

Death and suicidal ideation among nursing home residents in a Chinese city – a pilot study

Sheng-Ming Yan^{a*} and Song-Guo Yi^b

^a*Department of Sociology, Peking University, China and Peking University – Hong Kong Polytechnic University Social Work Research Center, China;* ^b*Department of Sociology, Shenzhen University, China*

This paper examines death and suicidal ideation among nursing home residents in a Chinese City using a questionnaire survey data. Findings from the survey show that 17.4% of the participants have death and suicidal ideation, and the prevalence of passive and active ideation are 15.4% and 6.2% respectively. The presence of death and suicidal ideation among nursing home residents correlates with depressive symptoms, life satisfaction, and satisfaction with nursing home services. As death and suicidal feelings are risk factors for suicide, the findings imply that implementing depression prevention programmes and improving service quality of nursing homes are vital in preventing suicides among nursing home residents.

摘要：通过问卷调查，本文将探讨在中国某城护理院住户的死亡和自杀意念。调查发现，17.4%的住户在以往有过死亡和自杀意念，而被动性及活跃性意念分别占15.4%和6.2%。作者认为死亡和自杀意念的出现与抑郁症状、生活满意度和对护理院满意度相关。因此，这意味着抑郁预防措施及改善护理院服务素质会对预防住户自杀有重大帮助。

Keywords: death ideation; suicidal ideation; nursing home; China

关键词：死亡意念、自杀意念、护理院、中国

In most countries, the suicide rate amongst the elderly is high (Ji 2000, De Leo *et al.* 2001, Chiu *et al.* 2003). Findings from previous studies reveal that depression or depressive symptoms are the most important predictor of suicide among the elderly (Conwell *et al.* 2002, O'Connell *et al.* 2004, Conwell and Thompson 2008). In addition, other factors associated with suicide among older adults include suicidal thoughts, other mental health problems, physical illnesses/functional impairment, losses and lack of social support (O'Connell *et al.* 2004, Heisel 2006, Ku *et al.* 2009). As nursing home residents are more likely to be depressive, and vulnerable in physical health than those outside of institutional care (Beekman *et al.* 1999, Yi and Yan 2006), nursing home residents are often assumed to be at greater risk of suicide.

However, reports about suicide and attempted suicide among the older adults living in institutional settings are mixed. On the one hand, some researchers claim that suicides and attempted suicides are less common among nursing home residents than those outside of

*Corresponding author. Email: shengmingyan@yahoo.com.cn

institutional care (Abrams *et al.* 1988). On the other hand, recent evidence shows that nursing home residents are as likely to commit suicide as those without institutional care (Scocco *et al.* 2006, Scocco *et al.* 2009). As suicides are infrequent events and so far there have been few studies of suicide among older adults living in institutional settings, more studies are needed so as to better evaluate the risk for suicide among older adults in institutions and then to take proper preventive measures.

A helpful approach to respond to this need is to examine the death and/or suicidal feelings, which compose the more frequent phenomena on the suicide continuum and which may precede a completed suicide (Scocco *et al.* 2009). This was supported by evidence from previous studies of community-dwelling older adults which showed that frequency decreased gradually along the suicide continuum from death wishes to suicidal behaviour (Scocco and De Leo 2002). Still, there have been few studies of the death and suicidal ideation among the older adults living in institutional settings.

Previous studies show that the prevalence of death and suicidal ideation among nursing home residents ranged from 21.5% to 40.1% and 2.3% to 12.1% respectively, and the prevalence of passive and active ideation ranged from 20.9% to 39.0% and 2.3% to 9.3% respectively, depending on the measures and reference time frame. Overall, the prevalence of death or suicidal ideation was 30.8% in the previous month (Haight 1995, Scocco *et al.* 2009). The residents who lacked a significant other person in their life, had lower life satisfaction, lower well-being, higher self-esteem,¹ were more depressed, more hopeless, and had arthritis, were more likely to report suicidal ideation. Results about the association of age and gender with death and suicidal ideation were mixed. In one study, age was significantly associated with suicidal ideation, and no gender difference was found (Haight 1995). In the other, age and gender were correlated only with specific ideation (e.g. active or passive ideation) in a specific time frame (e.g. previous month, previous year, or life time) (Scocco *et al.* 2009). In addition, no significant differences were found in race, marital status, religion, education, presence of family members, finances, self-report of health, or most chronic illnesses (e.g. diabetes, hypertension, heart disease, and cancer) (Haight 1995).

