Feature Article

Informal support for older adults is negatively associated with walking and eating during hospitalization

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ABSTRACT

Processes related to daily care of older adults during hospitalization, such as mobility and nutrition, have long-term consequences for their health and functioning. Although instrumental support provided by family members during hospitalization is highly prevalent, its relationship to older adults' actual walking and eating is unknown.

Data on walking level (walking outside vs. inside the room) and nutritional intake were collected from 493 independent older adults admitted to internal medicine wards through up to three daily interviews using validated questionnaires. Informal support with walking and eating was assessed with the modified Informal Caregiving for Hospitalized Older Adults scale. Multivariate regression showed that informal support with walking and eating was associated with greater likelihood of walking inside the room and with lower nutritional intake. This association between informal support and less walking and eating call for routine functional assessments and tailored counseling of informal caregivers to meet older patients' support needs.

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Introduction

Hospitalization is not a rare occurrence in the lives of older adults.[1] They stay in the hospital longer and are at higher risk for adverse hospitalization outcomes than younger adults.[2] Recently, it was recognized that in-hospital processes related to daily activities have long-term consequences for the recovery of older adults.[3] Previous analyses of the association between these processes and functional outcomes and recovery demonstrated the effects of in-hospital low mobility and poor nutritional intake on immediate post-discharge and 1-month post-hospitalization functional decline.[4] Even short-term immobilization and low nutritional intake of older adults hospitalized in internal medicine units has been associated with loss of muscle mass and decreased weight.[5,6]

Despite the increasing realization of the consequences of immobilization and low nutritional intake of hospitalized older adults, their performance remains poor. Research showed that most hospitalized older adults who are able to walk spend almost all their daytime hours (83%) in bed (lying or sitting), and at least 50% of them do not walk outside their room during their hospital stay.[7] As for nutritional intake, one-fifth of hospitalized patients (age 65 years and older) have an average nutrient intake of less than 50% of their calculated maintenance energy requirements.[8] In-hospital immobility and low

nutritional intake were found to be related to personal predisposing characteristics, including baseline clinical, cognitive, functional and mental status, age and gender as well as length of hospital stay.[9,10] Recently, there is a growing recognition of the important role of informal caregivers (e.g., family members, friends, or paid caregivers) in helping older adults to maintain their daily activities in the community setting and during hospitalization.[11] The few studies that have quantified informal support provided in the hospital setting showed that 77%−96% of older adults are accompanied by an informal caregiver during a hospital stay.[12−14]

Despite the high prevalence of informal support, its association with older adult's performance of daily activities in the hospital setting is lacking.[15] To the best of our knowledge, only one study examined the association between informal support and functional outcomes among older adults admitted to internal medical units. This study showed that respondents who had more daily shifts in which informal caregivers were present were more likely to experience functional decline.[12] In light of the identified importance of in-hospital processes related to daily activities, and the lack of research on the relationship between informal support and these processes in older adults, the aim of the current study is to investigate the relationship between informal support and walking levels and nutritional intake in the hospital setting. We hypothesized that informal support will be related to walking level and nutritional intake after controlling for relevant risk factors of low levels of walking and eating in the hospital setting.

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Material and methods

Study design and participants

This study was a secondary analysis of data from the Hospitalization Process Effects on Functional Outcomes and Recovery (HoPE-FOR) cohort study. HoPE-FOR was designed to assess the effect of hospitalization care processes on functional outcomes in older adults. The HOPE-FOR study recruited patients age 70 and older who were admitted to internal medicine wards in two tertiary-care teaching medical centers in Israel from 2009 to 2011. Patients recruited had an unplanned admission. Patients admitted for disabling condition (e.g., stroke, coma, respiratory failure requiring mechanical ventilation) were not included. The recruitment process is fully described elsewhere.[4] Informal support with walking and eating and daily walking and eating levels were assessed with assisted questionnaire completion. Functional, cognitive, and nutritional status, as well as demographic characteristics, were assessed within the first 48 h of hospital admission. Data regarding severity of illness and chronic conditions were retrieved from medical records.

