta=2.212$, $p<0.001$; non-disability → moderate disability, $\beta=2.647$, $p<0.001$; non-disability → severe disability, $\beta=2.808$, $p<0.001$; mild disability → moderate disability, $\beta=2.496$, $p<0.01$; mild disability → severe disability, $\beta=1.685$, $p<0.05$) (recovery of disability status: moderate disability → non-disability, $\beta=-2.603$, $p<0.05$). This correlation between disability transitions and depressive symptoms among Chinese older adults varied with baseline disability status (BDS) (non-disability → mild disability, $\beta=2.212$, $p<0.001$; non-disability → moderate disability, $\beta=2.647$, $p<0.001$; non-disability → severe disability, $\beta=2.808$, $p<0.001$) (mild disability → moderate disability, $\beta=2.496$, $p<0.01$; mild disability → severe disability, $\beta=1.685$, $p<0.05$) (moderate disability → non-disability, $\beta=-2.603$, $p<0.05$). (4) Conclusion: The results show a correlation between disability transitions and depressive symptoms, especially the deterioration of disability status was positively correlated with depressive symptoms. This highlights the need for comprehensive public health policy and clinical interventions, as well as the importance of integrated intervention strategies that address both deterioration of disability status and depressive symptoms.

Keywords: Disability Transitions; Depressive Symptoms; Disability Status; Chinese Older Adults

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1 Introduction

According to a report by the World Health Organization (WHO) in 2011, the prevalence of disability globally is 8.9% in the age group of 15 to 49, 20.6% in the age group of 50 to 59, and as high as 38.1% in the age group of 60 or above. Data from the China National Research Center on Aging show that, by the end of 2014, there were nearly 40 million older adults with disability in China, and this is expected to reach 61.68 million by 2030 and 97.5 million by 2050. Due to the lack of a long-term care system specifically for older adults with disability, the burden of their care rests on families and society and has become a public issue, indirectly affecting the psychological health of the elderly themselves. Therefore, the phenomenon of disability among older adults requires increased attention, and addressing the physical and psychological health issues of older adults with disability is of great practical significance.

The relationship between physical health and mental health has long been a key focus in academia. Physical disability may be one of the most severe manifestations of health problems in older age and depressive symptoms are a common mental health disorder in later life [1-3]; therefore, the connection between physical disability and depressive symptoms in older adults is a crucial topic [4]. Previous studies have explored the relationship between disability and depressive symptoms, and a certain degree of consensus has been found, with scholars concluding that there is a significant correlation between them [5-8].

Most studies focus on static disability status when exploring the relationship between disability and depressive symptoms. Some empirical research has used longitudinal data for this analysis [9]. It is believed that disability status has a significant positive correlation with depressive symptoms in older adults, meaning that higher levels of disability status can worsen depressive symptoms [10]. For instance, a study based on two waves of longitudinal data (with a 3-year interval) found that disability status in the first wave could predict changes in depressive symptoms [11]. Additionally, theoretical research based on stress process theory has developed a framework to explain how disability status affects depressive symptoms [12]. According to stress process theory, disability status can be seen as a chronic stress experience [13]. This means that disability status interferes with individuals' perceived social support, sense of control, and self-worth, which leads to the deterioration of depressive symptoms in older adults. When relatively physically healthy, individuals can feel a stronger sense of well-being and have lower depressive symptoms. However, when a person is physically unwell, their depressive symptoms are higher. Limitations in mobility can especially negatively affect mental health and increase the risk of experiencing depressive symptoms [14].

Research indicates that the disability of older adults is a dynamic process, even involving recurrent changes [15, 16]. Only a few studies have focused on disability transitions from a dynamic perspective. For instance, one study applied a multi-state model to analyze the transition rates between non-disability, mild disability, severe disability, and death among Chinese older adults. It found that the transition rate from disability status to non-disability status significantly decreases with age. The recovery rate of mild disability in rural areas is higher than in urban areas [17]. Other studies have examined the relationship between disability transitions and other variables. For example, one study explored the transitions of older adults' disabilities from onset, to existing, and to persistent disability, and their impact on social inclusion. It found that both persistent disability and the onset of disability are significantly associated with a decrease in the likelihood of social inclusion in terms of poverty and social participation [18].

