

Prevalence and Correlates of Depression among Nepalese Rai Older Adults

Hom Nath Chalise* and Sai Laxmi Rai

Asian College for Advance Studies, Purbanchal University, Satdobato, Lalitpur, Nepal

Abstract

Introduction: Depression is a common public health issue with the increasing life expectancy worldwide and depression is associated with morbidity as well as disability among the elderly. There are very few studies related with depression among elderly from developing countries.

Objective: The purpose of this study was to analyze the situation of depression and its correlates among the Nepali Rai elderly.

Methods: This is a cross-sectional study carried out in 2010. Data were collected by face-to-face interview in using Geriatric Depression Scale (GDS) and prepared with a translation and back translation technique from English into Nepalese. The data were analyzed using percentage, mean, simple correlation and regression. Results: The subjects (N=165) were member of the Rai caste/ethnicity living in Kathmandu valley, aged 60 years and above. Mean age of the subjects was 69.77 (\pm 5.75) years and 52 % were male. The average family size was 4.47 and more than 70 percent (73.3%) elderly were living with their family members. Finding shows the prevalence of depression among Nepalese Rai older adults was 29.7 %. A statistically significant correlation was found between feelings of depression with age, sex, marital status, family size, instrumental activities of daily living (IADL), loneliness and participation in household activities. Regression analysis shows that higher the age, larger the family size, being widow/widower, higher the dependency in IADL and illiteracy were associated with depression.

Conclusion: The present results indicate many Nepalese older adult experiences some form of depression although they are living in the joint family size. However, this result may not be generalized to the greater population of Nepalese older adults and the external validity of the GDS Scale is an important criterion to examine in future research.

Keywords: Depression; Loneliness; Older adults; Rai ethnicity

Introduction

Depression is common in the elderly and is a major public health problem. The WHO (2005) [1] also emphasizes that depression, which is the fourth most common illness, can lead to physical, emotional, social and economic problems. The prevalence rate of depression varies worldwide and their prevalence rates range between 10 and 55% [2-6]. Depression in late life is associated with significant morbidity, including deficits in a range of cognitive functions and considerable influence on functional impairment, disability [7], decreased quality of life, and has a negative effect on the body's recovery from illness, increases the rate of suicide, increases use of health care services and expenses [8-10], and can result in early death and disturbance in the general state of wellness [8,9].

The long-term prognosis of geriatric depression is bleak with incomplete recovery [11] and higher relapse rates [12]. Along with the physiological and psychological changes associated with aging, changes in the associated risk factors also modify the prevalence and prognosis of geriatric depression [13]. Medical co-morbidity [14] and cognitive impairment [15] have a complex bidirectional relationship with geriatric depression.

Depressive symptoms are associated with greater impairment and decreased quality of life among patients with coexisting chronic illnesses, such as emphysema, cancer, and diabetes. When depression coexists with other medical conditions, the resulting disability appears to be additive [16]. However, even in older adults without a disability, "depression significantly increases the risk for subsequent incident ADL and mobility disability [17]. Further, studies show that "depressed persons, including depressed elderly persons, use two to three times as many medical services as people who are not depressed [16]." Other studies have estimated that "elderly persons with depressive symptoms accrued 50% higher healthcare costs from more frequent use of medical services" than do other older adults not suffering from depression [18].

Unfortunately, depression is particularly problematic in developing countries, where data on the prevalence and scope of the disease as well as the resources to address it are sorely lacking. Cost-effective interventions are available, but do not often reach those who need them because of a number of overwhelming challenges in low-resource settings-lack of facilities and trained mental health personnel, questions about effective population-based screening, and the general stigma surrounding mental disorders [19].

The Proportion of elderly in Nepal is increasing rapidly and reached 8.2 percent of total population in 2011. But the government has not given priority to identify the problems of the elderly through research and even to implement existing senior citizen act for the wellbeing of elderly. This study tries to assess the depression among elderly in Nepal. Very little is known about the true rates of depression, its correlates and predictors. There is no exact figure reported for the incidence of depression among Nepali elderly. However, a study was performed among elderly patients attending the outpatient department of a hospital showed that the incidence of depression was as high as 53.2% [5].

