# Depressive symptoms, apathy, and adverse health outcomes in acutely hospitalized older patients

*Research to get the ball rolling*

Reichardt, L.A.

Chapter

9

# Motivational factors mediate the association of general self-efficacy and performance outcomes in acutely hospitalized older patients

Lucienne A. Reichardt
Jesse J. Aarden
Rosanne van Seben
Marike van der Schaaf
Raoul H.H. Engelbert
Martin van der Esch
Jos W.R. Twisk
Jos A. Bosch
Bianca M. Buurman

*Revisions Age and Ageing*

**Abstract**

*Objectives:* To study 1) the association of general self-efficacy (GSE) on the course of subjective (i.e., basic and instrumental activities of daily living (ADL and IADL) and objective physical performance outcomes (Short Physical Performance Battery (SPPB)) among older persons from discharge up to three months post-discharge and 2) the extent to whether motivational factors such as depressive symptoms, apathy, and fatigue mediate this association.

*Methods:* Prospective multicenter cohort of acutely hospitalized patients aged ≥70 (Hospital-ADL study). Structural equation modeling was used to analyze the structural relationships.

*Results:* The analytic sample included 236 acutely hospitalized patients. GSE had a significant direct effect on the course of subjective and objective performance outcomes (ADL: β = -.21, $p$ <.001, IADL: β = -.24, $p$ <.001, and SPPB: β = .17, $p$ <.001). However, when motivational factors as mediator were included into the same model, motivational factors (IADL: β = .51, $p$ < 0.001; SPPB: β = .49, p < 0.001), but not GSE remained significantly associated with IADL (β = -0.06, $p$ = 0.16) and SPPB (β = .002, $p$ =0.97). Motivational factors partially mediated the relationship between GSE and ADL (β = -0.09, $p$ =0.04). The percentage of mediation was 55%, 74%, and 99% for ADL, IADL, and SPPB respectively.

*Conclusions:* Motivational factors and GSE are both associated with subjective and objective performance outcomes. However, the relationship between GSE and subjective and objective performance outcomes was highly mediated by motivational factors. Taken together, this suggests that GSE is important to being physically active but not sufficient to becoming more physical active in acutely hospitalized older patients; motivation is important to improving both subjective and objective performance.

## Introduction

Self-efficacy is conceptualized as one's belief in their personal capabilities to successfully execute courses of action.[1] In general, self-efficacy is interpreted as being a task- or domain-specific concept[2] by using instruments, such as the falls efficacy scale[3] and the self-efficacy scale specifically developed for individuals with chronic obstructive pulmonary disease.[4] However, previous research has also described a more trait-like generalized belief of self-efficacy (GSE).[5] This latter concept refers to "a broad and stable sense of personal competence in mastering a variety of stressful situations"[6] and may be useful in investigating the well-being of patients (for example, among acutely hospitalized older patients) who have to adapt to the consequences of their acute medical illness.[7]

Acute illness among older adults leading to hospital admission frequently precipitates limitations in activities of daily living (ADL), and the prognosis for older adults with new or additional ADL limitations after hospitalization is poor.[8] Research has shown that GSE is linked with ADL limitations in older persons.[9, 10] It is important to note that self-efficacy is also related to motivational factors, such as depressive symptoms,[2, 11] apathy,[12] and fatigue.[13] However, to our knowledge, this is the first study that investigated the impact of motivational factors in the relationship between GSE and performance outcomes.

Considering the potential importance of GSE on physical outcomes among older adults, as well as a lack of studies investigating GSE in relation with motivational factors among acutely hospitalized older patients, this study aims to investigate the mutual influence of GSE on performance outcomes and the extent to which motivational factors mediate this association.

## Methods

*Design*

The current analysis was based on data from the prospective multicenter Hospital-ADL cohort study, previously described in detail elsewhere.[14] Local approval has been provided by all participating hospitals. The study has been approved by an Institutional Review Board in the Netherlands. The research was performed according to the Dutch Medical Research Involving Human Subjects Act and the principles of the Declaration of Helsinki (1964).