In summary, most previous studies have examined the relationship between disability status and depressive symptoms from a static perspective; thus, there is a lack of research on disability status as a dynamic transition. There is also a gap in the research on the relationship between dynamic disability transitions and depressive symptoms among older adults in non-Western countries. Hence, this study utilized China Health and Retirement Longitudinal Study (CHARLS) data from 2013, 2015, and 2018 to investigate the relationship between disability transitions and depressive symptoms among Chinese older adults from a dynamic perspective, aiming to fill the research gap in this field.

2 Methods

2.1 Data Source

The data for this study were obtained from CHARLS, conducted in 2013, 2015, and 2018. CHARLS, led by the

National School of Development at Peking University, is a large-scale nationally representative household survey covering 28 provinces (municipalities and autonomous regions), 150 counties, and 450 villages across China. The CHARLS questionnaire covers a wide range of individual and family information about older adults, covering health-related variables such as depressive symptoms, disability status, and self-rated health, as well as demographic variables such as gender, age, marital status, and education level. These data support research on the relationship between disability transitions and depressive symptoms among older adults. The details of data selection and exclusion are presented in Figure 1. The study focused on individuals aged 60 years and above. After data cleansing, a total of 6,608 older adults participated in the surveys conducted in 2013, 2015, and 2018. Then, the samples were screened based on the completeness of the data. After filtering, 5,072 respondents were ultimately included in the study.

