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Signing contracts for family doctors, functional limitations and home care willingness among older adults: a cross-sectional study

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Abstract

Background Traditional Chinese culture advocates home care be provided by family members. Home care can improve mental health and enjoy a familiar environment for older people. This study aimed to investigate the relationship between signing contracts for family doctors and home care willingness, as well as the interaction effect of functional limitations in this relationship.

Methods This study was based on the sixth National Health Service Survey of Shandong province, China in 2018. A total of 8,055 older adults aged ≥ 60 years were included in the study. The logistic regression models were employed to examine the role of functional limitations in the relationship between signing contracts for family doctors and home care willingness.

Results There were 6,891 (85.55%) participants had home care willingness in Shandong province, China. Compared to respondents who did not have family doctors, older adults with family doctors were more likely to report higher levels of home care willingness after adjusted for covariates (OR = 1.45, 95% CI: 1.27, 1.66). The interaction effect between signing contracts for family doctors and functional limitation on choosing home care for older adults was statistically significant (OR = 0.68, 95% CI: 0.47, 0.97).

Conclusions The association between signing contracts for family doctors and home care willingness varies by functional limitations. Therefore, there is a need to improve social security system and family doctor service policy to suit the care needs of older people, especially those without functional limitations. Social care institutions should also provide comfortable care to disabled older adults as an effective complement.

Keywords Family doctor, Home care willingness, Functional limitation

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Background

Globally, the population is experiencing rapid ageing and China has the largest ageing population in the world [1]. It is predicted that nearly 35.1% of the total population will be aged over 60 in China by 2050 [2]. The long-term care system faced enormous challenges as a result of the ageing population's extraordinary growth. Under the influence of traditional filial piety in China, home care from family members is the predominant form of caring for the older adults [3]. Filial piety, a core value of the Chinese family system, requires children to fulfill their obligation to care and support for their parents [4]. Home care is services provided in the older individual's own home, including daily care provided by relatives (mainly spouses and adult children) and other care delivered in their homes [5, 6]. It is in line with Chinese cultural values and inherent mindset. The 14th Five-Year Policy Plan of China highlighted that strengthening the capacity of home and community care services and promoting medical services into the home and community was of great significance [7]. Living with family members in their home allows older adults to enjoy a familiar environment [8], feel at ease and improve mental health [9, 10]. To offer scientific support for the establishment of home care policy, it is important to identify the factors related to home care willingness so as to satisfy the health requirements of older adults and improve their quality of life.

Chinese government fully implemented family doctor contract service (FDCS) as a key component of primary health care in 2016 [11]. Older adults and those with physical limitation were classified as priority groups in receiving family doctor contracted services [12]. The FDCS policy played a significant role in promoting self-management behaviors and improving health-related quality of life for older adults [13, 14]. Previous literature has supported the vital role of family doctors in home care [15, 16]. Older adults with family doctors have access to get personalized daily health care and chronic illness management in their own homes instead of large general hospitals. This not only satisfies the older adults ' wish to age in place and the sense of belonging, but also bridges the gap in health care from informal caregivers. Lu et al. [17] indicated that the community care resources provided by the government were effective supplements to informal care and encouraged older adults to choose home care. Clarifying the relationship between signing contracts for family doctors and home care willingness is of great practical significance in improving primary care policies and rationally allocating resources for older adults. Nevertheless, most available studies have focused on the factors influencing the home care willingness in China [6, 18]. There is still a lack of direct research examining the relationship between signing contracts for family doctors and willingness to care at home.

Most older people would suffer from physical function decline as they get older [19]. Previous studies found that family doctors served as the gatekeepers to health services and provided essential medical assistance to people with disabilities [20, 21]. Furthermore, family doctors were able to adaptively address the physical barriers faced by patients with disabilities in seeking medical care [22]. Different from healthy age groups, disabled older adults have a higher requirement for family doctor services [23]. Due to the deterioration of physical functions, older adults with poorer physical function need more and urgent long-term care as compared to their peers [24]. Prior research indicated that home care was still the first choice for most older adults with functional limitations [25, 26]. However, another study conducted in Jiangsu province, China showed that older people with disabilities preferred institutional care [27]. At present, few studies have incorporated these factors in combination. It is unknown that the role of functional limitations in the link between signing contracts for family doctors and home care willingness.

