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REVIEW

Life-Space Mobility in the Elderly: Current Perspectives

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Abstract: Life-space mobility (LSM) is a concept for assessing patterns of functional mobility over time. LSM is gaining traction in the research of geriatric population health. Several instruments have been developed to measure LSM, such as the University of Alabama at Birmingham Life-Space Assessment (LSA) or the Nursing Home Life-Space Diameter instrument. There has been exponential growth in the use of instruments measuring LSM in studies of older adults since the concept was introduced in 1985. In response to the increased volume of publications with clinical applicability to those working in geriatric health or conducting population-based research in older adults, we conducted a narrative review: a) to provide a summary of the articles that have assessed validation of the University of Alabama at Birmingham LSA instrument, the most widely used instrument to assess LSM in older adults; and b) to provide a summary of the research articles that have examined LSM as independent or outcome variable. Studies for this review were obtained with an organized search format and were included if they were published in the past 20 years, written in English, published in peer-reviewed literature, and included LSM as an independent or outcome variable. Seventy-nine articles were identified: 36 that employed a cross-sectional design and 22 that employed a longitudinal/prospective design to examine LSM as outcome variable; 17 longitudinal/prospective design articles that examined LSM as primary independent variable; 3 review articles; and 1 systematic review. Areas of research included physical function, cognitive function, sensory impairment, mental health, falls, frailty, comorbidities, healthcare use, mortality, and social/environmental factors. These studies showed that LSM instruments can accurately predict morbidity, mortality, and healthcare use.

Keywords: life-space mobility, LSA, LSM, mobility, older adults

Introduction

Physical mobility affects all aspects of daily life and is a crucial part of independent living. As we age, the ability to maintain mobility becomes even more important, affecting the health and quality of life.[1] Mobility in older adults is critical to aging successfully since it is essential to maintain independence and autonomy.[2,3] Mobility is determined by cognitive and physical function, psychosocial factors, environmental factors, and transportation.[4] These determinants have raised the profile of assessing mobility among older adults beyond the traditional measures of assessing activities of daily living (ADLs), instrumental activities of daily living (IADLs), and walking ability, all focusing on a single specific activity rather than capturing the full continuum of mobility in older adults.[4] Life-space mobility (LSM), an emerging concept that allows this assessment, assesses functional, environmental, and social factors that affect how people live their day-to-day lives.[5]

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In 1985, May, Nayak, and Isaacs published the "The life-space diary, a measure of mobility in old people at home."[6] This measure marks the introduction of LSM, both as a concept and as the first instrument used to quantify it. The original goal of the instrument was to measure an individual's geospatial movements over an interval of time. Inquiring about patient's recent restrictions in movement was not new to clinicians, but systematically recording it in a comparable format was. While the life-space diary did not gain widespread use in research, the concept proved accessible and adaptable in later, newer instruments. The LSM concept has proven so accessible that it formed the foundation of a comprehensive framework used to address research questions related to mobility in older adults.[4]

The Nursing Home Life-Space Diameter (NHLSD) instrument, published in 1990 by Tinetti and Ginter, focused on institutionalized patients in a long-term care setting.[7] The NHLSD separated a patient's living area into four spaces: their room, outside the room but within the unit, outside the unit but within the facility, and outside the facility; it measured movement over a two-week period; was validated in 398 residents of 3 nursing homes in New Haven, Connecticut; and the test-retest reliability was 0.92.

The Life-Space Questionnaire (LSQ), published in 1999 by Stalvey et al,[8] validated in 200 participants aged 55–85 years with cataracts from an outpatient eye clinic, includes 9 (Yes/No) questions that assess mobility across 9 life-space zones in the preceding 3 days ranging from the participant's room to traveling outside of the United States. The total scores range from 0 to 9, reflecting the numbers of zones in which an individual has moved. This measure does not take into account frequency and independence of the LSM.