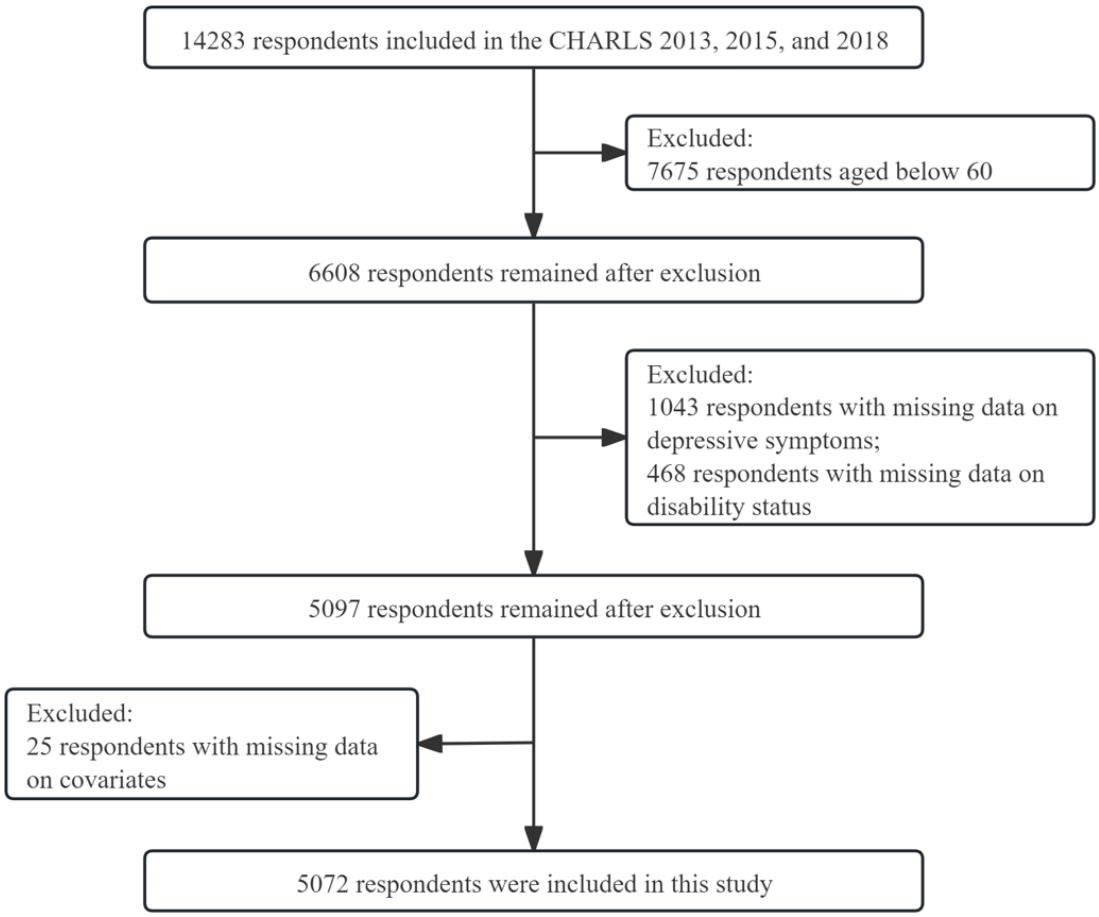

Figure 1 Flowchart of the respondent selection process

2.2 Assessment of Depressive Symptoms

The dependent variable in this study was depressive symptoms. For the measurement of depressive symptoms among older adults, the CES-D-10 scale was utilized, which comprises 10 questions assessing the feelings and behaviors of respondents from the past week. Eight questions pertain to the frequency of various depressive symptoms experienced during the week, while the remaining two questions focus on the frequency of positive emotions during the same period. Each response option for the 10 questions is assigned a value, and the scores for all 10 questions are summed up (with two questions requiring reverse scoring). The scoring method primarily relies on the number of days that negative and positive emotions were experienced in the past week. Responses such as "rarely or none of the time (less than 1 day)" are assigned 0 points, "some or a little of the time (1-2 days)" are assigned 1 point, "occasionally or moderate amount of the

time (3-4 days)" are assigned 2 points, and "most or all of the time (5-7 days)" are assigned 3 points. Scores on the CES-D-10 scale range from 0 to 30, with higher scores indicating higher levels of depressive symptoms.

2.3 Assessment of Disability Status and Disability Transitions

The independent variables in this study were disability status and disability transitions. In our study, the term "static disability status" refers to "disability status", and the term "dynamic disability transitions" refers to "disability transitions". Disability status was operationalized as an ordinal variable, including "non-disability", "mild disability", "moderate disability", and "severe disability". For the measurement of disability status, we mainly relied on relevant indicators in the CHARLS survey. We constructed three indices to measure disability status: Basic Activities of Daily Living (BADL), Instrumental Activities of Daily Living (IADL), and the Nagi index. BADL is mainly based on the Activities of Daily Living (ADL) scale [19]. The response options for the six questions of the ADL scale include "no difficulty", "some difficulty but still able to complete", "difficulty and need assistance", and "unable to complete". When assigning scores, "no difficulty" and "some difficulty but still able to complete" are assigned 0 points, while the remaining options are assigned 1 point. Then, the scores of the six questions are added together. The BADL score ranges from 0 to 6, with higher scores indicating more severe disability. The assignment of IADL values depends on the responses to five questions on the IADL scale [20]. Similar to BADL, "no difficulty" and "some difficulty but still able to complete" are assigned 0 points, and the remaining options are assigned 1 point. Then, the scores of the five questions are added together. The IADL score ranges from 0 to 5, with higher scores indicating more severe disability. The measurement of the Nagi index mainly relies on the Nagi scale [21], which includes six questions such as "Do you have difficulty standing up after sitting in a chair for a long time?" Similar to BADL and IADL, "no difficulty" and "some difficulty but still able to complete" are assigned 0 points, and the remaining options are assigned 1 point. Then, the scores of the six questions are added together. The Ngai index score ranges from 0 to 6, with higher scores indicating more severe disability. Finally, through the Ngai index, IADL indicators, and BADL indicators, we constructed disability status variables and assigned values. The operational rules of the disability status variables are outlined in Table 1.

