

Differences in Longevity Factors amongst Korean Centenarians, Octogenarians, and Sexagenarians*

Jong-In Kim

Division of health and Welfare, Wonkwang University, Republic of Korea

CONTENTS

I . Introduction	IV . Discussion
II . Methods	References
III . Results	Abstract

I . Introduction

The world is fast ageing, have we noticed? (WHO, 2005), the older population is itself ageing. Currently, the number of centenarians is projected to increase 13-fold, from approximately 287,000 in 2006 to 3.7 million by 2050 (United Nations. 2007).

Everyone's dream is living to centenarians' age over while being healthy and happy. This is not an impossible dream. In 2003, a While there are 10.7 centenarians per 100,000 people across the whole of Japan, some areas boast much higher

proportions, including Okinawa Prefecture with 31.19 and in 2002, there were 5 centenarians per 100,000 people in Korea, including Boseong County with 41 (Kim, 2002).

From every aspect, the Korean society is rapidly ageing, and time period taken for elderly share of the whole population to increase from 7% to 14% is expected to be only 18 years (2000-2018). It is far less than in any other countries including even Japan, in which it took 24 years (1970-1994) (OECD, 2002). Specially, the proportion of elderly population in Korean total population is

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Corresponding Author: Jong-In Kim

Division of health and Welfare, Wonkwang University

#344-2 Shinyong-dong, Iksan City, Chonbuk, 570-749, Republic of Korea

Tel: +82-63-850-6569, Email: kji122@wku.ac.kr

projections that 7.71% sexagenarians, 1.43% octogenarians, and 0.03% centenarians in 2007 (KNSO, 2007).

Preceding studies of centenarians have been conducted in a few countries. Specially, study of cognitive functioning in centenarians (Hagberga et al., 2001), and age changes and differences in personality traits and states of the old and very old (Poon et al., 2002), as well as first autopsy study of an Okinawan centenarian as absence of many age-related diseases, centenarians die healthy as an autopsy study (Bernstein et al., 2004), and comprehensive health status assessment of centenarians as results from the 1999 large health survey of veteran enrollees (Selim et al., 2005).

In Korea, preceding longevity factors of centenarians have been performed (Kim, 2003), and distributions of polymorphisms relations with dementia status in Korean centenarians (Choi et al., 2003). Lifestyle factors between gastric cancer and centenarians (Kim, 2003a), and studies on social and environmental factors related to centenarians' prevalence (Kim, 2005).

Though studies of this kind in the past were searching to recognize a prevalent factor that was linked to longevity among centenarians, since longevity is believed to be associated with several factors, continued studies are still required to identify the secrets that lead to a long life, with focus on centenarians.

If longevity studies of the ageing

population are neglected, the ageing society results for future generations demonstrate that this can lead to serious consequences that may become catastrophic without an effective and timely action plan.

However, despite the increase of very old people in the population, at present little studies have to investigate differences in factors among centenarians or very old people.

In particular, studies of centenarians need to identify factors associated with the longevity factors of the old and very old which may lead to a long and happy life.

Therefore, the purpose of this study was to investigate differences in longevity factors for 3 age groups: centenarians, octogenarians, and sexagenarians. This paper compares three age groups in Korea in terms of longevity factors related to health behaviors and psychological reactions. So, this paper examines how centenarians are different from two younger age groups and discusses how the differences are related to longevity.

II. Methods

Theoretical Frameworks

In this paper, a theoretical study on longevity factors is made within the framework of approaches based on the results of previous studies (Kim, 1998; Kim, 2002a; Kim, 2005; Kim, 2007; Evert et al., 2003).

The approach describes longevity factors related to health behaviors and psychological reactions of three age groups. Fig.1 shows the characteristics of Korean centenarians and theoretical framework on longevity factors in this paper. It will be to identify Korean centenarian differences of longevity factors compared with the younger 2 age groups.

The health behaviors included visiting hospitals, alcoholic drinking and smoking. Because centenarians are a group with a low number of age-associated diseases and good mental health despite substantial physical limitation (Selim et al., 2005). Refraining from alcoholic drinking may lead to prevention of diseases including alcoholic liver disease in the elderly (Woodhouse et al., 1985). Non-smoking can be a preventative measure for diseases such as lung cancer in the elderly (Kim, 2007). Therefore, these factors have a positive impact upon longevity.