The Life-Space at Home (LSH), published in 2013 by Hashidate et al,[9] providing a measure of mobility among outpatient ophthalmology patients, was created by physical therapists who sought to obtain more detail about the distances traveled by their homebound patients.[9]

The University of Alabama at Birmingham (UAB) Life-Space Assessment (LSA) was developed by Baker et al[10] in 2003. The LSA measures mobility in five areas: outside the bedroom, outside the house, in the neighborhood, outside of the neighborhood but in town, and outside town during the past four weeks. Each life-space level is allocated a sub-score based on the average weekly frequency and independence of LSM. The composite score ranges from 0 to 120, with higher scores representing greater mobility. The LSA was validated in a random sample of 306 Medicare beneficiaries from central Alabama 65 years and older. The test-retest reliability at 2-weeks of follow-up for the composite score was 0.96 (95% CI=0.95–0.97). The LSA has emerged as the most widely used instrument in the US and internationally, validated and translated into several languages,[11–17] including French-Canadian,[11] Finnish,[13] Chinese,[16] Japanese,[15] Spanish,[12] Portuguese,[12] Danish,[14] and German.[17] Within the past 10 years, nearly all studies have used the LSA instrument to measure mobility in older adults.

Adoption of LSM in scientific peer-reviewed literature has accelerated in recent years, with more than 20 articles including an LSM instrument published in 2019. Most of these studies involve community-dwelling older adults, a critical group to study as we seek to improve the health and healthcare of older adults. The LSA instrument has been found to predict morbidity, mortality, and healthcare utilization with greater accuracy than many standard measures.[18–21]

The objectives of this narrative review were: a) to provide a summary of the articles that have assessed validation of the UAB LSA instrument, the most widely used instrument to assess LSM in older adults; and b) to provide a summary of the research articles that have examined LSM as an independent or outcome variable.

Methods

Retrieval Strategy

In this review, a search strategy was designed in coordination with a medical librarian to assess the review objectives. Articles were selected if they were published within the in the past 20 years (January 2000 to April 2020), written in English, published in peer-reviewed literature, and included LSM as an independent or outcome variable. The search parameters included the terms "lifespace", "life space", "life-space", and "mobility" in article titles. PubMed was searched using the terms: ("lifespace"[Title] OR "life-space"[Title] OR "life space"[Title] AND "mobility"[Title]). Ovid was searched using the terms: (("lifespace" or "life-space" or "life space") and "mobility").m_titl. SCOPUS was searched using the terms: TITLE ("lifespace" or "life-space" or "life space") and "mobility"). PsychInfo was searched using the terms: (("lifespace" or "life-space" or "life space") and "mobility").m titl. CINAHL was searched using the terms: TI (("lifespace" or "life-space" or "life space") and "mobility"). Cochrane was searched using the terms: ("lifespace" or "life-space" or "life space" and "mobility"):ti. Google Scholar was searched using the terms: allintitle: mobility "life space" OR "lifespace" OR "life-space".

Results

Study Descriptions

The search, produced 504 results; of these, 324 duplicates, 89 conference abstracts, 2 book chapters, 6 non-English-language, 1 editorial, 2 letter to the editor, 2 thesis, 1 dissertation, 2 registered protocols for clinical trials, 2 registered protocols for systematic reviews, and 1 with average age < 50 years were removed, leaving a total of 72 full-text articles for review from the databases searched. We added 7 more articles manually retrieved (Appendix Figure 1). Of these, 36 articles employing a cross-sectional design and 22 employing a longitudinal/prospective design examined LSM as an outcome variable; 17 longitudinal/prospective design articles examined LSM as primary independent variable; 3 were review articles; and 1 was a systematic review. A total of 79 peer-reviewed articles addressing the objectives of this narrative review were included. Of the 75 cross-sectional or longitudinal design articles, 60 were conducted in community-dwelling older adults, 12 in a clinical setting, and one each in a rehabilitation facility, a nursing home facility, and an independent living facility.

Validity of the UAB LSA Instrument

The UAB LSA has been translated from English into 8 languages and test-retest, construct and criterion validity, and responsiveness have been conducted. Eleven articles were found assessing the translation to other Non-English language and the validity of the LSA instrument. For example, Auger et al[11] examined the measurement properties of the French-Canadian version of the LSA for power mobility device (PMD) users presenting with neurological, orthopedic or complex medical conditions. The translation/back translation from English to French with cultural adaptation was performed and pretested with five bilingual users. The intraclass correlation coefficient (ICC) for the composite LSA was 0.87 (95% CI=0.69–0.92) and the concordance was moderate to substantial (kappa=0.47–0.73).

