Original Article

Predicting Factors of Successful Aging among Community Dwelling Older Adults in Thimphu, Bhutan

Lobzang Dorji, RN, MNS[1] ; Pornchai Jullamate, RN, PhD[2] ; Rarcharneepon Subgranon, RN[3] ; Edwin Rosenberg, RN, PhD[4]

Lobzang Dorji, RN, MNS

[1] International Program, Faculty of Nursing, Burapha University,Chonburi Province, Thailand.
[2] Department of Gerontological Nursing, Faculty of Nursing, Burapha University, Chonburi Province, Thailand.
[3] Assistant Professor, External Academician
[4] Department of Sociology, Appalachian State University, Boone, North Carolina 28608, USA

*Address Correspondence to author:
Asst. Prof. Pornchai Jullamate
Department of Gerontological Nursing,
Faculty of Nursing, Burapha University,
169 Long-had, Bangsaen Road, Saensuk,
Muang, Chon Buri, 20131,
e-mail: pornchai@buu.ac.th

Received: July 27, 2018
Revision received: July 28, 2018
Accepted after revision: August 08, 2018
BKK Med J 2019;15(1): 38-43.
DOI: 10.31524/bkkmedj.2019.02.007
www.bangkokmedjournal.com

Abstract

OBJECTIVES: The objective of this study aimed to study predicting factors between perceived self-efficacy, social support, educational level, perceived health status, life satisfaction, and successful aging among community dwelling older adults.

MATERIAL AND METHODS: A descriptive, correlational predictive design was used to collect data at Thimphu, Bhutan during April to May, 2018. Convenience sampling was used to recruit 90 older adults from four villages. Structured questionnaire was used to gather data on 8 explanatory and 5 outcome variables. Instruments were the General Self-Efficacy Scale, the Multidimensional Scale of Perceived Social Support, the Perceived Health Status scale, the Life Satisfaction Index for the Third Age-Short Form and the Successful Aging Inventory. Descriptive statistics and standard multiple regression analysis were used to describe the sample and examine the predicting factors.

RESULTS: Multiple regression analysis showed perceived self-efficacy, social support, educational level and life satisfaction significantly predicted successful aging, accounting for 58% of the variance ($R2 = 0.58$, $F5,84 = 22.89$, $p < 0.001$). Standardized beta coefficient was obtained for perceived self-efficacy ($\beta = 0.38$, $p = < 0.001$), social support ($\beta = 0.31$, $p = < 0.001$), life satisfaction ($\beta = 0.25$, $p = < 0.001$) and educational level ($\beta = 0.23$, $p = < 0.05$).

CONCLUSION: It was concluded that perceived self-efficacy, social support, educational level and life satisfaction can predict successful aging among community dwelling older adults in Thimphu, Bhutan. Therefore, implementing intervention programs upon the significant predicting factors to enhance successful aging of community dwelling older adults is recommended.

Keywords: successful aging, older adults, Bhutan

Physiological aging is inevitable and is characterized by gradual deterioration of the body structure and function.[1] Globally, however, life expectancy is increasing and, in many countries, fertility and mortality rates are declining. Consequently, the number and percentage of older individuals is increasing in nearly every nation.[2] The World Health Organization estimated there were 600 million people aged 60 years and over in the year 2000.[3] In 2017, it was estimated 962 million people aged 60 years and above in the world, comprising 13 percent of the global population. World Health Organization (WHO) projected 1.2 billion older adults worldwide by 2025 and 2 billion by 2050.The global older population will be 1.4 billion in 2030 and 2.1 billion in 2050, and as many as 3.1 billion in 2100.[4] The most rapid increases in the older population (140 percent by 2030) are occurring in developing countries.[5] In the Kingdom of Bhutan in the eastern Himalayas, life expectancy has increased substantially, more than doubling from 32.4 years in 1960 to 69.5 years in 2014, and it is projected to be 75 by 2030.[6] The number of adults 60 and older represents over 5% of the population and is expected to increase to 11.2% by 2045.[7] With aging come physical, psychological and social challenges for individuals, communities and societies. Studies in many nations have documented rising rates of problems such as fractures, osteoarthritis, other chronic diseases and disability, dementia and hospitalization.[8,9] In both modernized and developing countries, therefore, it is vital to focus on not only longevity but also on healthy longevity and quality of life. These, more than mere years lived, are essential components of successful aging.