The aim of this study is to determine the prevalence of depression and its predictors among community living elderly. The rationale for this study is the widely held impression that depression is common

*Corresponding author: Hom Nath Chalise, Asian College for Advance Studies, Purbanchal University, Satdobato, Lalitpur, Nepal, E-mail: chalisehkpp@gmail.com

Received August 08, 2013; Accepted September 09, 2013; Published September 11, 2013

Citation: Chalise HN, Laxmi Rai S (2013) Prevalence and Correlates of Depression among Nepalese Rai Older Adults. J Gerontol Geriat Res 2: 130. doi:10.4172/2167-7182.1000130

Copyright: © 2013 Chalise HN, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

in elderly and results in more days of disability than chronic medical conditions such as heart disease, hypertension and diabetes [20].

Methods

Study site and sample

This is a cross-sectional study carried out in Kathmandu Valley. For the purposively of this study Rai ethnicity elderly living in Kathmandu valley were selected purposively. Rai is one of the indigenous ethnic groups of Nepal, generally they are found living in Eastern Mountain and Hill area of Nepal. Now days some of them have migrated and living scattered in different parts of Kathmandu valley. With the help of organization working for the rights of Rai in Kathmandu valley we tried to find the household of Rai living in Kathmandu and interviewed elderly 60 years and above with the help of structured questionnaire. We tried to census all the households of Rai ethnicity having elderly 60 years and above living in Kathmandu valley. Inclusion criteria included: Only one elderly from each household through convenience sampling, who can speak Nepali language. Those suffering from severe mental and physical illness e.g., psychosis, dementia, hearing impairment, and dumbness were excluded. This study was carried out in two month September-October of 2010. During this time we approached 170 elderly but questionnaire was completed with 165 elderly only.

The study protocol was approved by the Research Committee of Asian College for Advance Studies, Lalitpur. Oral informed consent was obtained from all participants before interviews [21]. The interviews were conducted in the subjects' homes and took an hour on average.

To ensure the questionnaire's quality and sensitivity, Geriatric Depression Scale (GDS) [22] and instrumental activity of daily living (IADL) [23] were translated into Nepali from English and then back translated into English by English language teacher's proficient in both languages. Different people conducted the back translation. A pilot study of 25 respondents from the non-study area was conducted to identify potential problems with the questionnaire.

Measurements

Dependent variable: In this study Depression was dependent variable and measured using widely used GDS [22]. The GDS has 30 statements with "yes" or "no" response. Theoretically sum of GDS ranged from 0 to 30. On the basis of score it is interpreted: 0-9 as "normal", 10-19 as "mildly depressed", and 20-30 as "severely depressed". Studies from the United States, United Kingdom and many Asian countries have shown that the GDS can be employed with different cultures and ethnicities. Further, a previous study carried out in Nepal has already proved GDS was a reliable tool to screen depression in the Nepalese patients [5]. Reliability of GDS measured through Cronbach's Alpha (0.89) shows quite high in this study.

Independent variables: Sex was measured as a dichotomous variable with male coded '1' and female '2'. Age and family size and monthly income of spouse were measured as a continuous variable. Marital status was dichotomized 'married' coded '1' and 'widow/widower' coded '2'. Widow or widower included unmarried, divorced and separated also. The proportion of unmarried divorced and separated was very low. Education was categorized as 'literate' coded '1' and 'illiterate' coded '2'. Illiterate were those who cannot read and write. Rest all the other was regarded literate irrespective of their level of education attainment. Living arrangement was measured as 'family members' coded as '1', 'spouse only' coded as '2', and 'others' coded as '3'. Feeling of loneliness was measured as 'often' coded as '1', 'some time' coded as '2', and 'rarely' coded as '3'.