A subset of 633 patients who had high cognitive functioning (scoring 5 or above on the Pfeiffer Short Portable Mental Status Questionnaire (SPMSQ)[16] and who were independent in activities of daily living (scoring 80 or above on the Barthel Index[17]) at admission were the focus of the current investigation. Of these, 140 patients were excluded for the following reasons. Five (0.8%) died during hospitalization, 14 (2.2%) were transferred to a surgical ward, two (0.3%) stayed in the hospital longer than 40 days, and 119 (18.8%) dropped out of the HoPE-FOR study during their hospitalization because of their unavailability due to intensive tests or procedures (97; 15.3%) or because they were missing data for the main study measures: informal support (10; 1.6%), walking level (5; 0.8%), nutritional intake (1; 0.2%), or anxiety symptoms (6; 0.9%), which left a final sample of 493 participants. The admission functional, cognitive, and nutritional status and length of stay of participants who dropped out or had missing data were comparable to those of participants retained in the final sample. The significant differences between these groups were: age in participants ($M = 77.7$ years; $SD = 5.5$) compared with dropped-out patients ($M = 79.1$ years; $SD = 6.3$), $p = .023$); education level in participants ($M = 11.5$ years; $SD = 5.1$) compared with dropped-out patients ($M = 10.3$ years; $SD = 4.9$; $p = .018$); and cognitive status in participants ($M = 8.9$; $SD = 1.3$) compared with dropped-out patients ($M = 8.6$; $SD = 1.5$).

Ethics statement

The study was approved by the institutional review boards of each of the hospitals and the Israeli Ministry of Health. All participants provided informed consent, and participation was voluntary and confidential.

Measures

Dependent variables

Walking level was assessed using the modified Mobility Index.[4,18] Participants were asked about the frequency of all walking efforts in the previous 24-h period. Summarized level of walking was classified into two categories indicating walking outside ("0") versus inside ("1") the room. The Mobility Index has been previously associated with functional decline, institutionalization, and death.[18]

Nutritional intake (mean of proportions of daily caloric intake) was estimated based on self-report visual estimation of quartiles consumed at each of three main meals (breakfast, lunch, dinner)[19] and relative caloric value of each meal during all in-hospital follow-ups. The score ranges from 0 (eating none of the suggested meals) to 1 (eating all suggested meals). Measurement of quartiles consumed was highly correlated with the weight of the food consumed.[20]

Independent variables

Informal support was measured with a modified version of the Informal Caregiving for Hospitalized Older Adults scale (ICHOA[14]). Help with walking was measured with the items "Did the informal caregiver help you to get out of bed and walk around" and "Did the informal caregiver make sure staff helps you get out of bed and walk around?" Help with eating was measured with the items "Did the informal caregiver help you to eat and drink?" and "Did the informal caregiver make sure staff helps you to eat and drink?" The scores of items indicating help with walking and eating were dichotomized as 0 (did not receive any help) and 1 (received help) for walking and eating, respectively. Convergent validity of instrumental subscale of ICHOA with time that informal caregivers spent in hospital during the day was previously established.[14]

Control variables

Severity of acute health conditions was measured with the APACHE II—Acute Physiology and Chronic Health Evaluation[21]—a measure considered to be a reliable and valid assessment of severity of illness in acute conditions.[22] APACHE II scores range from 0 to 71 based on the initial values of 12 routine physiological measurements, age, and previous health status to provide a general measure of severity of disease.

Chronic morbidity was assessed using Charlson's Comorbidity Index (CCI[23]). The CCI weighs 19 health conditions classified by four groups according to the intensity of the relationship between their presence and the incidence of mortality, so that each group has a prognostic weight ranging from 1 to 6. Overall scores range from 0 to 33; higher scores indicate a higher risk of death.

Malnutrition risk was assessed using the Malnutrition Universal Screening Tool (MUST[24]), which is specifically designed for health care settings and older adults. The measure relies on body mass index (BMI), a weight loss score, and an acute disease score summed as low (0), medium (1), or high (≥ 2) malnutrition risk.

Physical activity before admission was assessed using the Yale Physical Activity Survey (YPAS[25]). Total scores ranged from 0 to 142; higher scores indicate greater intensity and frequency of physical activity.

Anxiety symptoms were assessed using the 10-item Short Anxiety Screening Test[26] 48 h after admission.

Length of hospital stay was measured in days according to admission and discharge dates. We also controlled for age and gender.

Statistical analysis

A multivariate linear regression was modeled to assess the relationship between informal support and nutritional intake, controlling for factors known to be correlated with nutritional intake. Multivariate logistic regression was modeled to test the association between informal support and level of walking, controlling for known risk factors for low levels of walking. Standardized beta coefficients, adjusted odds ratios, and 95% confidence intervals were estimated for each predictor and each coefficient, respectively. The most conservative analysis in terms of sample size needed to capture the effect mentioned above is multivariate logistic regression. Considering nine independent variables and 30% incidence of low levels of walking, the minimum number of cases needed to fit logistic regression model is 297.[27] Analyses were performed using the IBM SPSS Statistical package version 23.0.