Curcio et al[12] assessed the reliability, construct, and convergent validity of the LSA in 150 men and 150 women aged 65–74 years from two Latin American countries (Colombia and Brazil). The LSA was translated into Spanish and Portuguese and back translated by bilingual translators. The test-retest reliability for the composite LSA was substantial in Colombia (ICC=0.70, 95% Confidence Interval (CI)=0.49–0.83). No test-retest was assessed in Brazil. Linear and logistic regression assessed the convergent and validity of the LSA. Low levels of education, low income, depressive symptoms, and poor performance in cognitive test were associated with LSA scores. Women in both countries were significantly more likely than men to have low LSA scores. High performance in the Short Physical Performance Battery (SPPB) was associated with high LSA scores.

Portegijs et al[22] examined the distribution, responsiveness, and reproducibility over 1-year of the LSA in older adults aged 75–90 years participating in the Life-Space Mobility in Old Age Study (LISPE) from Finland. The two-week overall ICC was 0.72 (95% CI=0.52–0.84), the ICC was 0.61 during winter time and 0.76 during spring season. Self-reported decline in health or mobility status and age over 85 years were associated with greater decreases in LSM score over 1-year follow up, indicating the responsiveness to changes of the LSA.

Fristedt et al[23] examined the concurrent validity of the LSA-Swedish with measures of mobility among 312 community-dwelling participants. The correlations were 0.53 for SPPB, 0.45 for stair climbing, 0.28 for transfers, 0.63 for transportation, 0.55 for food shopping, 0.42 for travel for pleasure, and 0.38 for community activities.

Ullrich et al[17] investigated the validity, reliability, sensitivity to change, and feasibility of a modified LSA in older adults with cognitive impairment recruited from rehabilitation wards of a German geriatric hospital. The LSA was translated into German and back-translated by bilingual translators. The test-retest reliability for the composite LSA was 0.91 (95% CI=0.87–0.94). In the construct validity, moderate to high correlation were found between LSA composite score and outdoor physical activities (range, 0.52 to 0.54), motor status (range, 0.39 to 0.41), fear of falling-related psychosocial variables (range, −0.11 to −0.38), physical activity (range, 0.52 to 0.54), and age (−0.32). The sensitivity to change for the LSA composite score was excellent (Standardized Response Mean = 0.80) and the feasibility was also excellent. Cut-off for the LSA were also estimated by Ullrich et al[24] among 118 older adults with cognitive impairment and comorbidities. The investigators found that the optimal cut-off point for the LSA to differentiate between those with low (confined to the home) versus high (active outdoors) LSM was < 26.75, with a sensitivity of 0.78 and specificity of 0.84, and a moderate accurate diagnostic validity of 0.81.

Tseng et al[16] translated and examined the validity and reliability of the LSA Chinese among 225 community-dwelling older adults. The LSA was translated into Chinese and back translated by two bilingual translators. The ICC was 0.88 (95% CI =0.78–0.94). Criterion validity analysis showed an ICC of 0.53 (p-value < 0.01) for physical ADLs, 0.69 (p-value < 0.01) for IADls, and 0.66 (p-value < 0.01) for the multidimensional functional assessment questionnaire. Construct validity analysis showed an ICC of −0.54 (p-value < 0.01) for depressive symptoms and 0.68 (p-value < 0.01) for the general health subscale of the Medical Outcomes Study Short Form 36.

McCrone et al[25] examined the construct/convergent validity, responsiveness, and floor/ceiling effects of the LSA among patients who had musculoskeletal, orthopedic, neurological, or general surgical presentations from a community-based physical interventions in United Kingdom. The convergent validity analysis demonstrated a correlation of 0.37 (p-value < 0.001) for the Performance Oriented Mobility Assessment. Significant improvements were found in the LSA after therapy intervention for the overall sample, with a mean change of 10.5 points (95% CI=8.3–12.8, p-value < 0.01). No floor/ceiling effects was found.

Pedersen et al[14] translated the LSA into Danish and examined the content validity among older adults with mobility limitations. The content validity was based on cognitive interviews, finding a wide range of source of error mostly related to comprehension, memory, and decision processes. These errors included difficulties in defining the geographical boundaries of neighborhood, town, and outside of town. Adaptations to the LSA Danish were made to be implemented in clinical practice and used to assess LSM in older Danish adults.

Phillips et al[26] generated normative population data for the LSA composite score, regardless of age or health service contact, among 3032 participants from the South Australian Health Omnibus Survey. The mean LSA was 98.3 (SD = 20.3), 5% scored < 60, 11% scored between 60 to 79, 27% scored between 80 to 99, and 57% scored between 100 and 120. Multivariate analysis showed that being female, being older, lower levels of education, living in a rural area, not working, low level of income, and more medical conditions were associated with low LSA scores.