Functional capabilities of older adults were measured using five items (traveling by public transportation, shopping for groceries, preparing meals, doing light house work, and taking medicine) from the seven item IADL scale [23]. Two items from the IADL scale, use of the telephone (look up the number, dial and answer) and management of money (write checks and pay bills) were not included in the final questionnaire because these were not applicable for the majority of Nepalese elderly [21,24,25] because they cannot read number and dial the telephone and even write the name also. Responses were categorized as 'unable to do at all', 'with some difficulty/need some help' and 'without help'. For the present study, responses were coded as 'Self' coded as '1' and 'with some difficulty /need some help' coded as '2' and 'cannot do at all - 3'. To calculate the level of functional disability the sum of the above five items was added and measured as a continuous variable. Higher the value of IADL score indicates the higher the dependency. Internal consistency reliability of IADL in this study measured through Cronbach's alpha (0.91) shows quite satisfactory.

Results

The distribution of social, demographic and health-related characteristics of the Rai ethnicity older adult subjects is shown in Table 1. Subjects ranged in age from 60 to 89 years with a mean (\pm SD) age of 69.77 (\pm 5.75) years. Eighty six (52.1%) were male. One hundred and eight (65.5%) was married, 77.6% were literate (who can read and write), and 89.7% were involved in the household activities. Family size ranged from 1 to 9 with mean family size 4.47 (\pm 1.59). Nearly three fourth (73.3%) older adults were living with family members, 14.5% living with spouse only and 14.5% living with others (other than family members including daughter).

More than ninety percent (93.9%) older adults had some health problem. Mean functional disability of the older adults was 6.11 (\pm 2.05). More than fifty percent (50.9%) felt loneliness some time, one third (33%) often and 15.8% felt loneliness rarely. Average income of

Variables	N	%	Mean	SD*	Range
Sex (male)	86	52.1			
Age			69.77	5.75	60-89
Family Size			4.47	1.59	1- 9
Marital Status (married)	108	65.5			
Education (literate)	128	77.6			
Having health problem (yes)	155	93.9			
Living arrangement					
Spouse only	24	14.5			
Family members	121	73.3			
Others	20	12.1			
Problem with IADL ^b			6.11	2.05	5- 14
Involvement in household activities (yes)	148	89.7			
Monthly Income (NRs)			10181.82 (\$101)	2403.05 (\$24)	5000 - 15500 (\$50 - \$155)
Food Habits (vegetarian)	12	7.3			
Feeling of loneliness					
Often	55	33.3			
Some time	84	50.9			
Rarely	26	15.8			
Activities to remain healthy (yes)	109	66.1			

*Standard Deviation

^bHigher score indicates worse functional disability

Table 1: Selected background characteristics of Rai older adults, n=165.

the older adults was NRs 10181.82 (\$101) (\pm 2403.05 (\$24)) ranged from Rs 5000 (\$50) to Rs 15,500 (\$155). Many older adults (66.1%) did some activities like Yoga, meditation and physical activities to remain healthy.

Table 2 shows the situation of depression of the older adults included in this study. This study found mean depression score of Rai older adults was 7.25 (\pm 5.55) ranging from 2 to 27. Further based on the individual score of the subjects this study shows 70.3 percent older adult had no depression, and remaining 29.7% had depression. So, the prevalence of depression in this study was 29.7%. Further analyzing the severity of depression 24.2% had mild depression and 5.5 % had severe depression. So, we dichotomized the data saying 70.3 % older adult had no depression and 29.7% older adults were suffering from depression for the purpose of this study. We also examined the correlation without dichotomized data and we got nearly same result, so in this study dichotomized data do not weakens the power in the analysis.

Table 3 shows results of bivariate analysis of depression with selected background variables. Age (P=0.025), sex (P=0.000), family size (P=0.000), Marital status (P=0.000), living arrangement (p=0.001), education (P=0.000), limitations in IADLs (P=0.000), involvement in household activities (P=0.000), and feeling of loneliness (p=0.009) were significantly positively or negatively correlated with depression and were included in logistic regression analyses. Non-significant predictors were removed from the model.

Results of the logistic regression of depression are shown in Table 4. The goodness of fit statistics (Hosmer and Lemeshow's test P= 0.618 and -2 Log likelihood= 102.342) indicated a satisfactory fit for the model. Significant predictors of depression in the model were higher the age (OR= 0.506, 95% CI 0.274-0.935, P= 0.030), illiteracy (OR= 4.245, 95% CI 1.336-13.488, P= 0.014), situation of being widow/widower (OR= 9.561, 95% CI 3.143-29.088, P= 0.000), family size (OR= 1.552, 95% CI 1.058-2.276, P= 0.025) and functional limitations in IADL (OR= 1.732, 95% CI 1.264-2.372, P= 0.001).