The aim of this study is to examine the associations between signing contracts for family doctors and home care willingness, as well as the role of functional limitations on the relationship between signing contracts for family doctors and home care willingness. We hypothesize that older adults who signed up to family doctors were more likely to choose home care than those who were not, and the relationship between signing contracts for family doctors and home care willingness varied by functional limitations.

Method

Sample and study design

The data were obtained from the sixth Health Service Survey of Shandong province, China in 2018, which was one part of National Health Service Survey (NHSS). The NHSS is a nationally representative survey conducted at 5-year intervals since 1993 by the Nation Health and Family Planning Commission of China [28]. Shandong province ranks first in China for the number of older people, which has reached 21.22 million in 2020 [29]. The participants were selected using a multistage stratified cluster sampling method. Firstly, 20 counties were chosen at random from 137 counties in Shandong Province. In the second stage, five townships in each county were randomly sampled, and two villages (communities) in each township were randomly included. Thirdly, 60 and more households were recruited in this survey in each village. A total of 100 townships and 200 villages were identified, with 12,938 households and 35,264 participants. All

household members were asked to complete a structured questionnaire by well-trained investigators using face-to-face interview. This survey was conducted from September to October 2018 in 17 cities under the leadership of the Statistical Information Center of the National Health Commission and the Health Commission of Shandong province [29–31].

Since our research focused on older adults, the inclusion criteria were respondents who were 60 years or older. A total of 261 participants with dementia and 587 participants with no information on the main variables were excluded from a total of 8,903 older adults interviewed. Finally, 8,055 older adults were enrolled in this research. Figure S1 illustrates the flow chart of the study sample (see Additional file 1).

Measurements

Home care willingness

The dependent variable was the preference for home care in older individuals and was measured by the question "What is the most preferred way of ageing for you?" If the response was "home care", this would be categorized as "yes". The option of "institutional care" or "community care" was classified as "no".

Signing contracts for family doctors

The status of the family doctor contracted service is measured by the following question "Did you contract for family doctor services?" Respondent was labelled as yes if she/he signed contracts for family doctors and the opposite is no [30].

Functional limitations

Participants were asked to answer whether they had problems with eight self-care behaviors: (1) dressing; (2) feeding; (3) bathing; (4) going to the toilet; (5) transfer; (6) controlling urination and defecation; (7) doing housework; and (8) managing money [32, 33]. Responses were categorized as: "can do it myself", "have some difficulties", "need help" and "can't do it". To construct a binary variable, functional limitations were described as having difficulty with one or more of the self-care behaviors items in this study.

Control variables

Previous studies have identified a range of predictors of home care [6, 34]. According to the Anderson model, covariates could be divided into the following three categories [35, 36]. (1) Predisposing characteristics, include demographic factors such as gender, age, marital status, educational level and employment status. (2) Enabling resources were residence, living arrangements, household income, health examination and social activities. (3) Need factors include chronic conditions, need caregiving and body mass index. In addition to the above variables, we also take health behavior factors into consideration, including smoking status (never, past, current), alcohol drinking status (never, past, current), exercise times weekly and teeth-brushing daily (<2, ≥ 2).

Statistical analysis

This study was performed using Stata 16.0 (StataCorp, College Station, TX, USA). All tests were two-sided and p values less than 0.05 were considered significant. First of all, descriptive analyses were conducted to test study variables. The t-tests for continuous variables and chi-square tests for categorical variables were used to examine group differences. Besides, logistic regression models determined the association between signing contracts for family doctors and home care willingness. In model 1, we considered only the signing contracts for family doctors. We added only the functional limitation in modal 2, and model 3 adjusted for all predisposing characteristics, enabling resources, need factors and health behavior factors. Furthermore, a stratified analysis by different functional status was undertaken after controlling for all influential factors. Then, we added the interaction term of functional limitations and signing contracts for family doctors into the regression model.

