

# Review on global strategy in healthy aging

Fovziye Sanaati<sup>1</sup>, Keshvar Samadaee Gelehkolaei<sup>1</sup>, Ziba Taghizadeh<sup>1</sup>, Ilia Zamani Hajiabadi<sup>2\*</sup>

<sup>1</sup>Department of Reproductive Health, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

<sup>2</sup>Student Research Committee, Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran

## Correspondence to:

Ilia Zamani Hajiabadi, Email:  
Email: madwx@yahoo.com,  
madwx78@gmail.com

**Received:** 22 Sep. 2019

**Accepted:** 1 Dec. 2019

**ePublished:** 16 Dec. 2019

**Keywords:** Global strategy,  
Healthy aging, Elderly

## Abstract

It is predicted that the elderly population of the world will be almost double by 2050. Therefore, the necessary preparations should be made before entering this stage of demographic structure. The present paper aims to review global strategies for healthy aging. This study was designed in five steps including identification of research question, search in databases, data extraction, classification of data, and presentation of results. In the present study, factors associated with healthy aging were classified into four general categories including economic-social-cultural problems, physical-mental-sexual problems, elder mistreatment, and proposal of global strategies. The elderly people should enjoy an active and high-quality life. Since all societies will sooner or later enter this stage of demographic transition, all countries should do their best in this regard to realize this objective on a cultural basis.

**Citation:** Sanaati F, Samadaee Gelehkolaei K, Taghizadeh Z, Zamani Hajiabadi I. Review on global strategy in healthy aging. J Prev Epidemiol. 2019;4(2):e23.



## Introduction

Population aging is a global process that is taking place in different countries at different rates. For the first time in history, people can expect to live up to the age of 60 and more. According to the United Nations population projections, the share of the elderly population will increase to 21% of the world's population by the middle of the 21st century (1). The fact that how individuals and society can take advantage of this opportunity is largely dependent on the key issue of health (2).

Developing countries will probably face more difficulties due to their further problems in terms of infrastructure needed to cope with this demographic phenomenon. This means that communities will need more facilities, more power, and more efficient ways to provide more appropriate services for the elderly (3, 4). The later the policies on this issue adopted, more serious problems countries will be faced with. Requirements in this period of life are not restricted to health needs but they involve emotional-economic-social needs, leisure, sense of being effective, and sense of dignity and respect (2,5,6). Considering the religious and cultural background of Iranians, the entity of family currently plays an important role in supporting the elderly in this country. However, demographic transition has caused huge changes in families and

## Key point

Before carrying out any intervention on the elderly, high-quality interventions should be extracted through a systematic review and the obtained data and information be used for the development and implementation of required interventions.

thereby led to an intergenerational gap and lack of mutual understanding between the two generations(7). On the other hand, the issue of aging is so important that it has been explicitly emphasized in Iran's population policies and the bill of citizenship rights (8).

## Objectives

Hence, to have healthy elderlies and use this opportunity as a source of wealth and experience in community and family, it is necessary to implement culture-based plans and strategies which have been successfully tried in other aging societies. Thus, the present paper aims to review global strategies for healthy aging.

## Methods and Materials

In this narrative review, researchers used Google Scholar general search engine, Science Direct, PubMed, Scopus, Cochrane library; Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, SID, Magiran, Irandoc, Berekat, World Health Organization (WHO), North

American Menopause Society (NAMS), and Springer sources. Search strategy was performed using the following keywords as well as their Persian equivalents. The terms used were: Health elderly or Health aging, Global strategy, Health older, Life style. The date included in this review was considered from 2003 to 2017.

### Study selection

A total of 136 studies were found in the first search. Then reviewers studied titles and abstracts. Secondly 105 papers were included due to the relevance of title and abstract. Finally, assessment of full text studies was performed by two independent reviewers. Researchers reviewed summary of all articles, ultimately used data from 53 full articles to compile this review paper. Data extracted were summarized in [Figure 1](#) and [Table 1](#). Reporting data were four categories.