The psychological reactions included laughing a day, interest in playing games, emotional tears, and anxiety about the future. Because older people were less able to identify facial expressions of anger and sadness (Phillips et al., 2002). Also, Korean centenarian optimists had outlived pessimists since a life style that didn't allow anger and stress (Kim, 2005). And negative emotions were associated with poor health, with a link between sadness and sickness being most prominent (Chipperfield et al., 2003). It has previously

been shown that when more cognitive effort was required to perform an activity, older adults tended to have difficulty later remembering the activity (Earles and Kersten, 1998).

Therefore, the health behaviors included visiting hospitals as health level for measures of morbidity or disability. There are association visiting hospitals when illness. By the way, the centenarians lower mortality rates than most of the population (Smith et al., 1997). So, the hypothesis that centenarians contrary to octogenarians and sexagenarians in Korea may be low utilizes of hospitals.

The health behaviors included abstinence and smoking as preference. There are association between females and males for abstinence from alcoholic drinking and smoking among Korean centenarians, octogenarians, and sexagenarians. Women outlive men in virtually all societies (WHO, 2005). So, the hypothesis that centenarian females group may be high in abstinence from alcohol drinking and non-smoking than males from these same age groups.

Meantime, the psychological reactions included times spent laughing daily as lots of laughter. Optimism with laughter based on denial of anger and absence of stress that seems to be longevity factors (kim,1998). The hypothesis that centenarian may be more in laughing when compared with the younger 2 age groups.

The psychological reactions included crying over sad scenes as emotional tears. Human emotions are things like hatred, anger,

sadness and happiness. It seems that centenarians produced less tears when watching sad scenes. So, the hypothesis that centenarian may be less emotion when compared with elderly people of younger age.

Also, the psychological reactions included anxiety about future fear. People feel anxiety for the future. But the older the person may be less anxiety they have because centenarians have an optimistic view and positive emotions. Specially, older who experienced more bereavement feared the dying process less than younger (Wink and Scott , 2005). So, the hypothesis that centenarian may be having no anxiety when compared with the younger 2 age groups.

The psychological reactions included interest in playing games as habit. The older the people will be having interest in playing games as habit by psychological reactions. So, the hypotheses that centenarian will be have interest in playing games when compared with the octogenarians and sexagenarians.

Participants of Study

An older person means that the WHO uses categories starting at the age of octogenarians and sexagenarians.

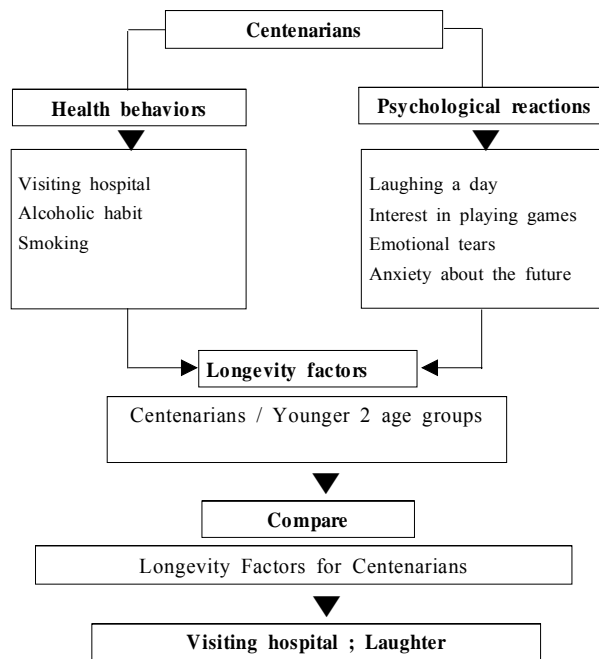


Fig.1. Description of theoretical framework on longevity factors for Korean centenarian

A person is therefore considered as old when he/she is unable to work due to advancement in years and reduced physical strength or poor health. Based on this physical capacity to work, the old are placed in three categories: (1) Recent old who are still active and undertake normal activities without support; (2) Old who work with difficulty and hence have reduced activities; (3) Very old who work with difficulty in the home or not at all (WHO, 2001). Therefore, older age group categories for participants of this study selected that recent old is sexagenarians, older persons is octogenarians, and oldest-old is centenarians.

Centenarians are a valuable resource for the study of successful aging. Participants of this study had centering on Korean centenarians. Population centenarians of this study are 109 centenarians (age; over 100) living in Korea. That comprised of 8.82% centenarians from a population of total 961 centenarians living across the country in 2005 (KNSO, 2007). The remainder of participants of this study comprise of 135 octogenarians (age; 80~89), and 145 sexagenarians (age; 60~69). Therefore, the overall participants for this paper was 389 elderly.