Results

Characteristics of participants

Of the 8,055 older adults in our survey, mean age was 68.74 (±6.80) years. A total of 6,891 (85.55%) participants had willingness for home care. The majority of older adults with willingness for home care were female, older, married, poorly educated, and unemployed, compared to people who without home care willingness. The contracted rate of family doctors among older adults was 66.83%. Further information on participant characteristics can be found in Table 1.

Association between signing contracts for family doctors and home care willingness

Table 2 illustrates the influence of family doctor contract status on home care willingness among older individuals. In Model 1, older adults who signed contracts for family doctors were more likely to choose home care than those who did not (OR = 1.51, 95% CI: 1.33, 1.72). After including covariates in Models 2 and 3, signing contracts for family doctors was still significantly associated home care willingness (Models 2: OR = 1.50, 95% CI: 1.32, 1.71; Models 3: OR = 1.45, 95% CI: 1.27, 1.66).

Table 1 Descriptive statistics among older adults ($N=8,055$)

Variable	Total *N* (%)	Home care willingness		*P*-value
		No *N* (%)	Yes *N* (%)	
Observation	8,055	1,164 (14.45)	6,891 (85.55)	
Age, Mean (SD)	68.74 (6.80)	66.88 (5.78)	69.05 (6.90)	< 0.001
Gender				< 0.001
Male	3,882 (48.19)	618 (15.92)	3,264 (84.08)	
Female	4,173 (51.81)	546 (13.08)	3,627 (86.92)	
Education				< 0.001
Illiterate	2,511 (31.17)	250 (9.96)	2,261 (90.04)	
Elementary school	2,665 (33.09)	350 (13.13)	2,315 (86.67)	
Middle school or above	2,879 (35.74)	564 (19.59)	2,315 (80.41)	
Residence				0.005
Urban	3,858 (47.90)	513 (13.30)	3,345 (86.70)	
Rural	4,197 (52.10)	651 (15.51)	3,546 (84.49)	
Marriage status				0.001
Single[a]	1,290 (16.01)	148 (11.47)	1,142 (88.53)	
Married	6,765 (83.99)	1,016 (15.02)	5,749 (84.98)	
Employment status				< 0.001
Employed	2,358 (29.27)	379 (16.07)	1,979 (83.93)	
Retired	1,852 (22.99)	341 (18.41)	1,511 (81.59)	
Unemployed	3,845 (47.73)	444 (11.55)	3,401 (88.45)	
Chronic conditions				0.015
No chronic condition	3,594 (44.62)	484 (13.47)	3,110 (86.53)	
One chronic condition	2,825 (35.07)	410 (14.51)	2,415 (85.49)	
Multimorbidity	1,636 (20.31)	270 (16.50)	1,366 (83.50)	
Household income [b]				< 0.001
Q1	4,469 (55.48)	588 (13.16)	3,881 (86.84)	
Q2	1,423 (17.67)	223 (15.67)	1,200 (84.33)	
Q3	1,023 (12.70)	145 (14.17)	878 (85.83)	
Q4	1,140 (14.15)	208 (18.25)	932 (81.75)	
Smoking status				0.038
Never	5,880 (73.00)	814 (13.84)	5,066 (86.16)	
Past	602 (7.47)	98 (16.28)	504 (83.72)	
Current	1,573 (19.53)	252 (16.02)	1,321 (83.98)	
Alcohol drinking status				0.194
Never	5,766 (71.58)	813 (14.10)	4,953 (85.90)	
Past	392 (4.87)	53 (13.52)	339 (86.48)	
Current	1,897 (23.55)	298 (15.72)	1,599 (84.29)	
Exercise times weekly				< 0.001
0	3,933 (48.83)	488 (12.41)	3,445 (87.59)	
1–5	980 (12.17)	134 (13.67)	846 (86.33)	
≥ 6	3,142 (39.01)	542 (17.25)	2,600 (82.75)	
Teeth-brushing daily				< 0.001
< 2	6,457 (80.16)	874 (13.54)	5,583 (86.46)	
≥ 2	1,598 (19.84)	290 (18.15)	1,308 (81.85)	
Health examination				0.235
No	2,230 (27.68)	339 (15.20)	1,891 (84.80)	
Yes	5,825 (72.82)	825 (14.16)	5,000 (85.84)	
Social activities				0.019
No	6,287 (78.05)	878 (13.97)	5,409 (86.30)	