Table 1 Operationalization of disability status

Disability Status	**Operationalization**
Non-Disability	= 1 if Nagi = IADL = BADL = 0, or Nagi = IADL = 0 and BADL score is missing; = 0 otherwise
Mild Disability	= 1 if Nagi >= 1 and IADL = BADL = 0, or Nagi >= 1 and IADL = 0 and BADL score is missing; = 0 otherwise
Moderate Disability	= 1 if Nagi >= 1 and IADL >= 1 and BADL = 0, or Nagi >= 1 and IADL >= 1 and BADL score is missing; = 0 otherwise
Severe Disability	= 1 if BADL >= 1; = 0 otherwise

Disability transitions refer to changes in an individual's disability status over time. Based on the values of the "disability status" variable in 2013 and 2015, we further constructed the "disability transitions" variable. Disability transitions, as categorical variables, specifically included 16 disability transition situations: 4 non-disability transition situations ("remain non-disability", "remain mild disability", "remain moderate disability", and "remain severe disability"), 6 situations of deteriorating disability status (transition from "non-disability" to "mild disability", "moderate disability", or "severe disability"; transition from "mild disability" to "moderate disability" or "severe disability"; and transition from "moderate disability" to "severe disability"), and 6 situations of the recovery of disability status (transition from "mild disability" to "non-disability"; transition from "moderate disability" to "non-disability" or "mild disability"; and transition from "severe disability" to "non-disability", "mild disability", or "moderate disability"). Table 2 shows the percentage distribution of "disability transitions" under different categories.

Table 2 Two-year transitions in disability in Chinese older adults (% Distribution): China Health and Retirement Longitudinal Study, 2013 to 2015 (N = 5463)

Disability Status in 2013 (T1)	Disability Status in 2015 (T2)				
	Non-Disability	Mild Disability	Moderate Disability	Severe Disability	Total
Non-Disability	53.60	8.90	2.54	2.31	67.35
Mild Disability	8.16	6.11	2.54	2.12	18.93
Moderate Disability	1.67	1.96	1.98	1.46	7.07
Severe Disability	0.99	1.34	1.03	3.29	6.65
Total	64.42	18.31	8.09	9.18	100.00

2.4 Covariates

In this study, we used demographic characteristics and health status as covariates, including age, gender (0=female, 1=male), region (0=rural, 1=urban), marital status (0=single, 1=married), education level (0=no formal education, 1=primary school, 2=junior middle school and above), and self-rated health (0=normal or poor, 1=good). The statistical descriptions of the relevant variables can be found in Table 3.

Table 3 Demographic and health characteristics of respondents (N = 5072)

Variables	N (%)	M (SD)
Depressive Symptoms		8.03 (5.81)
Disability Status		
Non-Disability		0.69 (0.46)
Mild Disability		0.19 (0.39)
Moderate Disability		0.06 (0.24)
Severe Disability		0.06 (0.23)
Age		67.07 (5.91)
Gender		
Female	2483 (48.96)	
Male	2589 (51.04)	
Region		
Rural	3879 (76.48)	
Urban	1193 (23.52)	
Marital Status		
Single	870 (17.15)	
Married	4202 (82.85)	
Education Level		
No Formal Education	2752 (54.26)	
Primary School	1249 (24.63)	
Junior Middle School and Above	1071 (21.12)	
Self-Rated Health		
Normal or Poor	3933 (77.54)	
Good	1139 (22.46)	
Note: Data: CHARLS 2013.		

2.5 Statistical Analysis

From a static perspective, we used ordinary least squares (OLS) regression models to build two models to test the relationship between disability status and depressive symptoms in older adults. Model 1 considered disability status as the independent variable and depressive symptoms as the dependent variable without any covariates. Model 2 included demographic and self-rated health variables as covariates based on Model 1.