*Study Population*

A total of 401 participants, aged 70 and above, were recruited from people who were acutely admitted at the Department of Internal Medicine, Cardiology and Geriatrics. Inclusion criteria consisted of the following: 1) being admitted for ≥48 hours; 2) Dutch language proficiency sufficient to complete questionnaires, and 3) Mini-Mental State Examination (MMSE) score of 15 or higher.[15] Note, we were not able to include delirious patients, due to the short time frame of inclusion, i.e., within 48 hours after admission. A delirium was often still present at this time point, which meant that an MMSE could not be performed or patients scored below 15 points. The Confusion Assessment Method (CAM) was used to identify the presence of delirium.[16] Patients were excluded if they exhibited any of the following: 1) had a life expectancy of three months or less according to the attending medical doctor, or 2) were disabled in all six basic ADL as determined by the Katz-6 ADL index.[17]

*Procedures*
Two researchers (RVS and LR) contacted eligible patients within 48 hours after hospital admission. Patients were informed about the objectives of the Hospital-ADL study and the study procedures. All participants provided written informed consent before inclusion. After informed consent was obtained, patients were enrolled in the study. A trained geriatric team completed personal interviews within 48 hours after admission, at discharge, and at one and three months post-discharge. All interviews were performed face-to-face in the hospital or at the participants' places of residence.

*Measurements*
*Independent variable.* The ALCOS-12 (In Dutch: *Algemene Competentie Schaal*) was used to measure GSE (Cronbach's α = 0.78[18]). It is based on the self-Efficacy scale[19] and consists of 12 items on a five-point Likert scale: 1) strongly disagree, 2) disagree, 3) no disagreement/agreement, 4) agree, and 5) strongly agree. The total score was the sum of the 12 items (range: 12–60), whereby higher scores indicated more self-efficaciousness. Due to the fact that GSE refers to a stable sense of personal competence,[19, 20] it was measured once at discharge.

*Mediator.* The course of motivational factors was the latent variable, which consisted of depressive symptoms, apathy, and fatigue, measured from discharge up to three months post-discharge. Apathy was measured with the apathy subscale of the Geriatric Depression Scale-15 (GDS-15), and consists of the following questions: *"Have you dropped many of your activities and interests?"*, *"Do you prefer to stay at home, rather than going out and doing new things?"* and *"Do you feel full of energy?"*.[21] The GDS-3A has been reported to have a sensitivity of 69% and a specificity of 85% in detecting apathy based on the customary cut off (>13) of the 14-item apathy scale of Starkstein et al[22] in older adults.[21] Depressive symptoms were measured with the 12 remaining items of the GDS-15 (GDS-12D).[23] Higher scores indicated more symptoms of depression and apathy (range GDS-12D: 0–12; range GDS-3A: 0–3). Fatigue was measured with the Numeric Rating Scale (NRS), which is a continuous scale with a score range from 0–10 (0 represents no fatigue and 10 the worst possible fatigue).

*Dependent variables.* The outcomes were longitudinal subjective- (i.e., basic ADL and instrumental ADL (IADL)) and objective physical performance (i.e., Short Physical Performance Battery (SPPB)). The course of subjective physical performances was measured with the 15 items modified Katz-ADL index[24] from discharge up to three months post-discharge. The first six items on the modified Katz-ADL index were used to measure the ADL and consisted of statements of the patients' independency in performing basic ADL.[17] The remaining nine items consisted of statements of their independency in performing IADL. Higher scores indicated more dependencies in ADL and IADL (range ADL: 0–6; range IADL: 0–9). The course objective physical performance was also measured from discharge up to three months post-discharge. The SPPB was applied to measure the balance, strength and gait speed of the participants. They were asked to stand with their feet in various balance positions, walk three or four meters and to rise from a chair and return to the seated position five times as quickly as possible. Higher scores indicated a better performance (range: 0–12).[25]

