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Testing of the Function Focused Environment Assessment and the Function Focused Policy Assessment in Assisted Living

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Abstract

This study tested two new instruments, the Function Focused Environment Assessment (FF-EA) and the Function Focused Policy Assessment (FF-PA). The measures were developed for clinical evaluation of AL settings to help optimize function and physical activity among residents. A total of 106 AL settings and 242 residents were included. There was evidence of item reliability (0.92) and interrater reliability ($\kappa=0.40$, $p=.015$; percent agreement 85%) of FF-EA and item reliability (0.89) and interrater reliability ($\kappa=0.48$, $p=.001$, percent agreement 82%) of the FF-PA, and support for validity of both measures based on INFIT and OUTFIT statistics and hypothesis testing.

Introduction

In the United States residents in assisted living settings (AL) engage in limited amounts of physical activity (Chung, 2013; De Lange, Van Der Veen & Van der Werf, 2008; Król-

Zieli ska, Kusy, Zieli ski & Osi ski, 2011; Resnick, Galik, Gruber-Baldini & Zimmerman, 2010) and decline in function more rapidly than their peers in nursing homes (Resnick & Galik, 2015). Reasons for decline are multifactorial and include resident (e.g., comorbidities, age) and setting factors (e.g., caregivers, environments and policies), among others. AL settings typically have barriers to keeping residents physically active (Chung, 2013; Król-Zieli ska et al., 2011; Resnick et al., 2010) which can contribute to adverse events including falls and hospitalizations. Settings are often smaller than nursing homes, have less open space for physical activity and ambulation is discouraged because direct care workers and families fear residents will fall while ambulating. AL residents also fear falls and consequently avoid physical activity (Lach & Parsons, 2013). In addition, the AL industry is primarily based on a pay-per-service model in which residents pay for services provided (Larkin, 2015). The payment is higher for residents who are more dependent in functional performance. The expectations of care among residents and families are that direct care workers will complete necessary care tasks (e.g., the resident will be bathed and dressed) and will protect residents from injury. Residents and families often become distressed if direct care workers just provide encouragement, cueing or minimal assistance needed to assure that residents walk, dress and bathe at their highest level (Resnick, Galik, Gruber-Baldini & Zimmerman, 2011; Resnick & Galik, 2014). Once residents are no longer allowed or encouraged to perform an activity (e.g., upper extremity bathing or ambulating), they lose the ability, motivation, and confidence to do so (Resnick, 1998; Resnick, 1999).

There are many factors that influence optimizing function and physical activity among AL residents as guided by a social ecological model. Specifically, these include intrapersonal factors such as age, gender, mood and motivation (Lin, Yeh, Chen & Huang, 2010; Chen, Li & Yen, 2015; Victor et al., 2016); interpersonal factors which include verbal encouragement from others or seeing role models perform a behavior (Victor et al., 2016); environmental factors such as access to safe walking areas; and policies that support and encourage physical activity such as the removal of wheelchairs from the dining room so that individuals walk to their tables or at least transfer from the wheelchair to a dining room chair (Benjamin, Edwards & Caswell, 2009; Benjamin, Edwards, Ploeg & Legault, 2014; Chung, 2012; Kalinowski, Wulff, Kölzsch, 2012; Krol-Zielinskia, Kusy, Zielinski et al., 2011; Resnick, Galik, Gruber-Baldini et al., 2010; McConnell, Pieper, Sloane, et al., 2002). Specifically, in long term care settings, environment barriers to engaging in physical activity have included a lack of designated areas for physical activity, lack of appropriate exercise activities, limited space for exercise equipment, poor lighting and uneven surfaces, lack of suitable outdoor walking paths, and clutter. Organizational factors have also been noted to influence physical activity of residents and include: insufficient staffing; a focus on task completion as the priority; and adherence to institutional routines over engaging residents in functional and physical activities (Benjamin, Edwards & Caswell, 2009; Benjamin, Edwards, Ploeg & Legault, 2014; Chung, 2012; Kalinowski, Wulff, Kölzsch, 2012; Krol-Zielinskia, Kusy, Zielinski et al., 2011; Resnick, Galik, Gruber-Baldini, et al., 2010; McConnell, Pieper, Sloane, et al., 2002). The relationship reported between the environment and policies on function and physical activity in institutional settings was based on qualitative studies from focus groups or individual interviews with staff in those settings

(Benjamin, Edwards, Ploeg & Legault, 2014; Kalinowski, Wulff, Kölzsch, 2012; Resnick, Galik, Gruber-Baldini et al., 2010).

