American Journal of Food and Nutrition, 2015, Vol. 3, No. 3, 84-89
Available online at http://pubs.sciepub.com/ajfn/3/3/4

DOI:10.12691/ajfn-3-3-4

Nutritional Risk in Acutely Admitted Older Medical Patients

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Received July 02, 2015; Revised August 13, 2015; Accepted September 01, 2015

Abstract Nutritional risk among older medical patients admitted to hospitals is high. More knowledge is needed of the association between nutritional risk when hospitalised and that after full recovery. This is the first step towards determining a more comprehensive cross-sectional nutritional risk. Our aim was to examine the association between nutritional risk at admission versus six months after discharge in acutely admitted older patients. We also examined the nutritional risk of patients who died or were lost to follow-up. This descriptive follow-up study included 90 older patients. Nutritional risk was determined by the Nutritional Risk Screening (NRS). The associations between nutritional risk measures determined at admission and six months after discharge and between nutritional risk measures and the reason for being lost to follow-up were analysed by Chi-square or Fisher's exact test, as appropriate. At admission, 74% of the patients were at nutritional risk. Of the patients who were not at nutritional risk at admission and who completed the six-month follow-up, five (31%) reported weight loss at follow-up. Furthermore, 12 (46%) of the patients who did not report weight loss at admission reported weight loss at follow-up. Forty-six (49%) patients were lost to follow-up: eight died, all of whom were at nutritional risk; seven had decreased appetite at admission; and ten were too exhausted to continue due to illness, including eight at nutritional risk and seven with decreased appetite. Being an acutely admitted older medical patient seems to be a risk factor for developing nutritional risk within six months, independent of nutritional risk status at admission. In addition, poor nutritional status was predictive of being lost to follow-up.

Keywords: *nutritional risk, older, medical patient, acutely admitted, hospital*

Cite This Article: Louise Lawson-Smith, Janne Petersen, Pia Søe Jensen, Ditte Maria Sivertsen, Mette Merete Pedersen, Gertrude Ellekilde, Tove Lindhardt, and Ove Andersen, "Nutritional Risk in Acutely Admitted Older Medical Patients." *American Journal of Food and Nutrition*, vol. 3, no. 3 (2015): 84-89. doi: 10.12691/ajfn-3-3-4.

1. Introduction

Nutritional risk among older patients admitted to departments of internal medicine in Danish hospitals is estimated to be 25%-58% [1,2,3]. Older patients have increased risks of poor nutritional outcomes, such as low functional level, increased morbidity and mortality, as well as increased use of social services and hospitalisations [4,5,6]. Undernourished older patients are more prone to complications and the average in-hospital costs of undernourished patients are four times greater than for those who are sufficiently nourished [7]. Identifying nutritional risk and initiating timely nutritional therapy may prevent poor nutritional outcomes [8]. A decline in appetite and food intake among older people is partly due to social factors and underlying metabolic changes that impair energy regulation [9,10,11]. Other well documented risk factors for undernutrition include dementia, low quality of life, requiring help to eat, nausea, pain, as well as dental and swallowing problems [9,10,11].

Undernutrition is not only a problem for patients during hospitalisation but also before and after, as weight loss during the six months prior to hospitalisation is regarded as a risk factor for undernutrition during hospitalisation [12,13]. Older patients who are undernourished at admission tend to continue to lose weight during their hospitalisation [12]. Furthermore, hospitalisation within the previous year is associated with significant decline in body mass and hospitalisation for eight or more days is associated with lower body mass [15]. Previous studies on undernutrition focused on non-acutely admitted patients. To our knowledge, this study is the first to examine associations between nutritional risk at and six months after admission in acutely admitted older medical patients. These patients are prone to having a high stress metabolism that results in decreased protein syntheses and increased protein catabolism and anorexia [16]. Therefore, the aim of this study was to examine the association

between nutritional risk at admission versus six months after discharge in acutely admitted older patients. Furthermore, we wanted to study the characteristics of patients who died or were lost to follow-up.