### Inclusion criteria

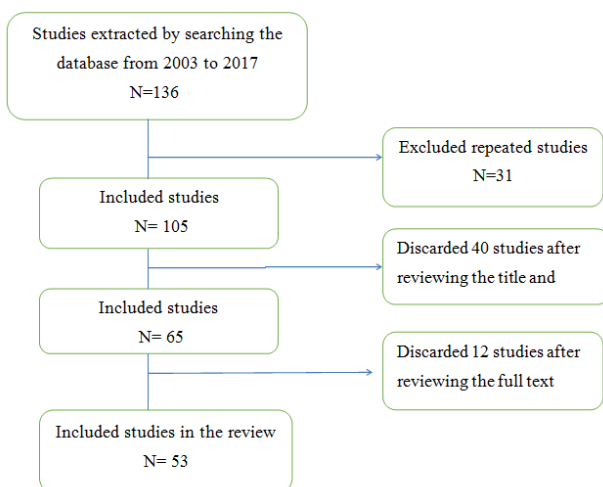
We included peer-reviewed articles published between 2003 and 2017 that described health elderly in different contexts and as the solutions.

### Exclusion criteria

We excluded papers that did not express a solution or included other ages.

### Results

After the review of relevant papers ([Figure 1](#)), 53 studies that met the inclusion criteria were selected for further analysis. These studied were of cross-sectional, clinical trial, narrative review, systematic review, case-control, and prospective longitudinal types. Reports of the World Health Organization (WHO) were also included. These studies were conducted between 2003 and 2017 and, except for one that was related to 1993, most of them were done after 2010.



**Figure 1:** Flowchart of study selection progress.

### Discussion

The findings obtained from the review of papers were classified into the following four categories:

#### *Economic, social, and cultural problems*

As one of the largest socioeconomic problems, poverty can severely affect the quality of life in the elderly. The prevalence of chronic diseases and health problems along with increased health costs and reduced capacity for work increase the household expenditure. If the necessary supportive measures such as enjoyment of pension and basic health insurance are not planned, aging of the family head could put them at risk of poverty. The combination of poverty and aging causes these people to be viewed among the highly vulnerable groups in society (9,10). In this regard, gender discrimination is a significant social factor. For example, elderly women are more susceptible to poverty. For various socio-cultural reasons, women are more likely than men to remain alone at older ages, and with the change in the family structure from extended to nuclear, the financial security of such women will be in trouble. On the other hand, in a study conducted by Arber and Ginn, women are less likely than men to report positive health and this is a serious threat to women than men in terms of practical disability. Loneliness is one of the major damages to elderly women. There are many obstacles to the marriage or remarriage of elderlies and particularly women which can be removed through education and culture-building (11,12). Beliefs about aging, influenced by culture, have a significant impact on the well-being and health of the adult population. Ageism is based on myths and prevailing beliefs as well as the negative mentality of aging. Even some argue that adoption of healthy behaviors during oldness is strongly linked with people's beliefs about aging (13).

#### *Physical, mental, and sexual problems*

Aging increases the odds of chronic diseases such as diabetes, cancers, and mental disorders because of a weakened immune system and changes in living conditions which can affect the quality of life. Particularly, the elderly behaviors after diagnosis of a disease are associated with their coping mechanism, depression, and self-concept (14-16). Sexual problems are among the common difficulties of aging that are less considered by the elderly and even healthcare providers. Sexual problems are caused by different reasons, the simplest of which is reduced quantity and quality of sex hormones. Contrary to public opinion, sexual problems are not among the inevitable consequences of aging but they may be caused by physical, mental, socio-cultural, and interpersonal factors, lifestyle, and gender differences (17,18). General practitioners usually are the first level of health care that provide primary care to the elderly. Therefore, their attitude towards sexual problems of aging can be very helpful in this regard. Gott et al studied the attitude of general practitioners towards sexual

