Prevalence of depressive symptoms and its associated factors in older adults: A cross-sectional study in Kathmandu, Nepal

Abstract

Objective: Globally, depression is one of the most prevalent and burdensome conditions in older adults. However, there are few population-based studies of depression in older adults in developing countries. In this paper, we examine the prevalence of depressive symptoms and explore possible contributory risk factors in older adults living in Nepal.

Methods: A cross-sectional study was conducted in two semi-urban communities in Kathmandu, Nepal. Depression was assessed using the 15-item Geriatric Depression Scale in 303 participants, aged 60 years and over. Multivariate logistic regression was then used to assess associations between potential risk factors and depression.

Results: More than half of the participants (n=175, 60.6%) had significant depressive symptomatology, with 27.7% having scores suggesting mild depression. Illiteracy (aOR = 2.01, 95% CI: 1.08–3.75), physical immobility (aOR = 5.59, 95% CI: 1.75–17.93), the presence of physical health problems (aOR = 1.97, 95% CI: 1.03–3.77), not having any time spent with family members (aOR = 3.55, 95% CI: 1.29–9.76) and not being considered in family decision making (aOR = 4.02, 95% CI: 2.01–8.04) were significantly associated with depression in older adults.

Conclusion: The prevalence of depression was significant in older adults. There are clear associations of depression with demographic, social support and physical well-being factors in this population. Strategies that increase awareness in the community along with the health and social care interventions are needed to address the likely drivers of depression in older adults.

Keywords: depression, GDS-15, older adults, community, Nepal

Introduction

Globally, the number of older persons (aged 60 years and over) is expected to reach two billion by 2050, up from the current estimate of 900 million. Of these, 80% will be living in developing countries (World Health Organization, 2015). The increasing number of older persons presents considerable challenges for health and social care services worldwide and especially for resource-constrained countries. This is particularly true for countries like Nepal where older adults make up 9.1% of the total population, many of whom live in rural areas (Central Bureau of Statistics, 2012a). Decreasing fertility rates in recent years and better access to healthcare has contributed to increasing life expectancy (Dhakal, 2012). However, the quality of life of older adults in Nepal is likely to be adversely affected by an increased risk of mental health problems such as depression (Geriatric Centre Nepal, 2010).

Depression is an important public health problem in older adults and a leading cause of disability worldwide (Ferrari et al., 2013). It is often under-diagnosed and under-treated and is frequently associated with other co-morbid conditions, such as physical disability, anxiety as well as other general medical conditions (Bryant, Jackson, & Ames, 2008; World Federation for Mental Health, 2012). Feelings of loneliness and neglect by loved ones in older age can cause stress and if that is not treated in a timely manner could shorten the longevity of a person (Steptoe, Shankar, Demakakos, & Wardle, 2013).

Population based studies in England and the United States have reported prevalence rates for depressive symptoms in older adults of around 17.6% and 14.6% respectively (Zivin et al., 2010). Another study in Greece found considerably higher rates (48.1%) in older adults living in urban and semi urban areas (Argyropoulos, Bartsokas, Argyropoulou, Gourzis, & Jelastopulu, 2015). Other studies in developed countries have observed that poor health status, disability, low social support and female gender are significant predictors of depression among older adults (Djernes, 2006; Zivin et al., 2010).

There have been a few studies of depression in older persons in developing countries but the findings show considerable variation. One recent systematic review from China reported the prevalence of depression of between 11.0 to 79.7% among community dwelling Chinese (Chen, Hicks, & While, 2012). Another review from India found similarly large variations in prevalence rates of between 12.5 to 98% among older adults in community settings (Grover & Malhotra, 2015). The prevalence rate of depression was observed to be 63% in elderly welfare and public health centres in South Korea (Kim, Choe, & Chae, 2009), and 40.6% in Pakistan (Bhamani, Karim, & Khan, 2013). Studies from various Asian countries indicate that lower levels of education, female gender, marital status, low socio-economic status, increasing age, family related issues, loneliness, and perceived health status are linked with higher incidences of depressive symptoms in older adults (Chong et al., 2001; Maulik & Dasgupta, 2012; Chalise, 2014). In addition, older adults with chronic diseases and poor physical health have a higher risk of depression (Chang-Quan et al., 2010).