Results

Table 1 summarizes the characteristics of the study population. The mean age of participants was 78 years (SD = 5.5), 43% were females, and 62% were married. The mean number of years of education was 11.5 (SD = 5.1). The basic functional status of the sample was found to be very high (as assessed by the Barthel Activities of Daily Living [BADL], described below), with a mean score of 96.1 (SD = 6.0). The mean cognitive status score was 8.9 (SD = 1.3) on the SPMSQ, indicating that participants were mostly cognitively intact[16] (described below). The average length of hospitalization was 5.5 days (SD = 3.7).

Informal caregivers stayed in the hospital on average for 4.4 h per day (SD = 3.3). Mean proportion of daily caloric intake was 0.6 (SD = 0.2), and 146 (30%) of participants stayed in the room during their hospital stay. Forty-six respondents (10.5%) received help with eating, and 81 (18%) received help with walking. Most (96.5%) of the informal caregivers were family members.

The multivariate logistic regression model shows that informal support with walking was associated with higher odds of walking inside the room only (OR = 1.87, 95% CI = 1.09−3.19), controlling for age, gender, severity of illness, comorbidity, length of stay, anxiety symptoms, risk for malnutrition, and pre-hospital physical activity. Other statistically significant risk factors for walking inside the room only were sex (female; OR = 2.44, 95% CI = 1.53−3.88), high risk of malnutrition (OR = 2.05, 95% CI = 1.33−3.16), and longer hospital stay (OR for 1 day = 1.10, 95% CI = 1.03−1.17). Higher preadmission physical activity levels were associated with lower odds of walking inside the room only (OR for 1 YPAS unit increase = 0.98, 95% CI = 0.98−0.99). The multivariate linear regression model shows that informal support was associated with lower proportion of daily caloric intake (b = −0.088 95% CI = −0.172 to −0.003), controlling for age, gender, severity of illness, comorbidity, length of stay, anxiety symptoms, and risk of malnutrition. Other statistically significant factors associated with lower nutritional intake were being female (b = −0.276, 95% CI = −0.365 to −0.186), having more anxiety symptoms (b = −0.091, 95% CI = −0.172 to −0.003), and having a high risk of malnutrition (b = −0.164, 95% CI = −0.25 to −0.08). The results of the multivariate models are summarized in Table 2.

Discussion

The current study investigated the relationship between informal support for older adults and walking and eating in the hospital setting. The results of this study suggest that hospitalized older adults who received help with walking were less likely to walk outside the room than those who did not receive help with walking. In addition, older adults who received help with eating had lower nutritional intake

Table 1
Characteristics of study population (N = 493).

Characteristics	
Age in years	77.7 ± 5.5
Gender (females), n (%)	210 (42.6)
Married or living with partner, n (%)	304 (61.7)
Education in years	11.5 ± 5.1
SPMSQ (0−10)	8.9 ± 1.3
Charlson comorbidity index (0−33)	2.3 ± 2.1
APACHE II (0−71)	11.0 ± 3.9
Length of stay in hospital (days)	5.5 ± 3.7
Total ADL at admission (0−100)	96.1 ± 6.0
Pre-hospital physical activity (0−135)	33.3 ± 26.6
High risk of malnutrition Risk, n (%)	171 (34.7)
Anxiety symptoms	18.4 ± 5.0

Note. SPMSQ = Short Portable Mental Status Questionnaire; APACHE II = Acute Physiology and Chronic Health Evaluation; ADL = activities of daily living.

Table 2
Multivariable logistic or linear regression analyses of factors associated with levels of walking or nutritional intake, respectively.

Study variables	OR of walking inside the room only (95% CI)	Beta coefficient for nutritional intake (95% CI)
Received informal support[a]	1.87 (1.09, 3.19)*	−0.088 (−0.172, −0.003)*
Gender (female)	2.44 (1.53, 3.88)***	−0.276 (−0.365, −0.186)***
Age	1.03 (0.99, 1.07)	0.018 (−0.068, 0.103)
Charlson Comorbidity Index	1.062 (0.95, 1.19)	0.027 (−0.065, 0.119)
APACHE II	1.01 (0.95, 1.07)	−0.015 (−0.105, 0.076)
Length of stay	1.10 (1.03, 1.17)**	0.085 (−0.001, 0.172)
Anxiety symptoms	1.03 (0.99, 1.08)	−0.091 (−0.172, −0.003)*
High risk of malnutrition	2.05 (1.33, 3.16)**	−0.164 (−0.25, −0.08)***
Pre-hospital physical activity	0.98 (0.98, 0.99)**	NA