Environment and Policy Assessments for Physical Activity

There are no known measures to evaluate policies that optimize function and physical activity in long-term care settings. There are two measures that have been most commonly used to evaluate the environment with regard to physical activity, the Neighborhood Satisfaction Scale (Sallis et al., 2009) and the Senior Neighborhood Quality of Life Survey (Cerin, Saelens, Sallis & Frank, 2006). Both measures evaluate communities rather than institutional settings. Items include such things as whether or not there was a park, library, grocery store or crime in the neighborhood. Some community based studies (King et al., 2017; Ribeiro, Mitchell, Carvalho, De Pina, 2013) have used the Geographic Information System to evaluate the environment. These measures or approaches are not appropriate for evaluation of environments in AL settings.

The Therapeutic Environment Screening Scale (Lawton, Weisman, Sloane, & Calkins, 1997) was developed for assessment of long-term care facilities. The purpose of this measure was to address the therapeutic goals of nursing home and residential care residents with dementia. The 37-item checklist consists of items measuring a range of environmental domains, such as exit control, maintenance, and safety as well as three global evaluative ratings: staff interaction, resident involvement in activities, and physical environmental atmosphere. It does not evaluate the environment for factors that influence or encourage physical activity such as availability of clear areas for walking or access to age appropriate exercise equipment. Lastly, the Housing Enabler Instrument, although developed for community dwelling older adults, has been used with individuals in long-term care settings. This measure was developed to evaluate the person-environment fit between the individual and his or her home setting. The measure includes three steps: (1) assessment of functional limitations of the person; (2) assessment of the physical environmental barriers including outdoor, entrances, indoor, and communication features; (3) and calculation of Person-Environment-Fit. For each environmental barrier item, the instrument comprises predefined severity ratings and is scored from 1 (potential accessibility problem) to 4 (very severe accessibility problem). The assessment of the individuals' limitations is matched with the environment and a score calculated using Housing Enabler software. Prior use of the measure has focused on facilitation of aging in place rather than facilitation of physical activity (Sojung, Yoonsun, BoRin, Dunkle, 2017; Weil & Smith, 2016).

Given the lack of availability of measures to assess the impact of the environment and policies in institutional settings on function and physical activity among older adults, the purpose of this study was to test the psychometric properties of two newly developed measures, the Function Focused Environment Assessment (FF-EA) and the Function Focused Policy Assessment (FF-PA). Establishing reliable and valid measures of the environment and policies with regard to optimizing function and physical activity among residents will facilitate interventions to maintain and improve function and physical activity among residents in long-term care settings. The findings from these assessments can help clinicians, administrators and/or owners of settings evaluate their settings to establish if they

are optimally facilitating function and physical activity of residents and guide them in altering environments and policies as needed. These measures can also be used by researchers to determine if there were improvements in the environment and policies following implementation of interventions.

Methods

Design and Sample

This study used baseline data from two studies testing the dissemination and implementation of function focused care into AL settings. Both studies tested similar implementation approaches for the four step Function Focused Care for Assisted Living intervention (Resnick, Galik, Vigne, 2014) and both were reviewed and approved by a University Institutional Review Board. One study included 80 settings in Maryland (Resnick, Galik, Vigne, 2014) and the other included 26 settings across Maryland (10 facilities), Pennsylvania (10 facilities) and Massachusetts (6 facilities) (Resnick, Galik, Boltz, et al., in press). Settings were invited to participate if they: (1) were willing to identify a nurse (a direct care worker, licensed practical nurse or registered nurse) to be the champion and work with the study team in the implementation of function focused care; and (2) were able to access email and websites via a phone, tablet or computer. Settings were excluded if they had less than eight beds. For both studies recruitment was completed by sending invitations to approximately 400 AL settings that were eligible via traditional mailings and following up with telephone calls to provide additional information.