*Statistical methodology*

Baseline characteristics were summarized with descriptive statistics, using SPSS version 24 (SPSS Inc., Chicago, IL, USA). To investigate the influence of GSE on motivational factors and physical performances, we performed a path analysis by using SEM with STATA, version 15.0. The SEM analysis was performed in two steps: 1) the direct effect of GSE on subjective performance and objective performance was examined, and then 2) the indirect effect of GSE on subjective and objective performance was examined, taking into account motivational factors such as potential mediators. To remove the biased effect of measurement error,[26] depressive symptoms (GDS-12D), apathy (GDS-3A), and fatigue (NRS) were used as a latent variable, called 'motivational factors' (Figure 1). The following effects were measured: 1) total effect of GSE on performance outcomes (path c in Figure 1), 2) the effect of GSE on motivational factors (path a in Figure 1), 3) the effect of motivational factors on the performance outcomes (path b in Figure 1), and 4) the effect of GSE on performance outcomes taking into account motivational factors (path c' in Figure 1). The latter is called the direct effect and the amount of mediation is called the indirect effect and is estimated by a*b or c-c'. The percentage of mediation was estimated by indirect effect/total effect (*100%). For all analyses, standardized regression coefficients were reported and because the present analyses were performed in the context of a larger study, no *a priori* sample size calculations were performed.[14]

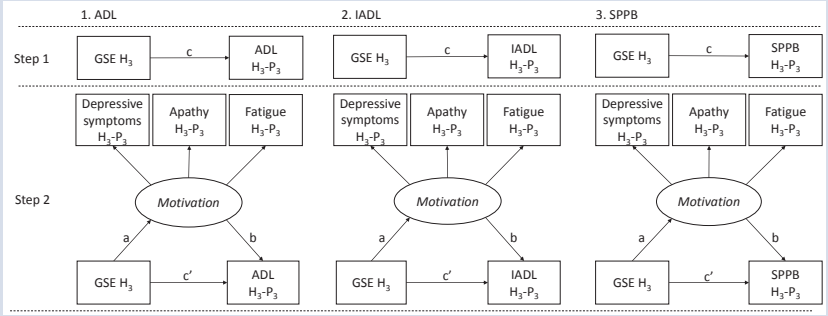


**Figure 1.** Conceptual model of structural equation model (SEM).
*Note:* ADL = basic activities of daily living; IADL = instrumental activities of daily living; SPPB = Short Physical Performance Battery; GSE = general self-efficacy; $H_3$ = at discharge; $H_3$-$P_3$=longitudinal (i.e., from discharge up to three months post-discharge); a = effect a; b = effect b; c = direct effect; c' = indirect effect.

## Results

*Description of the sample*

There were 1,024 acutely hospitalized patients admitted to the participating hospital wards for ≥48 hours between October 2015 and February 2017. Of the 1,024 unplanned admissions, 519 met the inclusion criteria and were contacted by the researchers. Of these, 401 agreed to partake. There were 165 patients without any GSE data; they were excluded from the sample. The analytic sample

for the current study included 236 acutely hospitalized patients (mean age = 79.4 years; SD = 6.6). The total number of observations was 708. Table 1 shows the baseline characteristics of the participants and Appendix 1 shows means, standard deviations, Cronbach's alphas, and Pearson r correlations of the main variables.

**Table 1.** Baseline characteristics of analytic sample.

| **Characteristics** | **All patients** |
|---|---|
| | (N=236) |
| Age, y, mean(SD) | 79.4(6.6) |
| Male sex, n(%) | 117(49.6) |
| Education, n(%) | |
| Primary school | 61(25.8) |
| ETS/DSS | 54(22.9) |
| SVE | 74(31.4) |
| HLHS/TLE | 47(19.9) |
| Hospital department, n(%) | |
| Cardiology | 63(26.7) |
| Internal Medicine | 133(56.4) |
| Geriatrics | 40(16.9) |
| Hospital admission diagnoses, n(%) | |
| Cardiac | 67(28.4) |
| Gastrointestinal | 25(10.6) |
| Infection | 33(14.0) |
| Respiratory | 46(19.5) |
| Cancer (including hematology) | 9(3.8) |
| Electrolyte disturbance | 7(3.0) |
| Renal | 7(3.0) |
| Other | 42(17.8) |
| Cognitive impairment, n(%)* | 40(17.5) |
| Severity of comorbid diseases | |
| CCI score, mean(SD) † | 5.7(2.0) |

*Note:* SD = standard deviation; *n* = number of participants; y = years; PS = Primary School; ETS/DSS = Elementary Technical School/Domestic Science School; SVE = Secondary Vocational Education; HLHS/TLE = Higher level high school/third-level education; CCI = age-combined Charlson comorbidity index score. *Cognitively impaired if a score of less than 24 on the Mini-Mental State Examination at admission (range, 0–30); †Age-combined Charlson Comorbidity Index score: a higher score indicating more or more severe comorbidity.