2. Material and Methods

2.1. Participants

Eligible patients were admitted to the Medical Section of the Emergency Department at Hvidovre Hospital, University of Copenhagen, Denmark, from December 2010 – October 2011. Consecutively, we included patients, aged older than 65 years, who were admitted from their own home and had one or more comorbidities. Patients were also excluded if they had: an inability to cooperate in an interview, inability to walk, inability to speak Danish, an expected hospitalisation of less than 48 hours, been admitted to an intensive care unit, or a terminal illness. Chronic obstructive pulmonary disease patients who were included in a disease-specific management program were also excluded. Patients who were eligible were approached on the day of their admission and included in the study. All patients gave informed consent. An admission interview took place at ward level and was conducted by two project nurses. Six months after discharge, a follow-up interview was conducted in the patient's own home. The Danish Data Protection Agency and The Research Ethics Committees of The Capital Region approved the study (06072010/1631).

2.2. Nutritional Risk

Each patient's nutritional risk was determined using the Nutritional Risk Screening (NRS), which is utilized in Danish hospitals [17,18,19]. The NRS was assessed at admission by the project nurses and consisted of four items: body mass index (BMI <20.5), self-reported weight loss within the last three months, self-reported decreased appetite, and severity of disease, including severe infection. Patients were considered to be at nutritional risk if they met the conditions for one of the four items [17,18,19] and were categorised as at-risk or not at-risk. At the follow-up interview six months after discharge, the patients were weighed to calculate BMI and were asked about decreased appetite and weight loss.

2.3. Background Data

Health-related quality of life was measured by EuroQol (EQ-5D-3L) [20,21]. This includes five dimensions (mobility, personal care, usual activities, pain/discomfort, and anxiety/depression). Each dimension has three levels (no problems, some problems, or extreme problems/unable to) and is answered based on the patient's current state of health. The EuroQol index ranged from 1 = fully functional quality of life to 0 = death. Patients scoring ≤ 0.8 were considered to have low quality of life [20,21]. Cognitive status was measured by the Mini-Mental State Examination (MMSE) [22]. It consists of 13 items with a maximum score of 30 points. Cognitive impairment was defined as a score below 25 [22]. In addition, the patients were asked if they had nausea, poor dental status, swallowing problems, if they needed assistance to eat, or experienced mouth pain. We obtained information on C-reactive protein (CRP), leucocytes, albumin, haemoglobin, and comorbidities, from the hospital´s clinical systems. These data were used in the Charlson Comorbidities Index [23]. Patients with CRP >10 were considered to have infection.

2.4. Lost to Follow-up

Patients who were lost to follow-up were divided into three groups: 1) patients who died between admission and the six-month follow-up; 2) patients who were too exhausted or ill to continue in the study, i.e., patients who were transferred to the intensive care unit or were unable to cooperate; and 3) patients who declined further participation and who did not fit into group 2.

2.5. Functional Measures

Data on function, strength, and mobility were collected in the first 30 patients. These data have previously been published by Bodilsen et al (2013) and Pedersen et al (2013) [24,25].

2.6. Statistical Analysis

To describe the cohort, we reported medians with interquartile ranges (IQR) or percentages, depending on the variable type. To investigate the association between nutritional risk at admission and the six-month follow-up, we estimated the associations between the NRS, BMI, decreased appetite, and weight loss measured at admission with a BMI<20.5, decreased appetite, and weight loss six months after discharge using the likelihood ratio Chi-square test or Fisher's exact test. The Fisher's exact test was used when the number of observation in the cells were less than five in more than 20% of the cells. Similarly, the associations between the NRS, BMI, decreased appetite, weight loss, and severity of disease at admission and the reasons for being lost to follow-up were analysed using the Chi-square or Fisher's exact test. The cases where Fisher's exact test was used are noted in the Result section. Statistical analyses were carried out with SAS 9.3 software, and $P < 0.05$ was considered significant.

