

Successful Ageing of the Oldest Old in China

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- Introduction
- Previous study
- Data and method
- Result
- Discussion

I. Introduction

- Concept of successful ageing dates back to 1960's.
- Quite different definitions:
physical functioning or psychological state?

- Traditionally research in ageing has emphasised average –related losses and neglected the substantial heterogeneity of older persons
- Used to group the elderly into dichotomous categories: impaired or normal ageing

- This classification concealed the vast heterogeneity among the elderly population without impairment
- Such a classification may limit our further research into the most psychologically and physically healthy group and their characteristics

Usual Ageing and Successful ageing

- In 1987, Rowe and Kahn suggest that within the category of normal ageing, a distinction can be made between usual ageing and successful ageing
- Several studies have now sought to identify subgroups of old people in the population that exhibit minimal functional limitations, using a variety of approaches

Definition of Successful Ageing

- Among these studies, successful ageing was often defined as:
 - living in the communities,
 - without disability on activities of daily living,
 - no serious difficulties on gross mobility and physical performance,
 - a high score on a cognitive screening test,
 - excellent or good self-rated health.

II. Previous Study

MacArthur study of ageing in the United States

- First reported by Berkman *et al.*(1993)
- The MacArthur studies aimed to identify, within a population-based cohort of older men and women,
 - a subgroup with higher levels of physical and cognitive function,
 - and to compare their characteristics in a range of domains with those of subgroups functioning at intermediate and lower levels, respectively.

- The MacArthur studies examined data from participants aged 70-79 years drawn from three community-based populations
- High, medium, and low functioning subgroups were defined on the basis of predetermined criteria of physical and cognitive function, and significant differences were identified among these three subgroups in biomedical, physiological, psychological and social functioning.

Australian studies

- Australian studies (Jorm, Christensen, Henderson, Jacomb, Korten & Mackinnon, 1998; Andrews, Clark & Luszcz, 2001) have addressed the issue of the prevalence of successful ageing and factors associated with it.
- In ALSA study, consistent with the MacArthur studies, they used both physical and cognitive criteria to distinguish *successful* from *usual* ageing.

ALSA study

- Discrete groups of individuals aged 70 or more and showing higher, intermediate or lower degrees of successful ageing were identified.
- More importantly, they could be distinguished from each other on additional measures of physical functioning and health, lifestyle and psychological status and key indicators remained after controlling for the effects of age, gender, education and income.

Successful Ageing: A case study on Beijing elders

- By Du Peng and Gary R. Andrews(2003)
- The Beijing study is based on the data of the Beijing Multidimensional Longitudinal Study on Aging, 1992-2000

Beijing Multidimensional Longitudinal Study on Aging

- The target population in the Beijing Multidimensional Longitudinal Study on Aging was those people aged 55 years and over living in Beijing
- Data was collected through home interview as well as physical examination
- 2035 community dwelling respondents for whom necessary information was available for the analysis of successful ageing.

III. Data and Method

- Survey on Determinants of Healthy Longevity in China
- Base line survey in 1998
- 8959 oldest old aged 80 and over
- 22 provinces covered
- Two follow-ups in 2000 and 2002

7737 cases included

- Live in community
- Aged 80-105
- Answered questions about SRH & MMSE

Measurement

- Self-reports of health were rated from excellent (1) to poor (5).
- Medical conditions were obtained by asking participants to indicate which of a comprehensive list of conditions they had ever suffered from.
- Measurement of activities of daily living (ADL)

- Physical performance:

Able to pick up a book from the floor?

Able to stand from a chair?

Questions on physical exercise was used to classify exercise intensity as often or not.

- The cognitive function was assessed with the Mini Mental State Examination (MMSE).
- Personality was measured by giving optimistic or pessimistic answers to questions.

Successful group

- **Individuals were classified as higher functioning (N = 1161 or 15.0%) if they fulfilled all of the following 5 criteria:**
 1. **according to the score of Mini-Mental State Examination (MMSE), the respondents are grouped as successful;**

2. with good or very good self-rated health;

3. no disability in 6 activities of daily living (bathing, dressing, toileting, eating, indoor mobility, continence);

4. no problem on physical performance:

Able to stand up from a chair without using hands;

Able to pick up a book from the floor.

