Nutritional and functional assessment of older people at health home care Nepal

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Abstract. This study sought to assess the functional activities of daily living (ADL) and nutritional status of older persons admitted to Health Home Care Nepal. In aim of developing better care management protocol, attention was placed on identifying explanatory factors of functional status among residents and the associations between their socio-demographic variables.165 residents above the age of 60 (>60 years old) were included. Socio demographic information was gathered from family members and comprehensive geriatric assessments, including nutritional and functional assessments, in accordance to a nutritional checklist and the Barthel score index, respectively. According to the nutritional screening initiative, 48.5% of residents were at high risk and 20.0% had good nutrition. There was a high nutritional risk in urban residents (56%) in comparison with rural residents (30%); 70.0% of illiterate residents and 39.1% of educated residents were at high nutritional risk.62.0% of illiterate residents were dependent whereas only 58.2 % of educated residents were dependent. The Barthel score index score was significantly lower in those at high risk of malnutrition compared to those at moderate risk and those with good nutrition. There was a significant association of nutrition with age, gender, education and income. However functional status was significantly associated with education and income. Significant associations were noticed between specific socio-demographic variables with both nutritional and functional status which are significantly interrelated too. The Collection of data is deemed important for the planning of care activities and rehabilitation for admitted older persons.

Keywords: Older People, Functional, Nepal, Nutrition.

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Introduction

In recent years, there has been a sharp increase in the number of older persons worldwide. According to the 2011 census, conducted by the Government of Nepal, National Planning Commission, Central Bureau of Statistics of Nepal, the population of people aged 60 years and over, referred to as senior citizens was 2.15 million, accounting for 8.1 percent of Nepal's total population of 26.5 million (Government of Nepal, National Planning Commission, Central Bureau of Statistics, 2012). (Table 1).

Table 1: Demographic situation of ageing Nepal, 1961 – 2011

Census Year	Population (60+)	Population growth rate		Percent of elderly(+60)			Percent of elderly(+60)	
		Total (%)	Elderly (%)	Rural	Urban	Total	Male	female
1961	489346	1.65	1.79	5.22	5.23	5.2	4.8	5.6
1971	621529	2.07	2.42	5.63	5.12	5.4	5.3	5.9
1981	857061	2.66	3.26	5.74	5.11	5.7	5.9	5.5
1991	1071234	2.10	2.26	5.95	4.99	5.8	5.9	5.7
2001	1504311	2.24	3.40	6.60	5.70	6.5	6.4	6.3
2011	2154410	1.36	3.65	8.4	6.8	8.1	8.3	8.0

Health Home Care Nepal (HHCN) is the residential care home for older persons which was established to provide comprehensive holistic package of services addressing human ailments (social, psychological & medical needs), while ensuring comfort for its residents and their family care providers. Functional independence and the ability to manage daily routines are of major concern for older persons. The prevalence of both chronic conditions and activity limitation increases with age, with health-related limitation in mobility or self-care increasing fourfold between ages 65-74 and 85 or older (Eberhardt, Ingram, & Makuc, 2001).

Assessment of functional capacity is a key element in geriatric health, as it can help in identifying what services or programs are needed (Stuck, et al. 1999). Malnutrition is the major geriatric problem associated with poor health status and high mortality, marking this challenge as well recognized in clinical outcomes (Ahmed & Haboubi, 2010). Nutrition changes the functional activity of people through changes in body composition (Kuczmarski, Weddle, & Jones, 2010). The prevalence of malnutrition is increasing among the Nepali population and is associated with a decline in functional status (Fang et al., 2013). It is argued that the functional ability of older persons could be enhanced by improving their nutritional status by means of proper diet management. In order to administer optimal and adequate care in HHCN, it is deemed better to disclose information about the functional and nutritional status of patients during admission followed by several intervals throughout his or her stay at the care home. The ideal goal of services for older persons should be better quality care. The objectives of the study was to assess the functional (ADL) and nutritional status of older persons at admission and to identify explanatory factors of functional status so that better care management protocol would be developed for the better care of the residents. The explanatory

factors are to clarify the impact of socio-demographic factors on nutritional status of the older persons in addition to the interrelationship between both.