**Table 1.** Challenges and solutions of healthy aging

Factors associated with healthy aging	Number of relevant papers	Included	Mechanism of action	Recommendations
Economic, social, and cultural factors	5	Poverty, cultural stereotypes including ageism, intergenerational gap, gender inequality and discrimination	Illiteracy, widowhood, no retirement, and no insurance coverage cause poverty and vulnerability. Lack of understanding of parents and children as a result of family disengagement, poor attitude towards aging	Training, culture-building in schools to reduce the generation gap, culture-building to avoid gender discrimination, social protection, insurance coverage for the elderly
Physical, mental, and sexual factors	7	Prevalence of chronic diseases, prevalence of mental disorders, prevalence of sexual dysfunctions, erectile dysfunction	Weakness of the immune system, loss of physical strength, reduced social role as a result of dignity loss, sexual impotence	Screening examinations for early diagnosis, training of healthy lifestyles, different types of consultation
Elder mistreatment	6	Physical-sexual-mental-financial violence, neglect, rejection	Financial dependence, issues of inheritance, limited mobility	Training the elderly and their families, social supports, legal support
Global strategies for healthy aging	42	Administrative obligations, health systems aligned with the needs of the elderly, development of elder-friendly environments, improvement of long-term care, improved monitoring of the care assessment and research programs	Execution of all 5 dimensions of the World Health Organization report increases the quality of life and level of satisfaction with life among the elderly	Intersectional cooperation and coordination for implementation of care program for the elderly integrated with primary health care, development of an elder-friendly society, conduction of research projects

health at ages of oldness in a qualitative research and their results showed that general practitioners usually overlook sexual health of the elderly in providing primary care to them because of the prevailing thoughts and attitudes about sexuality in old age. Hence, Gott et al emphasized the need for learning, training, and addressing the sexual problems of patients in primary care (19). On the other hand, Lindau et al point out that sexuality is one of the issues that are less addressed at these ages, while failure to address and meet them can cause depression and social isolation in the elderly. Moreover, side effects of some drugs on the sexual life of the elderly sometimes cause them to stop other treatments. The study findings indicated that the prevalence of different sexual practices like oral sex is 48% in younger elderlies and 31% in older elderlies. In addition, the prevalence of masturbation is 42% and 55% in elderly men with/without a sexual partner and 25% and 23% in elderly women with/without a sexual partner, respectively. These statistics clearly indicate the existence of sexuality and the need for paying attention to old age (20).

### **Elder mistreatment**

The elderly may be mistreated by their family member, sexual partner or society. Different types of mistreatment include physical, mental, sexual, financial, and neglect (7). In 90% of cases, an elderly is mistreated by their spouse or one of the family members. The consequences of such mistreatment include depression, somatization disorder, suicide, and drugs abuse (21). About 10% of the elderly

experience at least one case of such violence and usually do not express it because of fear or cultural considerations. Such mistreatments usually can cause physical injuries or premature death (22,23). Predisposing factors include illiteracy, economic dependence, living with married children, widowhood, and physical illnesses (24). In countries where there are strong supportive laws against all forms of violence, reporting such cases can be helpful in the prevention of further damages (25). However, this is a controversy that whether training the elderly on types of violence and reporting them in a timely manner can reduce the amount of violence or exacerbate the abuser's behavior (22). What is certain is the positive relationship between understanding the affected elderly and their willingness to report cases of mistreatment. In addition, one's perception of mistreatment is related to Senior Citizens Welfare Act and accessible information (25).

