Archives of Gerontology and Geriatrics 82 (2019) 238–244

Contents lists available at ScienceDirect

Archives of Gerontology and Geriatrics

journal homepage: www.elsevier.com/locate/archger

Social exclusion, self-rated health and depression among older people in China: Evidence from a national survey of older persons

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ARTICLE INFO

Keywords:
China
Social exclusion
Self-rated health
Depression

ABSTRACT

Background: It is well established that social exclusion is a key social determinant of health; however, such association between social exclusion and health outcomes among older people remain a relatively under-researched area. This paper explores the effects of four dimensions of social exclusion on self-rated health and depression among older people in China.

Methods: This paper includes 8038 individuals aged 60 and over from the first wave national multi-stage probability sample (2014) from the China Longitudinal Aging Social Survey (CLASS). Descriptive univariate information for individual variables and four dimensions of social exclusion are presented. Multinomial and binary logistic regression models are used to examine the associations between social exclusion and self-rated health and depression.

Results: Older people who were in the lower level of exclusion from social relationships or subjective feelings of exclusion were significantly less likely to report fair or poor self-rated health than people in the higher level of exclusion (lower level of exclusion from social activities was significantly associated with being less likely to report poor SRH only). Older people who were in the lower level of subjective feeling of exclusion or exclusion from financial products were significantly less likely to report depression.

Conclusions: Different dimensions of social exclusion have different effects on self-rated health and depression. Social policies need to reflect this and efforts of services could usefully be oriented to prevent multi-dimensions of social exclusion. Ultimately, such policies should have the potential to enhance the health of older people in China.

1. Introduction

Social exclusion, in general, refers to the separation of individuals or groups from mainstream society (Walsh, Scharf, & Keating, 2017). It can be considered a multidimensional process under which individuals and groups become detached from social relations and institutions. The concept has considerable potential to explain and potentially affect disadvantage in society which itself links to a variety of serious conditions such as lack or denial of access to resources, goods, rights, information and services. It therefore can cause an inability to participate in normal relationships and activities available to the majority of people in any given society (Sacker, Ross, MacLeod, Netuveli, & Windle, 2017; Scharf & Keating, 2012; Hawton et al., 2011; Levitas et al., 2007; Walsh et al., 2017). Among older people in particular, social exclusion is receiving increasing attention due to the combination of global demographic ageing patterns, on-going economic instability and the susceptibility of ageing cohorts to increasing inequalities and disadvantage (Walsh et al., 2017). Unlike most younger age groups, older people who experience social exclusion often have their own often age-related characteristics (such as the prevalence of illness, frailty and frequently low incomes and poverty), cumulative disadvantage (vulnerable social position over the lifecourse, or prevalence of being excluded), age-based discrimination (ageism), unfriendly environments and inadequate infrastructure and district planning in the communities (Feng, Phillips, & Jones, 2018; Jose & Cherayi, 2017; MacLeod, Ross, Sacker, Netuveli, & Windle, 2018; Phillips & Feng, 2015; Van Regenmortel et al., 2017; Yuan & Ngai, 2012).

Excluded people may lose a sense of belonging to society and exhibit a separation from mainstream society. Consequently, they may develop psychological problems and exclusion could potentially exacerbate

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https://doi.org/10.1016/j.archger.2019.02.016
Received 29 June 2018; Received in revised form 25 January 2019; Accepted 23 February 2019
Available online 25 February 2019

physical disease that negatively impacts on quality of life, physical health, and mental health (Hawton et al., 2011; Levitas et al., 2007; McCulloch, 2001; Payne, 2010). Their cohort characteristics could result in older people being in an increasingly vulnerable position in their later life. They often risk a steady or sometimes precipitate decline in participation in different domains of life due to loss of paid work, reductions in income and increases in health problems (Feng, 2011), and they are more reliant on the resources available and potentially less able to adapt in their area of residence than younger adults (Robert & Li, 2001), thus affecting their autonomy and security (Phillips, Siu, Yeh, & Cheng, 2005). They are often therefore highly influenced by what their localities offer (Sun, Phillips, & Wong, 2018). Given these cohort characteristics, the effects of social exclusion on health among older people could have rather different patterns and expressions than in the general population, with important implications for policies and services in demographically ageing societies. However, social exclusion and especially its associations with health outcomes among older people remains a relatively under-researched theme (Kneale, 2012; Van Regenmortel et al., 2016; Walsh et al., 2017).