Method

This study has been carried out on 165 residents admitted at this HHCN during the period between January 2013 to January 2016. The cross-sectional descriptive study was conducted with older persons admitted to this 20bed HHCN and who have been residing for the last three years. Socio-demographic information was collected, from both residents who could answer for themselves, and those requiring the assistance from their family members with consent. The Barthel Score Index (BSI), was used, which is a validated and reliable generic instrument used to measure daily functioning, specifically the activities of daily living (ADL) and mobility (Mahoney & Barthel, 1965).This Index measures the capacity to perform 10 basic ADL and gives a quantitative estimation of the patient's level of dependency, with scoring from 0 (totally dependent) to 20 (totally independent) (ibid.). All assessments were carried out by the nurses together with an experienced physiotherapist. Patient characteristics and outcome measures were analyzed with descriptive statistics. Residents were classified according to age, as follows: young old (60–74.9 years), old old (75–84.9 years), and oldest old (≥85 years). All participants or family members gave informed consent and the study was given approval from local ethical committee.

The nutritional screening initiatives (NSI) are the most frequently used nutritional screening tool for older adults (Bassem & Kim, 2011). It is intended to prevent impairment by identifying and treating nutritional problems before they become a detriment to the lives (Sennett et al., 2010). For this study the NSI was used as a nutritional screening tool, which included 10 items with a total score of 21 points. A score from 0to 2 was considered as good nutrition, 3 to 5 as moderate nutritional risk, and 6 or more as high nutritional risk (The Nutrition Screening Initiative, 2007).Nutritional screening indicators include illness and tooth or mouth problems affecting feeding; number of meals per day; types of foods and drinks, the level of independence for meal preparation, feeding oneself, and weight management.

Data were checked, entered, and analyzed using SPSS version 21.0 for data processing and statistics. Categorical variables were compared with the chi-square test(X^2). For all analyses, *P*value <0.05 was considered statistically significant.

Results

Socio-demographic data of the studied residents are presented in Table2. A total of 165older persons were included in the study. The majority of residents (47.9%) were oldest old and female (53.9%) of primary education level (38.8%), with friends (66.1%) and children (81.2%), even though most are no longer in close contact with their friends and children. It was further noted that the majority of residents came from moderate income (58.2%) and were paying to reside in this HHCN.

Table 2: Socio-Demographic data of studied patients:

Age Group		Frequency	%
	Young old ((64 - 74.9)	45	27.3
	Old old (75 - 84.9)	41	24.8
	Oldest old (85 and above)	79	47.9
Gender			
	Male	76	46.1
	Female	89	53.9
Residence			
	Urban	118	71.5
	Rural	47	28.5
Education Level			
	No formal education	51	30.9
	Primary education	64	38.8
	Secondary education	31	18.8
	Tertiary education	19	11.5
Presence of close friends			
	Yes	109	66.1
	No	56	33.9
Income			
	Low	**0**	**0**
	Moderate	96	58.2
	High	69	41.8
Children			
	Yes	134	81.2
	No	31	18.8

Table 3: Nutritional Assessment (NCL Category) and Functional Assessment (BSI-category)

Nutritional Assessment (NCL Category)		Frequency	Percent
	Good nutrition (0 - 2)	33	20.0
	Moderate risk of malnutrition (3 - 5)	52	31.5
	High risk of malnutrition (6 and above)	80	48.5
Functional Assessment (BSI-category)			
	Dependent (1)	98	59.4
	Needs some help (1-10)	42	25.5
	Independent (11 - 20)	25	15.2

Table 4: Variables associated with - Functional Assessment (BSI) & Nutritional Assessment (NCL)