In the study including 26 AL settings, in addition to setting data, 10 residents were recruited from each setting and resident specific data were obtained related to function and physical activity. Residents were eligible to participate if they were 65 years of age or older, able to speak English, lived in a participating AL setting at the time of recruitment, and were able to recall at least one out of three words as per the Minicog (Borson et al., 2003). Residents were excluded from the study if they were enrolled in hospice. All participants were given the Evaluation to Sign Consent and a five-item questionnaire evaluating the individual's understanding of participation in the research project (Resnick et al., 2007). A total of 381 residents were approached, 110 (29%) refused to participate (6 of these were refusals from the legally authorized representative), 7 (2%) individuals were excluded/ineligible as they were either too young or enrolled in Hospice and 15 (4%) were unable to assent or the evaluator was unable to reach the legally authorized representative to obtain consent. A total of 249 individuals consented, five of whom were ineligible due to cognitive status, leaving a baseline enrolled sample of 244 residents. Of the 244 residents, one individual withdrew prior to baseline data and there was missing baseline data on one enrolled resident. Data analysis was therefore done on 242 enrolled participants with data.

Measures

The environment and policy assessments were completed in each of the settings by research evaluators prior to implementation of the intervention. The research evaluators were staff members of the research team with expertise in recruitment of residents and completion of

data collection related to assessment of both residents and facilities. In 13 settings a second rater evaluated the environment and policies at baseline.

The FF-EA includes 16 items as shown in Table 1. The items were developed by a team of three researchers and three clinicians based on prior qualitative findings (Benjamin, Edwards & Caswell, 2009; Benjamin, Edwards, Ploeg & Legault, 2014; Chung, 2012; Kalinowski, Wulff, Kölzsch, 2012; Krol-Zielinska, Kusy, Zielinski, et al., 2011; Pomeroy, Scherer, Runkawatt, et al., 2011; Resnick, Galik, Gruber-Baldini et al., 2010; McConnell, Pieper, Sloane, et al., 2002) and clinical experience identifying the factors that optimize function and physical activity in these settings. A single brainstorming session was done and the six members of the team identified and came to consensus with the stated items. The measure was then pilot tested by one of the clinicians for feasibility. Examples of items include the following: whether or not there were areas for residents to walk that were free of clutter; if there were rest areas along longer stretches for walking; if there were cues in the environment to encourage physical activity; if chair, bed and toilet heights facilitated resident transfers; if residents had access to appropriate supplies to facilitate physical activity; and if the environment was safe (e.g., sufficient lightening, no slippery floors).

As shown in Table 2, the FF-PA includes 15 items which were developed by the same team of three researchers and three clinicians with a focus on policy factors that were likely to optimize function and physical activity in these settings. Items were developed based on what was known about the factors that influence function and physical activity in long term care settings (Benjamin, Edwards, Ploeg & Legault, 2014; Holmes, Galik, Resnick, 2017; Resnick, Galik, Gruber-Baldini, Zimmerman, 2010; Rodiek, 2008). The same brainstorming for item development and pilot testing was done. Examples of items include evidence of policies: for use of physical restraints that optimize function and physical activity; around use of free space that optimizes function and physical activity; and associated with fall prevention that optimize function and physical activity, among others. For both measures, items are scored as being present or not present and coded so that higher scores on both measures are indicative of environments and policies that are better for optimizing function and physical activity. The scores are then summed for a total score on the FF-EA of 16 and a score of 15 on the FF-PA.

To evaluate the validity of the FF-EA and FF-PA, resident assessments were done to include descriptive information related to age, gender and race, function was measured using the Barthel Index (Mahoney & Barthel, 1965), physical activity was measured based on MotionWatch 8 data, and number of resident falls, hospital admissions and emergency room visits in the four months prior to baseline were obtained from a designated staff member in each setting. The Barthel Index is a 10-item measure of activities of daily living (e.g., bathing, dressing). Items are weighted to account for the amount of assistance required. A score of 100 indicates complete independence. Estimates of internal consistency ranged from alpha coefficients of 0.62 to 0.80, interrater reliability was supported based on an intra-class correlation of 0.89 between two observers; and validity was based on correlations with the Functional Inventory Measure ($r=0.97$, $p<.05$)(Mahoney & Barthel, 1965).

The MotionWatch 8 is a compact, lightweight, water resistant, body-worn activity monitoring device that is used to measure physical movement. The device is intended to monitor limb or body movements during daily living and sleep. The MotionWatch 8 contains a miniature accelerometer to allow measurement and recording of physical movement of the wrist which provides a close correlation to whole body movement. The data are sampled at 50Hz and processed into 'epochs' of user selectable length (e.g., every minute). These data are stored in an internal non-volatile memory and then downloaded for analysis at the end of the study period. Prior evidence of reliability of the MotionWatch 8 was based on consistency between recordings across three days of wear and evidence of validity was based on a consistent match between activity counts and recorded activity performed and a statistically significant difference in Borg Rating of Perceived Exercise Scale (RPE) between the sedentary group (Borg RPE = 8.6, SD=3.0) and those with some level of activity (Borg RPE = 9.9, SD= 2.3; $F=5.72$, $p=.02$) (Chakravarthy & Resnick, 2017). The MotionWatch 8 was placed on each participant for a five-day period and the three full days of counts of activity were obtained (days 2, 3, and 4) and used for analysis. The mean scores for resident outcomes per setting were used in all analyses.