Procedure

Data collecting process that taken a random sample selection for analysis of data. In order to collect the data of centenarians, octogenarians, and sexagenarians their telephone numbers and

addresses were obtained from provincial offices. Researchers directly contacted 57 of centenarians, 135 octogenarians, and 145 sexagenarians who were able to communicate, and contacted centenarians' care givers 52 who were not be able to communicate, from Dec. 2004 to Jan. 2005. This paper investigated longevity factors relations with health behaviors and psychological reactions in Korean centenarians by cross-sectional study. A total of 109 centenarians (8 men and 101 women) were included in this study. The longevity factors were compared with those of two control groups: 145 sexagenarians (55 men and 90 women), and 135 octogenarians (36 men and 99 women). The health status of the centenarians was assessed by researchers using the questionnaires score. Questionnaires were administrated; there were items, classified into categories including longevity factors related to health behaviors and psychological reactions, covering their way of living during the last century in a retrospective manner. Therefore, limitation of the data of this paper is very small of sample size as low of response rate in Korean elderly, cross-sectional analysis.

Characteristics of Variables

The differences among centenarians, octogenarians, and sexagenarians were analyzed through associations between centenarians and their associated longevity (Fig.1). A longevity factors approached was

used which examined health behaviors and psychological reactions. The health behaviors included visiting hospitals, Alcoholic drinking and smoking. The psychological reactions included laughing a day; laughing less than one time or more than two times a day, interest in playing games ; hwatu: Korean playing cards, baduk: Korea Baduk Association, emotional tears; not crying or crying during sad scenes, and anxiety about

the future; having no anxiety or having anxiety about the future. But limitation of the variables of this paper is psychological reactions included anxiety about the future.

Statistical analysis was done using the odds ratio by logistic regression. To identify relationships in variables were used binomial dummy variables. Because that statistical power estimates are advisable when using the binary variable approach (Ferraro et al., 2000).

Table 1. Differences in variables for examined health behaviors and psychological reactions.

Variables		Sexagenarians		Octogenarians		Centenarians		X ²	P
		60~69		80~89		over 100			
		N=145	%	N=135	%	N=109	%		
Gender	Female	90	62.07	99	73.33	101	92.66	35.05	0.000
	Male	55	37.93	36	26.67	8	7.34		
Visiting Hospital	Never	27	18.62	12	8.89	62	56.88	76.13	0.000
	Frequently	118	81.38	123	91.11	47	43.12		
Drinking Habit	Abstinence	97	66.90	111	82.22	92	84.40	13.56	0.001
	Drinking	48	33.10	24	17.78	17	15.60		
Smoking	Yes	15	10.34	18	13.33	17	15.60	1.584	0.453
	No	130	89.66	117	86.67	92	84.40		
Laughing a day	More than twice	102	70.34	84	62.22	100	91.74	32.56	0.000
	Less than once	43	29.66	51	37.78	9	8.26		
interest in games	Little	68	46.90	87	64.44	98	89.91	56.05	0.000
	Lots	77	53.10	48	35.56	11	10.09		
Sad scenes	Crying	133	91.72	105	77.78	57	52.29	53.53	0.000
	Not crying	12	8.28	30	22.22	52	47.71		
Anxiety	Having no	29	20.00	48	35.56	83	76.15	86.36	0.000
	Having	116	80.00	87	64.44	26	23.85		

For dependent variables, measurements of this study tried to select instrument of significance to represent each characteristics well, and organized them into visiting or not visiting hospitals, abstinence or drinking habit and smoking or non-smoking, more than two times or less than one time laughing every day, having no anxiety about the future or having, crying during sad scenes or not crying; for example, producing tears of sorrow when watching sad scene, and little interest in playing games or lots. Therefore, (Table 1) shows characteristics of Variables of this study with description of centenarians, octogenarians, and sexagenarians.

III. Results

Differences in abstinence from alcoholic drinking and smoking for males and females elderly

Table 2 shows the association between

females and males for abstinence from alcoholic drinking and smoking. Results concerning age-group differences indicated that centenarian and octogenarian females scored 9 times in abstinence from alcohol than males from these same 2 age groups. However, centenarian and octogenarian females scored about 7 times in non-smoking when compared with male from these 2 age groups.

