Original Article

Is Life Expectancy Associated with Depression in the Elderly?

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A B S T R A C T

Introduction: Depression is one of the most common psychiatric disorders and risk factors for suicide in aging that often underdiagnosed and those who are more hopeful, suffer from less depression. The present study was conducted to determine the relationship between life expectancy and depression among older people in Yazd, Iran.

Methods: This descriptive cross-sectional study was conducted on 250 community-dwelling elderlies over 60 years of age, Yazd city. Eligible older people were selected using cluster sampling method. The data collection instrument included geriatric depression scale and The adult hope scale. Data analysis was carried out using descriptive frequency distribution, independent t-test, ANOVA and Pearson correlation.

Results: The mean score of depression and life expectancy in the elderly was 6.77 ± 3.17 and 39.52 ± 6.27, respectively. There was a significant negative correlation between life expectancy and depression ($r = -0.594$ and $p = 0.005$), and a significant positive correlation between age and depression ($r = 0.258$ and $p = 0.005$).

Conclusion: Considering that the depression score in the elderly was at a moderate level, and also considering that with decreasing life expectancy, depression increased in the elderly, psychological interventions focusing on preventing and reducing depression, and increasing the life expectancy, are recommended.

Keywords: Depression, Life Expectancy, Aged

Introduction

One of the common psychiatric disorders of old age is depression. There are multiple risk factors for depression in the elderly such as bereavement, sleep disturbance, disability, prior depression, and female gender (1). A study shows that the prevalence of depression in Iranian elderlies was 22.4 percent (2). According to a study report, the prevalence of depression in nursing homes is higher than in the elderly community (3). In various studies, the prevalence of major depression in general population is 1-16%, while 24% of the elderly suffer from clinical depression. In fact, aging is associated with a higher prevalence of depression (4).

Psychological disorders and depression are associated with disability, decreased life satisfaction and decreased quality of life in elderly people (5-8). Depression in the elderly is caused by a combination of genetic, biological and environmental (psychosocial) factors. In general, it has been shown that depression occurs as a result of a series of chemical interactions in the brain. Modern brain imaging techniques revealed that the neural circuits responsible for regulating thoughts, mood, thinking, sleep, appetite and behavior lose their normal state during depression and there is no proper relationship between these areas (9,10). On the other hand, increasing longevity has created the expectation that

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people lead longer healthy life in a way that it made the authorities to substitute the word "life expectancy" with the notion of hope for a healthy life (not in the sense of lack of disease, but in the sense of life without functional limitations) (11). In Snyder's view, hope is a positive motivational state that is based on a sense of successful agency and pathway and the product of the individual with the environment; in other words, hope is the capacity to imagine and the ability to create pathways towards the desired goals and to think of the motivation for moving in this direction (12). Since life expectancy is related to attitudes and structures related to life, every person who has a life expectancy should be sensitive to how to lead a life and its quality, and promote quality of life (13). In a study on the relationship between depression and life expectancy in 35 elderly people, Chimic, showed that depression and life expectancy were strongly associated with aging, and the elderly who are more hopeful, suffer from less depression (14). Despair may be the source of many other psychological problems, including depression. The current study aimed to determine the relationship between depression and life expectancy in the elderly in Yazd.

Methods

Procedure

The present study is a descriptive cross-sectional one. The sample size was estimated to be 244 people based on ratio of 0.6 (15) and error rate of 0.03 units with CI of 95%; however, 250 individuals were finally enrolled in the study to ensure more reliability. To do so, 10 clusters from 21 health centers were selected randomly and 25 samples from each cluster were included in the study.

Data collection was carried out using questionnaires by a trained interviewer at subjects' houses. The first question was whether a person over 60 was living in this house and if yes, the elder was asked to fill the questionnaire. If there was no elderly in that house, he would go to the next house, and this would continue until all the questionnaires are completed in each cluster. If the elderly is living in a house and was not present at the time of the interview, the researcher made an appointment and came back to complete the questionnaire. The research objectives were explained verbally to the participants. Regarding the illiteracy or low literacy of majority of the elderly people, to complete the questionnaires, each statement of the questionnaire was read out to them and their responses were noted.

Inclusion criteria were age 60 years and above, living in urban areas of Yazd, ability to speak Persian, willingness to participate in the study (voluntary consent), lack of mental diseases and lack of hearing loss. Exclusion criteria were lack of cooperation, family disagreement participation in the research, disease that prevents the elderly to answer the questions, and having severe disability.