*Motivational factors as mediator between GSE and physical outcomes*

Figure 2 shows the final mediation models with standardized regression coefficients. Initially, model 1 showed a significant direct effect of GSE at discharge on ADL from discharge up to three months post-discharge (β = -.21, $p < 0.001$). However, when motivational factors such as depressive symptoms, apathy, and fatigue were taken into account, the coefficient decreased to -0.09 (p = 0.04), leading to a percentage mediation of 55%. This was due to a significant relation between GSE and motivational factors (β = -.35, $p < 0.001$) and between motivational factors and ADL (β = .33, $p < 0.001$). Also, model 2

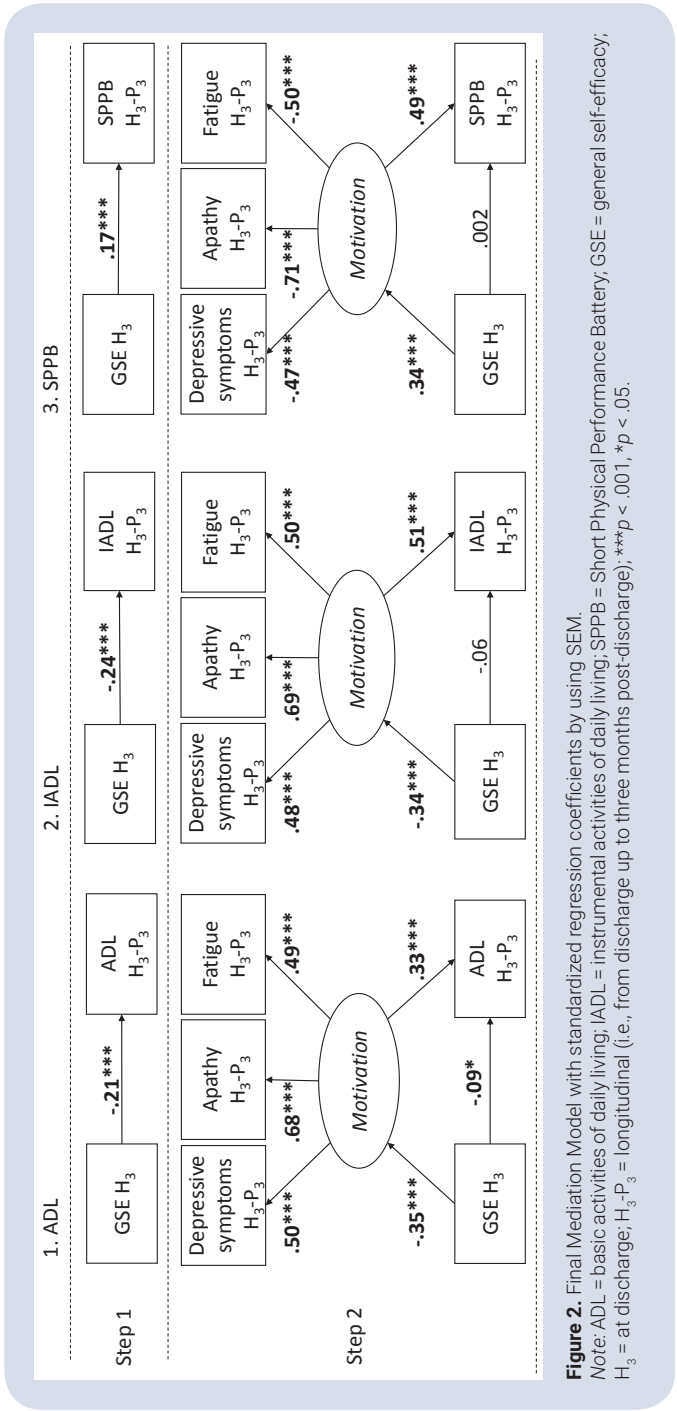


**Figure 2.** Final Mediation Model with standardized regression coefficients by using SEM.
*Note:* ADL = basic activities of daily living; IADL = instrumental activities of daily living; SPPB = Short Physical Performance Battery; GSE = general self-efficacy; $H_3$ = at discharge; $H_3$-$P_3$ = longitudinal (i.e., from discharge up to three months post-discharge); ***$p < .001$, *$p < .05$.