		Functional Assessment (BSI)						Nutritional Assessment (NCL)						Total
		Dependent		Needs some help		Independent		Good nutrition		Moderate risk of malnutrition		High risk of malnutrition		
		N	%	N	%	N	%	N	%	N	%	N	%	
Age Group	Young old ((60-74)	13	29	17	38	15	33.3	19	42	19	42	7	16	45
	Old old (75 - 84)	28	68	9	22	4	9.8	11	27	21	51	9	22	41
	Oldest old (85 and above)	57	72	16	20	6	7.6	3	4	12	15	64	81	79
	X²	69.06						27.06						
	P value	0.00						0.00						
		Dependent		Needs some help		Independent		Good nutrition		Moderate risk of malnutrition		High risk of malnutrition		
		N	%	N	%	N	%	N	%	N	%	N	%	
Edu. Level	No formal education	31	62	15	30	4	8	5	10	10	20	35	70	50
	Primary education	32	50	20	31	12	19	7	11	25	50	32	50	64
	Secondary education	20	63	7	22	5	16	10	31	15	30	7	22	32
	Tertiary education	15	79	0	0	4	21	11 / 58		2 / 4		6 / 32		19
	X²	11						39.7						
	P value	0.08						0.00						
		Functional Assessment (BSI)						Nutritional Assessment (NCL)						Total
		Dependent		Needs some help		Independent		Good nutrition		Moderate risk of malnutrition		High risk of malnutrition		
		N	%	N	%	N	%	N	%	N	%	N	%	
Income	Moderate	53	55	20	21	23	24	32	33	26	27	38	33	96
	High	45	65	22	29	2	3	1	1	26	38	42	61	69
	X²	14.35						25.58						
	P value	0.001						0.00						
		Functional Assessment (BSI)						Nutritional Assessment (BSI)						Total
		Dependent		Needs some help		Independent		Good nutrition		Moderate risk of malnutrition		High risk of malnutrition		
		N	%	N	%	N	%	N	%	N	%	N	%	
Residence	Urban	70	59	23	19	25	21	23	19	29	25	66	56	118
	Rural	28	60	19	40	0	0	10	21	23	49	14	30	47
	X²	15.70						11.12						
	P value	0.00						0.00						

		Functional Assessment (BSI)						Nutritional Assessment (NCL)						Total
		Dependent		Needs some help		Independent		Good nutrition		Moderate risk of malnutrition		High risk of malnutrition		
		N	%	N	%	N	%	N	%	N	%	N	%	
Gender	Male	45	59	23	30	8	11	7	9	27	36	42	55	76
	Female	53	60	19	21	17	19	26	29	25	28	38	43	89
	X²	3.27						10.2						
	P value	0.19						0.006						

		Functional Assessment (BSI)						Nutritional Assessment (NCL)						Total
		Dependent (1)		Needs some help (1-10)		Independent (11 - 20)		Good nutrition		Moderate risk of malnutrition		High risk of malnutrition		
		N	%	N	%	N	%	N	%	N	%	N	%	
Marital Status	Married	40	53	21	28	14	19	13	17	37	49	25	33	75
	Widowed	39	59	16	24	11	17	9	14	10	15	47	71	66
	Divorced	5	100	0	0	0	0	4	80	1	20	0	0	5
	not married	14	74	5	26	0	0	7	37	4	21	8	42	19
	X²	8.30						40.49						
	P value	0.21						0.00						

According to NSI, 48.5% of the residents were at high risk, 31.5% at moderate risk and 20.0 % had good nutrition. 59.4% of the study residents were found to be dependent and only 15.2 % were independent (Table 3).

This study found an association between age group with NSI as well as BSI. It found that 81.0% of oldest old were at high nutritional risk and 22.0 % of old old had high nutritional risk but the percent in young old was 16.0%. In terms of BSI, 29.0% of young old residents were dependents, which increased to 68% among old old and to 72% among oldest old.70.0% of illiterate residents were at high nutritional risk and 39.1% of educated residents were at high nutritional risk. 62.0% of illiterate residents were dependent where as 58.2% of educated residents were dependent. There was significant association between education with BSI (*P*= 0.08) and with nutrition *(P*=0.00). A significant association between income with NSI as well as with BSI was discovered. There was a high nutritional risk in urban residents 56%, in comparison with rural residents 30%; it was found that almost same percent of urban as well as rural residents were dependent with significant difference. No significant association was found between BSI and gender (*P*=0.19), but significant association found between NSI and gender (*P*= 0.006). A significant association of demographic variables with respect to NSI and BSI indicate that both nutrition and functional ability are interrelated. Also, it was found that a significant interrelationship between the nutritional status of the elderly and functional capacity (Table 4).