Successful aging is a concept stressing the quality of aging. This term has been used interchangeably with terms such as healthy aging, productive aging, and aging well.[10] The concept of successful aging has been interpreted from diverse perspectives, and while its definition has evolved through research over the last 50 years, there remains no consensus definition.[11,12] Generally, successful aging is characterized by high ability and function in the physical, mental, and social domains.[13] Successful aging was proposed based on a theory of adaptive development and effective life management domains. It incorporated behavioral, motivational, and cognitive processes in aging. Acknowledging decreasing cognitive function, the importance of adaptation strategies through selective optimization with compensation has been suggested.[13] Successful aging concept was described by differentiating it from "usual" aging.[14] Successful aging comprises three components: 1) avoiding disease and disability, 2) maintaining high cognitive and physical functioning, and 3) prolonging active engagement in life. [14,15]

Successful aging is often defined as an individual's "perception of a favorable outcome in adapting to the cumulative physiologic and functional alternations associated with the passage of time, while experiencing spiritual connectedness, and a sense of meaning and purpose in life".[16] Successful aging occurs when an individual uses adaptive mechanisms and spiritual resources to achieve a balance between physical limitations and environmental challenges.[17] Successful aging can include various factors such as perceived self-efficacy, social support, educational level, and perceived health status and life satisfaction. However, despite the recognized importance of these factors, the relationship between them and successful aging remains undefined.[18,19]

Perceived self-efficacy is, for older adults, a belief in their ability to control life-affecting events. Individuals with high self-efficacy will persevere, even in the absence of positive outcomes.[20] Perceived self-efficacy shows a strong positive correlation with successful aging. Self-efficacy declines with increasing age, and that decline is steepest in old age.[21] Even with many of the problems associated with aging, however, a person with high perceived self-efficacy can accommodate health and functional declines and achieve successful aging.

Social support is also linked to successful aging, typically coming from family, friends and others with close relationships with the older person. Social support plays a meaningful role in creating happiness, allowing older people to share age-related difficulties and to express love and affection. Research has found social support to be an essential factor in successful aging.[2,19]

Educational attainment can affect health in different ways at different stages of the life cycle. Successful aging has been highly correlated with education, and evidence suggested that those with higher levels of education were more likely to engage in healthy behaviors and less likely to adopt unhealthy habits.[22,23]

Older adults' perceived health status has been linked to reduced risk of mortality, disability, depression, and better cognitive health.[24-27] High perceived health means individuals feel better able to cope with changes that have occurred to their bodies as they age, to deal overall with their aging, and to promote successful aging.[16]

Another key to successful aging is life satisfaction. Numerous studies have found life satisfaction positively correlated to successful aging. Education, lifelong learning activities, life satisfaction, and well-being were positively associated with successful aging.[28] Life satisfaction and the feeling of being in control over one's life are important aspects of psychological functioning in old age and have been discussed as important indicators of successful aging.[13]

Since there is no study about successful aging in Bhutan, therefore, we decided to study the predicting factors of successful aging among community dwelling older adults in Thimphu, Bhutan. We expect that this study will help to promote successful aging among community dwelling elderly, in addition to increasing public awareness of the importance of successful aging in Bhutan.

Materials and Methods

In this predictive correlational study, data were collected with 90 community dwelling participants living in four villages at Thimphu, Bhutan using convenience sampling from April to May, 2018. The selection criteria included:

1. Age ≥ 60 years old.
2. No cognitive impairment as measured by Six Item Cognitive Impairment Test.[29]
3. Voluntary participation.
4. Ability to speak and understand the native language, Dzongkha.

Sample size was calculated following n = 50 + 8m (where n is sample size, m is the number of independent variables).[30] Since this study has five independent variables, the minimum sample size was 90.

Research Instruments

Data were collected using six questionnaires.

Part 1: Demographic questionnaire. Constructed by the researcher, this consisted of items measuring age, gender, marital status, educational level, income, co-morbidity, religion, and living arrangements.

Part 2: The General Self-Efficacy Scale (GSES). This scale, developed by Schwanrtzer and Jerusalem,[31] consists of 10 items, each scored on a four-point scale ranging from 1 (not at all true) to 4 (exactly true). GSES scores thus range from 10-40, with higher scores indicating higher self-efficacy. Cronbach's alphas ranged from 0.76 to 0.90 with the majority around 0.80.

