British Journal of Medicine & Medical Research
5(6): 780-787, 2015, Article no.BJMMR.2015.082
ISSN: 2231-0614

SCIENCEDOMAIN *international*
www.sciencedomain.org

In-Hospital Mobility and Associated Factors

Senait Demeke[1*], Janakiraman Balamurugan[1], Getahun Asres Alemie[2] and Eskedar Abebe[1]

[1]Department of Physiotherapy, School of Medicine, University of Gondar Hospital, Gondar, Ethiopia.
[2]Department of Internal Medicine, School of Medicine, University of Gondar Hospital, Gondar, Ethiopia.

Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2015/10787
Editor(s):
(1) Costas Fourtounas, Faculty of Medicine, School of Health Sciences, University of Thessaly, Greece.
Reviewers:
(1) Nwadike Victor, Department of Medical Microbiology and Parasitology, Federal Medical Center, Owerri, Nigeria.
(2) Mauro Colombo, Geriatric Rehabilitation Department, Geriatric Institute "Camillo Golgi", Abbiategrasso (Milan, Italy) Agency for Services to Persons (ASP) "Golgi Redaelli", Milan, Italy.
(3) Anonymous, State University of New York, USA.
(4) Joseph L. Verheijde, Physical Medicine and Rehabilitation, Mayo Clinic, Arizona, USA.
Complete Peer review History: http://www.sciencedomain.org/review-history.php?iid=696&id=12&aid=6416

Original Research Article

Received 9th April 2014
Accepted 13th June 2014
Published 9th October 2014

ABSTRACT

Background and Purpose: Immobility during hospitalization can lead to deleterious consequences and substantial decline in functional capacity, and even a rise in mortality rate has been reported. Determining and understanding varying levels of mobility, barriers to mobility, and associated factors during hospitalization will help in the development of successful health care interventions.
Study Design: An institution-based cross sectional study design was used to determine various levels of mobility (LOM) and to identify their associated factors and barriers in a single academic center in Ethiopia.
Methods: A 400 bed university teaching hospital and referral center for different health centers in and around Gondar was the study set-up. Four hundred twenty three adult patients of various wards admitted for different conditions were recruited by stratified sampling and assessed for in-hospital LOM using a previously validated scale.
Results: Four hundred twenty three subjects were included in this study (n=423, mean age 37±14,

**Corresponding author: Email: senidemeke@gmail.com;*

45.2% male). One hundred fifty three (36.17%) of the patients were identified as having low LOM with median Modified Clinical Mobility Score (MCMS) of 12 (inter quartile range [IQR]: 6-15). Low in-hospital LOM was associated with multiple variables. Risk of low LOM was three-fold higher in male patients (p 0.001).Old age groups were associated with 4.7 times lower LOM, and symptoms like weakness, dyspnea or dizziness increase the risk of having low LOM compared to not having these symptoms (AOR=2.7, 95% CI = 1.39- 5.43). Other perceived barriers to mobility during hospitalization were pain (60.3%), followed by environmental factors (19.4%), and personal factors (14.7%). Symptoms, age, sex, length of stay at the hospital and presence of invasive medical lines, catheters, etc. are found to have significant association with low LOM at 95% CI.

Conclusion: More than one third of hospitalized patients were identified as having low LOM. Old age, presence of pain symptom, duration of stay at the hospital and invasive medical lines are significantly associated with a low level of mobility during hospitalization. We recommend early and effective management of contributing symptoms, and adjustment of the hospital environment for a better level of mobility. We posit early detection and classification of influential factors of mobility level is an important step towards developing successful intervention programs.

Keywords: Mobility barriers; hospitalization; in-hospital mobility; bed rest; movement order.