3. Results

One hundred and nine patients were included. Ninety patients completed the admission interview and 44 completed the six-month follow-up interview (Figure 1). Forty-six patients were lost to follow-up for the following reasons: death (n=8), being too exhausted to continue due to illness (n=10), and declining further participation (n= 28). The median age was 82 years (SD 7.46) for the 90 included patients, 50% were men and 46% had a Charlson Comorbidity Index above 1 (Table 1). Seventy-one percent of the patients were at-risk at admission.

3.1. Nutritional Risk

The associations between nutritional risk at admission and six months after discharge are shown in Table 2. For the 44 patients with a follow-up interview, there was an association between BMI at admission and BMI at follow-up ($P<0.0001$). Otherwise, there was no significant

association between the NRS, severity of disease, BMI, decreased appetite, or weight loss at admission with a BMI<20.5, decreased appetite, and weight loss at the six-month follow-up. Of the patients who were not at-risk, five (31%) reported decreased appetite and seven (44%) reported weight loss at follow-up.

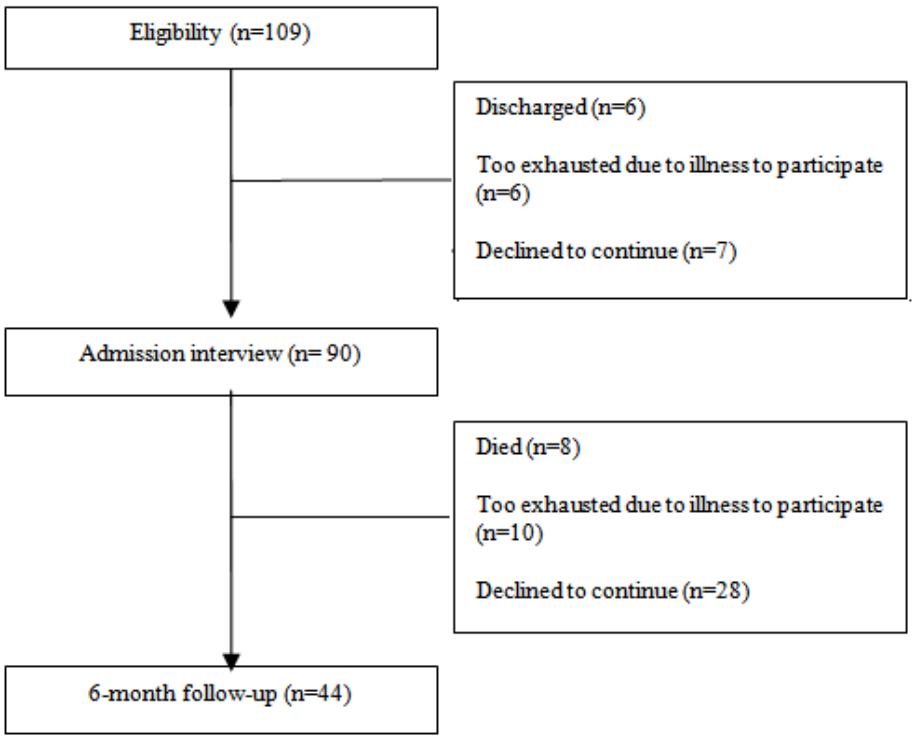

Figure 1.