showed a significant direct effect of GSE on the course of IADL (β = -.24, $p$ < 0.001). However, again, when motivational factors were taken into account, the standardized coefficient decreased to -0.06 ($p$ = 0.16), leading to a percentage mediation of 74%. This was due to a highly significant relation between GSE and motivational factors (β = -.34, $p$ < 0.001) and between motivational factors and IADL (β = .51, $p$ < 0.001). Finally, model 3 also showed a significant direct effect of GSE on the course of objective physical performance (β = .17, $p$ < 0.001). However, once again, when motivational factors were taken into account, the standardized coefficient decreased to .002 ($p$ = 0.97), leading to a percentage mediation of 99%. This was due to a highly significant relation between GSE and motivational factors (β = .34, $p$ < 0.001) and between motivational factors and SPPB (β = .49, $p$ < 0.001).

**Discussion**

Acutely hospitalized older patients with lower GSE at hospitalization were associated with a worse course of subjective (i.e., ADL and IADL) and objective performance (i.e., SPPB) outcomes up to three months post-discharge. However, when motivational factors were considered, motivational factors, but no longer GSE became significantly associated with both IADL and SPPB. To our knowledge, this is the first study that investigates this relationship among acutely hospitalized older patients. Motivational factors partially mediated the relationship between GSE and ADL. A possible explanation for this finding could be that motivation may play a smaller role many of the basic ADL that recur at routine intervals compared with more complex activities.[27] With the repetition of behavior in stable contexts, actions become more automatic in the sense that deliberation about actions is superfluous.[27]

The positive effects of patient-centered goal-setting in geriatric rehabilitation centers are widely recognized.[28] However, implementation of a comprehensive goal-setting process in the context of an acute care setting is an ongoing problem and might be too ambitious,[29] possibly due to a discrepancy between geriatric patients and professionals regarding recovery goals.[30] As described above, patients wished to regain independence in ADL,[30] whereas professionals in the acute setting focused on discharge-related goals, with the aim of ensuring the earliest discharge of patients.[30, 31] Therefore, there is limited time for the provision and coordination of structured goal-setting in an acute care setting.[29, 32] In other words, professionals may pay attention to a home rehabilitation approach addressing older patients' long-term goals post-discharge that is tailored to the individual needs.[33] Previous home rehabilitation studies prove to be cost-effective[34, 35] and, perhaps more importantly, show beneficial effects on functional outcomes.[36, 37] Future studies are needed to examine the effectiveness of home rehabilitation on goal attainment among older persons after acute hospitalization.

The current study has potential clinical implications for an acute hospital care setting. Firstly clinical training could be offered to physicians and health care professionals not accustomed to assessing psychiatric disorders in order to better detect the presence of proximal motivational risk factors to prevent poor performance outcomes. For example, symptoms of apathy are frequently reported among acutely hospitalized older adults[38] and depressive symptoms

are often undiagnosed in older individuals,[39] highly persistent after acute hospitalization, and associated with worse functional outcomes.[40] Secondly, professionals need to be aware of the high physical inactivity among acutely hospitalized older patients during hospitalization[41, 42] and, therefore are possibly at high risk to have a passive attitude post-discharge. Education by professionals for patients and caregivers that discusses the importance of behavioral activation during and after acute hospitalization as well as the relation with activity engagement in older individuals[43] may be helpful. Due to the inactivity, it is conceivable that it may be difficult for older patients to achieve goals post-discharge, because they are unable to picture themselves returning to their previous level of functioning and actively participating in goal setting.[44] Therefore, it seems crucial that professionals set goals that are easy to accomplish,[30] which will reinforce their engagement in activities and build self-efficacy to planning more complex ADL. Lastly, due to the discrepancy between geriatric patients and professionals regarding recovery goals professionals should make a distinction between goals during acute hospitalization and goals to achieve post-discharge.