Apart from a few studies in homes for the older adults (*Briddhashram*) (Chalise, 2014; Pradhan, 2014; Ranjan, Bhattarai, & Dutta, 2014), hospital outpatient setting (Khattri, 2006) and in the Rai ethnic community (Chalise & Rai, 2013), there is a dearth of population-level studies of depression in older adults in Nepal. These few studies reported prevalence rates of between 47.3% and 89.1% in homes for the older adults, 53.2% in an out-patient department and 29.7% in the Rai community. It is evident that in Nepal depression in older adults is largely under-diagnosed and under treated, but also under-researched (Khattri, 2006). Indeed it is a neglected issue in developing countries like Nepal where other competing health issues take priority. This study therefore seeks to ascertain the prevalence of depression in older adults in the wider community setting and identify potential contributory risk factors in older adults in Nepal.

Methods

Study setting and participants

A community based cross-sectional study was conducted between August and October 2012 in the Pharping area of Nepal. Pharping is a semi-rural area in the Kathmandu district and has six Village Development Committees (VDCs) with a population of approximately 25,000 (Central Bureau of Statistics, 2012b). Eligible participants were all adults aged 60 years and above. The cut-off age used to define 'older person' in this study is based on the definition used by the Government of Nepal for who is a 'senior citizen' (Nepal Law Commission, 2006). Exclusion criteria included those with cognitive impairment, mental incapacity or inability to provide verbal consent and responses to the questionnaire.

Sample size and sampling procedures

Two semi-urban VDCs, Dakshinkali and Sheshnarayan, were randomly selected from a list of six VDCs in the Pharping area. Eligible study participants were randomly selected from the lists of households that were provided by the respective VDCs and were interviewed in the community setting. The sample size was calculated using a single population proportion formulation; considering 25% proportion of prevalence which is nearly the half value of highest prevalence of depression in older adults reported in Nepal (Khattri, 2006) and a precision of 5%. The total sample size was estimated to be 289. Equal proportions of participants were recruited from each VDC to ensure a balanced representation of older adults. The communities in both VDCs were diverse and consisted of both affluent and poor individuals. The socio-demographic characteristics of the two VDCs (Central Bureau of Statistics, 2012b) are described in Table 1.

Data collection and study variables

Data was collected using a structured questionnaire administered by trained interviewers. The questionnaire was pre-tested following expert validation to ensure the general acceptability and feasibility of the questionnaire in other VDCs apart from the study area. All survey questionnaires were completed through face-to-face interviews. The questionnaire collected information on the socio-demographic profile (age, gender, marital status and literacy status), social support (living arrangements, status of older adults in the household, financial support, physical support, time spent with family members, mistreatment by family members, consideration in family decision making and feeling respected) as well as lifestyle and physical wellbeing (alcohol intake, smoking, mobility and presence of physical health problems) of respondents. All the variables were dichotomized.

Operational definition

The 15-item Geriatric Depression Scale (GDS-15) was used to assess depressive symptoms (de Craen, Heeren, & Gussekloo, 2003). This instrument focuses on psychological symptoms: 10 questions indicated the presence of depression when answered positively while the rest 5 questions indicated depression when answered negatively. This instrument has previously been used in Nepal and in other Asian studies (Khattri, 2006; Sengupta & Benjamin, 2015). The GDS-15 questions were read out to study participants and who were asked how they had felt over the past week using a yes and no response format. The score ranges from 0 to 15 where a test score from 0 to 4 is considered to be normal, 5 to 8 indicates mild depression, 9 to 11 indicates moderate depression, and a score of 12 or more indicates severe depression.