Measures

The instruments used in this research include:

Geriatric Depression Scale: This scale contains 15 questions and measures the presence of depression and is answered with two items, yes and no. In this questionnaire, a score of 0-4 indicates no depression, 5-8 indicate mild depression, 9-11 indicate moderate and 12-15 indicate severe depression; and a total score of more than 7 means a risk of severe depression (16). Validity and reliability of this questionnaire had previously been verified in Iranian elderly population. The reliability coefficient of the elderly depression scale was 0.9 using Cronbach's alpha (17).

The Adult Hope Scale (AHS): This scale consists of 12 questions and aims to assess the level of life expectancy in individuals. It is based on 5-point Likert scale (Complete disagreement 1, Disagreement 2, No idea 3, Agreement 4 and complete agreement 5). But this scoring procedure is reversed with regard to questions 3, 7 and 11, and is as follows: To get the total score of the questionnaire, the total scores of each single question were calculated together. Higher scores indicate a higher life expectancy for the respondent, and vice versa. Validity and reliability of this questionnaire have been reviewed and approved (18, 19). Also, the questionnaire included several demographic questions (age, gender, level of education, …) and questions about some common diseases and conditions.

Ethical considerations

The ethics committee in Shahid Sadoughi University of Medical Sciences, Yazd, Iran, approved the study protocol (IR.SSU.SPH.REC.1394.71). Meanwhile, informed consent was obtained from the participants after explaining the aim of the study for them and they were insured for the confidentiality of their information. Moreover, participation in the study was voluntarily.

Statistical analysis

After collecting data, SPSS software was used for statistical analysis. Summery statistics and frequency distributions were used to describe and interpret the meaning of data; The differences between life expectancy and depression by demographic variables were calculated by *t*-test and one-way ANOVA tests. Pearson correlation coefficient, was used to demonstrate the associations between life expectancy and depression.

Results

The mean age of participants was 69.12 ± 7.21. Male and female participants accounted for 47.6 and 52.4% of the elderly studied, respectively. Married and illiterate individuals had the highest frequency in terms of marital status and level of education, respectively. With regard to retirement aspect, over

52% were not retired. A total of 85% of the elderly had private housing (Table 1).

Findings showed that, more than 80% of participants were satisfied with their life While 64.4% felt that their lives had been meaningless. Meanwhile, a total of 58.8% of them felt that the value of life had decreased.

A total of 67% of the respondents believed that there are many ways to achieve things that are important in life. Also, 64% believed that there were many ways to solve the problem and 42.8% of them did not believe that they had a lot of energy to achieve their goal (Table 3).

Mean score of depression and life expectancy in the elderly was 6.77 ± 3.17 (0-15) and 39.52 ± 6.27 (12-60), respectively. In terms of degree of depression, the results showed that 32.5, 41.1 and 24.4% had no depression, moderate and severe depression rates, respectively. The results showed that the mean depression score was higher in the participants, illiterate and spouseless elderly.

Also, the elderly who lived with their children and those who are housewives were more depressed than others. But, compared to female counterparts, the mean score for life expectancy was higher in employed men with high level of education, and those living with their own spouses. Elderly patients with heart disease, cancer, vision and hearing problems, joint pain, osteoporosis, diabetes, respiratory diseases, sleep disorders, weight loss, digestive problems, headache and lipid disorders suffered from elevated depression level. There was also lower life expectancy score in the elderly with heart disease, cancer, vision and hearing problems, osteoporosis, respiratory diseases, sleep disorders, digestive problems, headache and lipid disorders. Based on Pearson's correlation coefficient, there was a significant correlation between life expectancy and depression (r = -0.594 and p = 0.005). Also, there was a positive and significant correlation between age and depression (r = 0.258 and p = 0.005).

Table 1. Demographic characteristics of the participants (n = 250)

Variable		N (%)	Variable		N (%)
Age	60-74	168 (67.2)	**Children number**	1-4	97 (39.1)
	75-84	58 (23.2)		5-9	138 (55.6)
	85<	24 (9.6)		10<	13 (5.2)
Gender	Male	131 (52.4)	**Retired**	Yes	108 (46.2)
	Female	119 (47.6)		No	126 (53.8)
Marriage status	Married	189 (76.5)	**Current employment status**	Employed	51 (20.8)
	Not married	58 (23.5)		Housewife	98 (40)
				Unemployed	96 (39.2)
Type of housing	Private	212 (85.8)	**Living status**	With spouse	128 (51.2)
	Leasing	11 (4.5)		With spouse and unmarried children	58 (23.2)
	Children's housing Resident in their children, s home	24 (9.7)		With unmarried children	5 (2)
				With married children	24 (9.6)
				single	35 (14)