Part 3: The Multidimensional Scale of Perceived Social Support (MSPSS). Developed by Zimet GD, et al.,[32] this instrument measures perceived social support from three sources: family, friends and significant others. The instrument consists of 12 items comprising three subscales: 1) Significant others subscale items 1, 2, 5, 10, 2) Family subscale items 3, 4, 8, 11., 3) Friends subscale items 6, 7, 9, 12.

Each item is rated on a 7-point Likert scale (ranging from 1 = very strongly disagree to 7 = very strongly agree). Internal consistency coefficients for the three subscales were 0.69 for significant others; 0.78 for family and 0.76 for friends.[33]

Part 4: The Perceived Health Status scale. Self-rated health was used to measure perceived health status. This instrument, developed by the Stanford Chronic Disease Self-Management Study, consists of 1 Likert scale item asking participants to rate their general health, scored from 1 (poor) to 5 (excellent). Test reliability was 0.92.[34]

Part 5: Life Satisfaction Index for the Third Age-Short Form (LSITA-SF). This is an updated and comparatively briefer scale of 12 items based on the theoretical framework.[35] LSITA-SF scale reliability was 0.90 with satisfactory content, construct and criterion validity. This short version measures only the overall construct of life satisfaction. Each item score ranges from strongly disagree to strongly agree. Reverse scoring is used for some items.

Part 6: The Successful Aging Inventory (SAI). This instrument, developed by Troutman,[36] based on theory,[37] consists of 20 items, each a brief, positively worded statement expressing a single idea or behavior suggestive of successful aging. Items are rated on a 4 point Likert scale (from 0 = hardly ever/ strongly disagree to 4 = almost always/strongly agree). Higher scores indicate more successful aging. Cronbach's alpha coefficient was 0.86.

The original versions of all instruments were translated into Dzongkha, the Bhutanese language. The back translation process was used to ensure content validity of the questionnaires.[38] Then the Dzongkha versions of all instruments were tested by a pilot test for internal consistency using Cronbach's alpha. Reliability was tested on 30 older adults in Thimphu, Bhutan with characteristics similar to the samples. Cronbach's alpha for GSES, MSPSS, LISTA-SF and SAI were 0.90, 0.90, 0.70 and 0.70, respectively.

Ethical considerations

This study was approved by the Human Research Ethics Committee of Faculty of Nursing, Burapha University (approval 07-02-2561) and the Research Ethical Board, Ministry of Health, Bhutan. This is to protect the rights of the samples, starting from the data collection process until the findings of the research are presented. The researcher explained clearly the purpose of the research and research procedures, and notified the participants of their rights regarding withdrawal from the study, which stipulates they can withdraw anytime without any negative effects.

Data collection procedure

Researchers visited participants who met inclusion criteria at their home. Firstly, they were screened with the Six Item Cognitive Impairment Test. If they passed the test, then the researcher explained and administered those 6 questionnaires in Dzongkha. Each interview took 40-50 minutes. Interviews were conducted between 9 a.m. and 5 p.m. everyday. The researcher finally collected the data from 90 cases as planned.

Data analysis

1. The collected data was analyzed using a statistical software program. The significant level of statistical test was set at $\alpha = 0.05$. Both descriptive and correlation statistics were used for data analysis. The res earcher followed the sequential.
2. The data was tested for normality and assumptions of Pearson's Product Moment correlational coefficient including histogram, scatterplots, and linearity. The data met the assumptions.
3. Descriptive statistics including frequency, percentage, mean (M), and standard deviation (SD) was used to describe the demographic information and other study variables.
4. Standard multiple regression was used to determine the prediction among the variables.

Results

Characteristics of the sample are shown in Table 1. Most of the participants (58.9%) were female, all (100%) were Buddhist, and half were young-old (52.2% age 60-69, mean = 70.43, SD = 7.53). Half (51.1%) had no formal education and half (50.7%) were married. Almost three-quarters (72.2%) were living with their families. Half (50%) had no current illness and most (83.3%) had no income. Summary statistics for the variables used to measure variables are shown in Table 2. The mean score of perceived self-efficacy was 31.58 (range = 10-40, SD = 8.49). The mean score for social support was 74.87 (range = 12-84, SD = 12.46). The mean educational level score was 1.18 (range = 0-18, SD = 1.63). The mean perceived health status score was 2.59 (range = 1-5, SD = 0.75). The mean life satisfaction score was 47.07 (range = 16-68, SD = 8.56). The mean successful aging score was 69.78 (range = 27-80, SD = 11.72).