Analysis

Descriptive statistics were used to calculate means and percentages to describe the study participants. To identify possible significant predictors for depression in older adults, a

stepwise multiple logistic regression was used. The dependent variable was dichotomised: a GDS score of 0–4 was coded as '0' (not depressed) and a score of 5–15 was coded as '1' (depressed). Univariate logistic regression analysis was performed and only significant independent variables ($p \leq 0.05$) from the univariate analysis were entered into a stepwise logistic regression analysis. Independent variables were entered into three sets: socio-demographic variables were entered first, and then all remaining social support and lifestyle variables were entered based on the maximum likelihood-ratio statistic. All the analyses were performed in IBM SPSS Statistics version 21.0.

Ethical approval for this study was granted by the Nepal Health Research Council (Ref. 65/2012), and the University of Sheffield. Informed verbal consent was obtained from each study participant as most of the study participants were illiterate. They were informed that participation in the study was entirely voluntary, not remunerated, and that they were free to withdraw at any time without prejudice.

Results

Socio-demographic Characteristics

A total 303 older adults were approached for the survey of which 300 participants consented to participate in the study and 54.7% of respondents were female. The mean age of the sample was 71.2 (SD: 8.38) years. More than two thirds of the sample (69.2%) was in the age group 60–74 years. The prevalence of depressive symptoms in this sample was 60.6% (n=175) with a higher prevalence in females (68.4%) as compared to males (51.1%). In terms of severity of depressive symptoms, mild-depression was commonest (27.7%) followed by moderate (21.1%) and severe depression (11.8%) respectively. Table 2 shows the socio-demographic characteristics of study participants.

There were more literate males defined as those able to read and write (55.9%) compared to females (9.8%). Almost all (95.7%) participants reported having good family support i.e. they were living with family members or spouse. About three-quarters (74.1%) of the study participants lived as a head of the household.

Logistic regression analyses

Table 3 reports the factors associated with depression on univariate and multivariate analyses. In univariate analysis, participants in the age group 60-74 years (OR = 1.93, p = 0.016), who were female (OR = 2.06, p = 0.003), illiterate (OR=3.13, p < 0.001) or did not have the status of head of the household (OR = 2.31, p = 0.005) were more likely to suffer from depression. Among the lifestyle and physical wellbeing factors, participants who were unable to leave home (OR=5.27, p =0.002) and who had physical health problems (OR=2.0, p = 0.012) were more likely to be depressed than participants who were able to leave home and had no physical health problems. Conversely, participants who received physical support (OR = 0.37, p = 0.012), financial support (OR = 0.48, p = 0.038), who felt respected in the family (OR = 0.05, p < 0.001), were considered in family decisions (OR = 0.12, p < 0.001), spent time with family members (OR = 0.11, p < 0.001) and were not mistreated (OR = 0.13, p = 0.001) were less likely to have depression.

In multivariate analysis (Table 3), those participants who were illiterate were twice as likely to be depressed compared to those who were literate (adjusted OR (aOR) = 2.01, 95% CI: 1.08-3.75). Older adults who were not able to leave home (physically immobile) were more than five times more likely to be depressed (aOR = 5.59, 95% CI: 1.75-17.93) than participants who were able to leave home. Likewise, the presence of physical health problems (aOR = 1.97, 95% CI: 1.03–3.8), lack of time spent with family members (aOR = 3.55, 95% 1.29-9.76), and lack of consideration in family decisions making (aOR = 4.02, 95% CI 2.01-8.04) were associated

with depression. Factors such as age, gender, status of older people in the household, physical support, financial support, feeling respected and mistreatment by family members were significant in the univariate analysis, but subsequently found to be not significant in the multivariate analysis.