Next, from a dynamic perspective, we employed a longitudinal one-period lagged OLS regression model to build four models to explore the relationship between disability transitions and depressive symptoms in older adults. These four models all used disability transitions (2013–2015) as the independent variable and depressive symptoms in the later period (2018) as the dependent variable. However, the reference items for the four models were different. From Model 1 to Model 4, the reference items for the independent variable "disability transitions" were "remain non-disability," "remain mild disability," "remain moderate disability," and "remain severe disability," respectively. Through this analysis, we can reveal the relationship between disability transitions and depressive symptoms in older adults and how different baseline disability status (BDS) influence this relationship. In this study, BDS refers to the disability status of the respondents during the baseline survey in 2013.

All data analyses in this study were conducted using Stata 17.0 software, with the statistical significance level set to a p-value of less than 0.05.

3 Results

3.1 Association between Disability Status and Depressive Symptoms

This study aimed to investigate the relationship between disability transitions and depressive symptoms in Chinese older adults. Therefore, it was first necessary to verify whether disability status is associated with depressive symptoms. This step confirms the conclusions of previous studies, laying the foundation for further research on the relationship between dynamic disability transitions and depressive symptoms.

Table 4 shows the OLS regression results for the relationship between disability status and depressive symptoms among Chinese older adults in 2013. The statistical results reveal a significant positive correlation between disability status and depressive symptoms ($p<0.001$). In other words, the worse the disability status, the worse the depressive symptoms in older adults.

The results of Model 1 in Table 4 show a significant positive correlation between disability status and depressive symptoms in older adults without covariates ($p<0.001$). This means that the more severe the disability status, the more severe the current depressive symptoms in older adults (mild disability, $\beta=2.905$, $p<0.001$; moderate disability, $\beta=4.896$, $p<0.001$; severe disability, $\beta=5.612$, $p<0.001$).

The results of Model 2 show that, even with covariates included, there is still a significant positive correlation between disability status and depressive symptoms in older adults (mild disability, $\beta=2.012$, $p<0.001$; moderate disability, $\beta=3.881$, $p<0.001$; severe disability, $\beta=4.766$, $p<0.001$), showing that the worse the disability status, the worse the depressive symptoms; this is consistent with previous findings [11].

Table 4 Association between disability status and depressive symptoms

Variables (Reference)	Depressive Symptoms Model 1		Depressive Symptoms Model 2	
	Coefficient	SE	Coefficient	SE
Disability Status (Non-Disability)				
Mild Disability	2.905***	(0.20)	2.012***	(0.20)
Moderate Disability	4.896***	(0.32)	3.881***	(0.32)
Severe Disability	5.612***	(0.33)	4.766***	(0.33)
Covariates				
Age			-0.058***	(0.01)
Gender (Female)			-0.996***	(0.16)
Region (Rural)			-1.291***	(0.19)
Marital Status (Single)			-1.012***	(0.21)
Education Level (No Formal Education)				
Primary School			-0.682***	(0.19)
Junior Middle School and Above			-0.879***	(0.22)
Self-Rated Health (Normal or Poor)			-2.525***	(0.18)
Intercept	6.847***	(0.09)	13.570***	(0.95)
R-Squared	0.105		0.175	
Sample Size	5,072		5,072	

Note: *** $p<0.001$, ** $p<0.01$, * $p<0.05$; coefficients are presented in the table, with standard errors in parentheses.

3.2 Association between Disability Transitions and Depressive Symptoms

After examining the relationship between disability status and depressive symptoms in Chinese older adults, this study further used longitudinal one-period lagged OLS regression to test the relationship between disability transitions and depressive symptoms in older adults. Since individuals may have different BDSs during disability transitions, to investigate the impact of BDS on the relationship between disability transitions and depressive symptoms, this study constructed four models. From Model 1 to Model 4, the reference items for the independent variable "disability transitions" were "remain non-disability," "remain mild disability," "remain moderate disability," and "remain severe disability," respectively.

Table 5 shows the OLS regression results of the relationship between disability transitions from 2013 to 2015 and subsequent depressive symptoms in 2018. The results indicate a significant correlation between disability transitions and depressive symptoms. However, this correlation is complex and closely related to BDS (i.e., 2013).