These aspects of social exclusion of older people are of particular importance in China. The country is demographically ageing quite rapidly and has the largest population of older persons of any country in the world. There were 209.2 million people aged 60 and over in 2014, 14.4 per cent of the nation's total population (Helpage International, 2015). In the last forty years, China has experienced fundamental changes in economic, demographic and social structures and these have been accompanied by sometimes serious changes in social attitudes towards older people. From the family size perspective, the younger generations aged under 40 generally do not have any or only have fewer siblings to share filial obligations (duties of care) for older people. This stems principally from family policies implemented since the late 1970s (particular the One-Child policy). Therefore, today's young and young-middle age children often find it very difficult to be 'filial' to their parents in the traditional way and many look to the state to take more responsibility for the support of older people (Du, 2013; Phillips & Feng, 2017; Phillips & Feng, 2015; Phillips & Feng, 2018). From a societal perspective, the changes have been felt to have caused older people to experience marginalisation and social exclusion during the enormous modernisation and transitions in contemporary institutions in China (Tong & Lai, 2016). In addition, it is widely believe that rapid socio-economic development and demographic changes are associated with a generalised decline in close family relationships (Phillips & Cheng, 2012). Crucially, the development of the social security system and formal support have lagged some way behind economic development and the system is generally unable to provide appropriate formal support for older people. The combination of exclusion from family and society in the absence of suitable support is therefore doubly threatening older people in China.

Previous research in Shanghai (China's most developed and economically leading city), has found that social exclusion variables can be significantly associated with health outcomes (Tong & Lai, 2016) and these variables are often more important than other socio-demographic factors in affecting depressive symptoms (Tong, Lai, eng & Xu., 2011). However, broad-based comparative research on the relationships between social exclusion and health among older people in China is still very scarce and no studies have been carried out of a more comprehensive national survey. This paper therefore aims to address this gap in the literature by investigating social exclusion and health for older people in China using a national representative sample drawn from the China Longitudinal Aging Social Survey (CLASS) data base.

Regarding the operationalisation of social exclusion, many scholars suggest that this needs to be multi-dimensional and sensitive to stage in the life cycle (Scutella and Wilkins, 2010; Van Regenmortel et al., 2017). In this present study, four dimensions of social exclusion were constructed from the CLASS dataset, following Kneale's (2012), namely: exclusion from social relationships, exclusion from social activities, subjective feeling of exclusion and exclusion from financial products. *Exclusion from social relationships* refers to whether individuals report relationships with children, friends, and other immediate family, how often and close the respondent perceives these relationships to be and how these relationships are maintained through, for example, talking on telephone or meeting up. In addition, the frequency with which a child(ren) helped to do housework is also included in this dimension to reflect filial duties, traditional culture and the responsibility of children to support and take care of their parents in China. *Exclusion from social activities* denotes the ability of older people to participate effectively in social, political and cultural life, and isolation and distance from mainstream society (Duffy, 1995; see also in Kneale, 2012). Whether older people had participated in for example community security patrols, help for other older people, environmental protection, dispute resolution, chatting with others for psychological advice, providing professional volunteer services (such as to visit clinics), taking care of another family's children, and any other participation in their neighbourhood during the past three months, were measured in this study. These social activities could increase the chance of social interaction with neighbours and reduce the risk of being excluded. *Subjective feeling of exclusion* is measured by individuals' feelings of being ignored, isolated and lonely in the last week, and how s/he feels isolated or whether making new friends has become much more difficult because age, and whether growing old is a form of loss. *Exclusion from financial products* reflects whether people are generally unable to access financial resources to help them maintain their living either on a day-to-day basis or longer term. This includes access to short-term financial product (income from own labour and work as main income sources), medium-term financial products (previous savings and other financial products) and long-term savings products (pension) (details are shown below in Methods). This paper therefore explores the effects of these four dimensions of social exclusion on self-rated health and depression health among older people in China.