Table 1. Characteristics of Older Medical Patients Acutely Admitted to a Medical Ward

	All			Not at nutritional risk	At nutritional risk
	N	n (%)		(n=23)	(n=64)
Age	90				
65-80 years		34	(41)	8 (35)	26 (41)
>80 years		53	(59)	15 (65)	38 (59)
Sex	90				
Women		43	(48)	15 (56)	12 (44)
Men		44	(49)	28 (48)	32 (53)
The Charlson Comorbidity Index;	89				
0		48	(54)	14 (61)	33(52)
1-2		36	(40)	8 (35)	26 (41)
3+		5	(6)	1 (4)	4 (6)
Blood samples;					
Leucocyte (Median, IQR)	89	9.0	(7;12)	7.9 (6;12)	9.3 (8;12)
Albumin (Median, IQR)	90	32	(28;35)	32 (31;38)	31.5 (27;34)
CRP>10	90	54	(60)	10 (43)	43 (67)
Haemoglobin g/dl (Median, IQR)	90	12.4	(11.1-13.7)	12.7 (11.9;13.8)	11.9 (10.6;13.4)
Men		12.6	(11.1-13.8)	13.0 (12.2;13.8)	11.8 (10.5;13.7)
Women		12.2	(11.1;13.2)	12.4 (11.6;13.0)	12.2 (10.5;13.2)
Health related quality of life;					
EQ5D <0.82		74	(82)	18 (78)	56 (88)
Cognitive impairment at admission;					
MMSE <25	83	22	(27)	5 (22)	17 (27)
Self-reported symptoms related to nutritional status;					
Suffering from nausea	90	13	(14)	1 (4)	11 (17)
Having poor dental status	63	45	(50)	14 (31)	30 (68)
Need help to eat	67	4	(6)	2 (9)	2 (3)
Swallowing problems	90	15	(17)	5 (22)	10 (16)
Experience mouth pain	90	12	(13)	6 (26)	5 (8)

Table 2. Association Between Nutritional Risk Screening, Severe Disease, BMI, Decreased Appetite and Weight Loss on Admission and BMI<20.5, Decreased Appetite and Weight loss at Six-Month Follow-up

		Six-month follow-up					
	N=44	BMI<20.5 N=8	P	Decreased appetite N=12	P	Weight loss N=18	P
Nutritional risk screening			0.11[f]		1.00[f]		0.73
Yes	26	7 (29%)		7 (28%)		10 (38%)	
No	16	1 (6%)		5 (31%)		7 (44%)	
Severe disease			1.00[f]		1.00[f]		1.00[f]
Yes	1	0 (0%)		0 (0%)		0 (0%)	
No	43	8 (20%)		12 (29%)		18 (42%)	
BMI			<0.0001		1.00[f]		1.00[f]
<20.5	8	6 (75%)		2 (29%)		3 (38%)	
>20.5	34	2 (6%)		9 (26%)		14 (40%)	
Decreased appetite			0.43		0.16		0.86
Yes	12	4 (27%)		7 (44%)		7 (41%)	
No	31	4 (15%)		5 (19%)		10 (38%)	
Weight loss			0.43		0.73		0.48
Yes	18	4 (27%)		4 (24%)		6 (35%)	
No	26	4 (15%)		8 (32%)		12 (46%)	

[f] Fisher's Exact Test.

3.2. Lost to Follow-up

The associations between the NRS, BMI, decreased appetite, weight loss, and severity of disease at admission with death, being too exhausted to continue, and declining further participation are shown in Table 3. The eight (13%) patients who died were all at-risk at admission. Sixteen patients had low BMI at admission; of these, two (13%) died before follow-up. Forty-seven patients had decreased appetite at admission; of whom, seven (15%) died before follow-up. Forty-five patients reported weight loss at admission, and five (11%) died before follow-up. Of the patients alive at follow-up, eight (14%) who were at-risk were too exhausted and 22 (39%) declined to participate. Finally, weight loss was significantly associated with declining to further participate (P=0.03), but was not significantly associated with being too exhausted to continue (P=1.00). Furthermore, five (19%) patients who did not report decreased appetite at admission and 12 (46%) who did not report weight loss at admission did so at follow-up.