[a] With walking or eating, respectively *p < .05; **p < .01; ***p < .001 Note. OR = odds ratio; CI = confidence interval; APACHE II = Acute Physiology and Chronic Health Evaluation; NA = not applicable.

than those who did not receive help with eating. Some of the potential covariates, such as age, chronic morbidity and severity of illness were not statistically significant in the multivariate analyses. This may be due to the high levels of independency of the current sample, i.e., insufficient heterogeneity in terms of these measures might have affected the ability to detect variations in walking and eating.

Previous investigation has found a relationship between the number of shifts during which the informal caregiver was present and functional decline in the hospital.[12] The current study extends this finding in two important ways; first, by focusing on specific processes that were previously identified as important to older adults' outcomes,[4] and second, by analyzing not the mere presence of informal caregivers but specific types of support. This kind of analysis could potentially point to exact mechanisms underlying the relationship between informal support and walking and eating in the hospital setting.

The current study's findings should be interpreted in light of the characteristics of its sample, which include older adults who were high-functioning and cognitively intact at admission. Informal support with walking and eating provided to older adults who can perform these kinds of tasks by themselves might hamper independence, which is a fundamental aspect of older adults' quality of life.[1] Future studies with more dependent older adults could shed more light on the way in which functional level affects the relationship between informal support and processes related to daily activities.

Another interpretation of the current study's results stems from the unique requirements of providing informal support in acute care contexts. Informal caregivers might not know how to help older adults in the hospital setting,[15] especially informal caregivers of independent older adults, who are not required to provide and therefore are not used to providing such support in the home setting. Thus, it is possible that in the hospital setting informal caregivers perform certain activities for the independent patients instead of adjusting their activities to the patients' circumstances.[28] Qualitative investigations pointed to the lack of clarity about informal caregivers' roles and to the discrepancies between expectations and actual help performed by informal caregivers in the hospital setting. Moreover, nursing staff described family involvement as sometimes distracting rather than helpful.[29]

This study arises the need for interventions with nursing staff and informal caregivers to encourage physical activity and to optimize nutritional intake among hospitalized older adults. Boltz and colleagues demonstrate the effects of such an intervention - the Family-centered Function-focused Care (Fam-FFC), intended to promote functional recovery in the hospitalized older adult. This intervention is targeted both at nursing staff and informal caregivers and was aimed to support them in encouraging patients' activity maintenance during the hospital stay. Older adults whose informal caregivers participated in the intervention demonstrated better ADL and walking performance compared with the control.[30,31] Our results suggest that

replicating such interventions in more highly independent patients may be merited.

This study has some limitations. First, it was based on older adults' self-reports, which were assessed concomitantly. This design precludes inference of the direction of the relationships and causality. Experimental designs that induce intervention might further shed light on causality. In addition, self-reports about informal support provide only patients' perspectives on caregiving and are prone to recall bias. Future observational studies and studies that examine the perspectives of informal caregivers and of hospital staff could expand our understanding of the meaning and context of informal caregiving in the hospital setting and of how caregiving support could be directed to help achieve favorable patient processes and outcomes.

Finally, the generalizability of the study findings may be limited by the unique characteristics of the Israeli healthcare system, with its high hospital-bed occupancy rate.[32] Moreover the Israeli culture may affect the study's generalizability. Because of the familial nature of Israeli culture,[33] Israeli informal caregivers might provide support as a means of affection and connection to older adults. However, similar cultural norms were identified as relevant in informal support in different cultural contexts such as Italy[12] and Korea.[13] Further research should explore these relationships in other countries with different social structures and in different cultural settings, especially in more individualistic cultures characterized by higher divorce rates and fewer children per family.

Conclusions

The growing theoretical interest in the importance of close relatives' support in the context of acute illness[34] calls for more quantitative studies on this issue. Results of the current study suggest that informal support with walking and eating for independent older adults may hamper the performance of daily processes in the hospital setting. This association between informal support and less walking and eating during hospitalization call for more investigations about function focused care[35] in acute care setting, including routine functional assessments and tailored counseling of informal caregivers to meet older patients' support needs.

Acknowledgments

Conflict of interest

The authors declare no conflict of interest.