Correlations between the dependent variable of successful aging and the five predictors. Perceived self-efficacy, social support, life satisfaction and educational level were all positively and significantly ($p < 0.001$) related to successful aging. Perceived health status was not related to successful aging see Table 3. Multiple regression analysis showed social support, life satisfaction and perceived self-efficacy, and educational level significantly explained successful aging accounting for 58% of the variance in successful aging ($R2 = 0.58$, $F(5, 84) = 22.90$, $p < 0.000$) see Table 4.

ISSN 2287-0237 (online)/ 2287-9674 (print)

Table 1: Characteristics of the samples (n = 90).

Characteristics	n (%)
Gender	
Female	53 (58.9)
Male	37 (41.1)
Religion	
Buddhist	90 (100)
Age (Years)	
60 - 69	47 (52.2)
70 - 79	29 (32.2)
80 - 89	13 (14.4)
>90	1 (1.1)
Range 60 to 92 years	70.43 ± 7.53
Education	
No formal education(0 years)	46 (51.1)
Primary school (1 - 5 years)	16 (17.8)
Secondary school (6 - 9 years)	9 (10.0)
High school (10 - 12 years)	5 (5.6)
Bachelor's degree (15 years)	6 (6.7)
Master's degree (18 years)	8 (8.9)
Marital status	
Single	6 (6.7)
Married	51 (56.7)
Divorced	1 (1.1)
Widowed	32 (35.6)
Living Arrangement	
Alone	14 (15.6)
Spouse	10 (11.1)
Family	65 (72.2)
Co-morbidity (current illness)	
No disease	45 (50.0)
Hypertension	29 (31.2)
COPD	4 (4.4)
Diabetes	6 (6.7)
Hypertension and diabetes	1 (1.1)
Other	5 (5.6)
Income (Nu per month, 1 USD = 68 Nu)	
No income	75 (83.3)
<5,000	1 (1.1)
5,000-10,000	6 (1.1)
≥10,001	8 (8.9)

Table 2: Descriptive statistics of variables.

Variables	Possible score range	Actual range	Mean ± SD
Perceived self-efficacy	10 - 40	10 - 40	31.58 ± 8.49
Social support	12 - 84	12 - 84	74.87 ± 12.46
Educational level	0 - 18	0 - 18	1.18 ± 1.63
Perceived health status	1 - 5	1 - 5	2.59 ± 0.75
Life satisfaction	12 - 72	16 - 68	47.07 ± 8.56
Successful aging	0 - 80	27 - 80	69.78 ± 11.72

Table 3: Correlation coefficients for perceived self-efficacy, social support, life satisfaction, educational level, perceived health status, and successful aging.

Variables	1	2	3	4	5	6
Successful aging	1					
Perceived self-efficacy	0.62**	1				
Social support	0.49**		1			
Life satisfaction	0.39**		0.12	1		
Educational level	0.42**		0.13**	0.14	1	
Perceived health status	0.06		0.19	0.19	0.10	1

** $p < 0.001$; * $p < 0.05$

Table 4: Predicting factors of successful aging

Independent variable	B	β	
Perceived self-efficacy	0.53	0.38***	
Social support	0.29	0.31***	Intercept =19.53*
Educational level	1.66	0.23*	R2 = 0.58, F(5, 84)= 22.89***
Life satisfaction	0.34	0.25**	
Perceived health status	-0.24	-0.15	

*$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
DV = Successful aging, B = unstandardized beta coefficient,
β = standardized beta coefficient.

Discussion

This study hypothesized that high levels of five factors—perceived self-efficacy, social support, education, perceived health status, and life satisfaction—could predict successful aging among community dwelling older adults living in Thimphu, Bhutan.