Table 3. Association Between Nutritional Risk Screening, Severe Disease, BMI, Decreased Appetite and Weight Loss on Admission and Lost to Follow-up Because of Death, Too Exhausted To Continue Due To Illness or Declined To Participate

				Alive				
		Death		Too exhausted to continue due to illness			Declined	
	N=90	N=8	P	N=80	N=10	P	N=28	P
Nutritional risk screening			0.10[f]			0.71[f]		0.14
Yes	64	8 (13%)		56	8 (14%)		22 (39%)	
No	23	0 (0%)		23	2 (9%)		5 (22%)	
Severe disease			1.00[f]			0.04[f]		0.55
Yes	3	0 (0%)		3	2 (67%)		0 (0%)	
No	87	8 (9%)		79	8 (10%)		28 (35%)	
BMI			0.64[f]			1.00[f]		1.00[f]
<20.5	16	2 (13%)		14	2 (14%)		4 (29%)	
>20.5	71	6 (8%)		65	8 (12%)		22 (34%)	
Decreased appetite			0.06[f]			0.18		0.24
Yes	47	7 (15%)		40	7 (18%)		16 (40%)	
No	41	1 (2%)		40	3 (8%)		11 (28%)	
Weight loss			0.71[f]			1.00		0.03
Yes	45	5 (11%)		40	5 (13%)		18 (18%)	
No	43	3 (7%)		40	5 (13%)		9 (23%)	

[f] Fisher's Exact Test.

4. Discussion

In this study, we showed that almost half of the patients who were not at nutritional risk at admission and completed the six-month follow-up, reported weight loss at follow-up. Furthermore, almost half of the patients who did not report weight loss at admission reported weight loss at follow-up. Half of the patients were lost to follow up; of these, eight died who were at nutritional risk at

admission. Our results indicate that older acutely admitted medical patients, who are not at nutritional risk at admission, are still susceptible to developing nutritional risk within six months after discharge. Previous studies have showed that older non-acutely admitted patients who lost weight within six months regain some of the weight within a year [12,15]. Moreover, another study showed a significant association between weight loss in older patients and more than eight days of hospitalisation [15]. We do not know how many of our patients regained their weight within a year, but half of the patients who did not report weight loss at admission did report it at follow-up. This indicates that older acutely admitted patients should be regarded as having increased catabolism and anorexia and should have nutritional therapy during and after admission based solely on age, severity of disease, and hospitalisation. Thus, a focus on nutrition during and after hospitalisation in all older acutely admitted patients, regardless of the nutritional risk screening, may prevent further hospitalisations related to the consequences of undernutrition.

From admission to six-month follow-up, a large group of our patients were lost to follow-up due to various reasons; therefore, it was important to examine their nutritional risk characteristics. To our knowledge, this has not been done before among acutely admitted older medical patients. We found a tendency for patients at nutritional risk to be lost to follow-up because of death, being too exhausted, or declining to continue. This confirms the findings of previous studies that evaluated weight loss or other nutritional variables in non-acutely admitted patients as predictors of mortality and found that decreased food intake and weight loss were associated with increased mortality [26,27,28,29]. A previous study found a significant association between insufficient protein intake (<50% of requirements) and increased six month mortality [26]. Of the 64 patients who had nutritional risk at admission, 38 (59%) were lost at follow-up (data not shown). This indicates the problem is greater than it is possible to show in this study. Therefore, there is a need for better awareness of nutritional risk during hospitalisation. In addition, most of these patients were either too exhausted or declined to participate, factors that are important to include in the comprehensive understanding of nutritional risk.

4.1. Strengths and Limitations

A strength of this study was the inclusion of patients who were lost to follow-up. Another strength was the six-month follow-up period because patients were considered to be in a stable phase of the disease they were admitted for. Limitations of this study were the small sample size and the large group lost to follow-up, as these factors could have affected the results of the associations between the NRS at admission and low BMI, decreased appetite, and weight loss at follow-up. To keep these very valuable patients in a study over a long period of time is a difficult task. Patients do experience lack of energy and, therefore, are at-risk of dropping out. We believe we would have found an even higher nutritional risk at six months if more patients had participated. Furthermore, there could be recall bias in relation to the question on weight loss within the last three months. Finally, a limitation was that the full NRS was not included in the six-month follow-up; thus, we cannot compare the NRS at admission versus follow-up and determine any related associations.