Like other countries, the suicide rate for older adults is the highest across all age groups in China. For instance, during 1995 to 1999, the suicide rate for those aged between 60–84 years old was 68 per 100,000, compared with 23.2 per 100,000 for the general population (Phillips *et al.* 2002). Today, China has the largest elderly population in the world, with more than 167 million adults aged 60 years or older, of whom 18.99 million were aged 80 years or older in 2009 (China National Commission on Aging 2010). With the rapid increase of the elderly population, coupled with other profound social transformations, such as greater geographic mobility among children, a decrease in family size, a smaller number of adult children available to support aged parents and a decline in traditional values about living arrangements, etc., the number of elderly living in nursing homes is swelling. By the end of 2009, there were 38,060 nursing homes in mainland China, providing 2.662 million beds for 2.109 million residents. These constitute an increase of 9.1% and 7.7% respectively in the number of beds and residents compared to 2008 (China National Commission on Aging 2010). Recent research also shows that nursing home residents in mainland China are more likely to be depressive and have poorer physical health (Yi and Yan 2006, Yao 2010, Xie *et al.* 2010). In light of the findings from these studies, and the absence of specific research concerning suicidal phenomena among nursing home residents in China to date, such study is extremely important so as to better prevent suicide among those in institutional care. Thus, this study aims to explore the prevalence and correlates of death and suicidal ideation among nursing home residents in a Chinese city.

Method

Data for this study were collected by means of a face-to-face questionnaire interview of nursing home residents conducted at the end of 2004. At the time of the survey, there were 25 nursing homes with 924 residents in the city, but due to poor health and/or cognitive problems, only 206 residents successfully completed the questionnaire. No significant differences in age and gender distribution were found between those who completed the interview and all the 924 residents ($\chi = 6.712$, $df = 3$, $p = 0.082$; $\chi = 1.489$, $df = 1$, $p = 0.222$).

Death and suicidal ideation among the respondents was measured with a set of questions developed by Paykel and his colleagues, which other researchers have subsequently adapted to assess suicidal ideation and behaviour among elders living in community or other settings (Paykel *et al.* 1974, Scocco and De Leo 2002, Scocco *et al.* 2009). These questions had not been used previously in China. The questions were translated from English into Chinese by the first author and were subsequently reviewed by the second author and then back-translated by an experienced Chinese psychiatrist. The questions were then piloted and further refined in the light of piloting. The measure of the suicidal feelings and behaviour consists of five close-ended questions with yes or no response format: (1) Have you ever had the feeling that life is not worth living? (2) Have you ever wished to die, for example, to go to sleep and not wake up again? (3) Have you ever thought of taking your own life, even though you would never do so? (4) Have you ever seriously considered taking your own life, or made plans on how to go about doing so? (5) Have you ever attempted to take your own life? This format was chosen as it is easy to be administered, thus, suitable for collecting data from older adults. According to Scocco (2002), the five questions constitute a suicidal continuum, with one end representing the weakest suicidal phenomenon – death thoughts, and the other potentially fatal behaviour – attempted suicide. In this study, the fifth question probing the attempted suicidal behaviour will be excluded, and only the first four items regarding death and suicidal ideation will be included in the analysis, as the aim of this paper is to study the death and suicidal ideation. Respondents who gave an affirmative answer to any of the four items are considered to have death and suicidal ideation, regardless of their severity. As the prevalence of death and suicidal ideation is dependent on the reference time frame examined and a longer reference time frame may result in greater recall bias of the elder respondents, in this study, only the prevalence in the previous month of the survey was reported.

Depressive symptoms were measured with the Geriatric Depression Scale (GDS-30) developed by Brink, Yesavage and colleagues (1982). It was validated among Chinese older adults and has good reliability and validity (He *et al.* 2008, Yan 2008). In this study, the scale had a good internal consistency and the Cronbach's α was 0.82.

The data from the survey were analysed with univariate descriptive analysis, and followed by bivariate crosstabulation analysis. Chi-square test was used to examine the relationship between hypothesized correlates and death or suicidal ideation. For the 2 plus 2 tables, Fisher's exact test was used. All the statistical analysis was conducted with SPSS 12.0, and the significance level was set to $p < 0.05$.