Discussion

According to NSI, the results showed that about 48.5 %of patients had high nutritional risk. A study conducted in Canada indicated that 37–62% of older persons were at risk of poor nutrition (MacLellan & vantTil, 1998), while a similar study in India indicated 50.3% (Baweja, Agarwal, Mathur, & Haldiya, 2008). A recent study in China which was carried out using the NSI found that the overall prevalence of under nutrition and nutritional risk was 17.8% and 41.5%, respectively (Fang et al., 2013). Result of this study is close to India study but different result in different studies may be due to differences in the selection criteria of older persons as well as in socio-demographic variables. The results in relation to NSI and age group correspond with that obtained by study carried out in China (Fang et al., 2013) with findings showing that the prevalence of nutritional risk was significantly higher in patients more than 70 years.

In this study finding of higher nutritional risk was found in illiterate patients as opposed to educated patients. This is similar to the findings of a study carried out in Nigeria (Olasunbo & Olubode, 2006*)*. However, study (Yap & Ng, 2007) carried out in Singapore found no significant correlation between NSI and education. In this study high nutritional risk was found among high income people rather than in moderate income as was found in a study carried out in Egypt (Esmayel &Hassan, 2013). Regarding functional assessment, this study found a significant direct association between functional activities and advancing age, where functional activity decreased with advancing age. The same notion was found in study carried out in rural Malaysia (Hairi, Bulgiba, Cumming, Naganathan, & Mudla, 2010). Similarly, significant association was found between functional activity and income, education level and residence. This resulted in functional activity to decrease with increasing level of income, education and among urban dwellings. Such association was not found in the study carried out in Egypt (Esmayel & Hassan, 2013) where no significant association was found between disability and income. This study found that both older male and female showed similar prevalence of functional limitation, with 59% and 60% respectively. This finding is similar to study (Bergamini et al., 2007) done in Italy but in contrast to the study carried out in Egypt (Esmayel & Hassan, 2013) and Malaysia (Hairi et al., 2010) which suggested that such challenges resulted from limited education contributing to further functional limitation among older persons. Findings from this study further delineates that increased incidence of functional limitation was found to be associated with risk of malnutrition. This is in agreement with the study carried out in Brazil (Oliveira, Fogac, & Leandro-Merhi, 2009) which assessed the relationship between nutritional status and functional capacity. In a study carried out by (Cereda, Valzolgher & Pedrolli, 2008) and a study carried out in Montreal, Quebec (Chevalier, Saoud, Gray-Donald & Morais, 2008) showed that the poorer functional status was associated with low nutrition.

Nutritional risk increased significantly in urban residents in compare to rural residents and in males compare to female. High nutritional risk found to be among widowed people 71.0 % in relation to marital status.

Conclusion

Significant associations were noticed between specific socio-demographic variables with both nutritional and functional status. Hence socio demographic and nutritional factors can be taken as explanatory factors for the functional status of older persons. Special attention to these factors can better assist in the planning and the overall better outcome of care activities and rehabilitation for older persons who are admitted to this care home. Knowing the level of risk of malnutrition after admission could better aid in the planning of a proper diet plan, which may include an additional quantity or increase frequency of feeding enriched with the correct amount of protein and carbohydrates. Oral liquid high energy supplements or enteral feeding would be considered for high risk residents. Planning of different level of care activities depend on the Barthel score of every resident. Care activities include: bladder exercise for incontinence, assisted walking, and assisted feeding for those who can't eat by themselves. This implies that prior functional and nutritional assessment is needed before administration to a care home for older person sin order to establish proper management and outcome. Also, it is necessary to pay special attention to functional capacity when planning nutritional care for older persons, especially when they are debilitated.

Limitation of study

The patients included in study are residents at one care home only. Larger number of people should be included from different care homes. Further advanced research analysis is required for future research in this field.

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