References

1. World Health Organization. World report on Ageing and Health. 2015.
2. Evans SJ, Sayers M, Mitnitski A, Rockwood K. The risk of adverse outcomes in hospitalized older patients in relation to a frailty index based on a comprehensive geriatric assessment. Age Ageing. 2014;43(1):127–132. https://doi.org/10.1093/ageing/aft156.
3. Barnes DE, Mehta KM, Boscardin WJ, Fortinsky RH, Palmer RM, Kirby KA, et al. Prediction of recovery, dependence or death in elders who become disabled during hospitalization. J Gen Intern Med. 2013;28(2):261–268. https://doi.org/10.1007/s11606-012-2226-y.
4. Zisberg A, Shadmi E, Gur-Yaish N, Tonkikh O, Sinoff G. Hospital-associated functional decline: the role of hospitalization processes beyond individual risk factors. J Am Geriatr Soc. 2015;63(1):55–62. https://doi.org/10.1111/jgs.13193.
5. 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. 2013;92(9):789–796. https://doi.org/10.1097/PHM.0b013e31828cd2b6.
6. Charlton K, Nichols C, Bowden S, Milosavljevic M, Lambert K, Barone L, et al. Poor nutritional status of older subacute patients predicts clinical outcomes and mortality at 18 months of follow-up. Eur J Clin Nutr. 2012;66(11):1224–1228. https://doi.org/10.1038/ejcn.2012.130.
7. Mudge AM, McRae P, McHugh K, Griffin L, Hitchen A, Walker J, et al. Poor mobility in hospitalized adults of all ages. J Hosp Med. 2016;11(4):289–291. https://doi.org/10.1002/jhm.2536.
8. Heersink JT, Brown CJ, Dimaria-Ghalili RA, Locher JL. Undernutrition in hospitalized older adults: patterns and correlates, outcomes, and opportunities for intervention with a focus on processes of care. J Nutr Elder. 2010;29(1):4–41. https://doi.org/10.1080/01639360903574585.
9. Schindler K, Themessl-Huber M, Hiesmayr M, Kosak S, Lainscak M, Laviano A, et al. To eat or not to eat? Indicators for reduced food intake in 91,245 patients hospitalized on nutritionDays 2006–2014 in 56 countries worldwide: a descriptive analysis. Am J Clin Nutr. 2016;104(5):1393–1402.
10. Zisberg A, Syn-Hershko A. Factors related to the mobility of hospitalized older adults: a prospective cohort study. Geriatr Nurs. 2016;37(2):96–100. https://doi.org/10.1016/j.gerinurse.2015.10.012.
11. Bennett PN, Wang W, Moore M, Nagle C. Care partner: a concept analysis. Nurs Outlook. 2017;65(2):184–194. https://doi.org/10.1016/j.outlook.2016.11.005.
12. Ambrosi E, Biavati C, Guarnier A, Barelli P, Zambiasi P, Allegrini E, et al. Factors affecting in-hospital informal caregiving as decided by families: findings from a longitudinal study conducted in acute medical units. Scand J Caring Sci. 2017;31(1):85–95. https://doi.org/10.1111/scs.12321.
13. Cho SH, Kim HR. Family and paid caregivers of hospitalized patients in Korea. J Clin Nurs. 2006;15(8):946–953. https://doi.org/10.1111/j.1365-2702.2006.01342.x.
14. Gur-Yaish N, Zisberg A, Sinoff G, Shadmi E. Development and psychometric testing of a measure of informal caregiving for hospitalized older adults. J Adv Nurs. 2012;68(4):931–938. https://doi.org/10.1111/j.1365-2648.2011.05846.x.
15. Edwards D, Carrier J, Hopkinson J. Assistance at mealtimes in hospital settings and rehabilitation units for patients (>65years) from the perspective of patients, families and healthcare professionals: a mixed methods systematic review. Int J Nurs Stud. 2017;69:100–118. https://doi.org/10.1016/j.ijnurstu.2017.01.013.
16. Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. J Am Geriatr Soc. 1975;23(10):433–441. https://doi.org/10.1111/j.1532-5415.1975.tb00927.x.
17. Shah S, Vanclay F, Cooper B. Improving the sensitivity of the Barthel Index for stroke rehabilitation. J Clin Epidemiol. 1989;42(8):703–709. https://doi.org/10.1016/0895-4356(89)90065-6.
18. Brown CJ, Friedkin RJ, Inouye SK. Prevalence and outcomes of low mobility in hospitalized older patients. J Am Geriatr Soc. 2004;52(8):1263–1270. https://doi.org/10.1111/j.1532-5415.2004.52354.x.