1. INTRODUCTION

Many people assume bed rest is beneficial in restoring the health of an ill or injured person regardless of the degree of illness or injury; even ambulatory patients generally remain under their sheets when admitted to hospitals [1]. However, appropriately limiting mobility and prescribing bed rest only depending on individual circumstances is also beneficial in patient care. Sometimes severity of an illness or absence of treatment availability in sub Saharan countries may leave no choice except bed rest, but rest itself is rarely beneficial; in fact, it leads to deterioration of multiple systems in our body and increases rehabilitation costs. Level of mobility (LOM) during hospitalization describes the amount of time the patient stays out of bed doing his/her activities of daily living, or any ambulatory activity.

The prevalence of low mobility in older patients ranges from 23% to 33% during hospitalization for medical illness in some western countries [2-4]. Pederson et al. [5] have reported on the 24-hour mobility status of ambulatory and non-ambulatory patients using an accelerometer. They found that acutely hospitalized medical patients with walking ability spent 17 hrs/day of their in-hospital time in bed. A similar cohort study that examined the proportion of time spent in three levels of mobility (lying, sitting, and standing or walking) in hospitalized patients using a wireless accelerometer showed 83% of the measured hospital- stay to be spent lying in bed. The average amount of time that any one individual spent standing or walking ranged from a low of 0.2% to a high of 21%, with a median of 3%, or 43 minutes per day [2]. LOM is affected by different factors which include: age, type of medical diagnosis, dizziness, shortness of breath, weakness, absence of ambulation orders from a physician or a nurse, the presence of attached medical devices (IV line, catheter or other device), lack of a walking device, hostile hospital environment, length of stay in the hospital and fear of falling [5-8].

A qualitative study that assessed barriers to activity for older adults in the hospital shows that the most significant barriers include weakness (29%), fatigue (29%), pain (18%), shortness of breath (14%), dizziness (11%), nausea (4%) and stiffness (4%). Next to pain, the next most common barriers to mobility mentioned by the patients were institutional barriers, such as lack of support from nurses or doctors, and feeling tethered by an IV line or other device [4,9–12].

Bed rest in young adults demonstrates low plasma volume, orthostatic intolerance, and a loss of muscle mass within 24 hours of assuming supine position [3,6]. With extended periods of bed rest, anxiety, orthostatic intolerance, demineralization of bone, DVT, the inability of the cardiovascular system to maintain blood pressure, and inadequate cerebral perfusion against gravity can alter the ability to maintain an upright position or walk independently. In addition, due to that lack of gravitational force on the long bones and anti-gravity muscles, weakness will make the patient unable to walk independently [3,6,13,14].

The costs of immobility or low level of mobility during hospitalization are both human and financial. They can result in functional decline, increased risk of illness and death, diminished

quality of life, less autonomy and greater dependence, and sometimes institutionalization. Functional decline also leads to increased lengths of hospitalization and readmission [9,10,15–18], which the health care systems of many sub Saharan countries can ill afford.

Research done in western countries has consistently indicated that hospitalization adversely affects the functional outcomes of older adults, even in adults with non-disabling conditions and with relatively good baseline function [19,20]. Yet, scarce research has explored the association between hospitalization, level of mobility, and mobility barriers in Ethiopia, despite strong theoretical support for the potential adverse contribution of reduced mobility, sensory isolation, hostile environment, decreased nutritional intake, and other factors.

The objectives of this study were to assess level of mobility of hospitalized adults in University of Gondar Hospital (UOGH), to identify associated factors and explore barriers of mobility.

2. METHODS

2.1 Study Design and Study Area

The study was an institutional based cross sectional study, conducted from February 2013 to June 2013, Gondar, Ethiopia. The hospital serves as a referral center for the different health centers and health posts in and around Gondar. On average 382 patients are admitted per month in the surgical, medical and gynecology wards of this hospital. On average, there are 36 beds in each ward which are divided with partitions. In each partition there are about 8-10 beds. The rooms don't have enough space to allow patients to move around; rather, they are crowded with the patient's bed. Each ward has one or two wheelchairs which serve to transport patients to the radiology room or the toilet. A limited number of crutches are also available in the orthopedic ward. There is no television or separate TV room in the wards to entertain patients. The most common thing patients do when they are bored is to go outside and sit near the gate. It is not common to see patients ambulating in the hospital compound.