First, perceived self-efficacy was a significant correlate and predictor of successful aging ($r = 0.62$, $p < 0.001$); $\beta = 0.38$, $p < 0.001$). According to successful aging theories discussed above, more perceived self-efficacy meant greater personal control, creativity, and confidence. People with higher self-efficacy ostensibly have more knowledge and experience to cope with any type of change, including physiological, psychological, and social changes that typically accompany aging. Higher self-efficacy improves the odds of finding thoughtful, innovative solutions to age-related challenges.[37] It should be noted that just over half of the older adults in this study were young-old (age 60-69). Among the older population, this age group is most likely to be active, healthy, independent, socially engaged and able to cope with the modern accoutrements of contemporary life. This finds widespread research support. It was found that high perceived self-efficacy contributed to happiness, life satisfaction, positive behaviors, willingness to face challenges, emotional balance, and decreased stress.[39] It was reported in similar findings regarding perceived self-efficacy and successful aging.[2,19,40] In addition, low perceived self-efficacy may lead to giving up certain behaviors or activities once challenging circumstances arise.[41] High perceived self-efficacy is thus a logical and crucial factor in successful aging, determining whether older

adults can or are willing to try to meet age-linked threats to their well-being and quality of life.

Second, several studies have found social support significantly related to successful aging. The same was found among older community-dwelling adults in Thimphu, Bhutan (r = 0.49, p < 0.001); β =0.31, p < 0.001). Over 70% of participants were living with family, where intergenerational support, especially flowing from younger to older generations, is a strong cultural norm and can contribute to successful aging. Filial piety, where the younger generation respects and supports their older family members, is an expectation in several Asian cultures. Family is an important provider of social support for older adults and can provide them with confidence, goals and goal attainment, higher motivation and lifelong experiences. The notion that social support is significantly related and can predict successful aging is supported.[2,19,39,42]

Next, in this study educational level was a statistically significant correlate and predictor of successful aging in this sample of older adults (r = 0.42, p < 0.001; β = 0.23, p < 0.05). Education can be a significant facilitator of achieving goals, including health and physical functioning,[43] which can lead to greater perceived self-efficacy and thus greater odds of successful aging. In this study, though, 51% of participants had no formal education and another 18% had five years of less of education. This may be due to the uniqueness of Bhutanese that focus on gross national happiness. Therefore, even they have low educational level, they are happy and live successfully. However, it was found that higher educational level was not associated with successful aging.[44]

High perceived health status has been related to lower risk of mortality and reduced disability.[45] But as age increases, health typically worsens; the studies found a negative relationship between health and age.[46] Yet in this study, contrary to these and other studies, and thus the tested hypothesis, perceived health status was not a correlate or predictor of successful aging (r = 0.06, p > 0.05; β = -0.15, p > 0.05). It is possible that this could be due to sample homogeneity on some variables. For example, half the participants were age 60-69 and more likely to perceive their health as good. Half had none of the health problems measured in this study. Nearly three-quarters lived with family who could assist them, possibly obscuring health problems from the older adults or allowing them to deny them, which would lead them to perceive their health as better than it really was.

There can also be, with increasing age, a shift in metaperspective, from a materialistic and rationalist perspective to a more mature and existential one where transcending experiences are more likely (e.g., lower death anxiety, more wisdom). Consequently, physical health may decline in importance compared to, say, spiritual health. This would be consistent with criticisms of Rowe and Kahn's model,[14,15] i.e., that disease or disability disqualify one from aging successfully.

The last independent variable, life satisfaction, was a statistically significant correlate and predictor of successful aging (r = 0.39, p < 0.001; β = 0.25, p < 0.05). Life satisfaction is one's evaluation of life as a whole, rather than the feelings and emotions that are experienced in the moment. It can be argued that when older adults are satisfied with their lives, they are more accepting of death, they may increase both religiosity and religious practice, they are more likely to engage in regular physical activity or exercise to improve or maintain their health, they are more likely to monitor their diet, they will be more positive, and they will feel more autonomous; all of these are linked to successful aging. It was found that majority of respondents identified life satisfaction as leading to successful aging.[47] Koltko-Rivera[48] has proposed that subjective wellbeing in later life may be perceived as a building block process similar to Maslow's self-actualization hierarchy. Subjective well-being requires the fulfillment of lower needs (life satisfaction) before the individual can reach the higher level needs of self-actualization (successful aging).