2. Data and Methods

2.1. Data source

Data are drawn from the first wave of a national representative sample of persons aged 60 and older in the China Longitudinal Aging Social Survey (CLASS) study of 2014. The aim of CLASS is to understand various problems and challenges that older Chinese people face during the ageing process (CLASS webpage[1]). People aged 60 and above were randomly chosen from randomly selected villages (*cun*) in rural areas and neighbourhoods (*shequ* or *juweihui*) in urban areas within 28 of the 31 provinces in China. 8038 respondents with sufficient data were used for the present analysis. Among these respondents, 58 per cent of respondents were aged 60–69; 54 per cent of individuals were males; more than 90 per cent of individuals were Han-Chinese; around 65 per cent lived in urban areas; nearly 80 per cent were educated; 80 per cent of respondents were economically inactive; more than 85 per cent of individuals owned at least one house; and around 47 per cent were 'empty nesters' (Table 1).

2.2. Measures

2.2.1. Health

Two health outcomes representing physical and mental health outcomes were considered: Self-Rated Health (SRH: Good, fair or poor) and depression. SRH has been found to be a sensitive and reliable indicator of an individual's current health status (Wu & Schimmele, 2006); and depression was measured from whether respondents felt depressed during the last week.

[1] http://class.ruc.edu.cn/index.php?r=index/index&hl=en

Table 1
Descriptive univariate information for individual variables.

Whole Sample	n n = 8038	Exclusion from social relationships 0-26, mean = 9.0	Exclusion from social activities 0-6, mean = 0.3	Subjective feeling of exclusion 0-6, mean = 4.1	Exclusion from financial products 0-5, mean = 2.2
Self-rated health					
Good	3699(46.0%)	9.17	0.32	4.38	2.33
Fair	2476(30.8%)	8.88	0.30	4.17	2.20
Poor	1864(23.2%)	8.62	0.26	3.59	2.15
Depression			(p > 0.05)		
No	5620(69.9%)	9.06	0.31	4.47	2.28
Yes	2419(30.1%)	8.71	0.29	3.36	2.18
Age					
60-69	4684(58.3%)	8.29	0.33	4.19	2.39
70-79	2458(30.6%)	9.70	0.29	4.07	2.10
80-89	897(11.1%)	10.37	0.17	4.01	2.94
Gender			(p > 0.05)	(p > 0.05)	
Male	4350(54.1%)	8.70	0.29	4.15	2.40
Female	3689(45.9%)	9.25	0.31	4.11	2.06
Ethnicity					(p > 0.05)
Han[+]	7533(93.7%)	8.87	0.29	4.15	2.25
Non-Han	506(6.3%)	10.21	0.45	3.94	2.23
Resident			(p > 0.05)		
Urban	5298(65.9%)	8.82	0.29	4.29	2.10
Rural	2741(34.1%)	9.22	0.31	3.84	2.52
Educational attainment			(p > 0.05)		
No	1627(20.2%)	9.70	0.26	3.78	2.13
Elementary School or below	2870(35.7%)	9.26	0.29	4.02	2.30
Middle School	1926(24.0%)	8.51	0.33	4.32	2.28
High School and above	1615(20.1%)	8.18	0.32	4.46	2.24
Economic activity				(p > 0.05)	
Active	1596(19.9%)	3.36	0.37	4.13	3.29
Inactivity	6436(80.0%)	9.01	0.28	4.13	1.99
Missing	7(0.1%)	8.54	0.14	4.25	2.71
Total personal income					
Lowest Quintile	1223(15.2%)	9.43	0.26	3.75	1.88
2nd	1232(15.3%)	9.00	0.31	3.77	2.45
3rd	1629(20.3%)	9.12	0.33	4.15	2.44
4th	1485(18.5%)	8.71	0.28	4.34	2.24
Highest Quintile	1828(22.7%)	8.45	0.33	4.49	2.29
Missing	642(8.0%)	9.53	0.23	4.05	1.98
Housing tenure			(p > 0.05)		
Do not own any	1018(12.7%)	9.88	0.29	3.89	2.02
Own	6985(86.9%)	8.82	0.30	4.17	2.28
Missing	36(0.4%)	8.79	0.11	4.06	2.14
Living arrangements					
Empty nest[++]	3774(47.0%)	8.16	0.28	4.08	2.29
Others	4265(53.0%)	9.65	0.32	4.18	2.21