2.2 Participants

During hospitalization, patients of several wards were approached. All adult patients (≥18) admitted with a length of stay greater than three days in all wards except pediatrics, ICU and obstetrics wards were included. To our knowledge, no sufficiently powered studies on the subject of timely and appropriate mobilization of hospitalized patients have been conducted in Ethiopia.Allowing for a required confidence of 95% and 5% precision, 10% non-response, the required sample size was estimated to be 423 patients.Stratified sampling was used in the data collection process by allocating proportional sample size to each ward based on daily admission census. Wards were considered as different strata based on their homogeneity in terms of their patients. If more than three patients in a ward met the inclusion criteria, the patients to be included were randomly selected. The exclusion criteria were as follows: not able to cooperate, visually impaired, patients in intensive care unit, pediatrics and obstetrics ward.

2.3 Data Collection

A structured questionnaire was prepared in English language to collect the socio-demographic information and factors that contribute to low level of mobility from patients staying in the different wards of UOG hospital. The questionnaire also contains an adopted tool that assesses LOM, i.e., the clinical mobility score (CMS). The CMS assesses ability to perform standing, walking, sitting, usage of mobility appliances, wheel chair mobility, stair climbing ability, gait and bed rest time and provides a rating between 0 and 3 for each function, resulting in a total score from 0 (least mobile) to 24 (most mobile).Considering the applicability in the local context a modification has been made in the CMS and the resulting modified CMS (MCMS) was used to assess LOM. The modification consisted of removing the stair climbing component since we don't have stairs in our wards. Domains of scale were identified by pilot testing and based on conceptual model and linguistic validation was conducted by translating the tool to local language and back to English again. Information like presence of attached medical devices was checked by the data collector by observation while interviewing the patient. Data was collected by 5 trained nurses who work at the different wards of UOG hospital and supervised by the principal investigator. The training lasted two days and the data collectors were briefed about the data collection instrument and overall aim of the study.

2.4 Interview

A consent form was prepared and read to the subjects before conducting the interview. Willing participants who can write were asked to sign the papers, whereas those who can't write put their fingerprints. A face-to-face interview lasting 30 minutes was conducted at participants' bed side using an interview guide developed for this study. The data collectors conducted the interviews, and self reports of in-hospital mobility and barriers were also obtained.

3. STATISTICAL ANALYSIS

After coding, cleaning and editing, data was entered and analyzed using SPSS version 20. Descriptive data are given in medians with inter quartile ranges (IQRs) or percentages, depending on variable type. Bivariate and multivariate logistic regression analyses were performed to test the association between dependent and independent variables. Those variables that are found to have association at ά = 20% on the bivariate analysis were put into the multivariate model for further analysis to control the possible confounders in which case the significance level was with p-value less than 0.05. Multi-co linearity test has also been performed between potential interrelated variables before inclusion in to the multivariate model.

3.1 Ethical Clearance

The ethical review board of the Medical school approved the study.

4. RESULTS

A total of four hundred and twenty three patients were included in this study and the response rate was 100%. Participants' characteristics are shown in Table 1. The sample included 191 men (45.2%) and 232 women (54.8%) aged 18 to 77(mean 37±14). Young adults (18-35 years) comprise more than half of the study population, 27 % of the participants were middle age groups (36-50 years) and the rest (18%) were in the old age group. Approximately 53% of participants were found to be illiterate and 14% with high school level education. About 43% of participants were urban dwellers and 34% were single.