The main strength of this study was the use of a longitudinal research design, which made it possible to establish the influence of GSE, which was rather stable across time, on the temporal sequence of motivational factors and performance outcomes. Some limitations should also be noted. Firstly it should be noted that it is unclear whether depressive symptoms, apathy and/or fatigue were all full mediators because they are part of a latent variable. However, these factors were chosen on purpose due to the fact that depressive symptoms, apathy, and fatigue are overlapping constructs (and often comorbid). Therefore, they have a good deal of shared variance. Secondly, the interpretation of being fatigued as a motivational concept might be questioned. Future research is needed to investigate the distinction between fatigue as a psychological or a physical aspect and their prediction for functional recovery. Finally, we were not able to include data on the history of depression nor previous or current treatment of depression was not included, because such data was often not included in hospital records. As a result, there was no control on the potential effect of related medication on depressive symptoms. Future research is warranted on the impact of anti-depressant medication as a predictor, mediator or confounder in acutely hospitalized older patients.

## References


1. Bandura A. *Social foundations of thought and action: A social cognitive theory*. NJ: Prentice Hall: Englewood Cliffs; 1986.

2. Yardley L, Beyer N, Hauer K, Kempen G, Piot-Ziegler C, Todd C. Development and initial validation of the Falls Efficacy Scale-International (FES-I). *Age Ageing*. 2005;34(6):614-619.

3. Wigal JK, Creer TL, Kotses H. The COPD Self-Efficacy Scale. *Chest*. 1991;99(5):1193-1196.

4. Chen G, Gully SM, Whiteman JA, Kilcullen RN. Examination of relationships among trait-like individual differences, state-like individual differences, and learning performance. *The Journal of applied* psychology. 2000;85(6):835-847.

5. Warner LM, Ziegelmann JP, Schüz B, Wurm S, Tesch-Römer C, Schwarzer R. Maintaining autonomy despite multimorbidity: self-efficacy and the two faces of social support. *European Journal of Ageing*. 2011;8(1):3-12.

6. Bonetti D, Johnston M, Rodriguez-marin J, et al. Dimensions of perceived control: A factor analysis of three measures and an examination of their relation to activity level and mood in a student and cross-cultural patient sample. *Psychology & Health*. 2001;16(6):655-674.

7. Boyd CM, Landefeld CS, Counsell SR, et al. Recovery of activities of daily living in older adults after hospitalization for acute medical illness. *J Am Geriatr Soc*. 2008;56(12):2171-2179.

8. Hoogendijk EO, van Hout HP, van der Horst HE, et al. Do psychosocial resources modify the effects of frailty on functional decline and mortality? *J Psychosom Res*. 2014;77(6):547-551.

9. Kempen GI, van Sonderen E. Psychological attributes and changes in disability among low-functioning older persons: does attrition affect the outcomes? *Journal of clinical epidemiology*. 2002;55(3):224-229.

10. Bandura A. *Self-efficacy: the exercise of control*. New York: W.H. Freeman and Company; 1997.

11. Schwarzer R. *Self-efficacy: Thought control of action*. Washtingon, DC: Hemisphere; 1992.

12. Esposito F, Gendolla GHE, Van der Linden M. Are self-efficacy beliefs and subjective task demand related to apathy in aging? *Aging & Mental Health*. 2014;18(4):521-530.

13. Akin S, Kas Guner C. Investigation of the relationship among fatigue, self-efficacy and quality of life during chemotherapy in patients with breast, lung or gastrointestinal cancer. *European journal of cancer care*. 2019;28(1):e12898.

14. Reichardt LA, Aarden JJ, van Seben R, et al. Unravelling the potential mechanisms behind hospitalization-associated disability in older patients; the Hospital-Associated Disability and impact on daily Life (Hospital-ADL) cohort study protocol. *BMC Geriatr*. 2016;16:59.