Data Analysis

Descriptive statistics were done using SPSS version 24.0 to describe the settings. To evaluate the reliability and validity of the FF-EA and the FF-PA a Rasch analysis was done using the Winsteps statistical program. Bivariate correlations were done to determine if there were associations between assessments of the environment and policies and mean setting percentage of falls, transfers to the hospital or emergency room visits, mean setting function and mean setting physical activity of residents. A $p<.05$ level of significance was used for all analyses.

Reliability Testing

Testing of the internal consistency of the FF-EA and the FF-PA was based on the Rasch measurement model and item reliability and the item separation index (Smith & Smith, 2004). The item separation index defines how well items can be discriminated from one another on the basis of their difficulty and is analogous in interpretation to Cronbach alpha. The closer the reliability is to 1.0 the less the variability of the measurement can be attributed to measurement error. An equivalent to a Cronbach alpha of 0.70 was considered acceptable evidence of item reliability. Interrater reliability was also evaluated using a sub-sample of 13 facilities in which the evaluation was done by two evaluators at baseline. Interrater reliability was evaluated using the Kappa statistic and percent agreement (McHugh, 2012). Based on previously established cut points (Cohen, 1960), the Kappa result was interpreted as follows: values 0 indicated no agreement; 0.01–0.20 none to slight; 0.21–0.40 as fair; 0.41–0.60 as moderate; 0.61–0.80 as substantial; and 0.81–1.00 as almost perfect agreement. Percent agreement scores of 80 percent or greater were considered sufficient (McHugh, 2012).

Validity testing

Validity testing of the FF-EA and the FF-PA was based on construct validity and evidence that each item fit the appropriate concept. The Winsteps statistical program was used to

establish item fit based on INFIT and OUTFIT statistics. INFIT and OUTFIT statistics are based on conventional chi-squared statistics. The INFIT statistic is more sensitive to unexpected patterns of observations by individuals on items that are generally targeted to their ability. OUTFIT statistics are more sensitive to unexpected observations by individuals on items that are relatively very easy or very hard for them. INFIT and OUTFIT statistics are considered acceptable if they are between 0.4 and 1.6 (Smith & Smith, 2004). An INFIT or OUTFIT value of less than 0.4 indicates that the item may not provide additional information beyond the rest of the items on the scale. An INFIT or OUTFIT value of greater than 1.6 indicates that the item may not define the same construct as the rest of the items in the instrument, is poorly written and thus may have been misunderstood by participants, or is ambiguous (Bezruczko, 2005; Linacre, 2004; Smith & Smith, 2004).

Further support for the validity of the measure was based on evidence that the items within the FF-EA and the FF-PA comprehensively addressed each concept based on item mapping done in Rasch analysis. Lastly, validity of the FF-EA and the FF-PA was evaluated based on construct validity. It was hypothesized that scores on the FF-EA and the FF-PA would be significantly associated with mean percentage of falls, and hospital and emergency room transfers per setting and mean resident function and physical activity. Bivariate correlations were used to test these associations.

Results

The size of the settings ranged from 8 to 265 beds, with an average size of 55 (SD = 46) beds. The majority of the settings were single settings (n=76, 72%), 22 (21%) were chains (more than one setting with the same owner) and the remaining 8 (7%) were within continuing care retirement communities. As shown in Table 1, overall the mean score for the FF-EA was 13.09 (SD=1.86) and for the FF-PA was 5.42 (SD=4.40). The frequencies for each item on the FF-EA and the FF-PA are provided in Tables 2 and 3. The mean scores for number of falls per setting was 10.48 (SD=16.28), hospital admissions was 2.23 (SD=3.69), emergency room visits was 1.84 (SD=3.22), function based on the Barthel Index was 62.43 (SD=7.76) and overall counts of activity were 293,000 counts (SD=170,446). The mean percentage of falls per setting (i.e., number of falls per number of residents) was 21% (SD=24), mean percentage of hospitalizations was 6% (SD=9) and mean percentage of emergency room visits was 5% (SD=9).