Table 1. Socio-demographic characteristics of patients who were admitted at UOG hospital from March 25 to May 25, 2013, Gondar, Ethiopia

Characteristics	n (%)
Age (years)	
Young adults (18-35)	233(55)
Middle age groups (36-50)	114(27)
Old age groups(>50)	76 (18)
Mean (SD)	37 ±14
Sex	
Male	191(45.2)
Female	232(54.8)
Residence	
Urban	184(43.5)
Rural	239(56.5)
Marital status	
Unmarried	100(23.6)
Married	276(65.2)
Divorced	26(6.1)
Widowed	21(5)
Religion	
Orthodox	357(84.4)
Muslim	43(10.2)
Protestant	21(5)
Other	2(0.5)
Educational status	
Illiterate	224(53)
Grade 1-6	78(18.4)
Grade 7-8	59(13.9)
Grade 9-12	33(7.8)
>12	29(6.9)
Monthly income (birr)	
<500	192(45.4)
501-1000	125(29.6)
1001-2000	88(20.8)
>2000	18(4.3)
Occupation	
Governmental	58(13.7)
Private	48(11.3)
Farmer	114(27)
Daily laborer	37(8.7)
Student	22(5.2)
Unemployed	20(4.7)
Housewife	122(28.8)

SD= standard deviation

Two hundred and seventy participants (63.8%) had a relatively high LOM. The median MCMS was 12(IQR 6 -15). Majority of the patients (177) in the relatively high mobility group were females (65.6%), and one hundred fifty (55.5%) participants in the high LOM group were young adults (18-45 years) with eighty one (30.1%) middle aged adults (46-65 years). Thirty seven participants (24%) in the low LOM were old

adults (>65years).Patients admitted in the medical ward represented the highest percentage in both low and high LOM groups. There were also many participants with low level of mobility in the orthopedics ward.

The majority of the patients had one or more symptoms of pain; 237(56%) complained of weakness, 126(29.8%) complained of shortness of breath, and 194(45.9%) had dizziness. One hundred forty two (33.6%) participants received a physician order for mobilization, and only 75(17.7%) received physical therapy. Two hundred sixty nine (63.6%) of the participants had attached medical devices during the data collection. Clinical characteristics of patients are shown on Table 2.

Two hundred and fifty five participants (63.1%) had pain and weakness as barriers to their in-hospital mobility. Psychosocial factors (14.7%) like lack of motivation and fear of falling were the least mentioned barriers by the subjects. About 19.4% of the participants put environmental factors like lack of assistive device in the hospital and lack of assistant to help with out of bed activities and uncomfortable hospital environment as their barrier. Self reported barriers to mobility are shown in Fig. 1.

Table 2. Clinical characteristics of patients who were admitted at UOG hospital from March 25 to May 25, 2013 Gondar, Ethiopia. (N=423)

Characteristics	n (%)
Pain symptom	
Weakness	237(56)
Shortness of breath	126(29.8)
Dizziness	194(45.9)
Duration of stay in the hospital	
3 days- 1 week	178(42.1)
1 -2 weeks	124(29.3)
2 weeks- 1 month	68(16.1)
1 month -2 months	32(7.6)
>2 months	21(5)
Attached medical device	
None	154(36.4)
Catheter	64(15.1)
IV line	131(31.0)
Chest tube	29(6.9)
Pop cast	40(9.5)
Other	5(1.2)
Movement order	
Yes	142(33.6)
PT treatment	
Yes	75(17.7)

Other= external fixator, colostomy bag, traction pin and weight, ADL= activities of daily living
Movement order= order from a health professional to move around

Table 3. Association between some selected variables and LOM among hospitalized patients at UOG hospital, Gondar, 2013. (N= 423)

Variables	LOM		OR 95% CI		p value
	Low (%)	High (%)	Crude	Adjusted	
Age group					
Young adults	54.9	55.2	1	1	
Old adults	24.2	14.4	1.7 (1, 2.8)	4.73(2.17,10.3)	0.00
Sex					
Male	64.	34.4	3.4(2.2, 5.13)	3.1(0.17, 0.62)	
Female	35.9	65.5	1	1	0.001
Symptoms					
Yes	23.5	14.4	1.8(1.1,3.02)	2.75(1.39,5,43)	
No	76.5	85.6	1	1	0.004
Attached device					
Yes	83.7	52.2	4.7(2.9, 7.7)	3.95(2.19,7.12)	
No	16.3	47.8	1	1	0.000
Duration of stay					
3 days-1 wk	13.9	28.1	1.6(1.04, 2.7)	2.7(1.42, 5.1)	0.002
1 wk-2wk	13.2	16.1	1.4(0.79, 2.51	2.5(1.2 ,5.5)	0.017
>2 months	0.7	4.2	1	1	