15. 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*. 1975;12(3):189-198.

16. Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Annals of internal medicine*. 1990;113(12):941-948.

17. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of illness in the aged. The index of ADL: A standardized measure of biological and psychosocial function. *Jama*. 1963;185:914-919.

18. Bosscher RJ, Smit JH, Kempen GI. Algemene competentieverwachtingen bij ouderen: Een onderzoek naar de psychometrische kenmerken van de Algemene Competentieschaal (ALCOS). / Global expectations of self-efficacy in the elderly: An investigation of psychometric characteristics of the General Self-Efficacy

Scale. *Nederlands Tijdschrift voor de Psychologie en haar grensgebieden*. 1997(52):239-248.

19. Sherer M, Maddux JE, Mercandante B, Prentice-dunn S, Jacobs B, Rogers RW. The Self-efficacy Scale: Construction and validation. *Psychological Reports*. 1982;51(2):663-671.

20. Schwarzer R, Jerusalem M. Generalized Self-Efficacy scale. In: Weinman J, Wright S, Johnston M, eds. *Measures in health psychology: A user's portfolio. Causal and control beliefs*. Windsor: uk: NFER-NELSON; 1995.

21. Mast RC, van der , Vinkers DJ, Stek ML, et al. Vascular disease and apathy in old age. The Leiden 85-Plus Study. *Int J Geriatr Psychiatry*. 2008;23(3):266-271.

22. Starkstein SE, Jorge R, Mizrahi R, Robinson RG. A prospective longitudinal study of apathy in Alzheimer's disease. *Journal of neurology, neurosurgery, and psychiatry*. 2006;77(1):8-11.

23. Eurelings LS, van Dalen JW, Ter Riet G, Moll van Charante EP, Richard E, van Gool WA. Apathy and depressive symptoms in older people and incident myocardial infarction, stroke, and mortality: a systematic review and meta-analysis of individual participant data. *Clin Epidemiol*. 2018;10:363-379.

24. Laan W, Zuithoff NP, Drubbel I, et al. Validity and reliability of the Katz-15 scale to measure unfavorable health outcomes in community-dwelling older people. *The journal of nutrition, health & aging*. 2014;18(9):848-854.

25. Guralnik JM, Simonsick EM, Ferrucci L, et al. A short physical performance battery assessing lower extremity function: association with self-reported disability and prediction of mortality and nursing home admission. *Journal of gerontology*. 1994;49(2):M85-94.

26. Fiske ST, Gilbert DT, Lindze. *Handbook of social psychology: volume 2*. Wiley.

27. Wood W, Quinn JM. Habits and the structure of motivation in everyday life. In: *Social motivation: Conscious and unconscious processes*. New York, NY, US: Cambridge University Press; 2005:55-70.

28. Smit EB, Bouwstra H, Hertogh CM, Wattel EM, van der Wouden JC. Goal-setting in geriatric rehabilitation: a systematic review and meta-analysis. *Clinical rehabilitation*. 2019;33(3):395-407.

29. Muller M, Strobl R, Grill E. Goals of patients with rehabilitation needs in acute hospitals: goal achivement is an indicator for improved functioning. *Journal of rehabilitation medicine*. 2011;43(2):145-150.

30. van Seben R, Smorenburg SM, Buurman BM. A qualitative study of patient-centered goal-setting in geriatric rehabilitation: patient and professional perspectives. *Clinical rehabilitation*. 2019;33(1):128-140.

31. Welch A, Forster S. A Clinical Audit of the Outcome of Occupational Therapy Assessment and Negotiated Patient Goals in the Acute Setting. British Journal of *Occupational Therapy*. 2003;66(8):363-368.

32. Stucki G, Stier-Jarmer M, Grill E, Melvin J. Rationale and principles of early rehabilitation care after an acute injury or illness. *Disability and rehabilitation*. 2005;27(7-8):353-359.

33. Wade D. Rehabilitation – a new approach. Overview and Part One: the problems. *Clinical rehabilitation*. 2015;29(11):1041-1050.