### **Proposal of global strategies**

According to a WHO report, the global strategy to achieve healthy aging should focus on five key factors including human rights, fairness and justice, equality and non-discrimination, gender equality, and cohesion and reduction of the intergenerational gap. In order to achieve these objectives, the following infrastructural items should be provided in societies;

#### **A. Administrative obligations**

All relevant organizations and authorities that can somehow be effective in the promotion of the elderly

health, such as private and public sectors, municipalities, ministries of health, politicians, planners, education systems, and academics, must be committed to implementing intersectoral cooperation (2). Training the elderly, their families, and the medical staff in order to change the culture of ageism can be effective in promoting healthy aging. Presently, most people assume that aging is equal to infirmity, dependence, and disability. This view not only affects the quality of life in the elderly but also makes families elude the elder members, resulting in the intergenerational gap and further problems. To solve these problems, making changes to the dominant culture should begin in schools, and the media should promote the culture of active aging in society (13,26, 27). Furthermore, this training can play a major role in the prevention of elder mistreatment which is one of the main health problems (25). Coping with gender discrimination and inequality should be set as a top priority in the implementation of health aging programs by governments (11,12). Addressing the constructs like self-control, spirituality, joy, happiness, and hope can leave positive effects on the physical and mental health of the elderly. On the other hand, hope therapy programs can increase the effectiveness of treatment procedures and motivate self-care (4,28). Supportive measures for the prevention of poverty include Supplemental Security Income (SSI) which refers to having sufficient income to create financial security in old age. This program can be useful for the poor elderly, especially women. In this regard, governments are responsible for development and implementation of culture-based economic programs to support the elderly. On the other hand, encouragement of marriage life has been mentioned as a strategy to prevent poverty among elderly women (9, 10). Malaysian Social Welfare Department, affiliated with the Ministry of Social Development, is the only agency in this country responsible for the development of care services for the elderly which aims to improve the capacity and ability of the elderly, their families, and the who society in social development. One of the responsibilities of this department is providing services for poor elderlies aged over 60 (29).

#### *B. Health systems aligned with the needs of the elderly*

Changes in body systems and compliance with them are among the inevitable requirements of aging. Hence, care systems in society should be developed and provided in accordance with the needs of the elderly. A study in the US showed that the treatment cost for people aged over 65 is five times more than that of those aged under 65 (4). The eye is one of the major body organs that undergo fundamental changes during aging. Since visual impairment, for fear of damage, can limit daily activities, result in further disability, and reduce the quality of life, it should be seriously taken into account in the care systems (30). Injuries from falls cause mortality, morbidity, and

the imposition of heavy costs of fractures. As a result, the elderly should be trained to prevent falls and protect themselves. Cognitive behavior therapy programs, taking some dietary supplements and calcium, making the necessary changes to the place of residence such as increasing the ambient light, installation of knobs in the bathroom and toilet to prevent slipping, and removal of unnecessary stairs, and diagnostic tests can be helpful in this respect (4, 31). Oral health training also can improve the quality of life and prevent oral diseases in the elderly (32). With an emphasis on training in the elderly care, providing care for the elderly at home, good provision of primary health care, and mental health, integrated care programs for the elderly are currently being executed in Iran which bring many benefits (4). Satisfaction with life in old age depends on the active maintenance of family relations and continuous participation in important interactions (5). A study conducted by Pourmeidani et al in 2014 indicated that lifestyle can explain 20% of the variance in marital satisfaction. Therefore, it is necessary that the care systems provide lifestyle training programs in order to improve the health and marital satisfaction of the elderly and help them to achieve an active aging (33). Because of the vulnerability and affliction with chronic disorders, mental health should be more specially taken into account in old age (15,34). Social working to support the elderly and their family and group consultations can reduce the level of anxiety, stress, and depression in this group of the population (3,35). In addition, sexual consultations can improve both marital relations and quality of life of the elderly. Thus, many studies have emphasized the need for such consultations and training (17-20). Generally, the existence of special centers for providing all services needed for the elderly is considered an important necessity in the care systems.