Table 1 (continued)

Variable	Total *N* (%)	Home care willingness		*P*-value
		No *N* (%)	Yes *N* (%)	
Yes	1,768 (21.95)	286 (16.18)	1,482 (83.82)	
Living arrangements				0.258
Alone	898 (11.15)	141 (15.70)	757 (84.30)	
With others	7,157 (88.85)	1,023 (14.29)	6,134 (85.71)	
BMI [c]				0.005
Underweight	469 (5.82)	44 (9.38)	425 (90.62)	
Normal weight	3,616 (44.89)	522 (14.44)	3,094 (85.56)	
Overweight	2,909 (36.11)	451 (15.50)	2,458 (84.50)	
Obese	1,061 (13.17)	147 (13.85)	914 (86.15)	
Need caregiving				0.042
No	7,228 (89.73)	1,064 (14.72)	6,164 (85.28)	
Yes	827 (10.27)	100 (12.09)	727 (87.91)	
Functional limitations				< 0.001
No	6,399 (79.44)	971 (15.17)	5,428 (84.83)	
Yes	1,656 (20.56)	193 (11.65)	1,463 (88.35)	
Signing contracts for family doctors				< 0.001
No	2,672 (33.17)	481 (18.00)	2,191 (82.00)	
Yes	5,383 (66.83)	683 (12.69)	4,700 (87.31)	

[a] Singles include those who are unmarried, divorced and widowed

[b] Quartile 1 (Q1) was the poorest and Quartile 4 (Q4) was the richest

[c] *BMI* body mass index

The interaction effects between signing contracts for family doctors and functional limitations on home care willingness

Firstly, we conducted logistic regression model to examine the association between signing contracts for family doctors and home care willingness for with and without functional limitations separately. Among older adults without functional limitations, the effect of older adults signing contracts for family doctors on home care willingness was significant (OR = 1.56; 95% CI: 1.35, 1.82). In contrast, there was no effect of signing contracts for family doctors on home care willingness among older adults with functional limitations (OR = 0.98; 95% CI: 0.70, 1.39). Then, we included an interaction term of signing contracts for family doctors and functional limitations to further explore whether the associations between signing contracts for family doctors and home care willingness vary by functional limitations. Older people with functional limitations who signed contracts for family doctors had a lower willingness to care at home compared to those without functional limitations (OR = 0.68, 95% CI: 0.47, 0.97). More details could be found in Table 3.

Discussion

To the best of our knowledge, the current study examines the role of functional limitations in the relationship between signing contracts for family doctors and home care willingness. Our results indicated that older adults who signed contracts for family doctors were more willing to choose home care. Among the functional limitation group, however, older adults signed contracts for family doctors had less home care willingness.

Our study found that 78.26% older adults would prefer to choose home care. It was higher than the proportion in other Chinese cities, such as Chongqing (55.9%) [34], Beijing (67.3%) [37], and Chengdu(54.9%) [38]. The possible reason might be the cultural differences within the country. Shandong is the birthplace of Confucianism, and the culture of filial piety is deeply rooted in the choose of how to care for the older adult [39]. Filial piety is a fundamental part of traditional Chinese society, which essentially emphasizes social responsibility and obligation of children in providing support and care for parents, and respects the older person [40]. Based on the idea of rearing children for old age, most senior people in Shandong province might think that they have been abandoned and

Table 2 Association between signing contracts for family doctors and home care willingness among older adults