Discussion and Conclusion

In recognition of increasing worldwide concern for issues affecting the older adult, depression is recognized as an important public health issue, predicting, among other things, low quality of life among older adults. This study tries to explore the situation of depression among older adults from poor countries. Specifically present study examines the experience of depression and correlates of depression in Nepalese (Rai ethnicity) older adults.

This study found the prevalence of depression measured through GDS among Kathmandu valley living Nepalese (Rai) older adult was 29.7 percentages. The prevalence was 17.4 for male and 43.0 % for female. This is quite low when compared with the previous study of Khattri and Nepal (2006) [5]. Khatri and Nepal [5] found 53.2 % older adult patients attending the outpatient department of a hospital had depression. We found a variation in the results when looked the results of neighboring countries from south Asia. The prevalence of

Variables	N	%	Mean	SD	Range
Sum of GDS			7.25	5.55	2 – 27
Severity of Depression					
0 to 9 (normal)	116	70.3			
10 to 19 (mild)	40	24.2			
20 to 30 (severe)	9	5.5			
Prevalence of Depression	49	29.7			

Table 2: Situation and prevalence of depression in Rai older adults, n=165.

Variable	Measurement	Depression %	Spearman's Correlation Coefficient	P
Sex	Male	17.4	0.280**	0.000
	Female	43.0		
Age	60-64	21.6	0.175*	0.025
	65-69	25.0		
	70-74	32.0		
	75-79	34.5		
	80+	80%		
Family Size			0.335**	0.000
Marital Status	Married	11.1	0.560**	0.000
	Widow/widower	64.9		
Living arrangement	Spouse only	4.2	0.262**	0.001
	Family	31.4		
	Others	50.0		
Education	Literate	19.5	0.414**	0.000
	Illiterate	64.9		
Having health problem	Yes	30.5	0.002	0.983
	No	28.9		
Food habits	Vegetarian	41.7	-0.073	0.349
	Non-vegetarian	28.8		
Limitations in IADL			0.523**	0.000
Involvement in household activities	Yes	25.0	0.303**	0.000
	No	70.6		
Monthly Income (spouse)			-0.117	0.678
Self reported health	Good	26.7	0.032	0.684
	Fair	31.9		
	Poor	42.9		
Feeling of loneliness	Often	38.2	-0.203**	0.009
	Sometime	31.0		
	Rarely	7.7		
Activities to remain healthy	Yes	26.6	0.108	0.167
	No	35.7		

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 3: Correlation of depression with socio-demographic and health related variables, n=165.

Variables*	Regression Coefficients (B)	Standard Error	Odds Ratio	95% CI		P
				Lower	Upper	
Limitation in IADL	0.549	0.161	1.732	1.264	2.372	0.001
Marital Status	2.258	0.568	9.561	3.143	29.088	0.000
Family Size	0.440	0.195	1.552	1.058	2.276	0.025
Age	-0.681	0.313	0.506	.274	0.935	0.030
Education	1.446	0.590	4.245	1.336	13.488	0.014

Hosmer and Lemeshow's Test P=0.618

-2 Log likelihood=103.471

OR= Odds Ratio, CI= Confidence Interval

*Only significant variables (P<0.005) are shown from the variables entered: Age, sex, family size, marital status, living arrangement, literacy status, limitations in IADLs, involvement in household activities, monthly income of spouse

Table 4: Logistic regression of depression among Nepalese Rai older adults, N=165.

depression was 19.8 % in Pakistan [26]. Studies have revealed that the prevalence rates for depression in community samples of older adult in India vary from 6% to 53.7% [27-29]. These various studies are not exactly comparable in the criteria used to define depression i.e., use of the different cut off point, the selection of samples and cultures too.