Different in visiting hospitals and emotional tears for elderly

Table 3 shows the associated visiting hospitals when ill, and production of tears while watching sad scenes. Upon comparing age group differences, centenarians scored higher about 11 times in lack of visiting hospitals octogenarians. Centenarians scored higher 7 times in showing little emotional crying over sad scenes when compared to the sexagenarians.

Table 2. Differences in abstinence from alcoholic drinking and smoking for females and males elderly

Predictions variable	Odds Ratio	95%CI	P	
Centenarian and sexagenarian females / males				
Abstinence (vs. Alcoholic drinking)	4.90	2.50	9.61	0.000
Non-smoking (vs. Smoking)	6.94	3.15	15.28	0.000
Centenarians and octogenarians females / males				
Abstinence (vs. Alcoholic drinking)	9.04	4.04	20.24	0.000
Non-smoking (vs. Smoking)	2.44	1.09	5.47	0.029

Table 3. Different in visiting hospitals and emotional tears for elderly

Predictions variable	Odds Ratio	95%CI	P
Centenarians / Sexagenarians			
Not visiting hospitals (vs. Visiting)	4.43	2.40 8.17	0.000
Not crying during sad scenes (vs. Crying)	7.92	3.81 16.45	0.000
Centenarians / Octogenarians			
Not visiting hospitals (vs. Visiting)	11.48	5.56 23.70	0.000
Not crying during sad scenes (vs. Crying)	1.70	0.89 3.27	0.000

Different in laughter, gaming, and anxiety for elderly

Table 4 shows the association of laughter more than twice a day, having no anxiety about the future, and not much interest in playing games. On comparison of age groups, centenarians scored higher in laughing more

than two times a day than sexagenarians and octogenarians. Centenarians scored higher about 12 times in lacking anxiety about the future than sexagenarians. Centenarians scored higher 10 times in displaying little interest in playing games when compared with the sexagenarians.

Table 4. Different in laughter, gaming, and anxiety for elderly

Predictions variable	Odds Ratio	95%CI	P
Centenarians / Sexagenarians			
Laughing more than twice a day (vs. Less than once)	10.16	4.24 24.36	0.000
Having no anxiety about the future (vs. having anxiety)	12.49	6.42 24.32	0.000
Little interest in playing games (vs. Lots)	9.92	4.53 21.73	0.000
Centenarians / Octogenarians			
Laughing more than twice a day (vs. Less than once)	11.59	5.04 26.63	0.000
Having no anxiety about future (vs. Have anxiety)	6.39	3.42 11.94	0.000
Little interest in playing games (vs. Lots)	5.44	2.49 11.88	0.000

IV. Discussion

Women outlive men in virtually all societies (WHO, 2005). Because that

centenarian and octogenarian females are abstinence for smoking and drinking alcohol than males from these same age groups. It is known that refraining from alcoholic drinking may lead to prevention of diseases including

alcoholic liver disease in the elderly (Woodhouse et al., 1985). Non-smoking can be a preventative measure for diseases such as lung cancer in the elderly. Male gastric cancer appeared to be related to smoking 7 times more than in females. Furthermore, Gastric cancer victims were linked to smoking, 2 times more than the centenarians (Kim, 2003). Therefore, these factors have a positive impact upon women's longevity.

The centenarians had lower rates for visiting hospitals than having better health than octogenarians and sexagenarians. In particular, a centenarian is known to have a low number of age-associated diseases and good mental health despite substantial physical limitations (Selim et al., 2005). Therefore, centenarians may have inherited mental and physical health characteristics that are passed on by parents. Otherwise, they may have aged well due to good management of health care.

It has previously been shown that older people were less able to identify facial expressions of anger and sadness (Phillips et al., 2002). Also, the centenarians had lower cognitive performance compared with younger age groups (Hagberg et al., 2001). Therefore, it draws inference to conclude that centenarians produced less tears when watching sad scenes due to their lower ability to identify mental from expressions of sadness.

Overall, more Korean centenarian optimists had outlived pessimists since a life

style that didn't allow anger and stress (Kim, 2005). This indicates that Optimism with laughter, based on denial of anger. The tendency to anger was associated with an increased risk of being susceptible to stroke (Williams et al., 2002). Thus, a positive attitude towards life, without anger, with lots of laughter, will certainly minimize the risk of being affected by stroke, paving the way to a longer life. Those who do not get angry and enjoyed with lots of laughter their lives are believed to live longer.