Life-Space Mobility (LSM) as an Outcome Variable

Appendix Table 1 summarizes the characteristics of the 36 cross-sectional design articles and 22 longitudinal/prospective design studies that examined LSM as outcome variable.

Cross-Sectional Studies

Studies examining socio-demographics variables and LSM have found that older age,[5,27,28] female gender,[5,27–29] and lower level education[27,30] are associated with decreased LSA scores. Among comorbidities, stroke,[27] the presence of depressive symptoms,[27,31,32] undernutrition,[33] and obesity[27] were found to be associated with lower LSA scores.

Several studies have examined the relationship between physical function, disability, physical activities, and LSM.[5,27–29,33–38] For example, Fontenele et al[34] found that limitations in ADLs were strongly correlated with lower LSA scores in patients with chronic obstructive pulmonary disease (COPD). In another study conducted in Mexican Americans aged 75 years and older, using the Hispanic Established Population for the Epidemiological Study of the Elderly (HEPESE), Al Snih et al[27] showed that those with any limitation in ADLs scored 11.7 points lower in the LSA than those without ADL limitations. Using the Canadian Longitudinal Study on Aging, Kuspinar et al[33] found better performance in walking speed and grip strength associated with greater LSM. Peel et al[5] using the UAB Study found that high SPPB was associated with LSA score (β=0.282, p-value < 0.001). Portegijs et al[35] found that poorer performance in SPPB test was associated with lower LSA score (β=0.22, p-value < 0.01) in participants from the Life-Space Mobility in Old Age (LISPE) study. Tashiro et al[38] found that limitations in ADLs, low walking speed, and fear of falling were all independently associated with lower LSA scores in patients recovering from stroke. Rantakokko et al[37] examined the associations between motor and non-motor symptoms with LSM in Parkinson's disease and found that, among motor symptoms, perceived walking difficulties and, among non-motor symptoms, pain were associated with lower LSA scores. Tsai et al[39] found that step count (β=0.199, p-value=0.004), moderate activity (β=0.199, p-value=0.004), and low activity (β=0.172, p-value=0.010) were associated with higher LSA scores among participants from the LISPE study.

Auais et al[40] examined the association between fear of falling (FOF) and LSM in five cities in Brazil, Canada, and Colombia, found that a 1-point increase in the FOF scale was associated with a 0.15-point decrease in the LSA score, after controlling for demographics, comorbidities, physical function, depressive symptoms, and vision impairment.

Sverdrup et al,[41] examining the association between degree of dementia and LSM in nursing home residents using the NHLSD, found that residents with severe dementia had lower LSM compared to those with moderate dementia. Polku et al[42] found that participants' perception of the benefit they received from their hearing aid device correlated positively with a higher LSA score compared to those who perceived less benefit from using a hearing aid.

Sakakibara et al[43] examined the effect of wheeled mobility factors on LSA, finding that lower occupancy time and higher distance traveled were associated with greater LSA scores. In another study, Sakakibara et al[44] found that those with self-efficacy with a manual wheelchair had higher LSA scores (β=0.25, p-value < 0.01), after controlling for sex, comorbidities, geographic location, need for wheelchair assistance, wheelchair training, and being employed/volunteer.

In examining the association between transportation mode use and LSA scores among those with and without walking difficulties, Viljanen et al[45] found that men who were car drivers or had walking difficulty had greater restricted LSM (OR= 3.61, 95% CI=1.33–9.78 vs. OR=28.35, 95% CI=8.56–93.85, respectively). Women who were car drivers or passengers with walking difficulties had greater restricted LSM (OR=4.05, 95% CI=1.06–15.47 vs. OR=18.44, 95% CI=5.98–56.82, respectively).

In an examination of perceived environmental barriers to LSM, Rantakokko et al[36] found those reporting one or more environmental barriers in their neighborhood, such as high curbs or lack of sidewalks, had higher odds (OR=2.14, 95% CI=1.34–3.43) of restricted LSM as compared to those reporting no barriers. The authors also showed lower odds ratio of restricted LSM among those reporting four to seven environmental facilitators, such as safe crossings or good lighting.