Discussion

Depression in older adults is an under-researched topic in Nepal. To our knowledge, this is the first community-based study in Nepal examining the prevalence of depressive symptoms among older adults in a semi-urban community and addresses a key unknown that has significant ramifications for public mental health policy and planning. Our study found that depression in older adults was very prevalent in the community. Literacy status, mobility, presence of physical health problems, consideration in family decisions, and time spent by family members to talk to older adults were the major predictors of depression in older adults in this study.

The prevalence estimated by our study is more than twice that of a previous Nepalese study on older adults conducted in a single ethnic group in an urban setting in the Kathmandu Valley (Chalise & Rai, 2013). Although that study used the long version GDS-30 whereas our study used the GDS-15, both of these tools have high correlation and are therefore appropriate measures of depression in community settings in Nepal (Gautam & Houde, 2011). The observed difference may partly be explained by the inclusion of only Rai caste/ethnicity from a higher income group as opposed to our study participants who were recruited from a diverse community with varied socio-economic backgrounds (Central Bureau of Statistics, 2014). Similarly, another study (Pradhan, 2014) showed a higher prevalence of depression (89.1%) among residents in a home for the older adults (Briddhashram). The higher rate seen could be explained by the fact that these residents are likely to have more complex health needs and experience a combination of chronic conditions. In addition, the severity of depression in that

study was assessed using a different tool, the Beck Depression Inventory, which could account for some of the difference seen (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

We found the prevalence of depressive symptoms to be higher in Nepal compared to other Asian countries such as Singapore (32.9%) (Li, Theng, & Foo, 2015) or in urban India (51.9%) (D'souza, Ranganath, & Thangaraj, 2015). Both of these studies used GDS-15. Of note, another study (Barua, Ghosh, Kar, & Basilio, 2011) suggested an increasing trend of prevalence of depression in older persons in India compared to the rest of the world. This may be of significance for our study as the socio-demographic and cultural structure of India is similar to Nepal. Compared to the developed countries, our reported prevalence is higher than studies using GDS-15 conducted in Greece and the UK (Osborn et al., 2002; Argyropoulos et al., 2015).

In an attempt to compare the geographical and cross cultural variation in the prevalence of depression found in this study with other studies, it was noted that the fundamental differences in the studies, including study sites, measurement tools, cut off values, sample and the methodology may limit the comparability of such studies. Furthermore, cultural differences may affect the responses to specific items in the instruments (Jorm, 2006). The high prevalence in our study could potentially be due to over reporting by the participants and false positive results. Furthermore, better mental health facilities with primary health care integration could account for lower prevalence rates seen in the West and in other developed Asian countries (Wodchis, Dixon, Anderson, & Goodwin, 2015; Mugisha et al., 2017).

In this study, in terms of severity of depressive symptoms, mild depression was common (27.7%), followed by moderate (21.1%) and severe depression (11.8%). The greater prevalence of mild depression relative to severe depression is consistent with findings from other studies conducted across the globe (Khattri, 2006; Sinha, Shrivastava, & Ramasamy, 2013; Argyropoulos et al., 2015).

Predictors of Depression

The existing literature on depression in older adults reported higher prevalence rates in those who were illiterate (Blazer, 2003; Gautam & Houde, 2011; Maulik & Dasgupta, 2012) which tallies with our study findings (2013). Illiteracy could limit opportunities to well-paid jobs, and therefore better socio-economic status and financial security. This in turn reduces the individual's ability to cope with significant shocks and stresses (Krantz, 2001).

Our study found no significant gender differences in prevalence rates of depression which mirrors similar findings in Iran (2011). It does however contradict findings from another study conducted in Nepal by Chalise and Rai (2013) that reported female gender as a major predictor of depression. A possible explanation for this difference may be that their study was only focused on one urban ethnic group whereas our study participants were drawn from diverse backgrounds, castes and ethnicities from semi-urban communities.