Results

1. Sociodemographic characteristics of nursing home residents

Among the respondents, 70.2% were female and 29.8% were male. The youngest were 60 years old, while the oldest was 101 years old. 27.9% were under 75 years old, 21.1% were

75–79 years old, 22.1% were 80–84 years old, and 28.9% were 85 years or above. The mean age was 79.5 years old and the standard deviation was 8.1 years. 43.2% received no formal education, 24.4% received 1–6 years, and 32.4% received 7 years or above of formal education. 64.6% were widowed, 12.1% had never married, 18.7% were married at the time of survey, and the rest of 4.5% were either separated or divorced. In addition, most of the respondents had a permanent household registration in the city, accounting for 71.6%, 25.8% had an urban household registration in other provinces, and 2.6% had a rural household registration in other provinces. 73.0% of the respondents funded the expenses at nursing homes from private sources, while the rest were supported by the government, among whom 25.0% were those whom the government guarantees food, clothes, housing, medicine, and burial (the Five-Guarantees) and 2.0% were those who had no income, no working ability and no supporters (the Three-Nos).

2. Prevalence of death and suicidal ideation

Among the respondents, 14.4% of all respondents had ever had the feeling that life is not worth living, 8.2% had ever wished to die, 6.2% had ever thought of taking their own life, 1.5% had ever seriously considered taking their own life. Different degrees of suicidal feelings are not mutually exclusive to one another. Those who have severe ideation often have mild ideation also. Among the respondents, 9.2% have had one of the ideations listed above, 4.6% have had two of the ideations, 2.6% have had three of the ideations, 1.0% have had all of the four ideations, and 82.6% have had no ideations. If having death and suicidal ideation is defined as having any of the four kinds of ideation listed above, then the prevalence of death and suicidal ideation among the nursing home residents in the previous month of the survey was 17.4%. If an affirmative answer to any of the first two questions is defined as passive thought, and an affirmative answer to any of the latter two is regarded as active thought, then, the prevalence of passive ideation was 15.4%, and active ideation was 6.2%.²

3. Correlates of death and suicidal ideation

Bivariate analysis shows that the presence of death and suicidal ideation correlates with depressive symptoms, life satisfaction, and satisfaction with nursing home services, independent of the respondents' sociodemographic characteristics, economic status, level of social support within the nursing homes, chronic illness and respondents' self-rated health.

Analysis shows that respondents with depressive symptoms are more likely to have suicidal ideations. Compared to those who do not have depressive symptoms, those who experience depressive mood are 40% more likely to report death and suicidal ideations. Those who scored in the lowest quarter of the life satisfaction scale are significantly more likely to have death and suicidal ideations than others. The difference between this group and others is more than 30%. Those who were satisfied with their current life at the time of the survey were significantly less likely to have death and suicidal ideations than those who rated their life satisfaction as fair, somewhat unsatisfied, or very unsatisfied, but the difference in the prevalence of suicidal ideations between those who rated their life as somewhat satisfied and very satisfied was small.

Respondents' overall satisfaction with some specific nursing home services and general quality of the nursing home is another factor that correlates with the presence of death and suicidal ideations. Those who rated the services, management, living conditions,

meals, recreational activities, and expenses of the nursing home as fair, somewhat unsatisfied, or very unsatisfied, were more likely to have death and suicidal ideations than those who said that they were somewhat satisfied or very satisfied. The difference in the prevalence of death and suicidal ideation ranges from 17% to 30%. As was the satisfaction with current life at the time of the survey, the differences in prevalence of death and suicidal ideation between those who rated the above aspects as somewhat satisfied and very satisfied were very small. Nevertheless, the satisfaction of the nursing home residents with the environment, medical care, and interpersonal relationship within the nursing home was not correlated with death and suicidal ideations. On the other hand, the satisfaction with the general quality of the nursing home also correlates with death and suicidal ideations, and the association pattern was similar to that in the satisfaction with the specific aspects of the nursing home. That is, those who rated their satisfaction with general quality of the nursing home as fair, somewhat dissatisfied, or very dissatisfied were more like to have death and suicidal ideations than those who were somewhat satisfied or very satisfied, and the differences in the prevalence of death and suicidal ideation were very small between those who were somewhat satisfied and very satisfied.