- Individuals were classified as lower functioning (N =3222 (41.6%) if they fulfilled any of the following five criteria:
 - unable to answer the MMSE question
 - giving wrong answers for more than five questions;
 - with poor or very poor self-rated health;
 - 1 or more disabilities in activities of daily living;
 - 1 or more disabilities in physical performance.

Intermediate functioning

- Individuals were classified as intermediate functioning (N = 3354 or 43.4%) if they fulfilled the criteria neither for higher nor lower functioning.

Analytic approach

- Data analysis evaluated the relative importance of a large number of potential risk or protective factors for successful ageing and was a two-stage process

- First, univariate analyses were conducted of the relationship between each predictor and the functional classification of successful ageing.
- Secondly, a logistic regression model is used that controlled for the effects of age, sex, education ,urban/rural residence and marital status.

IV. Results

Table 1 Control Variables by Level of Function

Variable	High		Intermediate		Low		χ^2	Df
	no.	%	no.	%	no.	%		
Age group							711.747 ***	8
80-84	504	43.4	768	22.9	486	15.1		
85-89	291	25.1	672	20.0	488	15.1		
90-94	208	17.9	688	20.5	576	17.9		
95-99	99	8.5	513	15.3	613	19.0		
100+	59	5.1	713	21.3	1059	32.9		
Gender							342.458 ***	2
Male	725	62.4	1465	43.7	1023	31.8		
Female	436	37.6	1889	56.3	2199	68.2		
Education							384.223 ***	4
0 year	513	44.3	2152	64.4	2428	75.7		
1-6 years	460	39.8	871	26.1	587	18.3		
7+ years	184	15.9	320	9.6	192	6.0		
Residence							52.981 ***	2
Urban	508	43.8	1239	36.9	1034	32.1		
Rural	653	56.2	2115	63.1	2188	67.9		
Marriage							218.578 ***	4
Married	365	31.4	613	18.3	398	12.4		
Widowed	759	65.4	2657	79.2	2739	85.0		
Other	37	3.2	84	2.5	85	2.6		

*** p< .001

Table 2 Medical Conditions by Level of Function

Variable	High		Intermediate		Low		χ^2
	no.	%	no.	%	no.	%	
Hypertension	169	14.6	485	14.5	383	11.9	29.65 ***
Diabetes	8	0.7	32	1.0	22	0.7	30.75 ***
Heart disease	60	5.2	246	7.3	279	8.7	36.33 ***
Stroke or CVD	19	1.6	75	2.2	129	4.0	48.10 ***
Bronchitis	108	9.3	427	12.7	432	13.4	33.23 ***
Tuberculosis	6	0.5	31	0.9	30	0.9	25.81 ***
Cataract	133	11.5	595	17.7	697	21.6	81.92 ***
Glaucoma	9	0.8	72	2.1	98	3.0	48.87 ***
Cancer	5	0.4	10	0.3	22	0.7	27.77 ***
Prostate tumour	52	4.5	131	3.9	113	3.5	36.20 ***
Gastric or duodenal ulcer	30	2.6	118	3.5	107	3.3	27.88 ***
Parkinson's disease	6	0.5	26	0.8	44	1.4	35.08 ***
Bedsore	2	0.2	20	0.6	35	1.1	38.88 ***

*** $p < .001$

Table 3 Logistic Regression Summary: Level of Function by Medical Conditions Entered as a Block

	Higher vs intermediate		Higher vs Low	
	AOR ^a	95%CI ^b	AOR	95%CI
Hypertension	1.08	0.88-1.32	0.75 *	0.60-0.94
Diabetes	1.61	0.71-3.65	1.31	0.53-3.25
Heart disease	1.56 **	1.14-2.14	2.47 ***	1.76-3.47
Stroke or CVD	1.67	0.98-2.85	4.05 ***	2.37-6.92
Bronchitis	1.54 ***	1.22-1.95	1.82 ***	1.41-2.34
Tuberculosis	1.66	0.64-4.30	1.64	0.59-4.53
Cataract	1.47 ***	1.18-1.83	1.57 ***	1.25-1.98
Glaucoma	2.54 *	1.23-5.28	3.67 ***	1.72-7.82
Cancer	0.65	0.20-2.14	1.31	0.40-4.25
Prostate tumour	1.08	0.75-1.56	1.18	0.78-1.77
Gastric or duodenal ulcer	1.44	0.93-2.21	1.23	0.77-1.97
Parkinson's disease	1.28	0.50-3.33	2.36	0.90-6.20
Bedsore	2.61	0.58-11.74	3.74	0.83-16.74

a Adjusted Odds Ratio, where odds ratio are adjusted for age, gender, education, place of residence and marital status

b 95% confidence interval

* p<.05 ** p< .01 *** p< .001

Table 4 Activity, Physical Performance, Health and Psychological Indicators by Level of Function