#### *C. Development of elder-friendly environments*

Living in natural areas or open and green spaces reduces stress, increases mobility, and causes a sense of more comfort and welfare. Living in such regions can prevent the loss of communicative functions such as hearing, vision, mobility, and social behavior (29,36). Implementation of community-based and elder-friendly programs includes making the necessary changes to the urban transport system, improvement of sidewalks with appropriate floorings, easy access to essential services such as pharmacy, shops for providing the necessities of life, recreational venues such as parks and gathering places for the elderly, and special centers for the elderly care such as sanatoriums (37, 38). Under the rules of human rights, elderlies have the right to lead a good and active life and to maintain their relations with the family and society through participation in social, religious, economic, and civil activities (39-41). It is interesting to know that there are societies in which elder-friendly communities have



been creatively expanded by non-profit and private sectors without governmental aids (41). Developing societies like Iran, where the aging population still does not account for a considerable percentage of the whole population, should now think of providing the necessary infrastructures for development elder-friendly communities in a collaboration between public and private sectors.

#### *D. Improvement of long-term care*

Development of societies and advancement of science and technology have increased life expectancy. Therefore, the quality of life and care is important more than ever. Since the quality of care services provided for the elderly by caregivers (either families or care centers) may reduce in a long-term, researchers have taken advantage of technology to both provide the independence of the elderly and promote the quality of care (42,43). A good example of these technologies is the installation of different applications on the electronic devices of E-Health or special sensors to monitor, manage, and plan care of the elderly at home. These technologies not only reduce the financial burden on health systems but also help the elderly to enjoy a higher quality of life (6,44). Committed robots are widely used in the care of the elderly with diseases such as dementia which can put so much pressure on the family members or caregivers of the patient (45). One of the problems of the elderly who live alone is the timely taking of medicines. To solve this problem, electronic sensors and social networks can be used that their efficiency has been confirmed in previous studies (46,47). In addition, there are some programs like Advanced Care Planning (ACP) that give the right to individuals to receive care as they desire and are able to interfere in the decision-making process in the event of serious illnesses. In fact, if one does not have the power of decision-making, these programs act as an alternative decision maker (48,49). Another example is a pre-written complete care plan or a pre-developed legal document of treatment decisions that requires caregivers to act based on in the case of disabilities or failures (50). Accordingly, the rights of patients are protected and unwanted treatments are rejected in countries like the US, Australia, England, and Canada (51-53).

#### *E. Assessment of care services and research programs*

After all above-mentioned steps proposed by the WHO to achieve a healthy aging, the last point that should be taken into account is that states should monitor the implementation of programs and have an accurate assessment of their implementation. In addition, conduction of culture-based studies and release of experiences have been emphasized by the WHO in this regard (2, 27).

#### **Conclusion**

Given the process of population aging in the world, it is necessary that Iranian authorities estimate the

population pyramid of this country based on national and international figures. Then, according to global strategies for healthy aging, all strategies that may improve the quality of life in the elderly and help them to lead an active life should be developed, implemented, and evaluated in accordance with Iranian culture. It seems that societies can safely enter the population aging transition only if they provide the necessary infrastructures. Since the present research was a narrative review study, the quality of studies was not much focused on. Thus, it is recommended that, before carrying out any intervention on the elderly, high-quality interventions be extracted through a systematic review and the obtained data and information be used for the development and implementation of required interventions.

#### **Acknowledgements**

We appreciate other professors of Tehran University that help us in this study. The abstract of this review was presented as a poster in the 3rd International Conference on Reproductive Health and Medicine 2017 (<https://www.conferenceseries.com>, ISSN: 2161-038X).

#### **Authors' contribution**

SGK and TZ designed the study, observed accuracy and validity of the study. SF participated in the data collection. ASFT and ZHI supervised the project. HI, SGK and SF wrote the paper. All authors edited and revised the final manuscript and accepted its publication.

#### **Conflicts of interest**

The authors declare that they have no conflict of interest.

#### **Ethical considerations**

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

#### **Funding/Support**

This research is the result of narrative review that was supported by Tehran University of Medical Sciences.