Variable	Model 1		Model 2		Model 3	
	OR (95% CI)	*P*-value	OR (95% CI)	*P*-value	OR (95% CI)	*P*-value
Signing contracts for family doctors (reference = No)	1.51 (1.33, 1.72)	<0.001	1.50 (1.32, 1.71)	<0.001	1.45 (1.27, 1.66)	<0.001
Functional limitations (reference = No)			1.35 (1.15, 1.60)	<0.001	1.04 (0.86, 1.26)	0.707
Age					1.05 (1.04, 1.06)	<0.001
Gender (reference = Male)					1.10 (0.92, 1.31)	0.296
Education (reference = Illiterate)						
Elementary school					0.83 (0.69, 1.00)	0.051
Middle school or above					0.64 (0.53, 0.78)	<0.001
Residence (reference = Urban)					0.96 (0.94, 0.97)	<0.001
Marriage status (reference = Single)					0.79 (0.61, 1.02)	0.070
Employment status (reference = Employed)						
Retired					0.97 (0.77, 1.21)	0.768
Unemployed					1.18 (1.00, 1.39)	0.050
Chronic conditions (reference =No chronic condition)						
One chronic condition					0.85 (0.73, 0.99)	0.032
Multimorbidity					0.69 (0.58, 0.82)	<0.001
Household income (reference = Q1)						
Q2					0.92 (0.77, 1.10)	0.296
Q3					1.09 (0.87, 1.36)	0.707
Q4					0.86 (0.68, 1.08)	0.183
Smoking status (reference = Never)						
Past					0.91 (0.70, 1.18)	0.468
Current					0.94 (0.77, 1.14)	0.517
Alcohol drinking status (reference = Never)						
Past					1.31 (0.95, 1.80)	0.104
Current					1.12 (0.93, 1.34)	0.222
Exercise times weekly (reference = 0)						
1-5					0.97 (0.78, 1.20)	0.787
≥6					0.72 (0.62, 0.83)	<0.001
Teeth-brushing daily (reference = <2)					0.84 (0.71, 0.99)	0.042
Health examination (reference = No)					0.88 (0.76, 1.02)	0.089
Social activities (reference = No)					0.92 (0.79, 1.07)	0.253
Living arrangements (reference = Alone)					1.61 (1.24, 2.10)	<0.001
BMI (reference = Underweight)						
Normal weight					0.81 (0.58, 1.13)	0.213
Overweight					0.85 (0.61, 1.20)	0.358
Obese					0.99 (0.68, 1.43)	
Need caregiving (reference = No)					0.93 (0.73, 1.19)	

their own children are not filial if they choose social care like institutional care [39].

This study found that signing contracts for family doctors was positively associated with home care willingness. Older adults who had signed up with family doctors had a greater willingness to choose home care than those who had not. Generally, informal care from family members is typically favored as a care alternative for the older adults in China. The family doctor contracted services as a form of formal care is a supplement to informal care [41]. Contracting family doctors increases the accessibility of healthcare services for older adults when they need healthcare. When older adults seeking medical treatment, they are often restricted in their ability to move around in space due to the poor physical condition [42]. Family doctors can meet the basic or ordinary health needs for the majority of older adults, such as chronic diseases [43]. Furthermore, health management for older

Table 3 The physical functional status difference in the effect of signing contracts for family doctors on home care willingness among older adults