Tables 2. Frequency distribution of answer to depression items among participants

Questions	Yes N (%)	No N (%)
1) Are you generally satisfied with your life?	224 (89.6)	26 (10.4)
2) Are your interests and activities too low?	144 (57.6)	106 (42.4)
3) Do you feel that your life has become aimless?	156 (62.4)	94 (37.6)
4) Are you often bored?	131 (52.4)	119 (47.6)
5) Do you often have a good mood?	143 (57.2)	107 (42.8)
6) Do you worry when something bad happens to you?	96 (38.6)	153 (61.4)
7) Are you happy most of the time?	131 (52.4)	119 (47.6)
8) Do you often feel that you are inefficient?	88 (35.2)	162 (64.8)
9) Do you generally prefer staying at home over going out?	106 (42.4)	144 (57.6)
10) Do you think that you are more forgetful than others?	131 (52.6)	118 (47.4)
11) Are you happy to be alive?	208 (83.2)	41 (16.4)
12) Do you feel that the value of life has been reduced?	147 (58.8)	103 (41.2)
13) Do you feel a lot of energy and power?	98 (39.4)	151 (60.6)
14) Do you feel frustrated?	71 (28.4)	179 (71.6)
15) Is the life and situation of others better than yours?	76 (30.4)	174 (69.6)

Tables 3. Frequency distribution of answers to life expectancy items among participant (n=250)

		Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
1	I think there are many ways to get rid of the pressures.	2 (0.8)	26 (10.4)	59 (23.6)	154 (61.6)	9 (3.6)
2	I have a lot of energy to achieve my goal.	2 (0.8)	107(42.8)	44 (17.6)	84 (33.6)	13 (5.2)
3	I feel tired most of the time.	16 (6.4)	98 (39.2)	24 (9.6)	108 (43.2)	4 (1.6)
4	There are many ways to solve the problem.	-	37 (14.9)	41 (16.5)	160 (64.3)	11 (4.4)
5	I easily get along in an argument.	13 (5.2)	89 (35.7)	53 (21.3)	82 (32.9)	12 (4.8)
6	I think there are many ways to get things that matter in my life.	2 (0.8)	28 (11.2)	35 (14.1)	167 (67.1)	17 (6.8)
7	I'm sad about my health.	22 (8.8)	98 (39.2)	41 (16.4)	59 (23.6)	30 (12)
8	I know that I can find a solution to any problem.	2 (0.8)	74 (29.8)	52 (21)	108 (43.5)	12 (4.8)
9	My past experiences are good for my future.	2 (0.8)	30 (12)	16 (6.4)	142 (56.8)	60 (24)
10	I've made a lot of successes in my life.	8 (3.2)	54 (21.6)	35 (14)	126 (50.4)	27 10.8)
11	I usually find myself worrying about some things.	17 (6.9)	77 (31)	76 (30.6)	69 (27.8)	9 (3.6)
12	I will achieve all my goals.	2 (0.8)	68 (27.2)	79 (31.6)	92 (36.8)	9 (3.6)

Discussion

The present study which aimed to determine the relationship between depression and life expectancy in the elderly in Yazd showed that the depression score in the elderly studied was 6.77 ± 3.17 (0-15). The results showed that 24.4and 41.1% of the elderly suffered from severe and moderate depression, respectively. Other studies show that, compared to Yazd, severe depression is at around or more prevalent in other cities. Manzouri et al. (15), for instance, showed that in Isfahan, 23% of patients had

severe depression while Nemati et al. and Azadi et al. (20) in their research in Shahrekord, Iran, showed that 34.37% had severe depression. In a study in Kashan, 33% of patients suffered from severe depression (21). Hassanpoor et al. (22) showed that 65.8% of subjects had depression that indicates a lower prevalence of depression among elderly living in Yazd it could be attributed to the cultural and religious context of Yazd and how families interact with the elderly. The mean life expectancy score in the elderly was 39.52 ± 6.27 (12-60), which indicates a good level of life expectancy, which was at around the Barzegar et al. (23) in their study in Yazd, 71.40 ± 9.27 (40-85), Zanjani et al. (24), 40.33 ± 9.12 (12-60), and Firozeh Moghadam et al. (25) 25.7 ± 1.76. T mean depression score was higher in the age group of 85 years old and above, which is similar to the results of Shafiabadi et al. (26), Azadi et al. (27) and Mobasheri et al. (28). However, age and depression were not significantly correlated in a study conducted by Manzoori et al. (15). Considering that increasing age is associated with the higher likelihood of losing the spouse, the way the family and society interact will change and reduce to some extent. Also, considering the higher incidence of disability in very old elderly, institutionalization is more likely. It seems that the prevalence of depression increases with age.