Conclusions

This is first study of its kind in Bhutan. Most of the findings were consistent with prior research: it can thus be argued that perceived self-efficacy, social support, educational level and life satisfaction can predict successful aging in Bhutan. Nurses and health care providers should focus on these factors when providing care to enhance successful aging in older adults. More study is needed, however, on the relationship of perceived health status to successful aging among Bhutanese elderly. There is a strong (but not universal) consensus about the relationship, but it was not a statistically significant one in this study. Nursing intervention regarding perceived health status, perceived self-efficacy, and social support should be designed and researched in order to promote and enhance successful aging for older adults as well.

References

1. Van Leeuwen IM, Vera J, Wolkenhauer O. Dynamic energy budget approaches for modelling organismal ageing. Philos *Trans R Soc Lond B Biol Sci* 2010;365(1557):3443-54.
2. Cha NH, Seo EJ, Sok SR. Factors influencing the successful aging of older Korean adults. *Contemp Nurse* 2012;41(1):78-87.
3. World health organization. World health statistic 2012. Geneva, Switzerland;2012.
4. United Nations, Department of Economic and Social Affairs. World population ageing 2017:United Nation;2017
5. National Institute on Aging, National Institutes of Health, US Department of health and human services, U.S. Department of State. Why population aging matters: A global perspective. (Accessed November 5, 2017 from https://www.nia.nih.gov/sites/default/ files/2017-06/WPAM.pdf).

ISSN 2287-0237 (online)/ 2287-9674 (print)