According to the statistical results in Table 5, on the one hand, there is a significant correlation between disability transitions and depressive symptoms in older adults. The results of Models 1 and 2 show that the deterioration of disability status is positively correlated with depressive symptoms (non-disability → mild disability, $\beta=2.212$, $p<0.001$; non-disability → moderate disability, $\beta=2.647$, $p<0.001$; non-disability → severe disability, $\beta=2.808$, $p<0.001$; mild disability → moderate disability, $\beta=2.496$, $p<0.01$; mild disability → severe disability, $\beta=1.685$, $p<0.05$). The results of Model 3 show that the recovery of

disability status is negatively correlated with depressive symptoms (moderate disability → non-disability, β=-2.603, p<0.05).

On the other hand, the statistical results in Table 5 also show that the relationship between disability transitions and depressive symptoms in Chinese older adults varies with different BDSs. The results of Models 1 and 2 indicate that, when the BDS is non-disability or mild disability, there is a significant correlation between disability transitions and depressive symptoms in older adults. Five of the six disability transition situations had significant results (non-disability → mild disability, β=2.212, p<0.001; non-disability → moderate disability, β=2.647, p<0.001; non-disability → severe disability, β=2.808, p<0.001; mild disability → moderate disability, β=2.496, p<0.01; mild disability → severe disability, β=1.685, p<0.05). The results of Models 3 and 4 show that, when the BDS is moderate disability or severe disability, there is not much significant correlation between disability transitions and depressive symptoms in older adults. Only one of the six disability transition situations has a significant result (moderate disability → non-disability, β=-2.603, p<0.05).

Table 5 Association between disability transitions and depressive symptoms

Variables	Model 1		Model 2		Model 3		Model 4	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Disability Transitions (2013 to 2015)								
No Change in Disability Status								
Remain Non-Disability	-	-	-2.894***	(0.44)	-3.895***	(0.91)	-5.065***	(0.72)
Remain Mild Disability	2.894***	(0.44)	-	-	-1.001	(0.99)	-2.171**	(0.82)
Remain Moderate Disability	3.895***	(0.91)	1.001	(0.99)	-	-	-1.171	(1.14)
Remain Severe Disability	5.065***	(0.72)	2.171**	(0.82)	1.171	(1.14)	-	-
Deterioration of Disability Status								
Non-Disability to Mild Disability	2.212***	(0.36)	-0.682	(0.53)	-1.682	(0.96)	-2.853***	(0.78)
Non-Disability to Moderate Disability	2.647***	(0.71)	-0.247	(0.81)	-1.248	(1.13)	-2.419*	(0.99)
Non-Disability to Severe Disability	2.808***	(0.70)	-0.086	(0.80)	-1.087	(1.13)	-2.257*	(0.98)
Mild Disability to Moderate Disability	5.390***	(0.67)	2.496**	(0.77)	1.495	(1.11)	0.325	(0.96)
Mild Disability to Severe Disability	4.579***	(0.73)	1.685*	(0.82)	0.685	(1.14)	-0.486	(1.00)
Moderate Disability to Severe Disability	5.516***	(1.23)	2.622*	(1.28)	1.622	(1.51)	0.451	(1.40)
Recovery of Disability Status								
Severe Disability to Non-Disability	4.354***	(0.98)	1.460	(1.06)	0.460	(1.32)	-0.711	(1.20)
Moderate Disability to Non-Disability	1.292	(0.81)	-1.603	(0.90)	-2.603*	(1.20)	-3.774***	(1.06)
Mild Disability to Non-Disability	1.844***	(0.38)	-1.050	(0.55)	-2.051*	(0.96)	-3.222***	(0.78)
Severe Disability to Mild Disability	4.633***	(0.94)	1.739	(1.02)	0.739	(1.29)	-0.432	(1.16)
Moderate Disability to Mild Disability	5.059***	(0.80)	2.165*	(0.89)	1.164	(1.19)	-0.006	(1.05)
Severe Disability to Moderate Disability	6.558***	(1.05)	3.664**	(1.12)	2.664	(1.37)	1.493	(1.25)
R-Squared	0.178		0.178		0.178		0.178	
Sample Size	3,818		3,818		3,818		3,818	