Note: +: Han-Chinese is the largest ethnic group; Non-Han Chinese is persons from ethnic minorities.
++ "Empty nest" includes older people who are living alone or living with spouse only.
Most mean differences in four dimensions of social exclusion by health and other covariate measures are significant at 0.05 level (one-way ANOVA or *t*-test), "*" indicates the P-values are greater than 0.05.

2.2.2. Social exclusion

According to the measurement of social exclusion explained in the introduction, four dimensions of social exclusion were constructed from the CLASS data: (1) exclusion from social relationships (2) exclusion from social activities (3) subjective feeling of exclusion and (4) exclusion from financial products. Each dimension comprised up to 10 indicators capturing relevant aspects of social exclusion pertaining to that dimension. In order to maximise the comparability with the published literature, the scales of indicators in this study followed Kneale's (2012) definitions; the direction of each dimension of social exclusion is also the same as Kneale's.

Exclusion from social relationships: three types of social relationships were considered: relationships with children, friends, and other immediate family members. Respondents were given points (maximum 1 for each question) to develop a score based on the frequency of receiving help from a child, meeting with a child, and contact with a child by phone. Respondents were allocated 0, 0.25, 0.5, 0.75 and 1 respectively for "almost never", "couple of times a year", "at least once a month", "at least once a week", to "almost every day" for up to four children. The maximum score for the relationship with children was 20. In addition, respondents were allocated 0, 0.5, 1 and 1.5 respectively for "number of close relationships with children" from "none", "one close child, "two close children" and "more than two close children" (the maximum scores for the number of close relationships with children was 1.5). In terms of the relationship with friends/immediate family, respondents were also given points (maximum 1) to develop a score based on the number of friends/ immediate family. They were assigned 0, 0.2, 0.4, 0.6, 0.8 and 1 respectively for the number of friends/immediate family that they were able to meet each month, who they felt comfortable talking about private affairs with and who were

able to provide their help when needed, ranging from “none”, “one”, “two”, “three to four”, “five to eight”, and “nine and above”. The maximum scores for the relationship with friends and relationship with immediate family were 3 and 3 respectively. Scores on exclusion from social relationships were then summed to give an overall scale from 0 to 26, with a higher score indicating a greater level of inclusion in social relationships (no-one reached all the maximum scores for these four relationships) (see Table 1).

Exclusion from social activities: Respondents identified activities in which they had participated during the past three months, including community security patrols, help for other older people, environmental protection, dispute resolution, chatting with others for psychological advice, providing professional volunteer services (such as to visit clinics), taking care of another family’s children, and any other participation. Respondents were allocated 1 point for participating in one activity. Scores were summed via the number of activities in which respondents participated from 0 to 6, with higher score indicating a lower level of exclusion from social activities (see Table 1).

Subjective feeling of exclusion: Respondents were allocated 0, 0.5, and 1 respectively for the frequency “Always”, “Sometimes” or “No” they felt being ignored, isolated and lonely in the last week. In addition, respondents were also assigned 0, 0.25, 0.5, 0.75 and 1 respectively for the degrees to which they agree or disagree (from completely agree, agree, fair, disagree and completely disagree) with feeling isolated because of their age, feeling of growing old as a form of loss (such as experiencing poorer health and loss of friends) and feeling it more difficult to make new friends. The last three questions reflect aspects of ageism. Values ranged from 0 to 6. Again, scores were constructed by summing the points from these questions with a higher score implying feelings of higher inclusion (see Table 1).

Exclusion from financial products: Respondents were allocated 2, 1, and 2 points respectively for having short-term incomes (income from their own labour and work as a main financial sources), medium-term products (savings and other financial products) or long-term products (pension and pension support). Scores on the three products were summed and recalibrated to give an overall scale from 0 to 5, with high scores representing a lower level of exclusion from financial products (see Table 1).