The inability to leave home (physical immobility) and physical health problems were predictive factors for depression reported in other local and global studies (Chen et al., 2005; Imran, Azidah, Asrenee, & Rosediani, 2009; Sandhya, 2010). Poor mobility negatively affects the older person's independence and autonomy that in turn may adversely affect their psychological well-being leading to depression. In Nepal, older adults with physical health problems are less likely to receive adequate medical care particularly in rural areas due to the limited accessibility of health care services and lack of health education. Depression may also contribute to the development of physical illnesses and affect disease progression (National Research Council, 2009). Depression in older adults also has wider impacts on their family and carers such as the costs associated with care and lost work (Langa, Valenstein, Fendrick, Kabeto, & Vijan, 2004).

The involvement of older adults in family decisions as well as time spent with family members have also been previously observed to be strong predictors of depression (Arumugam,

Nagalingam, Nivetha, & Balaji, 2013). Gautam and Houde (2011) found less symptoms of depression among older adults who received emotional support. Social isolation and the lack or loss of close social contacts are recognized as important predictors of depression in older adults in Western countries (Djernes, 2006). Our study findings echo these observations from studies elsewhere and highlight the importance of social engagement by older persons. It is likely that when older persons are excluded from family decision making and social contact, they are more likely to experience depression because they may not feel valued or feel that they have little or no autonomy. There is good evidence that older people want to be engaged in social interactions (Singh & Misra, 2009), and especially value time spent with family members.

In Nepal, the extended family system is considered to be the ideal family structure, and local culture and tradition dictate that when people are old they will be obeyed, respected and taken care of by the younger generation. In the traditional family hierarchy, older adults expect to hold a place of authority in the family. However, rapid urbanization and modernization over recent past decades may have disrupted extended family networks leading to a shift towards the nuclear family especially in urban communities. Furthermore, the nature of contemporary lifestyles may mean that family members have less time to interact with older people (Acharya, 2011; Dhakal, 2012). In rural areas, when the young have migrated away in search of work, the "left behind older adults" have to take on all the household and income-generation responsibilities, the burden of which could have a negative impact on mental health (Wang et al., 2016). Conflicts within the family may also contribute to perceived feelings of loneliness associated with depression among the older people (Stek et al., 2005).

Our study highlights the high prevalence of depression in older persons. However, it is an under-detected condition, made worse by the stigma attached to it that may cause both the older person and their family to conceal and deny the condition, and therefore not seek appropriate

treatment. Consequently, it is essential to engage the family as the majority of older people live in joint family settings. Greater awareness of this issue is also needed, particularly among health professionals and primary health care providers. Policymakers also need to encourage interdisciplinary collaborations among community organizations, health and social care professionals to synergistically work towards better detection, diagnosis and treatment of depression in older adults.

Another possible solution that could be considered may be community-based screening programmes to help identify older adults who are at risk of depression. This could be conducted for example through screening for risk factors such as physical immobility, physical health problems, and social exclusion. Targeted interventions could then be introduced to help address these risk factors and reduce the risk of depression. Interventions might include the enhancement of social support, educating family members about depression, strengthening protective factors such as exercise programmes for older people and involvement in community activities. The latter could include participation in local community and faith based groups that may be a source of much needed social support. Social support and family ties are key ingredients for emotional strength in older people (Centers for Disease Control and Prevention, 2005; Ibrahim et al., 2013) and have a positive impact on their quality of life (Lee, Arozullah, Cho, Crittenden, & Vicencio, 2009).

Limitations

Due to resource and time constraints, the study sample was drawn from only two semi-urban VDCs in the Pharping area, out of 57 possible VDCs in the Kathmandu district. As such, the sample may not fully represent the elderly population of Nepal. That said, strength of the study is the diversity of the sample, with a good range of castes, socio-economic and ethnic groups represented. Unlike previous studies based on focused settings or ethnic groups, our sample may better reflect the population of older adults nationally.