There was evidence of item reliability of the FF-EA with an item separation of 3.47 and item reliability of 0.92. Likewise there was evidence of item reliability of the FF-PA with an item separation of 2.89 and item reliability of 0.89. Item kappa statistics are shown in Tables 2 and 3. For the FF-EA the individual item kappas ranged from 0 to .73 and the overall total measure kappa was .40. For the FF-PA the individual item kappas ranged from 0 to .77 and the overall total measure kappa was .48. The percent agreement for the FF-EA was 85% and it was 82% for the FF-PA.

INFIT and OUTFIT statistics for both measures are shown in Tables 2 and 3. The INFIT statistics for the FF-EA were all in the acceptable range of 0.4 to 1.6. The OUTFIT statistics for item 8, evaluating bed height, was high at 2.99 and the OUTFIT statistic for item 1,

evaluating for evidence of an area for walking that is clear of clutter, was low at 0.18. Item mapping showed that the least likely item to be endorsed/present in the settings was item 5, evidence of cues in the environment to encourage physical activity. The next more likely item to be endorsed or present in the setting was item 11, access to age appropriate exercise equipment. Item 10, which focused on evidence of cues in the environment to encourage functional activity, was the next most likely item to note being present. Item 6, which evaluated evidence of supplies to encourage function and physical activity, was the next most likely item to be endorsed. The next two items most likely to be endorsed were 8, which focused on bed height, and item 3 which evaluated the setting for areas for walking that were pleasant. The next two items identified as most likely to be endorsed were item 7 which was focused on chair height and item 16 which evaluated the setting for evidence of residents having unsafe footwear. The next item most likely to be endorsed was item 14 which focused on whether or not the setting had uneven surfaces. The next three items were equally likely to be endorsed: item 9 focused on toilet height; item 2 which evaluated the setting for evidence of areas for walking that have rest spots; and item 4 which evaluated the setting for evidence of pleasant destination areas. The next most likely item to endorse was item 15, which evaluated the setting for evidence of areas that might cause a trip. Following this the next item most likely to be endorsed was item 12 which evaluated the setting for evidence of poor lighting. The item most likely among all the items to be endorsed was item 13 which evaluated whether or not slippery floors were present. There were 22 facilities (21% of the total 106 participating facilities) that were so high in having environments that support function and physical activity that they could not be well differentiated. There were no facilities that were so low in support for function and physical activity in their environments that they could not be differentiated by the current measure.

The INFIT and OUTFIT statistics for the FF-PA were all within the acceptable range of 0.4 to 1.6. The least likely item for settings to endorse was evidence of having policies associated with discharge instructions that facilitate function and physical activity. The next most likely item to endorse was item 15, evidence of a policy associated with patient/family information that optimizes function and physical activity. The next most likely item to endorse was item 7, evidence of a policy associated with optimizing function and physical activity when residents transfer into the setting. The next most likely item to endorse was item 13 evidence of a policy associated with evaluation of nursing competencies to address function and physical activity of residents. The next most likely item to endorse was item 12, evidence of a policy associated with change in resident condition that addresses and optimizes function and physical activity. Following this item the next most likely item to endorse was item 5, evidence of a policy associated with transportation (e.g., going to the dining room) that optimizes function and physical activity. The next most likely item to endorse was item 11, evidence of a policy associated with nursing assessment that addresses and optimizes function and physical activity. The next two items most likely to be endorsed were item 14, evidence of a policy associated with documentation of function and physical activity and item 2, evidence of a policy regarding foley catheters that optimizes function and physical activity. The next most likely item to be endorsed was item 9, evidence of a policy associated with pressure ulcer prevention that optimizes function and physical activity. Following item 9, the next most likely item to endorse was item 3, evidence of a

policy related to use of free space that optimizes function and physical activity, then item 4, evidence of a policy around ambulation that optimizes function and physical activity. The next two items that were equally likely to be endorsed were item 6, evidence of a policy associated with bed/chair or toilet height that optimizes function and physical activity and item 10, evidence of a policy associated with falls prevention that optimizes function and physical activity. The item most likely to be endorsed was item 1, evidence of a policy regarding physical restraints that optimizes function and physical activity. There were eight facilities (8%) that were so high in having policies that optimize function and physical activity they could not be differentiated and there were 38 (36%) that were so low they could not be differentiated.