In the regression models, the scales on the four dimensions of social exclusion were standardized in this study due to different scale ranges, and the correlations among four dimensions were less than 0.2. We also consider age, gender, ethnicity, urban-rural residency, educational attainment, economically active, total personal income in the last year, housing tenure, and living arrangements as covariates, to make sure the effects of social exclusion on health are reliable. Table 1 shows the distribution of both health outcomes, the four dimensions of social exclusion and covariates across the sample.

2.2.3. Data analysis

In view of the response categories relating to the two health outcomes, a multinomial logistic regression examined the effect of social exclusion on SRH, and a binomial logistic regression was used to examine the effect of social exclusion on older people’s depression. Model 1 initially incorporates all covariates of older people, and Model 2 subsequently adds four dimensions of social exclusion to investigate the real effects of social exclusion on health outcomes.

3. Results

3.1. Descriptive findings

Table 1 presents descriptive statistics for health outcomes, covariates, the four dimensions of social exclusion, and mean differences in the four dimensions of social exclusion by the health and covariate measures (mean differences were analysed with a one-way ANOVA or *t*-test statistical analysis). Two-thirds of older people reported they had not felt depressed last week (69.9%), and around half reported good SRH (46%). Means of four dimensions of social exclusion show a consistent direction: namely, older people who were at a lower level of exclusion from four dimensions were more likely to report good SRH and no depression than those who were at a higher level of exclusion from four dimensions. The means of the four dimensions of social exclusion varied across values on different covariates. For example, the mean for exclusion from social relationships ranged from 8.29 for older people aged in their 60s, 9.7 for those in their 70 s and 10.37 for those aged 80 and above, while the means of exclusion from social activities for these three groups were 0.33, 0.29 and 0.17 respectively. A similar declining pattern was found for the subjective feeling of exclusion. These results indicate that as age advances, respondents were less likely to be excluded from social relationships than older people at a younger age, but they were more likely to be excluded from social activities and to report feelings of being excluded. Older people who are female, Non-Han Chinese, and living in rural areas, were less likely to be excluded from social relationship, and social activities than those who are male, Han-Chinese, and living in urban areas. Non-Han Chinese and rural residents were more likely to feel they were being excluded than Han-Chinese and urban residents. The higher the level of educational attainment, the more likely were people to be excluded from social relationships, but there was an inverted pattern in subjective feelings of exclusion, with the higher level of educational attainment the less likely to feel being excluded. Empty nesters were more likely to be excluded from social relationships, social activities and to feel being excluded than non-empty nesters. These results imply that, whilst there is a consistent direction effect of social exclusion on health outcomes based on the descriptive analysis, the varied directions of social exclusion and covariates could influence the reliable effects of social exclusion on health.

3.2. Statistical modelling

The results of reporting fair or poor self-rated health in the multinomial regression models in Model 1 show that older people who were in the older age group, with some educational attainment (elementary school and above), economically inactive and in other living arrangements (rather than empty nest - living alone or with spouse only), were more likely to report fair health than those who were at a younger age group, without educational attainment, economically active and were ‘empty nesters’. Older people who were rural residents, economically inactive, and those who did not own any property were more likely to report poor health than the urban residents, economically active and who owned any property. Higher educational attainment and income were associated with lower odds of reporting poor health. In Model 2, the effects of covariates on SRH are similar to those found in Model 1, when four dimensions of social exclusion were entered. The increased Pseudo R^2 values in Model 1 to Model 2 shows a sizeable improvement when four dimensions included. This indicates that Model 2 is a better fit model than Model 1. With regard to the effects of social exclusion on SRH, lower levels of exclusion from social relationships and subjective feelings of exclusion were significantly associated with being less likely to report fair and poor SRH, and a lower level of exclusion from social activities was significantly associated with being less likely to report poor SRH only. Exclusion from financial products was not significantly associated with SRH (Table 2).