#### **References**

1. World Health Organization. 10 facts on ageing and the life course [Internet]. 2009 [cited 2009 Aug 27]. Available from: <http://www.who.int/features/factfiles/ageing/en>.
2. Vaillant GE, Mukamal K. Successful aging. *Am J Psychiatry*. 2001;158:839-47. doi: 10.1176/appi.ajp.158.6.839.
3. Javadian SR. Gerontological social work. *J Soc Work*. 2015;4(2):27-32.
4. Hollander MJ, Miller JA, MacAdam M, Chappell N, Pedlar D. Increasing value for money in the Canadian healthcare system: new findings and the case for integrated care for seniors. *Healthc Q*. 2009;12:38-2. doi:10.12927/hcq.2009.20414
5. Rafiee S, Toozandehjani H, Ahoeei MR. Relationship of lifestyle and social support with marital satisfaction of elderly population. *Salmand*. 2016;11:226-33. doi:10.21859/sija-1102226
6. de Jong CC, Ros WJG, van Leeuwen M, Schrijvers G. How professionals share an E-Care plan for the elderly in primary care: evaluating the use of an e-communication tool by different combinations of professionals. *J Med Internet Res*. 2016;18:e304. doi: 10.2196/jmir.6332.
7. Heravi Karimoei M, Reje N, Foroughan M, Montazeri A. Elderly abuse rates within family among members of senior social clubs in Tehran. *Salmand*. 2012;6(4):37-50.