5. Conclusion

A high proportion of the patients, who were not at nutritional risk at admission, developed nutritional risk over six months. Being acutely admitted seems to be a risk factor for developing nutritional risk among older medical patients. This knowledge is the first step towards determining a more comprehensive cross-sectional nutritional risk. Future research should examine which groups of patients develop nutritional risk after hospitalisation. In addition, when examining nutritional risk in acutely admitted older medical patients, it is important to include the patients that are lost to follow-up, as they have a high risk of poor nutritional status and can contribute to a comprehensive understanding of the nutritional risk for these patients.

Acknowledgement

This work was supported by the Danish Ministry of Health (grant number 9170).

References

[1] Van Bokhorst-de van der Schueren, M.A.E., Lonterman-Monasch, S., de Vries, O.J., Danner, S.A., Kramer, M.H.H., and Muller, M., "Prevalence and determinants for malnutrition in geriatric outpatients," *Clin Nutr*., 32(6). 1007-11. Dec. 2013.

[2] Rasmussen HH, Kondrup J, Staun M, Ladefoged K, Kristensen H, Wengler A. Prevalence of patients at nutritional risk in Danish hospitals. Clin Nutr Edinb Scotl., 23(5):1009-15. Oct 2004.

[3] Kaiser MJ, Bauer JM, Rämsch C, Uter W, Guigoz Y, Cederholm T, et al. Frequency of malnutrition in older adults: a multinational perspective using the mini nutritional assessment. J Am Geriatr Soc., 58(9):1734-8. Sep 2010.

[4] Milne AC, Potter J, Vivanti A, Avenell A. Protein and energy supplementation in elderly people at risk from malnutrition. Cochrane Database of Systematic Reviews [Internet]. John Wiley & Sons, Ltd; [cited 2013 Sep 16]. 1996.

[5] Akner G, Cederholm T. Treatment of protein-energy malnutrition in chronic nonmalignant disorders. Am J Clin Nutr., 74(1):6-24. 2001.

[6] Morley JE. Undernutrition in older adults. Fam Pract., 1;29(suppl 1):i89-i93 Apr. 2012.

[7] Waitzberg DL, Baxter YC. Costs of patients under nutritional therapy: from prescription to discharge. Curr Opin Clin Nutr Metab Care., 7(2):189-98. Mar 2004.

[8] Guigoz Y. The Mini Nutritional Assessment (MNA®) review of the literature-what does it tell us? J Nutr Health Aging., 10(6):466. 2006.

[9] Brantervik ÅM, Jacobsson IE, Grimby A, Wallén TCE, Bosaeus IG. Older hospitalised patients at risk of malnutrition: correlation with quality of life, aid from the social welfare system and length of stay? Age Ageing., 1;34(5):444-9. Sep 2005.

[10] Brownie S. Why are elderly individuals at risk of nutritional deficiency? Int J Nurs Pract., 12(2):110-8. Apr 2006.

[11] Noel M, Reddy M. Nutrition and aging. Prim Care., 32(3):659-69. Sep. 2005.

[12] Lee JS, Kritchevsky SB, Harris TB, Tylavsky F, Rubin SM, Newman AB. Short-term weight changes in community-dwelling older adults: the Health, Aging, and Body Composition Weight Change Substudy. Am J Clin Nutr., 82(3):644-50. Sep 2005.

[13] Wallace JI, Schwartz RS. Epidemiology of weight loss in humans with special reference to wasting in the elderly. Int J Cardiol., 85(1):15-21. Sep. 2002.