Note: Covariates included in the model are gender, age, urban or rural residence, marital status, education level, and self-rated health. In Models 1–4, the reference categories for the explanatory variable "disability transitions" are "remain non-disability," "remain mild disability," "remain moderate disability," and "remain severe disability" respectively; *** p<0.001, ** p<0.01, * p<0.05. Regression coefficients are listed in the table, with standard deviations in parentheses.

4 Discussion

It is important to pay attention to disability and depression issues in older adults to effectively address the challenges of an aging population. Although numerous studies have demonstrated a relationship between disability status and depressive symptoms, there is a lack of research focusing on dynamic disability transitions, especially in non-Western countries. Therefore, this study used data from the China Health and Retirement Longitudinal Study (CHARLS), conducted in 2013, 2015, and 2018, to explore the relationship between disability transitions and depressive symptoms among Chinese older adults from a dynamic perspective.

4.1 Major Findings

Firstly, this study explored the relationship between disability status and depressive symptoms from a static perspective. The results show a significant positive correlation between disability status and depressive symptoms

in Chinese older adults, regardless of whether covariates were included. Our finding is consistent with that of previous studies based on Western older adults [8]. Additionally, this result expands and supports existing research on Chinese older adults. Disability may limit the physical activities of older adults, forcing them to withdraw from certain social roles, which can lead to a breakdown in social participation and interpersonal relationships, affecting their depressive symptoms [22, 23].

Secondly, this study examined the relationship between disability transitions and depressive symptoms in Chinese older adults from a dynamic perspective. The results show that disability transitions significantly affect subsequent depressive symptoms. Specifically, with the deterioration of disability status, depressive symptoms are higher; with the recovery of disability status, depressive symptoms are lower. Currently, only a few studies discuss disability transitions in older adults [24-26]. One study examined the relationship between disability transitions and depressive symptoms in older adults in the United States and found that the deterioration of disability status had a greater impact on depressive symptoms than the recovery of disability status [27]. However, there is a lack of research on non-Western older adults. Our study, focusing on non-Western older adults, shows correlations between both the deterioration of disability status and the recovery of disability status with depressive symptoms.

Thirdly, the relationship between disability transitions and depressive symptoms in Chinese older adults varies with different BDSs. Specifically, when the BDS is non-disability or mild disability, there is a significant correlation between disability transitions and depressive symptoms. When the BDS is moderate or severe, the correlation between disability transitions and depressive symptoms is not much significant. To date, some studies have found that different disability transitions have varying impacts on depressive symptoms [27], but they have not identified a relationship between BDS and the correlation between disability transitions and depressive symptoms. Compared with the existing literature, our study addresses the gap in the research on disability transitions in non-Western societies.

4.2 Theoretical Perspectives

Our study found a correlation between disability transitions and depressive symptoms in Chinese older adults; this finding validate stress process theory. Stress process theory suggests that stressful events have a significant impact on an individual's mental health [28]. As a chronic life event, disability may limit the daily lives of older adults, weakening their social support networks, social roles, and psychological resources, leading to poorer mental health [29, 30]. Therefore, disability transitions, especially deterioration of disability status, can be seen as stressors. The deterioration of disability status may increase physical stress and psychological burdens, worsening depressive symptoms. Conversely, the recovery of disability status may reduce these burdens, alleviating depressive symptoms [31, 32]. Additionally, our study found that the correlation between disability transitions and depressive symptoms is related to BDS. Stress process theory also emphasizes the subjective evaluation of stressful events and the extent of their impact. BDS affects an individual's response to new stressful events. For those who are already in a high-stress state (such as severe disability), new stressful events may no longer significantly alter their mental health, as they are accustomed to high-stress environments.