8. Khamenei SA. Ayatollah Ali Khamenei on Iran's Population Policy. *Popul Dev Rev.* 2014;40(3):573-5. doi: 10.1111/j.1728-4457.2014.00708.x
9. Rupp K, Strand A, Davies PS. Poverty among elderly women: Assessing SSI options to strengthen Social Security reform. *J Gerontol Psychol Sci Soc.* 2003;58:S359-68. doi: 10.1093/geronb/58.6.s359
10. Phua V, McNally JW, Park K-S. Poverty among elderly Asian Americans in the twenty-first century. *J Poverty.* 2007;11:73-92. doi:10.1300/j134v11n02\_04
11. Artazcoz L, Borrell C, Benach J. Gender inequalities in health among workers: the relation with family demands. *J Epidemiol Community Health.* 2001;55:639-47. doi: 10.1136/jech.55.9.639
12. Arber S, Ginn J. Gender and inequalities in health in later life. *Soc Sci Med.* 1993;36:33-46. doi: 10.1016/0277-9536(93)90303-1.
13. Masoudnia E. Perceptions and beliefs on aging and their impact on elderly general health: an appraisal of self-regulation model. *Salmand.* 2016;11:310-21. doi:10.21859/sija-1102310
14. Borhaninejad V, Iranpour A, Shati M, Tahami AN, Yousefzadeh G, Fadayevatan R. Predictors of self-care among the elderly with diabetes type 2: using social cognitive theory. *Diabetes Metab Syndr.* 2017;11:163-166. doi: 10.1016/j.dsx.2016.08.017.
15. Alwhaibi M, Sambamoorthi U, Madhavan S, Kelly K, Bias T, Walkup J. Newly diagnosed depression after cancer diagnosis among elderly with breast, colorectal, and prostate cancer. *J Natl Compr Canc Netw.* 2016;19:A185. doi: 10.1016/j.jval.2016.03.1403
16. Kornmann VN, Walma MS, de Roos MA, Boerma D, van Westreenen HL. Quality of life after a low anterior resection for rectal cancer in elderly patients. *Ann Coloproctol.* 2016;32:27-32. doi: 10.3393/ac.2016.32.1.27
17. Kao A, Binik YM, Kapuscinski A, Khalifé S. Dyspareunia in postmenopausal women: a critical review. *Pain Res Manag.* 2008;13:243-54. doi: 10.1155/2008/269571
18. Laumann EO, Waite LJ. Sexual dysfunction among older adults: Prevalence and risk factors from a nationally representative US probability sample of men and women 57–85 years of age. *J Sex Med.* 2008;5:2300-11. doi:10.1111/j.1743-6109.2008.00974.x
19. Gott M, Hinchliff S, Galena E. General practitioner attitudes to discussing sexual health issues with older people. *Soc Sci Med.* 2004;58:2093-103. doi: 10.1016/j.socscimed.2003.08.025.
20. Lindau ST, Schumm LP, Laumann EO, Levinson W, O'muirheartaigh CA, Waite LJ. A study of sexuality and health among older adults in the United States. *N Engl J Med.* 2007;357:762-74. doi: 10.1056/nejmoa067423
21. Nelson HD, Nygren P, McInerney Y, Klein J. Screening women and elderly adults for family and intimate partner violence: a review of the evidence for the US Preventive Services Task Force. *Ann Intern Med.* 2004;140:387-96. doi:10.7326/0003-4819-140-5-200403020-00015.
22. Baker Philip RA, Francis Daniel P, Hairi Noran N, Othman S, Choo Wan Y. Interventions for preventing abuse in the elderly. *Cochrane Database Syst Rev.* 2016:CD010321. doi: 10.1002/14651858.CD010321.pub2.
23. Means R, Langan J. Money 'handling', financial abuse and elderly people with dementia: implications for welfare professionals. *Health Soc Care Community.* 1996;4:353-8.
24. Munsur AM, Tareque I, Rahman K. Determinants of living arrangements, health status and abuse among elderly women: A study of rural Naogaon district, Bangladesh. *J Int Women's Stud.* 2013;11:162-76. doi:10.1007/978-94-017-8990-5\_21.
25. Kim E-Y, Choi M-J, Cho G-Y. Perception and Reporting intention to Elder Abuse among Elderly Women. *J Korea Cont Assoc.* 2014;14:238-49. doi:10.5392/jkca.2014.14.01.238.
26. Jacobsen FF. Understanding public elderly care policy in Norway: A narrative analysis of governmental White papers. *J Aging Stud.* 2015;34:199-205. doi: 10.1016/j.jaging.2015.04.006.
27. Werakul N, Pathumcharoenwattana W, Amatayakul K. The Main Components Of A Non-Formal Education Program Using Neo-Humanist Moral Principles To Enhance Ethics In Caring The Elderly For The Foreseen Aging Society. *Procedia Soc Behav Sci.* 2014;152:903-10. doi: 10.1016/j.sbspro.2014.09.341.
28. Ghazi Mohseni M, Soleimanian AA, Heidarnia A. Examining the effectiveness of hope-based group training on the life quality of the elderly people. *Salmand.* 2016;11(2):300-9. doi:10.21859/sija-1102300
29. Othman AR, Fadzil F. Influence of Outdoor Space to the Elderly Wellbeing in a Typical Care Centre. *Procedia Soc Behav Sci.* 2015;170:320-9. doi: 10.1016/j.sbspro.2015.01.042.
30. Skelton DA, Howe TE, Ballinger C, Neil F, Palmer S, Gray L. Environmental and behavioural interventions for reducing physical activity limitation in community-dwelling visually impaired older people. *Cochrane Database Syst Rev.* 2013(6):Cd009233. doi: 10.1002/14651858.cd009233.
31. McClure R, Turner C, Peel N, Spinks A, Eakin E, Hughes K. Population-based interventions for the prevention of fall-related injuries in older people. *Cochrane Database of Syst Rev.* 2005(1):Cd004441. doi: 10.1002/14651858.cd004441.pub2
32. Masood M, Newton T, Bakri NN, Khalid T, Masood Y. The relationship between oral health and oral health related quality of life among elderly people in United Kingdom. *J Dent.* 2017;56:78-83. doi: 10.1016/j.jdent.2016.11.002.
33. Pourmeidani S, Noori A, Shafti A. Relationship between life style and marital satisfaction. *J Family Res.* 2014;10:331-4.
34. Kessler RC, Ormel J, Demler O, Stang PE. Comorbid mental disorders account for the role impairment of commonly occurring chronic physical disorders: results from the National Comorbidity Survey. *J Occup Environ Med.* 2003;45:1257-66. doi: 10.1097/01.jom.0000100000.70011.bb.
35. Pahlavanzadeh S, Navidian A, Yazdani M. The effect of psycho-education on depression, anxiety and stress in family caregivers of patients with mental disorders. *J Kermanshah Univ Med Sci.* 2010;14:228-236.
36. Abraham A, Sommerhalder K, Abel T. Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments. *Int J Public Health.* 2010;55:59-69. doi:10.1007/s00038-009-0069-z.
37. Phillipson C. Developing age-friendly communities: New approaches to growing old in urban environments. *Handbook of sociology of aging:* Springer; 2011. p. 279-93. doi: 10.1007/978-1-4419-7374-0\_18.
38. Šírdlová Kunstová N, Šírdlo L. The future development of elderly care home capacity in South Bohemia. *Kontakt.* 2016;18:e103-e11. doi: 10.1016/j.kontakt.2016.05.004.
39. Buffel T, Phillipson C, Scharf T. Ageing in urban environments: Developing 'age-friendly' cities. *Crit Soc Policy.* 2012;32(4):597-617. doi: 10.1177/0261018311430457.
40. Forooghmand Araabi H, Karimi Fard I. Age-friendly city design criteria centers of social interaction with the concepts of space and culture approach to mental health. *Urban Manag.* 2015;14:7-34.
41. Scharlach AE, Lehning AJ. Ageing-friendly communities and social inclusion in the United States of America. *Ageing Soc.* 2013;33:110-36. doi: 10.1017/s0144686x12000578.
42. Liu J-E, Tian J-Y, Yue P, Wang Y-L, Du X-P, Chen S-Q. Living experience and care needs of Chinese empty-nest elderly people in urban communities in Beijing, China: a qualitative