[14] Beck AM, Ovesen L. At which body mass index and degree of weight loss should hospitalized elderly patients be considered at nutritional risk? Clin Nutr Edinb Scotl., 17(5):195-8. Oct. 1998.

[15] Alley DE, Koster A, Mackey D, Cawthon P, Ferrucci L, Simonsick EM, et al. Hospitalization and change in body composition and strength in a population-based cohort of older persons. J Am Geriatr Soc., 58(11):2085-91. Nov. 2010.

[16] Gordon BS, Kelleher AR, Kimball SR. Regulation of muscle protein synthesis and the effects of catabolic states. Int J Biochem Cell Biol., 45(10):2147-57. Oct. 2013.

[17] Kondrup J. Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials. *Clin Nutr*. 2003 Jun;22(3):321-36.

[18] Kondrup J. ESPEN Guidelines for Nutrition Screening 2002. *Clin Nutr*. 2003 Aug;22(4):415-21.

[19] Rasmussen HH, Holst M, Kondrup J. Measuring nutritional risk in hospitals. *Clin Epidemiol*. 2010 Oct 21;2:209-16.

[20] Dolan P. Modeling valuations for EuroQol health states. *Med Care*., 35(11):1095-108. Nov 1997.

[21] Brooks R. EuroQol: the current state of play. *Health Policy*., 37(1):53-72. Jul. 1996.

[22] Folstein MF, Folstein SE, McHugh PR. "Mini-mental state": A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res*., 12(3):189-98. Nov 1975.

[23] Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chronic dis*, 40(5):373-383, 1987.

[24] Bodilsen AC, Pedersen MM, Petersen J, Beyer N, Andersen O, Smith LL, et al. Acute Hospitalization of the Older Patient: Changes in Muscle Strength and Functional Performance During Hospitalization and 30 Days After Discharge. *Am J Phys Med Rehabil Assoc Acad Physiatr*., 92 (9):789-96. Sep. 2013.

[25] Pedersen MM, Bodilsen AC, Petersen J, Beyer N, Andersen O, Lawson-Smith L, et al. Twenty-four-hour mobility during acute hospitalization in older medical patients. *J Gerontol A Biol Sci Med Sci.*, 68(3):331-7. Mar 2013.

[26] Holst M. Undernutrition in hospitals: An evaluation of risk factors concerning the nutritional care process [Internet]. *Videnbasen for Aalborg UniversitetVBN, Aalborg UniversitetAalborg University, Det Teknisk-Naturvidenskabelige Fakultet The Faculty of Engineering and Science, Institut for PlanlægningDepartment of Development and Planning*; [cited 2013 Nov 8]. Availablefrom: http://vbn.aau.dk/ws/files/34058348/PhDThesis_MetteHolst.pdf 2010.

[27] Landi F, Lattanzio F, Dell'Aquila G, Eusebi P, Gasperini B, Liperoti R, et al. Prevalence and Potentially Reversible Factors Associated With Anorexia Among Older Nursing Home Residents: Results from the ULISSE Project. *J Am Med Dir Assoc.*, 14(2): 119-24. Feb. 2013.

[28] Diekmann R, Winning K, Uter W, Kaiser MJ, Sieber CC, Volkert D, et al. Screening for malnutrition among nursing home residents - a comparative analysis of the mini nutritional assessment, the nutritional risk screening, and the malnutrition universal screening tool. *J Nutr Health Aging.*, 17(4):326-31. Apr. 2013.

[29] Buys DR, Roth DL, Ritchie CS, Sawyer P, Allman RM, Funkhouser EM, et al. Nutritional Risk and Body Mass Index Predict Hospitalization, Nursing Home Admis si ons, and Mortality in Community-Dwelling Older Adults: Results From the UAB Study of Aging With 8.5 Years of Follow-Up. *J Gerontol A Biol Sci Med Sci*. 3; Mar. 2014.