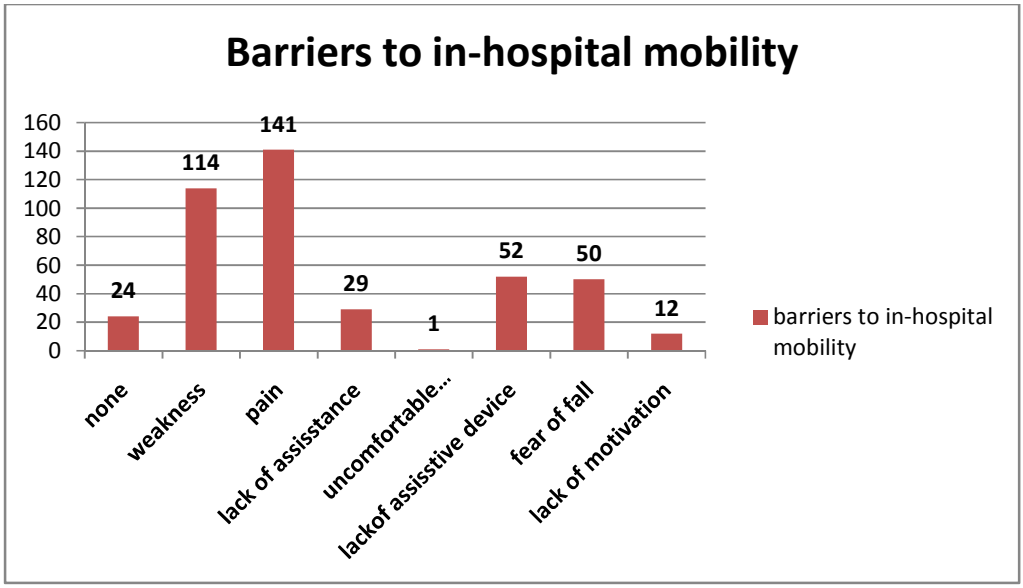

Fig. 1. Barriers to in-hospital mobility mentioned by patients at UOG hospital, Gondar, Ethiopia, 2013

Bivariate analysis showed sex, age, marital status, educational status, symptoms, presence of attached medical device, mobility barriers, and patient's ward and duration of stay at the hospital to have association with low LOM. Variables that were found to have significant association (P value<0.2) on bivariate analysis were put into a multivariate model for further analysis to control the possible confounders. However on the multivariate analysis only sex, age, duration of stay at the hospital, presence of attached medical device and symptom were found to have significant association with low level of mobility. Men exhibited three-times increased risk of low level of mobility compared to females (p=0.001). Old age groups were 4.7 times more likely to have low level of mobility than the young age groups. Symptoms like weakness, dyspnea, or dizziness increase the risk of having low LOM compared to not having symptoms (AOR=2.7, 95% CI, 1.39, 5.43). Association between the different variables is shown on Table 3.

5. DISCUSSION

Low LOM was found to be 36.2% in our study. Different studies have shown that during hospitalization for acute illness 23 to 33% of older patients experience low LOM [4,3,2]. Overall, the LOM seems comparable with the other studies but there is a wide variation in the study subjects like age, patients' admitted ward, and hospital set up. Among the total participants a relative majority of the old age group (48%) had low level of mobility. Some previous studies had found a higher prevalence of low LOM during hospitalization in the older population (p<0.004).

The LOM of patients in medical ward was 41.3%. Studies done on LOM of older medical patients show that the LOM ranges from 23% to 33%. The study subjects in the reported studies were old age groups, though they happen to have a better level of mobility compared to our study. This discrepancy might be due to the difference in the medical care facilities, nutritional status, and infrastructure like pain management, patient education, and variation in hospital set up. The other reason could be that only 26 out of 181 had amobilization order from a physician, a physiotherapist, or a nurse. Only 12.2% received physical therapy, whereas most of the study subjects in the other studies had received physiotherapy treatment, which can affect their level of mobility.