Longitudinal/Prospective Studies

Appendix Table 1 summarizes the characteristics of the 22 longitudinal/prospective design studies that examined LSA as an outcome variable.[20,35,39,46–64] For example, O'Connor et al,[55] examining 5-year trajectories of mobility change in older adults with mild cognitive impairment using the LSQ, found older age (β= −0.12, p-value < 0.05) and education (β=0.10, p-value < 0.05) were associated with LSM. A study conducted among independent living residents within a continuing care retirement community found that those who were separated or divorced had higher LSA scores than those married, cohabitating, or widowed.[56]

Portegijs et al[65] found that the rate of decline over 2 years in LSA was greater among pre-frail and frail older adults (β −12.3, p-value < 0.0001 and β −26.0, p-value < 0.0001, respectively) than in non-frail, after adjusting for age and sex among participants from the LISPE study. Tobinaga et -al[63] examined how strength and balance affect LSA scores after total knee arthroplasty among patients with severe osteoarthritis. The authors concluded that walking self-efficacy and knee extensor muscle strength on the operative side were correlated with preoperative LSA scores; that LSA scores increased significantly 3 months after surgery; and that stairs self-efficacy and knee extensor muscle strength on the operative side were positively correlated with LSA scores at 3 months post-surgery.

Lo et al[20] examined the effect of falls and fractures on LSM among participants in the UAB Study of Aging. After 6 months of follow up, the authors found a decline in LSA score of 3.6 points for any fall, 4.7 for those with injury including fractures, 14.2 for those with any type of fracture, and 23.6 for those with hip fracture. Poranen-Clark et al[59] examined the relationship between executive function (EF), measured with the Trial Making Test, and LSA scores; they found that better EF at baseline predicted higher LSA scores at 2 years of follow up among participants in the LISPE study. Polku et al,[57] examining whether self-reported hearing difficulty at baseline predicts changes in LSM at 2 years of follow-up, found that those without hearing difficulty at baseline had a higher LSA scores than those with mild or major hearing difficulty.

Brown et al[51] examined changes in LSA scores among surgical versus non-surgical hospitalized patients over a 4-year period. The authors found similar baseline scores, but a greater initial decline in LSA score in the surgical group. Despite this decline, the surgical group had a more rapid increase in LSA scores following the initial drop in score, compared to those who did not have surgery.

In a study that examined how walking difficulty and task modification for difficulty walking can predict LSA scores, Rantakokko et al[60] found that, over a 2-year period, those who had difficulty walking 2 km or who had modified how they walked 2 km had lower LSA scores.

LSM as an Independent Variable

Appendix Table 2 summarizes the characteristics of the 17 longitudinal/prospective studies that have examined LSM as a predictor over time of health outcomes such as cognitive decline, health care utilization (physician visits, hospitalizations, and hospital readmissions), admission to nursing homes, incidence of falls, quality of life, and mortality[18,21,66–78] For example, Crowe et al[68] examined the relationship between LSA and subsequent change in cognitive function over four years in participants from the UAB Study of Aging. The authors found that greater life-space at baseline predicted less decline over the 4-year period, after controlling for all covariates. Similarly, Silberschmidt et al,[77] using the HEPESE study, found that Mexican Americans in the highest life-space category (≥61) experienced slower rates of cognitive decline over a 5-year period compared to those in the lowest category (0–20), after adjusting for all covariates.

In examining clinical exacerbations in patients with COPD leading to emergency room visits or requiring hospitalization, Iyer et al[18] found that those with restricted LSM had a significantly reduced score on the 6-minute walk test, more severe dyspnea, worse quality of life, and greater depressive symptoms after one year of enrollment. Lo et al,[73] studying neighborhood disadvantage and LSM as predictors of incident falls, found that every 10-point decrease in LSA score increased the risk for one or more falls at six months after baseline assessment.

Kennedy et al[19] sought to determine whether decline in LSA predicts increased health care utilization among participants in the UAB Study of Aging. The authors found that a 10-point decrease in life-space was associated with 14% increased odds of an emergency department visit and/or hospitalization over the next month, after controlling for all covariates. Also, Kennedy et al[72] examined whether changes in LSA mobility predict 6-month mortality; they found that, for every 10-point decline in LSA over a 6 month period, the odds of dying over the subsequent 6-month interval increased by 72%. Recovery from low LSA score was associated with decreased mortality. Mackey et al[74] examined the relationship between LSA and mortality in participants from the Osteoporotic Fracture in Men Study and found that those with LSA scores ≤ 40 were at high risk for both non-cancer mortality and all-cause mortality. A 24-point decrease in LSA scores was associated with a 19% to 38% increased risk of all-cause mortality over approximately 3 years of follow up, after controlling for all covariates.