This study revealed being widow/widower is the stronger predictor of loneliness. The prevalence of depression was 11% in married and 65% in widow/widower. This is similar to many other studies [26,28,30]. The higher depression among widow/widower may be due to lack of partner to share emotional and social support. Being married

was found to have a protective effect on health [31]. Wilson et al. [32] reported in a study that while being widowed and having been divorced were risk factors for depression, marriage was protective especially for men. Other studies also reported that being single or widowed was a major cause of depression and increased the risk of depression 4.72 times [33,34].

The role of family systems in the depression among the older adult has not been studied extensively [26]. It is generally seen that urbanization promotes nucleation of family systems and a decrease in care and support for the older adult. But this study found larger family size was another predictor of depression. A study from Turkey also shows depression was more prevalent among older adult people living with children [35]. This might be due to very little interaction with other family members and feelings of neglect [21,36]. Okabayashi et al. [37] also found that social support provided by children is more important than from other sources (i.e., spouse, friends, and others) regarding mental health of the older adult (positive well-being and depressive symptoms). Older adult may not have received the social support from their children what they have expected and it may have effect on loneliness as well as on depression.

This study revealed age was another predictor of depression. This study found prevalence of depression increases from 21.6% at age 60-64 years, to 25.0% at 65-69, 32.0% at age 70-74 years, 34.5% at age 75-79 years and 80% at age 80 years and older. Similar to this findings Roberts et al. [38] showed an increase in the prevalence of major depressive episode from 8.1% at age 50-59 years and 6.9% at 60-69 years, to 10.4% at 70-79 and 12.7% at 80 years and more. Beekman et al. [39] reported an increase in prevalence of major depression from 1.3% at 55-59 years to 2.7% at 80-84 years, and a corresponding increase in the rate of minor depression from 9.4% to 16.7%. Kramer et al. [40] found that the major depression rate rose from 0.7% at 65-74 to 1.3% at over 75 years, and Kay et al. [41] reported the prevalence of major depression was 6.3% at 70-79 years and 15.5% at over 80 years.

Impaired in instrumental activities of daily living is an expression of functional dependence and one of the most commonly used measures in assessing health in old age. Having functional disabilities in IADLs is also another predictor of depression in this study. These findings are consistent with many other studies across the world [42-44]. Many researchers see a mutual causality between depression and disability such that "illness and physical disability cause depression, and also that depression leads to illness and physical decline, either because of behavioral factors (e.g., failure to take care of personal health) or biological factors (e.g., improper functioning of the immune or endocrine system) [45]."

Finally, illiteracy was other predictors of depression. This study found illiterate have higher depression compared to literate. These finding are consistent with the recent study carried out by Aylaz et al. [30]. Many studies have also found depression decreases with the increase in educational level [26,29,46].

Although this was a first attempt to study the prevalence of depression in the community living older adult, several limitations of this study should be considered before its generalization. First, it was cross-sectional in nature; thus, the results did not establish causal relationships for the study variables. Second, the data came from Kathmandu City and covered the older adult of only one caste/ethnicity and can't be generalized to other caste/ethnicities. Third, the validity of the GDS was not examined in this study, although the previous study [5] reported GDS is a valid measure to measure the depression in Nepali older adult.

In spite of the limitations, the findings of this study suggest that a feeling of depression is a serious problem among Nepalese older adults, despite the majority of older adults living in the larger family size with their children. Living in the joint family system and larger family size increased depression in older adult which is behind our cultural norms values and expectation. This may be due to eroding values and norms in the recent generations towards their elders. Further research using qualitative method also needed to identify risk factors of increasing depression among the older adult. This may contribute to the empowerment of the older adult and, thus, enhance their quality of life in the future.