Multivariate analysis of our data also shows older age is associated with increased risk of being less mobile than the younger population (AOR=4.73, 95 CI, 2.17, 10.3). This may be attributed to the changes in normal physiology and associated weakness with age that makes the older population less mobile and functioning [21,4]. Male participants were found to have low level mobility in our study. (OR=3, 95% CI 1.6,

5.9) However, no other study shows sex to have association with lower LOM; rather, in one study low level of mobility was higher in females ($p<0.001$). The reason might be that many of the patients in the orthopedics ward were male subjects who had the potential to have movement restrictions and bed rest orders for the sake of treatment which usually constitutes traction, pop casting and external fixation and the other possible reason might be variation in some of the clinical characteristics of patients in the different wards. In the fistula wards, female participants were given mobilization orders and physiotherapy services. Length of stay in the hospital was found to have significant association with low LOM. Patients who stayed in the hospital for shorter duration (3 days to 1 week) were found to be less mobile than those who stayed for more than two months (OR=2.7; 95% CI; 1.42- 5.1). A study done in Texas that assessed the ambulatory activity of patients found a similar result ($p<0.03$). This could be due to the acute nature of illness at the time of admission; patients may not feel like moving until pain levels decline. The other reason could be patients may get familiar with the environment when they stay longer which makes it easier for them to move around, and they may also get bored with the bed later in their stay [21].

Brown CJ and colleagues reported on barriers to mobility during hospitalization, which include clinical factors (symptoms) like pain and weakness, environmental factors like lack of assistive device and assistant, and personal factors like fear of fall and lack of motivation [8,4,2]. 60% of the participants in this study cited pain and weakness as their barrier to mobility. A multivariate analysis also shows symptoms to have strong association with low LOM, (OR=2.7, 95% CI, 1.4-5.43). The association of symptoms with low LOM was also explained in a study done in Washington on ambulatory activity of older adults ($p<0.05$) [21]. A study in North Carolina showed that environmental factors constitute 30% of patient's barriers, but in our study only 19% of the barriers were environmental factors. Another study done in Washington reported environmental factors to have significant association with low LOM.

The limitation of our study was the lack of control on intervention effect of participants due to a wide range of conditions observed in the different wards which is very difficult to group. However, we were able check the effect of 'staying ward' on LOM. Further studies should assess LOM by tightly controlling for intervening factors like patients' admitting diagnoses and level of ADL. Although a direct behavioral observation was a criterion standard to assess mobility, this was not feasible as part of this study. Therefore, use of the CMS remains the best available method to determine LOM. It was also ideal to assess the LOM of patients in the different wards [4,22].

6. CONCLUSION

Our results indicate that bed rest and low level in-hospital mobility is associated with many factors to a varying degree. This research has provided a new insight into modifiable factors of low level mobility among hospitalized adults in Ethiopia. Given these findings, bed rest for susceptible populations should be limited as much as possible, a progressive walking program initiated early in the hospital stay, provision of assistive devices to patients who need them, and early removal of catheters and intravenous lines is advised. In addition evidence-based practice standards should be developed and implemented to improve the overall healthcare through value added care. Standards need also be shared with medical staff to ensure appropriate ordering of early mobilization interventions.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report.