4.3 Limitations

This study has several limitations. First, we did not conduct a thorough investigation into the causal relationship between disability transitions and depressive symptoms. For a long time, the causal relationship between physical health and mental health has been a contentious issue in aging health research. Disability is the most severe physical health problem faced by older adults and directly affects their quality of life in later years. Depressive symptoms are common psychological health issues in old age. However, this study lacks an in-depth discussion of the causal relationship between depressive symptoms and disability transitions. Second, we did not fully consider sample selection bias. Some older adults in the research data might show strong selectivity. This could be due to their relatively good physical health, which makes them less sensitive to external factors, leading to sample selection bias. Third, we did not consider the issue of sample loss. Some older adults in the sample, especially those with a higher disability status, may have passed away during the follow-up period, leading to sample loss, which could affect the completeness of the research results. Fourth, we did not conduct a study on heterogeneity. When examining the relationship between disability transitions and depressive symptoms, we did not consider differences among various groups. Different groups, such as those varying in age, gender, and cultural background,

may show different research results. The lack of such research may limit the general applicability of the results and a comprehensive understanding of the relationship between disability transitions and depressive symptoms.

4.4 Implications

This study revealed a relationship between disability transitions and depressive symptoms in Chinese older adults. This finding has significant implications for the formulation and optimization of public policies concerning aging. Firstly, it underscores the need to strengthen measures for disability prevention and rehabilitation. The results deepen our understanding of the relationship between disability transitions and depressive symptoms among older adults. Therefore, it is necessary to implement early intervention and prevention strategies at the physical, nutritional, and social levels to improve disability and depressive symptoms in later life. This study provides a foundation for the development of intervention strategies and the better identification of older adults who experience disability transitions correlated with changes in depressive symptoms. Given that disability status can be measured during routine health check-ups, this study provides a substantial basis upon which policymakers can implement disability status screening through community-based healthcare programs for older adults, thereby increasing attention to their mental health needs.

Secondly, it emphasizes the need to establish a comprehensive mental health service system for older adults that includes psychological counseling, support groups, and community mental health service stations, and which can provide timely and effective psychological support to help them better cope with the depressive symptoms that come with disability.

Thirdly, it advocates for the promotion of community-based older adult care and home nursing policies. To mitigate the impact of disability and depressive symptoms on older adults, the government can increase support for community-based older adult care and home nursing policies, providing more older adult care services and nursing support, allowing older adults to receive better care and support in familiar environments, therebyreducing the psychological stress associated with the role of disability. Lastly, it stresses the importance of promoting mental health education for older adults. Strengthening mental health education for older adults, thereby enhancing their awareness and coping abilities regarding mental health issues, can contribute to the prevention and alleviation of depressive symptoms.

5 Conclusions

This study used data from the China Health and Retirement Longitudinal Study (CHARLS) to assess the relationship between disability transitions and depressive symptoms. The results show a significant positive correlation between the disability status and depressive symptoms of older adults. When shifting from a static to a dynamic perspective, we also found a correlation between disability transitions and depressive symptoms. The deterioration of disability status was positively correlated with depressive symptoms, while the recovery of disability status was negatively correlated with depressive symptoms. Additionally, the relationship between disability transitions and depressive symptoms was found to be related to BDS. When the BDS is non-disability or mild disability, a significant correlation between disability transitions and depressive symptoms was observed. Therefore, it is necessary to implement early intervention and prevention strategies at the physical, nutritional, and social levels to better identify older adults who may suffer from depressive symptoms due to disability. This can help to improve disability and depressive symptoms in later life.

Author Contributions

This paper was completed by Three authors. Data curation, Y.L.; language modification, Y.R.; formal analysis, Y.L.; funding acquisition, Y.R.; methodology, Q.W.; resources, Q.W. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement

The CHARLS study was approved by the Biomedical Ethics Committee of Peking University (IRB00001052-11015).

Informed Consent Statement

Not applicable.

Data Availability Statement

Data derived from public domain resources.

Conflicts of Interest

The authors declare no conflicts of interest.

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