References

1. World Health Organization (WHO) (2005) World Health Report.
2. Sherina MS, Rampal L, Mustaqim A (2004) The prevalence of depression among the elderly in Sepang, Selangor. *Med J Malaysia* 59: 45-49.
3. Chi I, Yip PS, Chiu HF, Chou KL, Chan KS, et al. (2005) Prevalence of depression and its correlates in Hong Kong's Chinese older adults. *Am J Geriatr Psychiatry* 13: 409-416.
4. Tsai YF, Yeh SH, Tsai HH (2005) Prevalence and risk factors for depressive symptoms among community-dwelling elders in Taiwan. *Int J Geriatr Psychiatry* 20: 1097-1102.
5. Khattri JB, Nepal MK (2006) Study of depression among geriatric population in Nepal. *Nepal Med Coll J* 8: 220-223.
6. Kaneko Y, Motohashi Y, Sasaki H, Yamaji M (2007) Prevalence of depressive symptoms and related risk factors for depressive symptoms among elderly persons living in a rural Japanese community: a cross-sectional study. *Community Ment Health J* 43: 583-590.
7. Tam CWC, Chiu HFK (2011) Depression and Suicide in the Elderly, The Hong Kong Medical Diary 16: 13-15.
8. Steffens DC, Skoog I, Norton MC, Hart AD, Tschanz JT, et al. (2000) Prevalence of depression and its treatment in an elderly population: the Cache County study. *Arch Gen Psychiatry* 57: 601-607.
9. Serby M, Yu M (2003) Overview: depression in the elderly. *Mt Sinai J Med* 70: 38-44.
10. Cole MG, McCusker J, Elie M, Dendukuri N, Latimer E, et al. (2006) Systematic detection and multidisciplinary care of depression in older medical inpatients: a randomized trial. *CMAJ* 174: 38-44.
11. Jhingan HP, Sagar R, Pandey RM (2001) Prognosis of late-onset depression in the elderly: a study from India. *Int Psychogeriatr* 13: 51-61.
12. Mitchell AJ, Subramaniam H (2005) Prognosis of depression in old age compared to middle age: a systematic review of comparative studies. *Am J Psychiatry* 162: 1588-1601.
13. van't Veer-Tazelaar PJ, van Marwijk HW, Jansen AP, Rijmen F, Kostense PJ, et al. (2008) Depression in old age (75+), the PIKO study. *J Affect Disord* 106: 295-299.
14. Jongenelis K, Pot AM, Eisses AM, Beekman AT, Kluiters H, et al. (2004) Prevalence and risk indicators of depression in elderly nursing home patients: the AGED study. *J Affect Disord* 83: 135-142.
15. Steffens DC, Potter GG (2008) Geriatric depression and cognitive impairment. *Psychol Med* 38: 163-175.
16. Langa KM, Valenstein MA, Fendrick AM, Kabeto MU, Vijan S (2004) Extent and cost of informal caregiving for older Americans with symptoms of depression. *Am J Psychiatry* 161: 857-863.
17. Penninx BW, Leveille S, Ferrucci L, van Eijk JT, Guralnik JM (1999) Exploring the effect of depression on physical disability: longitudinal evidence from the established populations for epidemiologic studies of the elderly. *Am J Public Health* 89:1346-1352.
18. Katon WJ (2008) The comorbidity of diabetes mellitus and depression. *Am J Med* 121: S8-15.
19. Worley H (2006) Depression: a Leading Contributor to Global Burden of Disease.