In terms of the results of the logistic regression models for reporting having depression, the results are very similar to those for reporting poor SRH. Higher educational attainment and income were associated with being less likely to report having depression; older people who were economically inactive were more likely to report having depression than those who were economically active. Importantly, females and non-Han Chinese (persons from ethnic minorities) were significantly more likely to report having depression than males and Han Chinese, and those in ‘other living arrangements’ were less likely to

Table 2
Multinomial regression estimates for reporting fair or poor self-rated health.

	Model 1		Model 2	
	Fair ORs (95%CI)	Poor ORs (95%CI)	Fair ORs (95%CI)	Poor ORs (95%CI)
Age (ref: 60-69)				
70-79	1.21(1.07-1.36)***	1.23(1.08-1.4) ***	1.26(1.11-1.42) ***	1.31(1.14-1.5) ***
80+	1.27(1.07-1.51)***	1.04(0.85-1.27)	1.32(1.11-1.58) ***	1.09(0.89-1.35) ***
Female (ref: Male)	1.05(0.95-1.17)	1.12(1.00-1.27) *	1.08(0.97-1.2)	1.19(1.05-1.35) ***
Non-Han (ref: Han-Chinese)	0.90(0.72-1.13)	1.10(0.88-1.38)	0.92(0.73-1.15)	1.16(0.92-1.46)
Rural (ref: Urban)	0.94(0.82-1.08)	1.52(1.32-1.75) ***	0.93(0.81-1.07)	1.46(1.25-1.69) ***
Educational attainment (ref: No)				
Elementary School or below	1.28(1.09-1.50) ***	0.89(0.76-1.04)	1.31(1.12-1.54) ***	0.96(0.81-1.12)
Middle School	1.28(1.07-1.53) ***	0.66(0.54-0.79) ***	1.32(1.1-1.58) ***	0.73(0.6-0.89) ***
High School and above	1.25(1.03-1.52) **	0.62(0.50-0.78) ***	1.3(1.07-1.58) **	0.7(0.56-0.88) ***
Economically active (ref: active)				
Inactive	1.50(1.30-1.74) ***	1.96(1.67-2.30) ***	1.43(1.21-1.68) ***	1.78(1.48-2.15) ***
Missing	1.06(0.19-5.81)	0.90(0.10-8.50)	1.01(0.18-5.58)	0.88(0.09-8.38)
Income (ref: Lowest Quintile)				
2nd	0.97(0.79-1.19)	0.97(0.80-1.18)	0.98(0.80-1.20)	0.99(0.81-1.21)
3rd	0.80(0.66-0.97) **	0.57(0.47-0.70) ***	0.84(0.69-1.02) *	0.66(0.54-0.81) ***
4th	0.81(0.66-0.99) **	0.48(0.39-0.60) ***	0.86(0.70-1.06)	0.58(0.46-0.72) ***
Highest Quintile	0.91(0.74-1.12)	0.47(0.37-0.59) ***	0.99(0.8-1.22)	0.6(0.47-0.76) ***
Missing	1.07(0.85-1.36)	0.74(0.58-0.95) **	1.12(0.88-1.42) *	0.82(0.64-1.05)
House tenure (ref: Own)				
No	0.96(0.81-1.13)	1.21(1.03-1.44) **	0.94(0.8-1.11)	1.16(0.98-1.38) *
Missing	2.18(1.02-4.67) **	1.43(0.54-3.77)	2.11(0.98-4.52)	1.34(0.5-3.6)
Living arrangement(ref: Empty nest)				
Others	1.12(1.01-1.24) **	0.91(0.81-1.02)	1.2(1.08-1.34) ***	1.07(0.95-1.21)
Exclusion from social relationships			0.89(0.84-0.95) ***	0.82(0.77-0.88) ***
Exclusion from social activities			1.00(0.95-1.05)	0.94(0.89-1) **
Subjective feeling of exclusion			0.8(0.76-0.85) ***	0.57(0.53-0.61) ***
Exclusion from financial products			0.97(0.9-1.03)	0.96(0.89-1.03)
Pseudo R2	0.0353		0.0604	

***p < 0.01, **p < 0.05, *p < 0.1.

report having depression than 'empty nest' older people (Model 1). Looking at the effects of social exclusion on depression in Model 2 (Model 2 is a better fit model than Model 1 according to the Pseudo R^2), lower levels of a subjective feeling of exclusion and exclusion from financial products were significantly associated with being less likely to report having depression (ORs = 0.34 and 0.91 respectively) (Table 3).