The results of bivariate analysis of death and suicidal thought among the nursing home residents are presented in Table 1.

Discussions and conclusion

This paper analysed data from a survey undertaken in a city in mainland China to explore death and suicidal ideation among nursing home residents. Results show that at least 17.4% of the nursing home residents have had death and suicidal ideation in the month prior to the survey. As previous studies suggest that suicidal feelings are associated with suicidal behaviours among the elderly, relevant governmental departments should pay more attention to the issue of death and suicidal ideation among nursing home residents.

Compared to the research reports of other countries, it seems that the prevalence of death and suicidal ideation among the nursing home residents in urban China is in an intermediate level. Nevertheless, as the instruments and methods used to assess the death and suicidal ideation are more or less different between this study and previous ones in other countries,³ and moreover, the highly sensitive nature and stigma associated with death and suicidal ideation in mainland China may prevent some nursing home residents from freely expressing their true inner feelings, more studies are needed so as to determine how prevalent the death and suicidal ideation is among the nursing home residents in China.

This study shows that depressive symptoms and life satisfaction are associated with death and suicidal ideation. Those who have depressive symptoms and lower life satisfaction are more likely to report death and suicidal ideation. This pattern is consistent with the findings of previous research (Haight 1995), suggesting the importance of screening for and prevention of depressive symptoms and enhancement of quality of life so as to improve life satisfaction among nursing home residents. On the other hand, the results show that education, marital status, chronic diseases, self-rated health, and financial status are not significantly correlated with death and suicidal ideation. This is also consistent with the results of previous studies (Haight 1995). In addition, this study also shows that age and gender are not significantly correlated with death and suicidal ideation. As previous studies were mixed in the association between age and death/suicidal ideation and between gender and death/suicidal ideation (Haight 1995, Scocco *et al.* 2009), more studies are needed so as to better disentangle the relationship between these two

Table 1. Bivariate analysis of death and suicidal ideation.

Correlates	Having death and suicidal ideation (%)	
	Yes	No
Gender		
Male	22.8	77.2
Female	14.6	85.4
Age		
60–74	17.9	82.1
75–84	12.5	87.5
85 +	22.8	77.2
Status of Household Registration		
Local City	18.9	80.1
Other Provinces	11.8	88.2
Who paid the expenses of nursing homes		
by self	13.4	86.6
by welfare program	25.5	74.5
Years of formal education		
0	17.7	82.3
1–6	23.3	76.7
7 +	10.5	89.5
Marital status		
Married	14.7	85.3
Widowed	18.0	82.0
Separated, divorced or never married	15.6	84.4
No. of close friends in the nursing home		
0	10.3	89.7
1	20.0	80.0
2	32.4	67.6
3	14.3	85.7
4 +	12.5	87.5
Monthly income		
0	25.0	75.0
1 – 1000 Chinese Yuan	15.0	85.0
1001 – 2000 Chinese Yuan	9.5	90.5
2000 + Chinese Yuan	12.5	87.5
Having chronic diseases		
Yes	18.1	81.9
No	15.2	84.8
Having depressive symptoms ***		
Yes	47.3	52.7
No	5.7	94.3
Self-rated health		
Poor or very poor	22.5	77.5
fair	17.6	82.4
Good or very good	13.7	86.3
Current life satisfaction**		
Very satisfied	15.4	84.6
Somewhat satisfied	10.0	90.0
Fair/somewhat or very dissatisfied	32.7	67.3
Scores on the life satisfaction scale***		
The lowest quarter	45.5	54.5
The lower quarter	8.5	91.5
The upper quarter	5.9	94.1
The top quarter	14.6	85.4