Variable	Model 4 No functional limitations		Model 5 Functional limitations		Model 6 Interaction	
	OR (95% CI)	*P*-value	OR (95% CI)	*P*-value	OR (95% CI)	*P*-value
Signing contracts for family doctors (reference = No)	1.56 (1.35, 1.82)	<0.001	0.98 (0.70, 1.39)	0.919	1.55 (1.33, 0.79)	<0.001
Functional limitations (reference = No)					1.33 (0.98, 1.80)	0.066
Signing contracts for family doctors × Functional limitations					0.68 (0.47, 0.97)	0.033
Age	1.04 (1.03, 1.06)	<0.001	1.07 (1.04, 1.10)	<0.001	1.05 (1.04, 1.06)	<0.001
Gender (reference = Male)	1.06 (0.87, 1.29)	0.546	1.25 (0.83, 1.90)	0.289	1.10 (0.92, 1.31)	0.305
Education (reference = Illiterate)						
Elementary school	0.73 (0.59, 0.90)	0.988	1.23 (0.83, 1.82)	0.295	0.83 (0.69, 1.00)	0.052
Middle school or above	0.55 (0.44, 0.69)	0.214	1.09 (0.68, 1.73)	0.733	0.62 (0.53, 0.78)	<0.001
Residence (reference = Urban)	0.96 (0.94, 0.98)	<0.001	0.94 (0.90, 0.98)	0.006	0.96 (0.94, 0.97)	<0.001
Marriage status (reference = Single)	0.70 (0.52, 0.94)	0.017	1.20 (0.72, 1.99)	0.480	0.79 (0.61, 1.02)	0.072
Employment status (reference = Employed)						
Retired	1.00 (0.79, 1.27)	0.988	0.74 (0.37, 1.44)	0.371	0.97 (0.70, 1.18)	0.804
Unemployed	1.12 (0.94, 1.34)	0.214	1.47 (1.00, 2.17)	0.053	0.94 (0.77, 1.14)	0.047
Chronic conditions (reference =No chronic condition)						
One chronic condition	0.82 (0.70, 0.97)	0.016	1.12 (0.75, 1.67)	0.566	0.85 (0.73, 0.98)	0.029
Multimorbidity	0.63 (0.52, 0.77)	<0.001	1.05 (0.70, 1.57)	0.823	0.69 (0.58, 0.82)	<0.001
Household income (reference = Q1)						
Q2	0.91 (0.75, 1.11)	0.351	0.90 (0.57, 0.41)	0.636	0.91 (0.76, 1.09)	0.328
Q3	1.03 (0.81, 1.31)	0.826	1.50 (0.78, 2.88)	0.222	1.09 (0.87, 1.36)	0.471
Q4	0.81 (0.63, 1.03)	0.086	1.35 (0.69, 2.67)	0.382	0.86 (0.68, 1.07)	0.176
Smoking status (reference = Never)						
Past	0.87 (0.65, 1.16)	0.333	1.08 (0.59, 1.97)	0.814	0.91 (0.70, 1.18)	0.474
Current	0.95 (0.77,1.18)	0.664	0.85 (0.52, 1.41)	0.535	0.94 (0.77, 1.14)	0.522
Alcohol drinking status (reference = Never)						
Past	1.43 (0.99, 2.08)	0.058	0.98 (0.50, 1.93)	0.965	1.31 (0.95, 1.81)	0.103
Current	1.12 (0.92, 1.36)	0.256	1.20 (0.71, 2.01)	0.490	1.12 (0.93, 1.34)	0.231
Exercise times weekly (reference = 0)						
1-5	1.07 (0.85, 1.36)	0.564	0.64 (0.38, 1.05)	0.078	0.97 (0.79, 1.20)	0.803
≥6	0.75 (0.64, 0.88)	0.001	0.63 (0.44, 0.90)	0.010	0.72 (0.62, 0.83)	<0.001
Teeth-brushing daily (reference = <2)	0.92 (0.76, 1.10)	0.343	0.83 (0.34, 0.81)	0.003	0.84 (0.71, 0.99)	0.042
Health examination (reference = No)	0.88 (0.75, 1.04)	0.146	0.93 (0.65, 1.34)	0.693	0.88 (0.58, 0.82)	0.094
Social activities (reference = No)	0.89 (0.75, 1.04)	0.141	1.27 (0.79, 2.04)	0.318	0.91 (0.78, 1.06)	0.236
Living arrangements (reference = Alone)	1.65 (1.23, 2.23)	0.001	1.53 (0.87, 2.67)	0.138	1.61 (1.24, 2.09)	<0.001
BMI (reference = Underweight)						
Normal weight	0.63 (0.40, 0.99)	0.044	1.24 (0.73, 2.10)	0.431	0.81 (0.58, 1.13)	0.209
Overweight	0.68 (0.43, 1.06)	0.091	1.24 (0.71, 2.17)	0.452	0.85 (0.61, 1.20)	0.363
Obese	0.75 (0.46, 0.22)	0.245	1.95 (0.99, 3.82)	0.053	0.99 (0.68, 1.43)	0.953
Need caregiving (reference = No)	0.75 (0.53, 1.05)	0.096	1.06 (0.74, 1.52)	0.735	0.94 (0.74, 1.20)	0.624