4. Discussion

This study's principal findings of importance concern the associations between social exclusion and health outcomes among older people in China using a national representative sample. In the previous literature (admittedly, mainly drawn from Western countries), it is generally accepted that there will be a greater chance that older people will become socially excluded as they grow older (for example, Sacker et al., 2017; Van Regenmortel et al., 2017; Walsh et al., 2017). Importantly, our results in Table 1 show differentiation among the older Chinese respondents, for example, in that older people aged 80 and above were more likely to be at a lower level of exclusion from social relationships and exclusion from financial products but more likely to be a higher level of exclusion from social activities and higher subjective feeling of exclusion than the other old age groups. This may reflect the actual and latent effects of filial piety in many Asian countries, and previously particular prominent in China. Both societies and families tend to show great respect for those of advanced age (80+), which may ensure the oldest old people could meet, contact and receive help from their family members regularly. Moreover, and local government also provides financial and care assistance to the oldest old people in China (Feng, Wang, & Jones, 2013; Phillips & Feng, 2015; Phillips & Feng, 2018).

Within this unique background in China, the results show specific associations between different dimensions of social exclusion and self-rated health and depression. Older people who reported lower levels of exclusion from social relationships were significantly less likely to report fair or poor SRH. Keeping contact with children, friends, or other immediate family, on one hand, could increase the chances that older people receive social support from their social relationships when they are sick which could reduce the negative responses to stressful events (Feng, Jones, & Wang, 2015; Lyyra & Heikkinen, 2006). On the other hand, older people's health could be more easily monitored by their social relationships which could prevent the worsening of disease. Similarly, lower levels of subjective feelings of exclusion were associated with being statistically less likely to report fair or poor SRH, and depression. Age-based discrimination (ageism) are factors that lead to social exclusion of older people (Phillipson & Scharf, 2004). The stress of subjective feelings of exclusion could negatively impact people's psychological and mental health status. Scoring lower levels of exclusion from social activities was significantly associated with being less likely to report poor SRH only. Age-related characteristics may be barriers for persons in the oldest old cohorts to participate in social activities (Phillipson & Scharf, 2004). A lower level of exclusion from financial products was significantly associated with being less likely to report depression. This is consistent with Tong et al.'s (2011) findings among older people living alone in Shanghai, where a lower level income adequacy, as one dimension of social exclusion, was significantly associated with more depressive symptoms. Tong et al. (2011) pointed out that finance is often a major concern for older people who are living alone as they have to worry about having inadequate financial resources to support themselves in later life. Indeed, the rapid economic changes in China have changed all aspects of Chinese life and led to an obvious and marked increase in the overall costs of living in China. Our findings contribute to and extend those of Tong et al.'s (2011) by using a more recent national dataset that includes both living alone and living

Table 3
Logistic regression models for reporting having depression.