6. Długosz Z, Raźniak P. Risk of population aging in Asia. *Procedia-Social and Behavioral Sciences* 2014;120:36-45.
7. Dorji N, Dunne MP, Seib C, et al. Quality of life among senior citizens in Bhutan: Associations with adverse life experiences, chronic diseases, spirituality, and social connectedness. *Asia Pac J Public Health.* 2017;29(1):35-46.
8. Rapp K, Becker C, Cameron ID, et al. Femoral fracture rates in people with and without disability. *Age Ageing.* 2012;41(5):653-8.
9. Sousa RM, Ferri CP, Acosta D, et al. Contribution of chronic diseases to disability in elderly people in countries with low and middle incomes: A 10/66 dementia research group population-based survey. *The Lancet,* 2009;374(9704):1821-30.
10. Depp CA, Jeste DV. Definitions and predictors of successful aging: A comprehensive review of larger quantitative studies. *Am J Geriatr Psychiatry* 2006;14(1):6-20.
11. Martin P, Kelly N, Kahana B, et al. Defining successful aging. *The Gerontologist* 2014;55(1): 14-25.
12. Cosco TD, Stephan BCM, Brayne C, et al. Education and successful aging trajectories: A longitudinal population-based latent variable modelling analysis. *Can J Aging* 2017;36(4): 427-34.
13. Baltes PB, Baltes MM. Psychological perspectives on successful aging: The model of selective optimization with compensation. Successful aging: Perspectives from the behavioral *Sciences* 1990;1(1):1-34.
14. Rowe JW, Kahn RL. Human aging: Usual and successful. *Science* 1987;237(4811):143-9.
15. Rowe JW, Kahn RL. Successful aging. *The Gerontologist* 1997;37(4):433-40.
16. Flood M. Successful aging: A concept analysis. *J Theory Constr Test* 2002;6(2):105-8.
17. Young Y, Frick KD, Phelan EA. Can successful aging and chronic illness coexist in the same individual? A multidimensional concept of successful aging. *J Am Med Dir Assoc.* 2009;10(2):87-92.
18. Arias-Merino ED, Mendoza-Ruvalcaba NM, Arias-Merino MJ, et al. Prevalence of successful aging in the elderly in western Mexico. *Curr Gerontol Geriatr Res* 2012;1-6.
19. Kim HK. Factors affecting successful aging among male elders in Korea. *J Converg Infor Technol* 2013;8(14):341-50.
20. Carter A, Breen L, Yaruss JS, et al. Self-efficacy and quality of life in adults who stutter. *J Fluency Disord* 2017;54:14-23.
21. McMullin JA, Cairney J. Self-esteem and the intersection of age, class, and gender. *J Aging Stud* 2004;18(1):75-90.
22. Ross CE, Wu CL. Education, age, and the cumulative advantage in health. *J Health Soc Behav* 1996:104-20.
23. Van Oort FV, van Lenthe FJ, Mackenbach JP. Cooccurrence of lifestyle risk factors and the explanation of education inequalities in mortality: results from the GLOBE study. *Prev Med* 2004;39(6):1126-34.
24. Wilkins K. Social support and mortality in seniors. *Public Health Rep* 2003;14(3):21-34.
25. Mendes de Leon CF, Glass TA, Berkman LF. Social engagement and disability in a community population of older adults: The new haven EPESE. *Am J Epidemio* 2003;157(7):633-42.
26. Fiori KL, Antonucci TC, Cortina KS. Social network typologies and mental health among older adults. *J Gerontol B Psychol Sci Soc Sci* 2006; 61(1):P25-32.
27. Engelhardt H, Buber I, Skirbekk V, et al. Social involvement, behavioural risks and cognitive functioning among older people. *Ageing Soc* 2010;30(5):779-809.
28. Yamashita T, López EB, Stevens J, et al. Types of learning activities and life satisfaction among older adults in urban community-based lifelong learning programs. *J Act Adapt Aging.* 2017;41(3):239-57.
29. Jefferies K, Gale TM. 6-CIT: six-item cognitive impairment test. *In cognitive screening instruments. Springer, London.* 2013: 209-18.
30. Tabachnick BG, Fidell LS. Multiple regression. *Using multivariate statistics* 2001;3:709-811.
31. Schwarzer R, Jerusalem M. Optimistic self-beliefs as a resource factor in coping with stress. In extreme stress and communities: Impact and intervention 1995 (pp. 159-177). Springer,Dordrecht.
32. Zimet GD, Dahlem NW, Zimet SG, et al. The Multidimensional scale of perceived social support. *J Pers Assess* 1988;52:30
33. Cheng ST, Chan AC. The multidimensional scale of perceived social support: dimensionality and age and gender differences in adolescents. *Per Individ Dif* 2004;37(7), 1359-69.
34. Lorig K. Chronic disease self-management: A model for tertiary prevention. *Am Behav Sci*. 1996;39(6):676-83.
35. Neugarten BL, Havighurst RJ, Tobin SS. The measurement of life satisfaction. *J Gerontol* 1961;16(2):134-43.
36. Troutman M, Nies MA, Small S, et al. The development and testing of an instrument to measure successful aging. *Res Gerontol Nurs* 2011;4(3): 221-32.
37. Flood M. A Mid-Range Nursing Theory of Successful Aging. *J Theory Constr Test* 2005;9(2):35-9.
38. Cha ES, Kim KH, Erlen JA. Translation of scales in cross cultural research: Issues and techniques. *J Adv Nurs*. 2007;58(4):386-95.
39. Frisch MB. Quality of life therapy: Applying a life satisfaction approach to positive psychology and cognitive therapy. New Jersey: John Wiley & Sons; 2005.
40. Trieu NT, Jullamate P, Piphatvanitcha N. Factor related to successful aging among older adults in Danang, Vietnam. *J Nurs Heal Sci* 2015;10 (3):38-44.
41. Pender NJ, Murdagh C, Parson MA. Health Promot Pract, 6th ed. New Jersey:Prentice Hall;2011.
42. Howie LO, Troutman-Jordan M, Newman AM. Social support and successful aging in assisted living residents. *Educ Gerontol*. 2014;40(1):61-70.
43. Ross CE, Wu CL. The links between education and health. *Am Sociol Rev* 1995;60(5):719-45.
44. Meng X, D'arcy C. Successful aging in Canada: prevalence and predictors from a population-based sample of older adults. *Gerontology.* 2014;60(1):65-72.
45. Mendes de Leon, CF, Glass TA, Berkman LF. Social engagement and disability in a community population of older adults. *Am J Epidemiol* 2003;157(7), 633-642.
46. Centre for Bhutan Studies. *Gross national happiness.* KMT printing, Thimphu,Bhutan;2015.
47. Fisher BJ. Successful aging, life satisfaction, and generativity in later life. *Int J Aging Hum Dev.* 1995;41(3):239-50.
48. Koltko-Rivera ME. Rediscovering the later version of Maslow's hierarchy of needs: Self-transcendence and opportunities for theory, research, and unification. *Rev Gen Psycho* 2006;10(4):302-17.