The older the person, the less anxiety they have because centenarians have an optimistic view and positive emotions. Actually, the positive emotions, and namely happiness were displayed more than the negative emotions, and frustration, in very old. Negative emotions were associated with poor health, with a link between sadness and sickness being most prominent (Chipperfield et al., 2003). Therefore, centenarians have life styles with less anxiety about the future and laugh more when compared with the octogenarians and sexagenarians because they have an optimistic view and positive emotions.

Korean Centenarians had little interest in playing games when compared with the octogenarians and sexagenarians. These findings suggest that with age comes the desire to partake in less activity with rules which are played with other people, for example, although not a favorite activity, gambling is

among several types of social activities in sexagenarians (Zaraneck and Chapleski, 2005). However, when more cognitive effort was required to perform an activity, older adults tended to have difficulty later remembering the activity (Earles and Kersten, 1998). Therefore, centenarians had indifferent to playing games like gambling when compared with the octogenarians and sexagenarians because games that require cognitive effort are difficult for them to perform.

In conclusion, when comparing Korean centenarians with octogenarians and sexagenarians, it becomes evident that people, who abstain from alcoholic drinking and smoking, utilize hospitals less, cry little over sad scenes, laugh lots, show no anxiety, and indifference towards games have a greater probability of living longer. This is because they are always pleasant, maintain positive attitudes toward life, don't smoke, and abstain from alcoholic drinking. Thus, the Korean centenarian that leads to a life of longevity is the result not only of psychological reactions but also of health behaviors.

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ABSTRACT

The purpose of this study was to investigate differences in longevity factors for 3 age groups: centenarians, octogenarians, and sexagenarians.

There were 389 elderly Korean subjects who participated in this study. This included 109 centenarians who participated in the 1-wave study that examined the longevity factors using the health behaviors and psychological reactions. The study that examined the longevity factors by using odds ratio of the logistic regression analysis.

The major findings indicate that female centenarians and octogenarians scored the highest in abstinence from alcoholic drinking than males from these same 2 age groups (OR=9.04, CI=4.04, 20.24). Centenarians scored higher in non-visiting hospitals (OR=11.48, CI=5.56, 23.70) and showed little emotion when watching sad scenes, upon comparison with the younger 2 age groups. Also, centenarians scored higher in laughter (OR=11.59, CI=5.04, 26.63), showing no anxiety (OR=12.49, CI=6.42, 24.32), and displaying indifference towards games, when compared with the younger 2 age groups.

The findings imply that Korean centenarian leads to a life of longevity is the result not only of psychological reactions but also of health behaviors. Also, these results support future studies of improvement of longevity factors.

Key Words: Centenarian, Longevity factors, Visiting hospitals, Drinking habit, Laughter

〈국문초록〉

한국 백세인, 팔순인, 환갑인의 장수요인의 차이

이 연구의 목적은 한국의 백세인(100세 이상), 팔순인(80~89), 환갑인(60~69)의 3개 집단간의 수명요인의 차이를 규명하고자 시도되었다. 조사대상은 백세인의 109명을 포함하여 총 한국노인 389명이다. 수명요인은 건강행태와 심리적인 요인을 선정하여 분석하였다. 자료처리는 백세인과 2집단간의 차이를 로지스틱 회귀분석(logistic regression analysis)을 통하여 이루어졌다.

분석결과, 백세인과 팔순인의 여성들은 같은 남성에 비해 음주를 9배정도 억제하는 것으로 조사되었다. 백세인은 팔순인 보다 병원이용률의 경우 11배정도 낮은 것으로 분석되었다 (OR=11.48, CI=5.56, 23.70). 또한 하루에 2회 이상 웃는 백세인은 팔순인 보다 10배, 환갑인보다 12배 정도 많았다 (OR=11.59, CI=5.04, 26.63). 그밖에 백세인은 환갑인보다 미래에 대한 근심 걱정이 없으며, 오락에도 관심이 없는 것으로 분석되었다 (OR=12.49, CI=6.42, 24.32).

이와 같은 연구결과를 볼 때, 건강행태와 심리적인 반응이 장수요인으로 작용한 것으로 판단된다. 그러므로 노인건강은 절주, 금연, 정신건강을 중심으로 보건교육을 강구해야 할 것으로 사료된다.

주제어: 백세인, 장수요인, 절주, 병원이용률, 웃음