19. Hiesmayr M, Schindler K, Pernicka E, Schuh C, Schoeniger-Hekele A, Bauer P, et al. Decreased food intake is a risk factor for mortality in hospitalised patients: the Nutrition Day survey 2006. Clin Nutr. 2009;28(5):484–491. https://doi.org/10.1016/j.clnu.2009.05.013.
20. Olin AO, Osterberg P, Hadell K, Armyr I, Jerstrom S, Ljungqvist O. Energy-enriched hospital food to improve energy intake in elderly patients. JPEN J Parenter Enteral Nutr. 1996;20(2):93–97. https://doi.org/10.1177/014860719602000293.
21. Knaus WA, Draper EA, Wagner DP, Zimmerman JE. APACHE II: a severity of disease classification system. Crit Care Med. 1985;13(10):818–829. https://doi.org/10.1097/00003246-198510000-00009.
22. Covinsky KE, Martin GE, Beyth RJ, Justice AC, Sehgal AR, Landefeld CS. The relationship between clinical assessments of nutritional status and adverse outcomes in older hospitalized medical patients. J Am Geriatr Soc. 1999;47(5):532–538. https://doi.org/10.1111/j.1532-5415.1999.tb02566.x.
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. 1987;40(5):373–383. https://doi.org/10.1016/0021-9681(87)90171-8.
24. Stratton RJ, Hackston A, Longmore D, Dixon R, Price S, Stroud M, et al. Malnutrition in hospital outpatients and inpatients: prevalence, concurrent validity and ease of use of the 'malnutrition universal screening tool' ('MUST') for adults. Br J Nutr. 2004;92(5):799–808. https://doi.org/10.1079/BJN20041258.
25. Dipietro L, Caspersen CJ, Ostfeld AM, Nadel ER. A survey for assessing physical activity among older adults. Med Sci Sports Exerc. 1993;25(5):628–642. https://doi.org/10.1249/00005768-199305000-00016.
26. Sinoff G, Ore L, Zlotogorsky D, Tamir A. Short Anxiety Screening Test—a brief instrument for detecting anxiety in the elderly. Int J Geriatr Psychiatry. 1999;14(12):1062–1071. https://doi.org/10.1002/(SICI)1099-1166(199912)14:12<1062::AID-GPS67>3.0.CO;2-Q.
27. Peduzzi P, Concato J, Kemper E, Holford TR, Feinstein AR. A simulation study of the number of events per variable in logistic regression analysis. J Clin Epidemiol. 1996;49(12):1373–1379. https://doi.org/10.1016/S0895-4356(96)00236-3.
28. Nicholson C, Morrow EM, Hicks A, Fitzpatrick J. Supportive care for older people with frailty in hospital: an integrative review. Int J Nurs Stud. 2017;66:60–71. https://doi.org/10.1016/j.ijnurstu.2016.11.015.
29. Ayalon L, Halevy-Levin S, Ben-Yizhak Z, Friedman G. Family caregiving at the intersection of private care by migrant home care workers and public care by nursing staff. Int Psychogeriatr. 2013;25(9):1463–1473. https://doi.org/10.1017/S1041610213000628.
30. Boltz M, Chippendale T, Resnick B, Galvin JE. Testing family-centered, function-focused care in hospitalized persons with dementia. Neurodegener Dis Manag. 2015;5(3):203–215. https://doi.org/10.2217/nmt.15.10.

31. Boltz M, Resnick B, Chippendale T, Galvin J. Testing a family-centered intervention to promote functional and cognitive recovery in hospitalized older adults. *J Am Geriatr Soc.* 2014;62(12):2398–2407. https://doi.org/10.1111/jgs.13139.
32. Meydan C, Haklai Z, Gordon B, Mendlovic J, Afek A. Managing the increasing shortage of acute care hospital beds in Israel. *J Eval Clin Pract.* 2015;21(1):79–84. https://doi.org/10.1111/jep.12246.
33. Katz R, Lavee Y. Families in Israel. editors. In: Adams BN, Trost J, eds. *Handbook of World Families.* Thousand Oaks, CA: Sage; 2005:486–506.
34. Wolff JL. Family matters in health care delivery. *JAMA.* 2012;308(15):1529–1530. https://doi.org/10.1001/jama.2012.13366.
35. Resnick B, Galik E, Boltz M. Function focused care approaches: literature review of progress and future possibilities. *J Am Med Dir Assoc.* 2013;14(5):313–318. https://doi.org/10.1016/j.jamda.2012.10.019.