Table 1 – continued

Correlates	Having death and suicidal ideation (%)	
	Yes	No
The overall satisfaction with the environment of nursing home		
Very satisfied	17.7	82.3
Somewhat satisfied	15.2	84.8
Fair/somewhat or very dissatisfied	29.0	71.0
The overall satisfaction with the nursing home services *		
Very satisfied	17.2	82.8
Somewhat satisfied	12.6	87.4
Fair/somewhat or very dissatisfied	34.3	65.7
The overall satisfaction with the management of nursing home**		
Very satisfied	14.8	85.2
Somewhat satisfied	12.5	87.5
Fair/somewhat or very dissatisfied	34.9	65.1
The overall satisfaction with the living conditions of nursing home**		
Very satisfied	15.0	85.0
Somewhat satisfied	14.6	85.4
Fair/somewhat or very dissatisfied	44.0	56.0
The overall satisfaction with the care of nursing home		
Very satisfied	14.3	85.7
Somewhat satisfied	14.6	85.4
Fair/somewhat or very dissatisfied	31.0	69.0
The overall satisfaction with the meals of nursing home*		
Very satisfied	17.0	83.0
Somewhat satisfied	10.1	89.9
Fair/somewhat or very dissatisfied	27.5	72.5
The overall satisfaction with the interpersonal relationship of nursing home		
Very satisfied	13.2	86.8
Somewhat satisfied	17.9	82.1
Fair/somewhat or very dissatisfied	23.9	76.1
The overall satisfaction with the recreational activities of nursing home*		
Very satisfied	14.0	86.0
Somewhat satisfied	13.1	86.9
Fair/somewhat or very dissatisfied	32.7	67.3
The overall satisfaction with the expenses of nursing home**		
Very satisfied	17.9	82.1
Somewhat satisfied	8.1	91.9
Fair/somewhat or very dissatisfied	31.6	68.4
The overall satisfaction with the general quality of the nursing home***		
Very satisfied	16.4	83.6
Somewhat satisfied	10.3	89.7
Fair/somewhat or very dissatisfied	40.0	60.0

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

sociodemographic characteristics and death/suicidal ideation among nursing home residents. For instance, age or gender may be correlated or not correlated with what type of death/suicidal ideation among nursing home residents in what reference time frame. Such information may have practical implication for suicide prevention in nursing homes.

The unique contribution of this paper which deserves a special note is that it reveals the significant association between satisfaction with a variety of nursing home services and management and death and suicidal ideation among nursing home residents. The findings may imply that the quality of services and management can play an important role in suicide prevention among nursing home residents, and also alert nursing home staff to be vigilant to any problems in the nursing home and to resolve these as soon as possible. To the best of authors' knowledge, this might be the first empirical study that examined the association between residents' satisfaction with different aspects of nursing home (e.g. services, management, fees, etc.) and death and suicidal ideation, although more studies are needed to conduct further study in this respect.

It should be noted that this study has the following limitations. First of all, there might be a selection bias in the research subjects. In the study, many residents failed to successfully complete the questionnaire interview due to health and/or cognitive problems, thus, those residents with relative better physical health and/or cognition might be over-represented in the sample. This may lead to an underestimation of the prevalence of death and suicidal ideation among nursing home residents, as poorer health and cognitive impairment may increase the risk of death and suicidal ideation (Schmid *et al.* 1994, Scocco *et al.* 2009). Second, due to missing data, multivariate analysis was not performed. As a consequence, this study failed to disentangle the most important correlates of death and suicidal ideation among the nursing home residents based on the bivariate results. Finally, since the data were collected by residents' self-report, this may also result in some bias as suicidal phenomena remain a very sensitive topic in mainland China.

In spite of these limitations, this is the first study to examine the prevalence and correlates of death and suicidal ideation among nursing home residents in mainland China, and provides a basis for developing policy and refining service programs as well as for promoting further research in this area.

Acknowledgement

The survey data analysis of this study was supported by The Hong Kong Jockey Club Centre for Suicide Research and Prevention, The University of Hong Kong.

Notes

1. The association between self-esteem and suicidal ideation revealed in Haight's study (1995) is exactly opposite to the pattern that was found among adolescents and not consistent with our daily life experience. Even Haight described it as 'unexpected'. In the discussion section of the paper, Haight (1995) attributes this counterintuitive finding to 'guts', as he explains 'it may take "guts" to complete a suicide in old age' (p.107).
2. As aforementioned, different degrees of suicidal feelings are not mutually exclusive to one another. Those who have severe ideation often have mild ideation also. This is also true for the passive and active ideation. Therefore, the sum of the individual prevalence of passive and active ideation is not equal to the overall prevalence of any specific kind of ideation.
3. For instance, in Haight's study (1995), the suicidal ideation was measured with Beck's Suicide Ideation Scale, while in Scocco *et al.*'s study (2009), the death and suicidal ideation were measured with Paykel's questions about suicidal phenomena. In addition, the research subjects of Haight's study were those frail elders who were newly relocated to nursing homes, whereas

the subjects of Scocco *et al.*'s study were from a random sample of nursing home residents in an Italian region.