34. Griffiths TL, Phillips CJ, Davies S, Burr ML, Campbell IA. Cost effectiveness of an outpatient multidisciplinary pulmonary rehabilitation programme. *Thorax*. 2001;56(10):779-784.

35. Sritipsukho P, Riewpaiboon A, Chaiyawat P, Kulkantrakorn K. Cost-effectiveness analysis of home rehabilitation programs for Thai stroke patients. *Journal of the Medical Association of Thailand = Chotmaihet thangphaet*. 2010;93 Suppl 7:S262-270.

36. Imanishi M, Tomohisa H, Higaki K. Impact of continuous in-home rehabilitation on

quality of life and activities of daily living in elderly clients over 1 year. *Geriatr Gerontol Int*. 2017;17(11):1866-1872.

37. Stevens-Lapsley JE, Loyd BJ, Falvey JR, et al. Progressive multi-component home-based physical therapy for deconditioned older adults following acute hospitalization: a pilot randomized controlled trial. *Clinical rehabilitation*. 2016;30(8):776-785.

38. Reichardt LA, Nederveen FE, van Seben R, et al. Hopelessness and Other Depressive Symptoms in Adults 70 Years and Older as Predictors of All-Cause Mortality Within 3 Months After Acute Hospitalization: The Hospital-ADL Study. *Psychosom Med*. 2019;81(5):477-485.

39. Ciro CA, Ottenbacher KJ, Graham JE, Fisher S, Berges I, Ostir GV. Patterns and correlates of depression in hospitalized older adults. *Arch Gerontol Geriatr*. 2012;54(1):202-205.

40. Reichardt LA, van Seben R, Aarden JJ, et al. Trajectories of cognitive-affective depressive symptoms in acutely hospitalized older adults: The hospital-ADL study. *Journal of Psychosomatic Research*. 2019;120:66-73.

41. Villumsen M, Jorgensen MG, Andreasen J, Rathleff MS, Molgaard CM. Very Low Levels of Physical Activity in Older Patients During Hospitalization at an Acute Geriatric Ward: A Prospective Cohort Study. *Journal of aging and physical activity*. 2015;23(4):542-549.

42. Maitra KK, Erway F. Perception of client-centered practice in occupational therapists and their clients. *The American journal of occupational therapy : official publication of the American Occupational Therapy Association*. 2006;60(3):298-310.

43. Polenick CA, Flora SR. Behavioral activation for depression in older adults: theoretical and practical considerations. *Behav Anal*. 2013;36(1):35-55.

44. Struhkamp R. Goals in their setting: a normative analysis of goal setting in physical rehabilitation. *Health care analysis : HCA : journal of health philosophy and policy*. 2004;12(2):131-155.

**Appendix 1.** Means, standard deviations, Cronbach's alphas, and Pearson r correlations between main variables.

| | | *M* | SD | α | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* | *(6)* | *(7)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | GSE | 44.5 | 8.4 | .54 | 1.00 | -.26** | -.24** | -.07 | -.21** | -.24** | .17** |
| (2) | GDS-12D | 2.0 | 2.4 | .80 | | 1.00 | .33** | .23** | .16** | .23** | -.18** |
| (3) | GDS-3A | 1.7 | 1.0 | .48 | | | 1.00 | .36** | .22** | .36** | -.34** |
| (4) | NRS fatigue | 4.2 | 3.0 | NA | | | | 1.00 | .23** | .31** | -.29** |
| (5) | ADL | 1.3 | 1.4 | .69 | | | | | 1.00 | .58** | -.68** |
| (6) | IADL | 3.0 | 1.8 | .69 | | | | | | 1.00 | -.55** |
| (7) | SPPB | 6.3 | 3.7 | .58 | | | | | | | 1.00 |

*Note:* GSE = general self-efficacy; GDS-12D = Geriatric DepressionScale-12D (i.e., depressive symptoms); GDS-3A = Geriatric Depression Scale-3A (i.e., apathy); NRS = numeric rating scale; ADL = activities of daily living; IADL = instrumental activities of daily living; SPPB = Short Physical Performance Battery. *M* = mean; SD = standard deviation; α = Cronbach's alpha; NA = not applicable; ***p* < .001.