Variable	High		Intermediate		Low	
	%	n	%	n	%	n
Intensity of exercise						
Often	48.1	559	31.3	1051	17.6	567
No	51.9	602	68.7	2303	82.4	2655
Self-rated health						
Excellent/good	100.0	1161	54.7	1833	44.3	1428
Fair/poor	0.0	0	45.3	1521	55.7	1794
Able to pick up a book from the floor?						
Yes	100.0	1161	71.0	2383	47.0	1514
No	0.0	0	29.0	971	53.0	1708
Able to stand up from a chair?						
Yes	100.0	1161	74.4	2494	51.6	1661
No	0.0	0	25.6	860	48.4	1561
Look on the bright side of things						
Always/often	100.0	1161	100.0	3354	83.4	2687
Sometimes/never	0.0		0.0		16.6	535
Keep my belongings neat and clean						
Always/often	92.0	1068	83.2	2792	74.9	2413
Sometimes/never	8.0	93	16.8	562	25.1	809
Feel fearful or anxious						
Always/often	9.5	110	11.2	376	13.6	437
Sometimes/never	90.5	1051	88.8	2978	86.4	2785
Feel lonely and isolated						
Always/often	9.3	108	13.2	444	18.5	595
Sometimes/never	90.7	1053	86.8	2910	81.5	2627
Make own decision						
Always/often	71.5	830	59.4	1993	49.3	1590
Sometimes/never	28.5	331	40.6	1361	50.7	1632
Feel useless with age						
Always/often	24.1	280	35.0	1173	44.2	1424
Sometimes/never	75.9	881	65.0	2181	55.8	1798
Be happy as younger						
Always/often	65.3	758	48.3	1620	39.4	1270
Sometimes/never	34.7	403	51.7	1734	60.6	1952

Table 5 Survival rate of the oldest old by level of function

	High		Intermediate		Low	
	%	n	%	n	%	n
Lost to follow-up	11.4	133	9.1	306	9.4	303
Still alive at 2000 survey	72.4	840	57.4	1925	46.5	1498
Died before 2000 survey	16.2	188	33.5	1123	44.1	1421
Total	100	1161	100	3354	100	3222

($\chi^2 = 308.21, p < .001$)

1. Successful ageing is associated with lower age, male sex, more years of education.
2. In this oldest old study, rural living and widowhood are also associated.

3. The relationship among physical, psychological and social functioning with ageing is evident.

4. The Chinese oldest old could be distinguished from each other on additional measures of physical functioning, health and psychological status.

5. The mortality data showed that death in the intervening years was more likely in those originally classified as ageing less successfully.

V. Discussion

- Different risk factors:
Ageing or geographical difference?
- Some controversial findings need further exploration.

Beijing Study

	Higher vs intermediate		Higher vs low	
	AOR ^a	95%CI ^b	AOR	95%CI
Hypertension	1.74 **	1.21-2.49	1.87 **	1.22-2.86
Coronary heart	1.68 *	1.12-2.54	2.44 ***	1.52-3.93
Chronic bronchitis	1.29	0.83-2.01	1.23	0.72-2.11
Cataract	1.06	0.69-1.65	1.23	0.74-2.05
Arthritis	1.65	0.86-3.15	3.13 ***	1.55-6.30
Cervical spondylosis	1.74	0.97-3.14	2.51 *	1.19-5.27
Tuberculosis	1.05	0.63-1.73	0.72	0.37-1.39
Stroke	2.15	0.80-5.77	7.94 ***	2.85-22.09
Diabetes	0.88	0.43-1.81	1.83	0.85-3.94
Peptic ulcer	1.24	0.66-2.33	2.17 *	1.02-4.60
Neurosis	0.73	0.36-1.47	1.94	0.91-4.12
Emphysema	1.16	0.40-3.33	3.89 **	1.31-11.60
Asthma	1.90	0.70-5.18	4.16 **	1.40-12.34

Thank you