References

- Abrams, R.C., *et al.* 1988. Suicide in New York City nursing homes: 1980–1986. *American journal of psychology*, 145, 1487–1488.
- Beekman, A.T.F., Copeland, J.R.M. and Prince, M.J., 1999. Review of community prevalence of depression in late life. *British journal of psychiatry*, 174, 307–311.
- Brink, T.L., *et al.*, 1982. Screening tests for geriatric depression. *Clinical gerontologist*, 1, 37–43.
- China National Commission on Aging, 2010. *The Annual Statistical Report on the development of population aging and related undertakings in China 2009*. Available at: <http://lyj.cncaprc.gov.cn/info/9196.html> [accessed 11 November 2010].
- Chiu, H.F., Takahashi, Y. and Suh, G.H., 2003. Elderly suicide prevention in East Asia. *International journal of geriatric psychiatry*, 18, 973–976.
- Conwell, Y. and Thompson, C., 2008. Suicidal behavior in elders. *Psychiatric clinics of North America*, 31, 333–356.
- Conwell, Y., Duberstein, P.R. and Caine, E.D., 2003. Risk factors for suicide in later life. *Biological psychiatry*, 52, 193–204.
- De Leo, D., *et al.*, 2001. Attempted and completed suicide in older subjects: results from the WHO/EURO multicentre study on suicidal behaviour. *International journal of geriatric psychiatry*, 16, 300–310.
- Haight, B.K., 1995. Suicide risk in frail elderly people relocated to nursing homes. *Geriatric nursing*, 16 (3), 104–107.
- He, X.Y., Xiao, S.Y. and Zhang, D.X., 2008. Reliability and validity of the Chinese version of geriatric depression scale: a study in a population of Chinese rural community-dwelling elderly. *Chinese journal of clinical psychology*, 16, 473–475.
- Heisel, M.J., 2006. Suicide and its prevention among older adults. *Canadian journal of psychiatry*, 51, 143–154.
- Ji, J., 2000. Suicide rates and mental health services in modern China. *Crisis*, 21 (3), 118–121.
- Ku, Y.C., *et al.*, 2009. Suicide experiences among institutionalized older veterans in Taiwan. *The Gerontologist*, 49 (6), 746–754.
- O'Connell, H., *et al.*, 2004. Recent developments: suicide in older people. *British medical journal*, 329, 895–899.
- Paykel, E.S., *et al.*, 1974. Suicidal feelings in the general population: a prevalence study. *British journal of psychiatry*, 124, 460–469.
- Phillips, M.R., Li, X. and Zhang, Y., 2002. Suicide rates in China 1995–99. *The lancet*, 359, 835–840.
- Schmid, H., Manjee, K. and Shah, T., 1994. On the distinction of suicide ideation versus attempt in elderly psychiatric inpatients. *Gerontologist*, 34, 332–339.
- Scocco, P. and De Leo, D., 2002. One-year prevalence of death thoughts, suicide ideation and behaviours in an elderly population. *International journal of geriatric psychiatry*, 17, 842–846.
- Scocco, P., *et al.*, 2009. Death ideas, suicidal thoughts, and plans among nursing home residents. *Journal of geriatric psychiatry and neurology*, 22 (2), 141–148.
- Scocco, P., *et al.*, 2006. Suicidal behaviour in nursing homes: a survey in a region of North-East Italy. *International journal of geriatric psychiatry*, 21, 307–311.
- Xie, G., Long, N. and Fu, L., 2010. An investigation of depressive symptoms among older people admitted to nursing homes and living at home. *Journal of Guizhou Normal University (Natural Sciences)*, 28, 58–62.
- Yan, S.M., 2008. Geriatric depression scale. In: V.W.Q. Lou and K.W. Boey, eds. *Handbook of measures for the Chinese elderly*. Hong Kong: Sau Po Centre on Aging, the University of Hong Kong, 69–77.
- Yao, L.L., 2010. A comparative research of the depressive symptoms between nursing home residents and the elders living at home. *Journal of psychosocial sciences*, 25, 1434–1437.
- Yi, S.G. and Yan, S.M., 2006. A comparative study of the health status between community-dwelling older adults and nursing home residents. *China demography*, 3, 73–79.