adults also requires the involvement of family members [44]. Collaborative work and life support by family members could bolster the doctor-patient interaction, and facilitate a mutually beneficial partnership among the family doctors, the older person and their family members [15, 45]. Therefore, FDCS can fulfill the daily care needs of older adults and address the lack of in-home care, which in turn promotes the choice of home care for older adults to some extent.

We also found that the relationship between signing contracts for family doctors and the home care willingness varied by functional limitations among older adults.

For older adults without functional limitations, signing contracts for family doctors increased the likelihood of willingness for home care. However, the influence of signing up for family doctors on the home care willingness was decreased for older adults with functional limitations. There are three possible reasons for this finding as follows. First, given the large number of older adults with functional limitation and the long duration of disability, disabled older adults showed a greater appetite for rehabilitation training. However, it's possible that the family doctor teams were lack of relevant rehabilitation services and facilities to meet the diverse rehabilitation care needs of the older adults with disabilities [23]. Second, there was a growing phenomenon of the reduced family sizes and the dual pressures of family and work on adult children in China [46]. There were several shortcomings of family members in the provision of care knowledge and professional skills for older adults with disabilities. Better care for older patients with functional impairments was also limited by the size and number of family doctors [23]. Family and community care resources were increasingly incapable to provide the prompt and adequate care to meet the needs of the older adults with functional limitations. Last, residents who had family doctors were more likely to referral to specialists through family doctors [47]. Thus, older adults with functional limitations may be referred to a healthcare institution for professional treatment and care under the assistance of their family doctor.

These findings provide some insight into improving the FDCS policy and the eldercare system. In the context of filial piety, most older people still choose home care. The governments need improve social security system and FDCS policy to ensure living care and medical assistance for older people without function limitations at home. The policymakers should improve incentive policy to increase the supply of family doctors. And the family doctors should enhance own professional skills and establish a strong collaborative relationship with older people and their caregivers, so as to provide multi-level and multi-dimensional services for older people. Moreover, eldercare institutions and rehabilitation hospitals should design age-friendly services and arrange adequate professional staffs to provide better services to disabled older adults.

Nevertheless, some limitations in the current study need to be taken into consideration. First, this study adopted cross-sectional data, which could not interpret the causal relationship of signing contracts for family doctors with home care willingness. It could be further validated in a longitudinal and experimental study in the future. Second, all variables were self-reported by the respondents, which recall bias might be present. Third, Shandong province has a distinctive cultural context, hence, the generalization of our results to other regions requires further validation.

Conclusion

In conclusion, our study implied a relationship between family doctor contract services and home care willingness, and this association varied by functional limitations. Governments and policymakers need to create age-friendly social environment, improve social security system and FDCS policy for older people at home, especially those without functional limitations. Besides, as an effective complement to home care, social care institutions should also provide adequate professional staffs and comfortable care to meet diverse need among disabled older adults.

Abbreviations

FDCS Family doctor contract service
NHSS National health service survey

Supplementary Information

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Additional file 1.

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Authors' contributions

Study concept and design: CZ. Acquisition of data: JS, PL and DZ. Analysis and interpretation of data: SC, XW, XW, JL and JL. Drafting of the manuscript: SC. Critical revision of the manuscript for important intellectual content: CZ, DZ and TG. All authors reviewed the manuscript. And all authors have approved the submitted version of this manuscript and agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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Data availability

The datasets used and analyzed during the current study are not publicly available due to the confidential policy, but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The research protocol was approved by the Institutional Review Board (Academic Research Ethics Committee) of Shandong University School of Public Health. All procedures were in accordance with the ethical standards of the Helsinki Declaration. Each participant signed informed consent prior and ethical approval.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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