	Model 1 ORs (95%CI)	Model 2 ORs (95%CI)
Age (ref: 60-69)		
70–79	0.90(0.81-1.01) *	0.83(0.73-0.94) ***
80 +	0.98(0.83-1.16)	0.87(0.72-1.05)
Female (ref: Male)	1.20(1.08-1.33) ***	1.31(1.17-1.47) ***
Non-Han (ref: Han-Chinese)	1.27(1.05-1.54) **	1.23(1-1.52) *
Rural (ref: Urban)	1.05(0.93-1.19)	0.92(0.8-1.05)
Educational attainment (ref: No)		
Elementary School or below	0.86(0.76-0.99) **	0.98(0.84-1.14)
Middle School	0.71(0.61-0.84) ***	0.89(0.74-1.06)
High School and above	0.72(0.60-0.87) ***	0.98(0.8-1.2)
Economically active (ref: active)		
Inactive	1.18(1.03-1.35) **	0.96(0.81-1.13)
Missing	1.85(0.40-8.49)	1.97(0.41-9.58)
Income (ref: Lowest Quintile)		
2nd	0.92(0.78-1.08)	0.92(0.76-1.11)
3rd	0.73(0.62-0.85) ***	0.90(0.75-1.08)
4th	0.59(0.49-0.71) ***	0.79(0.65-0.97) **
Highest Quintile	0.42(0.35-0.51) ***	0.60(0.48-0.74) ***
Missing	0.81(0.66-0.99) **	0.93(0.74-1.17)
House tenure (ref: Own)		
No	1.03(0.89-1.19)	0.88(0.75-1.03)
Missing	2.04(1.04-4.01) **	1.98(0.95-4.1) *
Living arrangement(ref: Empty nest)		
Others	0.85(0.77-0.94) ***	0.97(0.87-1.08)
Exclusion from social relationships		1.01(0.95-1.07)
Exclusion from social activities		0.99(0.94-1.05)
Subjective feeling of exclusion		0.34(0.32-0.36) ***
Exclusion from financial products		0.91(0.85-0.97) ***
Pseudo R2	0.0308	0.1762

***p < 0.01, **p < 0.05, *p < 0.1.

with other older people in China. This finding emphasises that having adequate financial resources is still a very important factor to older people's mental health in contemporary China. This is a very important finding in terms of targeting policy and financial support.

Our findings imply not only a detrimental association between social exclusion and health outcomes among older people, which is consistent with previous research in China or globally (i.e. Hawton et al., 2011; Payne, 2010; Tong and Lai, 2016), but they also highlight the key dimensions of social exclusion on different health outcomes, even though the effects of these four dimensions on health outcomes operate in the same direction. The findings in this study constitute a key original research contribution to knowledge on social exclusion and self-rated health and depression, especially in the context of the world's largest ageing population.

Whilst providing novel findings and insights, this paper has a number of limitations. First, the CLASS survey lacks information on cultural activities, civic activities and access to information, nor does it have data on local amenities, public transport and common consumer goods, as do some international studies such as Kneale's (2012) or Tong and Lai (2016) in Shanghai. Many of these items are deemed important in research and policies such as the WHO's age friendly cities and communities programme (Sun et al., 2018; WHO (World Health Organization), 2018). However, we reviewed all the national representative surveys for older people in China and the CLASS data present the most comprehensive and recent information on social exclusion currently available. Second, we are not able to examine the potential cumulative disadvantage effects of social exclusion on health due to the cross-sectional nature of the dataset. Future research could usefully explore this effect when the CLASS team conduct and release subsequent surveys.

This paper nevertheless provides important insights into the growing challenges of social exclusion on health outcomes among older people in China. The results highlight the need to develop more comprehensive age-related social policy and services, especially those to address multiple dimensions of social exclusion. In the coming decades, given the demographic structure, older people in China will have fewer children to provide support due to population policies and effects of modernization. This factor alone could well result in many older people living at higher levels of exclusion from social relationships. This calls for the development of more specifically age-related social policies and services (WHO (World Health Organization), 2015) to ensure older people will have a safe and supportive social network with if possible family members, friends, neighbours or volunteers, to maintain their social relationships and encourage them to participate social activities. In addition, the state-public sector needs to develop support services and psychological counselling services for older people to help them face and ameliorate the effects of social exclusion from possible ageism. There is also an important need to develop social security to ensure older people could access appropriate financial products. Efforts to minimise the deleterious multi-dimensional effects of social exclusion have the potential to greatly enhance the future health and well-being of older people in China.

Conflict of interest

No.

Acknowledgements

Data analyzed in this paper (article) were collected by the research project "China Longitudinal Aging Social Survey(CLASS)", sponsored by Renmin University of China. The CLASS research project was conducted by Institute of Gerontology and National Survey Research Center of Renmin University. The authors acknowledge the assistance in providing data of the institutes and individuals aforementioned. The views expressed in this paper are the authors' own. This research was supported by Worldwide University Network Research Development Fund 2017 (a grant to Zhixin Feng).

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