20. Williams RA, Strasser PB (1999) Depression in the workplace. Impact on employees. *AAOHN J* 47: 526-537.
21. Chalise HN, Saito T, Takahashi M, Kai I (2007) Relationship specialization amongst sources and receivers of social support and its correlations with loneliness and subjective well-being: a cross sectional study of Nepalese older adults. *Arch Gerontol Geriatr* 44: 299-314.
22. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, et al. (1982) Development and validation of a geriatric depression screening scale: a preliminary report. *J Psychiatr Res* 17: 37-49.
23. Lawton MP, Brody EM (1969) Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist* 9: 179-186.
24. Chalise HN, Saito T, Kai I (2008) Functional disability in activities of daily living and instrumental activities of daily living among Nepalese Newar elderly. *Public Health* 122: 394-396.
25. Chalise HN, Kai I, Saito T (2010) Social support and its correlation with loneliness: a cross-cultural study of Nepalese older adults. *Int J Aging Hum Dev* 71: 115-138.
26. Taqui AM, Itrat A, Qidwai W, Qadri Z (2007) Depression in the elderly: does family system play a role? A cross-sectional study. *BMC Psychiatry* 7: 57.
27. Rajkumar AP, Thangadurai P, Senthilkumar P, Gayathri K, Prince M, et al. (2009) Nature, prevalence and factors associated with depression among the elderly in a rural south Indian community. *Int Psychogeriatr* 21: 372-378.
28. Vishal J, Bansal RK, Patel S, Tamakuwala B (2010) A study of depression among aged in Surat city. *National Journal of Community Medicine* 1: 47-49.
29. Maulik A, Dasgupta (2012) A Depression and its determinants in the rural elderly of West Bengal -a cross sectional study. *Int J Biol Med Res* 3: 1299-1302.
30. Aylaz R, Aktürk Ü, Erci B, Öztürk H, Aslan H (2012) Relationship between depression and loneliness in elderly and examination of influential factors. *Arch Gerontol Geriatr* 55: 548-554.
31. Waite IJ, Gallagher M (2001) *Case for Marriage: Why Married People are Happier, Healthier, and Better Off Financially*. Doubleday, New York.
32. Wilson KC, Chen R, Taylor S, McCracken CF, Copeland JR (1999) Socio-economic deprivation and the prevalence and prediction of depression in older community residents. The MRC-ALPHA Study. *Br J Psychiatry* 175: 549-553.
33. Maral I, Aslan S, Ilhan NM, Yildirim A, Candansayar S, et al. (2001) Depression and risk factors: a comparative study on elderly persons living at home and in nursing homes. *Turk J Psychiatry* 12: 251-259.
34. Çinar IO, Kartal A (2008) Signs of depression in the elderly relationship between depression and sociodemographic characteristics. *TAF Prev Med Bull* 7: 399-404.
35. Ekinci M, Tortumluoglu G, Okanlı A, Sezgin S (2004) The prevalence of depression in elderly living at home in eastern turkey: Erzurum. *International Journal of Human Sciences* 1.
36. Chalise HN, Saito T, Kai I (2007) Correlates of loneliness among older Newar adults in Nepal. *Nihon Koshu Eisei Zasshi* 54: 427-433.
37. Okabayashi H, Liang J, Krause N, Akiyama H, Sugisawa H (2004) Mental health among older adults in Japan: do sources of social support and negative interaction make a difference? *Soc Sci Med* 59: 2259-2270.
38. Roberts RE, Kaplan GA, Shema SJ, Strawbridge WJ (1997) Does growing old increase the risk for depression? *Am J Psychiatry* 154: 1384-1390.
39. Beekman AT, Deeg DJ, van Tilburg T, Smit JH, Hooijer C, et al. (1995) Major and minor depression in later life: a study of prevalence and risk factors. *J Affect Disord* 36: 65-75.
40. Kramer M, German PS, Anthony JC, Von Korff M, Skinner EA (1985) Patterns of mental disorders among the elderly residents of eastern Baltimore. *J Am Geriatr Soc* 33: 236-245.
41. Kay DW, Henderson AS, Scott R, Wilson J, Rickwood D, et al. (1985) Dementia and depression among the elderly living in the Hobart community: the effect of the diagnostic criteria on the prevalence rates. *Psychol Med* 15: 771-788.
42. Imran A, Azidah AK, Asrenee AR, Rosediani M (2009) Prevalence of depression and its associated factors among elderly patients in outpatient clinic of Universiti Sains Malaysia Hospital. *Med J Malaysia* 64: 134-139.
43. Biderman A, Cwikel J, Fried AV, Galinsky D (2002) Depression and falls among community dwelling elderly people: a search for common risk factors. *J Epidemiol Community Health* 56: 631-636.
44. Penninx BW, Guralnik JM, Ferrucci L, Simonsick EM, Deeg DJ, et al. (1998) Depressive symptoms and physical decline in community-dwelling older persons. *JAMA* 279: 1720-1726.
45. Penninx BW, Deeg DJ, van Eijk JT, Beekman AT, Guralnik JM (2000) Changes in depression and physical decline in older adults: a longitudinal perspective. *J Affect Disord* 61: 1-12.
46. Alexopoulos GS (1995) *Mood disorders*. Comprehensive Textbook of Psychiatry/6. Lippincott Williams and Wilkins, Baltimore 2566-2568.