Similarly, in studying the relationship between LSA and mortality among women from the Study of Osteoporotic Fractures, Mackey et al[21] reported a 2.44 times higher risk of all-cause mortality for those with LSA scores of 0 to 20 points and a 1.5 times greater risk for those with LSA scores of 21 to 60, compared to those with LSA scores of 81 to 120 points over 5.2 years of follow up. No relationship was found with all-cause mortality among women with LSA scores of 60 to 80 points. Findings were similar for cardiovascular, non-cancer, and other types of mortality.

In a study examining whether LSA predicts hospital readmission in patients with COPD or congestive heart failure, Fathi et al[69] reported that unrestricted LSA scores at baseline were associated with greater risk of mobility decline post-discharge compared to restricted LSA at baseline, after controlling for all covariates. Also, restricted LSA before hospitalization was associated with a greater risk of hospital readmission within 90 days of discharge, after controlling for all covariates. In another study, Sheppard et al[76] reported that restricted LSA scores (<60) were associated with a 4.4 times greater risk of admission to a nursing home compared to unrestricted LSA over 6 years, after controlling for all covariates. The odds of nursing home admission increased 2% for every 1 point decline in LSA score at baseline. In the LISPE study, Rantakokko et al[75] found that the decline in quality of life was greater among those whose LSA score decreased >10 points at any time during the follow-up period compared to those whose LSA score remained stable or improved.

Systematic Review

De Silva et al[79] conducted a systematic review to investigate the relationship between LSM and cognition in older adults. The authors found a random-effect pooled correlation of 0.30 (95% CI=0.19–0.40), and a high heterogeneity I^2=9.39%. The correlation coefficients for the relationship between LSA and cognitive function domains ranged from 0.22 to 0.23 for learning and memory, −0.19 to 0.37 for processing speed, and 0.13 to 0.26 for executive function.

Discussion

The objectives of this narrative review were to provide a summary of the research that have examined the relationship between demographic and health characteristics with LSM in older adults; and a summary of the studies that have validated the most widely used measure of LSM, the UAB-LSA. In this review we found that, in 60 (80%) articles, the research were conducted in community-dwelling older adults, 12 (16%) were conducted in the clinical setting, and 3 (4%) in post-acute or long-term care facilities. Despite of the increasing use of the concept of LSM, this has been limited to community-dwelling older adults from population-based studies such as the University of Alabama at Birmingham Study of Aging, Fragilité, une étude longitudinale de ses expressions, the Canadian Longitudinal Study on Aging, the Life-Space Mobility in Old Age, the Hispanic Established Population for the Epidemiologic Study of the Elderly, the Osteoporotic Fractures in Men Study, the Osteoporotic Fractures in Women Study, the Rush Memory and Aging Project, the Minority Aging Research Study, the International Mobility in Aging Study, the Housing and Independent Living, and the Advanced Cognitive Training for Independent and Vital Elderly trial. Those studies conducted in clinical settings included patients from geriatric, pulmonary, oncology, and orthopedic clinics.

We found socio-demographic variables such older age, female gender, and lower level of education,[5,27,28,30] fear of falling,[40] limitations in ADLs and IADLs,[5,27,34] depressive symptoms,[5,27,31,32,80] low physical activity,[29,39] poor performance in gait speed and muscle strength,[5,27,29,33] vision impairment,[33] oral HRQoL,[81] and transportation difficulty[45] were associated with lower LSM. Changes in LSM were predicted by injurious falls,[20,47] hospitalizations,[51] low executive function,[59] frailty,[65] walking difficulty and task modification,[60,82] weight loss,[61] obesity,[27] sedentary behavior,[83] hearing difficulty,[57] peripheral artery disease,[48] and reduced estimated glomerular filtration rate.[50] Recovery in LSM has been reported after surgery.[48,52,62,63]

LSM has been found to be a predictor of cognitive decline over 4-years[68] and 5-years[77] of follow-up, 90-day hospital readmission,[69] exacerbations of COPD requiring emergency room and hospital admission,[18,84] falls over 8.5 years,[73] mortality,[21,72,74,75] quality of life,[75,85] and admission to a nursing home.[76] Findings of this narrative review has shown that LSM instruments can help investigators and clinicians to assess both the current and future mobility status of older adults.

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Disclosure

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