Another caveat to this study is that the depressive symptoms reported by older adults may not necessarily equate to a clinical diagnosis of a depressive disorder. There is therefore a risk of incorrectly attributing reports of depressive symptomatology to actual clinical mental ill health, leading to potentially an overestimation of the 'true' prevalence of depression in this group. The study also excluded older people with cognitive impairment and therefore may have missed out further possible cases of depression in the community. Finally, due to the cross sectional design of the study, this limits definitive inferences of causal relationships between depression and the various variables collected.

Conclusions

Depressive symptoms among older adults in the community are common in Nepal and there are a range of potentially modifiable risk factors. Community-based screening and the implementation of appropriate social and health care interventions may help reduce the risk and burden of depression in this population group. This is a serious unmet need with considerable public health and wider social ramifications. Much more can and needs to be done to improve the mental health of older persons in Nepal.

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Table 1: Socio-demographic information of two study VDCs in the Kathmandu district

Characteristics	Dakshinkali	Sheshnarayan
No. of households	984	844
Total population	4,755	3,855
Female	2,411 (51%)	1,902 (49%)
Older population (60+ years)	466 (10%)	351 (9%)
Literacy (can read and write)	80.8%	79.2%

Table 2: Demographic characteristics of participants

Variables	Male N (%)	Female N (%)	Total N (%)
Total	136	164	299
Age			
60-74 years	90 (66.7)	117 (74.3)	207 (69.2)
75 years and above	45 (33.3)	47 (28.7)	92 (30.8)
Marital status			
Married	100 (73.5)	79 (48.2)	179 (59.7)
Unmarried/separated/widowed/ divorced	36 (26.5)	85 (51.8)	121 (40.3)
Literacy status			
Literate (able to read and write)	76 (55.9)	16 (9.8)	92 (30.7)
Illiterate	60 (44.1)	148 (90.2)	208 (69.3)
GDS category			
Normal	64 (48.8)	50 (31.6)	114 (39.4)
Mild	31 (23.7)	49 (31.0)	80 (27.7)
Moderate	25 (19.1)	36 (22.8)	61 (21.1)
Severe	11 (8.4)	23 (14.6)	34 (11.8)

Table 3: Logistic regression analysis of factors associated with depression

Variable	N	Depressed N (%)	Univariate analysis		Multivariate analysis	
			OR	95% CI	aOR	95% CI
Older age (≥75 years)	92	62 (71.3)	1.9*	1.1–3.3		
Female gender	164	108 (68.4)	2.1*	1.3–3.3		
Unmarried/separated/ widowed/divorced	121	81 (70.4)	2.0*	1.2–3.3		
Illiterate (unable to read and write)	208	137 (69.2)	3.1*	1.9–5.2	2.01*	1.1–3.7
Living alone	13	11 (84.6)	3.8	0.8–17.3		
Status in the family as household member	77	55 (74.3)	2.3*	1.3–4.2		
Received physical support	254	141 (57.6)	0.4*	0.2–0.8		
Received financial support	242	138 (58.0)	0.5*	0.25–0.96		
Felt respected	244	125 (53.0)	0.05*	0.01–0.22		
Lack of consideration in family decisions	123	97 (85.8)	8.25*	4.48-15.20	4.02*	2.01-8.04
Lack of time spent with family members	65	55 (90.2)	8.76*	3.62-21.18	3.55*	1.29-9.76
Not mistreated by family members	260	141 (56.0)	0.13*	0.04 –0.43		
Smoker	117	69 (61.1)	1.02	0.6–1.7		
Drinking alcohol	78	45 (61.6)	1.1	0.6–1.8		
Presence of physical health problems	224	140 (64.8)	2.0*	1.2–3.5	1.97*	1.03–3.8
Unable to leave home (immobile)	35	28 (87.5)	5.3*	1.8–15.5	5.62*	1.76–18.0

*Signifies statistical significance (p ≤0.05), aOR = adjusted Odds Ratio