ETHICAL APPROVAL

Ethical clearance has been obtained.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Corcoran PJ. Use it or lose it--the hazards of bed rest and inactivity. West J Med. 1991;154(5):536–8.
2. Brown CJ, Redden DT, Flood KL, Allman RM. The Underrecognized Epidemic of Low Mobility during Hospitalization of Older Adults. J Am Geriatr Soc. 2009;57(9):1660–5.
3. Brown CJ, Friedkin RJ, Inouye SK. Prevalence and Outcomes of Low Mobility

in Hospitalized Older Patients. J Am Geriatr Soc. 2004;52(8):1263–70.
4. Zisberg A, Shadmi E, Sinoff G, Gur-Yaish N, Srulovici E, Admi H. Low Mobility During Hospitalization and Functional Decline in Older Adults. J Am Geriatr Soc. 2011;59(2):266–73.
5. 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 [Internet]; 2012. [cited 2012 Dec 26]; Available from: http://hinari-gw.who.int/whalecombiomedgerontology.oxfordjournals.org/whalecom0/content/early/2012/08/31/gerona.gls165
6. Lindgren M, Unosson M, Fredrikson M, Ek AC. Immobility – a major risk factor for development of pressure ulcers among adult hospitalized patients: A prospective study. Scand J Caring Sci. 2004;18(1):57–64.
7. Stiller K, Phillips A. Safety aspects of mobilising acutely ill inpatients. Physiotherapy Theory Pract. 2003;19(4):239–57.
8. Brown CJ, Williams BR, Woodby LL, Davis LL, Allman RM. Barriers to mobility during hospitalization from the perspectives of older patients and their nurses and physicians. J Hosp Med. 2007;2(5):305–13.
9. Ettinger WH. Can hospitalization-associated disability be prevented? JAMA. 2011;306(16):1800–1.
10. Graf C. Functional decline in hospitalized older adults: It's often a consequence of hospitalization, but it doesn't have to be. AJN Am J Nurs. 2006;106(1):58.
11. Creditor MC. Hazards of hospitalization of the elderly. Ann Intern Med. 1993;118(3):219–23.
12. Landefeld CS, Palmer RM, Kresevic DM, Fortinsky RH, Kowal J. A Randomized Trial of Care in a Hospital Medical Unit Especially Designed to Improve the Functional Outcomes of Acutely Ill Older Patients. N Engl J Med. 1995;332(20):1338–44.
13. Buurman BM, van Munster BC, Korevaar JC, de Haan RJ, de Rooij SE. Variability in measuring (instrumental) activities of daily living functioning and functional decline in hospitalized older medical patients: A systematic review. J Clin Epidemiol. 2011;64(6):619–27.
14. Sager MA, Rudberg MA. Functional decline associated with hospitalization for acute illness. Clin Geriatr Med. 1998;14:669–80.
15. Kortebein P, Symons TB, Ferrando A, Paddon-Jones D, Ronsen O, Protas E, et al. Functional Impact of 10 Days of Bed Rest in Healthy Older Adults. J Gerontol A Biol Sci Med Sci. 2008;63(10):1076–81.
16. Murphy E. A key step for hospitalized elders: Comment on "early ambulation and length of stay in older adults hospitalized for acute illness". Arch Intern Med. 2011;171(3):268–9.
17. Covinsky KEPE. Hospitalization-associated disability: "she was probably able to ambulate, but i'm not sure". JAMA. 2011;306(16):1782–93.
18. Tucker D, Molsberger SC, Clark A. Walking for wellness: A collaborative program to maintain mobility in hospitalized older adults. Geriatr Nur (Lond). 2004;25(4):242–5.
19. Hirsch CH, Sommers L, Olsen A, Mullen L, Winograd CH. The natural history of functional morbidity in hospitalized older patients. J Am Geriatr Soc. 1990;38(12):1296–303.
20. Butson T. Review: Early mobilisation is better than bed rest for medical conditions and after healthcare procedures. Evid Based Nurs. 2000;3(2):52–52.
21. Fisher SR, Goodwin JS, Protas EJ, Kuo YF, Graham JE, Ottenbacher KJ, et al. Ambulatory Activity of Older Adults Hospitalized with Acute Medical Illness. J Am Geriatr Soc. 2011;59(1):91–5.
22. Wenger NK, Mattson ME, Furberg CD, Elinson J. Assessment of quality of life in clinical trials of cardiovascular therapies. Am J Cardiol. 1984;54(7):908–13.

© 2015 Demeke et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=696&id=12&aid=6416