- study. *Inte J Nurs Sci.* 2015;2:15-22. doi: 10.1016/j.ijnss.2015.01.008.
43. Kwak C, Lee E, Kim H. Factors related to satisfaction with long-term care services among low-income Korean elderly adults: A national cross-sectional survey. *Arch Gerontol Geriatr.* 2017;69:97-104. doi: 10.1016/j.archger.2016.11.013.
  44. Costa Â, Castillo JC, Novais P, Fernández-Caballero A, Simoes R. Sensor-driven agenda for intelligent home care of the elderly. *Expert Syst Appl.* 2012;39:12192-204. doi: 10.1016/j.eswa.2012.04.058.
  45. Mordoch E, Osterreicher A, Guse L, Roger K, Thompson G. Use of social commitment robots in the care of elderly people with dementia: A literature review. *Maturitas.* 2013;74(1):14-20. doi: 10.1016/j.maturitas.2012.10.015.
  46. Spagnoletti P, Resca A, Sæbø Ø. Design for social media engagement: Insights from elderly care assistance. *J Strategic Inf Syst.* 2015;24:128-45. doi: 10.1016/j.jsis.2015.04.002.
  47. Yu Z, Liang Y, Guo B, Zhou X, Ni H. Facilitating medication adherence in elderly care using ubiquitous sensors and mobile social networks. *Computer Communications.* 2015;65:1-9.
  48. Lum HD, Sudore RL, Bekelman DB. Advance Care Planning in the Elderly. *Med Clin North Am.* 2015;99:391-403. doi: 10.1016/j.comcom.2015.04.001.
  49. Detering KM, Hancock AD, Reade MC, Silvester W. The impact of advance care planning on end of life care in elderly patients: randomised controlled trial. *The BMJ.* 2010;340:c1345. doi: 10.1136/bmj.c1345.
  50. Winzelberg GS, Hanson LC, Tulskey JA. Beyond Autonomy: Diversifying End-of-Life Decision-Making Approaches to Serve Patients and Families. *J Am Geriatr Soc.* 2005;53:1046-50. doi: 10.1111/j.1532-5415.2005.53317.x.
  51. Cartwright CM, Parker MH. Advance care planning and end of life decision making. *Aust fam physician.* 2004;33:815-9.
  52. Mullick A, Martin J, Sallnow L. An introduction to advance care planning in practice. *Clin Res Ed.* 2013;347:f6064. doi: 10.1136/bmj.f6064.