Correlations between the FF-EA and the FF-PA and setting outcomes are shown in Table 4. The scores on the FF-EA were not significantly associated with falls, function or physical activity. FF-PA was associated with the mean percentage of falls ($r = -.28$, $p = .01$), hospitalizations ($r = -.22$, $p = .04$) and emergency room visits ($r = -.25$, $p = .03$) such that facilities with more policies that supported function and physical activity had fewer falls, transfers to the emergency room or hospitalizations.

Discussion

The findings from this study provide some evidence for the reliability and validity of the FF-EA and the FF-PA. Specifically, there was evidence of internal consistency and evidence for interrater reliability based on acceptable percent agreement scores and weak to moderate support based on kappa statistics. The percent agreement statistic is easily calculated and directly interpretable. The major limitation of the percent agreement calculation is that it does not account for guessing on responses and may therefore result in an over estimation of interrater reliability (McHugh, 2012). Conversely, kappa has been noted to underestimate interrater reliability (Strijbos, Martens, Prins & Jochems, 2006). Although there was some evidence of interrater reliability, based on feedback from evaluators it would be helpful to include a guide for completion of the measures with examples of what would be sufficient evidence of the item being present for each item on the FF-EA and FF-PA. In addition, the use of a Likert scale rather than using “present” or “not present” options should be considered as it would allow for variations in the degree to which an area was met. For example, there should be an option for all, most, some or none of the residents to wear sensible shoes rather than all having to wear sensible shoes to be able to endorse this item as being present.

With regard to validity, there was evidence that the items fit the concept of interest with the exception of a high OUTFIT statistic for one item, item 8 (evidence of bed height being appropriate). A lack of fit for OUTFIT statistics are less of a concern than lack of fit for INFIT statistics as OUTFIT statistics reflect results far from the individuals' ability level. It is possible that individuals doing the evaluation were not sure about the fit of the bed for each resident. Given the importance of bed, chair and toilet height in terms of optimizing function and physical activity we would recommend keeping the item and working with staff to improve assessment of this area. It may be necessary to evaluate bed height for each resident and establish a setting specific score (i.e., majority being appropriate height for the

individual). The assessment for chair, bed or toilet height could be done easily by having the evaluator determine if the resident can place his or her feet on the floor when sitting comfortably at 90 degrees.

There were 22 (approximately 20%) settings that were so high in having an environment that supported function and physical activity that they could not be differentiated. Further, in all but four of the items the majority of the settings indicated that the item was present or not present. Although there is little variance in these items, we recommend keeping these items as the items reflect clinically relevant factors known to facilitate function and physical activity among residents (e.g., having a clear pathway for walking). More challenging items, however, could be added to the measure to help differentiate these settings. Additional items might include access to pleasant outdoor areas for walking; and having rest areas for outside walking. Conversely, the policy measure had 38 facilities (36%) that scored so low in policy related to optimizing function and physical activity that they could not be differentiated. Easier items are needed to help differentiate these facilities. Examples of easier items might include policies around service plans that address ways to optimize function and physical activity; policies related to mealtimes that focus on optimizing function and physical activity; and policies that focus on engaging residents in activities.

Construct validity was not supported based on a lack of a significant relationship between the FF-EA and falls, hospitalizations, emergency room visits or function and physical activity among residents in the setting. The FF-PA was only associated with falls, hospitalizations and emergency room visits. Although it is possible that the lack of significant associations between the FF-EA, falls, hospitalizations and emergency room visits, function or physical activity indicates a lack of validity in the FF-EA, it is also possible that findings were due to the fact that there were relatively few hospitalizations and emergency rooms visits; function was based on verbal report and may have focused on what the nursing assistants do for the residents versus what they are able to do for themselves; and actigraphy data was missing in 57 (24%) of the sample due to individuals refusing to wear the Motionwatch 8; correlations were only done with a small sample of 26 sites that provided resident data; and it is possible that many other factors (e.g., such as cognitive status, provider practice and resident and family requests) may have influenced outcomes. Future research should test the validity of these measures using a larger sample with covariates considered.

From a practical perspective, the evaluators indicated that the measures were easy to complete based on direct observation of the environment or assessment of the policies. The findings from the FF-EA and FF-PA have very practical implications as well. Clinically, these assessments have been used when implementing Function Focused Care approaches in long-term care settings to alter environments and policies to facilitate function and physical activity in residents. Following baseline assessment in studies testing the implementation of Function Focused Care in AL (Resnick, Galik & Vigne, 2014; Resnick, et al., in press) the findings from the assessment are used by the nurse interventionists to help facilities alter their policies and environments to facilitate function and physical activity of the residents. For example, if it is noted that there are no rest areas along outside walking paths or long indoor hallways, the nurse interventionist works with the administrative staff in the setting to

obtain benches or chairs to place in these locations. The findings can also be used to improve the safety of the residents by altering the policies and/or environment with regards to fall prevention. If there are slippery areas or if residents are noted to have unsafe footwear, interventions can be implemented such as changes in housekeeping activities or getting all residents non-skid socks. These measures can also be used to evaluate if there are improvements over time in environments and policies in long-term care settings that support and encourage function and physical activity of residents.