In the present study, the mean score of depression in the elderly women was higher similar to other studies (27, 29). Hasanpour et al. (22) reported that the mean score of depression in women was higher than that of elderly men, but was not statistically significant; however, the average score of life expectancy was higher in the elderly men. In contrast, Barzegar Bafrooei et al. (23) showed that life expectancy was higher in the elderly women, which could be due to the difference in sample size and disproportional percentage of elderly women and men in these two studies.

The mean depression score among the illiterate elderly was higher in this study which is consistent with other studies (26, 29), while the mean life expectancy score for elderly people with higher education was higher. Ebrahimi et al. (30) reported a significant relationship between education and physical and mental health status of the elderly. Wells (31) stated that low-level education predicted low life expectancy score. This could be due to higher interactions and engagement in social partnerships seen at higher education levels.
The results of this study showed that the mean depression score in spouseless elderly was significantly higher than that of married elderly, which was supported with other studies (28, 29). The mean life expectancy score was also higher in the elderly who lived with their spouse, as shown in other studies (31, 32). Obviously, the elderly look at spouse as a supporter and source of emotional support and spend most of their time interacting with them, and the loss of spouse imposes a great psychological impact on the elderly, and even in the absence of other underlying factors, it can solely be a significant leading to depression.

In the present study, the mean depression score was higher among elderly who stated that their accommodation was their children's house. Since the elderly who usually live with their children have lost their spouses or have severe disabilities and consider themselves as burden to their children, this finding can be attributed to these factors. The results of the current study showed that the elderly people with respiratory diseases, sleep disorders, weight loss, digestive problems, headache and lipid disorders had more depression rate. Other studies also show that depression was more common in elderly people with chronic diseases (22, 32-34). The life expectancy score was low among people with heart diseases, cancer, vision and hearing problems, and osteoporosis. Life expectancy was lower among the elderly people with respiratory diseases, sleep disorders, digestive problems, headaches and blood lipids disorders too. Obviously, these chronic diseases are associated with lowered quality of life and they formed the belief that they are at the end of their life, and there is no hope for a longer life. Having multiple diseases and developing disabilities due to these diseases can lead to reduction in the participation of the elderly as well as their interactions with the environment, and thereby increasing the likelihood of developing depression. The results of Pearson correlation test showed that there was a significant inverse correlation between life expectancy and depression.

There was also a positive and significant correlation between age and depression. In other words, as life expectancy increases among the elderly, the less they suffered from depression, therefore life expectancy acts as a protective factor against depression. Therefore, interventions should be designed to increase life expectancy of the elderly so that the risk of depression, which is one of the most common psychiatric disorders in old age, can be prevented. Wells (31), in his research on life expectancy-based interventions for adults, concluded that the variance percentage of depression is explained by low life expectancy and there is a relationship between life expectancy and the better outcomes of psychotherapy, including happiness. Several studies have shown that hope therapy-related interventions have reduced the risk of depression (24, 35, 36). Life expectancy, by enabling the elderly to think of having longer lifespan with more opportunities with friends, family, interests, hopes and goals, can increase their desire to lead a better life so that they can focus more on their physical and mental health and thereby improve their quality of life. In addition, when psychological well-being of a person together with the opportunity to live longer is ensured, it provides a longer opportunity that comes with independence, self-respect, acceptance, goal setting, etc., which is the basis for one's desire for maintaining health, increasing life satisfaction and improving quality of life.

Conclusion

Considering the negative significant relationship between life expectancy and depression, it is necessary to reduce depression in the elderly by designing appropriate psychological interventions and provide solutions to increase in life expectancy. In this area, providing services to this group in the form of a rehabilitation team including specialist physician, elderly psychiatrist, social worker, nurses, physiotherapist and psychologist can be effective. It is recommended to provide conditions in which the family provides its supports for the elderly's mental health and well-being, including activities such as attending religious ceremonies, developing new roles for the elderly, and allocating a share of family income to them.

Study limitations

This study is limited by its characteristics as a cross-sectional study. Also, only community-dwelling elderlies were included in the study which should be addressed in using the results.

Conflict of interest

The authors declare that there is no conflict of interests.

Authors' contribution

Study design: HR, NY, ZR

Data collection and analysis: HR, NY, ZR, FA

Manuscript preparation and editing: HR, NY, ZR, FA

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