Conclusion and Study Limitations

This study was limited as it included AL settings across only three states and obtained resident data on function and physical activity from only a small number of the settings. The data on function was based on reports from staff that had worked with the resident on the day of testing and thus may have been biased. The falls, hospitalizations, and emergency room data was also obtained from staff versus claims data and thus may not have captured all of these events. Despite these limitations, the findings from this study provide some support for the reliability and validity of the FF-EA and the FF-PA. Currently there are no other measures to evaluate these factors for long-term care settings. Future use of the measures should consider adding the recommended additional items to differentiate those high in environments that optimize function and physical activity and those particularly low in evidence of policies that optimize function and physical activity. Establishing reliable and valid measures will guide the implementation of interventions that can improve AL environments and policies so that residents are able to optimize their function and physical activity.

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Table 1

Descriptive Findings for Setting Outcomes

Measure	N (number missing)	Total Score Range	Mean	Std. Deviation
Environment Assessment	106 (0)	7–16	13.09	1.86
Policy Assessment	106(0)	0–15	5.42	4.40
Barthel Index	233(9)	51–75	62.4348	7.76
MotionWatch 8 Counts	185(57)	11911–685142	293000	170446
Total Falls	241(1)	0–83	10.4874	16.38
Percent Falls		0–93	21.00	24.00
Total Hospitalizations	241(1)	0–23	2.2385	3.69
Percent Hospitalizations		0–48	6.00	9.00
Total Emergency Visits	241(1)	0–21	1.8423	3.22
Percent Emergency Visits		0–50	5	9.00

Table 2

Function Focused Environment Assessment (N=106)

Item	N (%)	INFIT	OUTFIT	Mapping	Kappa
1.Evidence of area for walking that is clear of clutter		.74(–.50)	.18(–1.2)	10	0
Present	102 (96%)				
Not Present	4(4%)				
2. Evidence of area for walking that has rest spots available		.89(–.20)	1.09(.40)	8	0
Present	100(94%)				
Not Present	6(6%)				
3. Evidence of area for walking that is pleasant		.84(–.60)	.85(.01)	5	0
Present	97(92%)				
Not Present	9(8%)				
4. Evidence of pleasant destination areas		.89(–.20)	.39(–.70)	8	0
Present	100(94%)				
Not Present	6(6%)				
5. Evidence of cues in the environment to encourage physical activity		.87(–.70)	.60(–.90)	1	.10
Present	27(25%)				
Not Present	79(75%)				
6. Evidence of supplies (i.e., safe assistive devices) to encourage function and activity		.85(–1.4)	.77(–1.1)	4	.18
Present	74(70%)				
Not Present	32(30%)				
7. Chair height appropriate (Between 80 to 120% of lower leg length)		1.17(.70)	1.52(.90)	6	0
Present	78(93%)				
Not Present	8(7%)				
8. Bed height appropriate (Between 80 to 120% of lower leg length)		1.12(.50)	2.99(2.3)	5	0
Present	97(92%)				
Not Present	9(8%)				
9. Toilet height appropriate (Between 80 to 120% of lower leg length)		.95(–.10)	.72(–.10)	8	.50
Present	100(94%)				
Not Present	6(6%)				
10. Evidence of cues in the environment to encourage functional activity		.85(–1.4)	.96(–.10)	3	.61
Present	50(47%)				
Not Present	56(53%)				
11. Access to age appropriate exercise equipment		1.18(1.3)	1.59(1.8)	2	.73
Present	35 (33%)				
Not Present	71(67%)				
12. Evidence of poor lighting		1.10(.40)	1.51(.80)	11	.61
Present	103(97%)				
Not Present	3 (3%)				
13. Evidence of slippery floors		-	-	12	0
Present	0 (0%)				

Item	N (%)	INFIT	OUTFIT	Mapping	Kappa
Not Present	106 (100%)				
14. Evidence of uneven surfaces		1.08(.40)	1.28(.60)	7	0
Present	7(7%)				
Not Present	99(93%)				
15. Evidence of items that could cause a trip		.99(.10)	.71(−.10)	10	0
Present	4(4%)				
Not Present	102(96%)				
16. Evidence of unsafe footwear		1.19(.70)	1.55(.90)	6	0
Present	8(8%)				
Not Present	98(92%)				

Table 3

Function Focused Policy Assessment (N=106*)

Item	N(%)	INFIT	OUTFIT	Mapping	Kappa
1.Evidence of policy regarding physical restraints that optimizes function and physical activity.		1.32(2.3)	1.53(1.9)	13	0
Present	56 (53%)				
Not Present	49(47%)				
2. Evidence of policy regarding Foley catheters that optimizes function and physical activity.		1.30(2.6)	1.58(2.6)	8	0
Present	38(36%)				
Not Present	67(64%)				
3. Evidence of policy related to use of free space (corridors, kitchens) that optimizes function and physical activity.		.85(−1.5)	.71(−1.6)	10	.18
Present	46(44%)				
Not Present	59(56%)				
4. Evidence of policy around ambulation that optimizes function and physical activity.					
Present	50(47%)	.87(−1.2)	.84(−.80)	11	.55
Not Present	55(53%)				
5. Evidence of policy associated with transportation (e.g., to dining room; to trips) that optimizes function and physical activity.		.80(−1.9)	.66(−1.8)	6	.14
Present	35(33%)				
Not Present	70(67%)				
6. Evidence of policy associated with bed/chair/or toilet height that optimizes function and physical activity.		1.10(.90)	1.46(1.8)	12	0
Present	53(51%)				
Not Present	52(49%)				
7. Evidence of policy associated with transfers into the setting that optimizes function and physical activity.		1.03(.30)	.85(−.50)	3	.77
Present	28(27%)				
Not Present	77(63%)				
8. Evidence of policies associated with discharge instructions that facilitate function and physical activity.		.87(−.50)	1.32(.70)	1	0
Present	14(13%)				
Not Present	91(87%)				
9. Evidence of policy associated with pressure ulcer prevention that optimizes function and physical activity.		1.05(.50)	1.06(.40)	9	.21
Present	39(37%)				
Not Present	66(63%)				
10. Evidence of policy associated with falls prevention that optimizes function and physical activity.		.93(−.60)	.80(−.90)	12	0
Present	53(51%)				
Not Present	52(49%)				
11. Evidence of policy associated with nursing assessment that addresses and optimizes function and physical activity.		1.04(.40)	1.11(.60)	7	.10
Present	36(34%)				

Item	N(%)	INFIT	OUTFIT	Mapping	Kappa
Not Present	69(66%)				
12. Evidence of policy associated with change in patient condition that addresses and optimizes function and physical activity.		.92(–.60)	.88(–.40)	5	.10
Present	31(30%)				
Not Present	74(70%)				
13. Evidence of policy associated with evaluation of nursing competencies to address function and physical activity of patients.		.96(–.30)	.95(–.10)	4	.42
Present	29(28%)				
Not Present	76(73%)				
14. Evidence of policy associated with documentation of function and physical activity.		1.00(.01)	1.04(.30)	8	.31
Present	38(36%)				
Not Present	67(64%)				
15. Evidence of policy associated with patient/family information that optimizes function and physical activity.					
Present	24(23%)	.87(–.80)	.71(–.90)	2	.13
Not Present	81(77%)				

* There was missing data on one setting

Table 4

Correlations between Function Focused Environment Assessment and Function Focused Policy Assessment and Resident Outcomes

	N (missing)	1	2	3	4	5	6	7
1.Environment Assessment	106 (0)	1	.146	.069	-.043	.099	.078	.077
2. Policy Assessment	106(0)	.146	1	-.083	-.244	-.280 *	-.250 *	-.360 *
3. Barthel Index	233(9)	.069	-.083	1	.146	-.013	-.277	-.075
4. MotionWatch 8 Counts	185(57)	-.043	-.244	.146	1	.053	.100	-.100
5. Percent Falls	141(1)	.099	-.083	-.013	.053	1	.350 **	.333 **
6.Percent Hospitalizations	141(1)	.078	-.222 *	-.277	.100	.350 **	1	.739 **
7. Percent Emergency Visits	141(1)	.077	-.248 *	-.075	-.100	.333 **	.739 **	1

* significant at $p < .05$;

**
 $p < .001$