Research Report

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Perceived Neighborhood Walkability is Associated with Recent Falls in Urban Dwelling Older Adults

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ABSTRACT

Background and Purpose: In rural communities, perceptions of neighborhood walkability, the rating of how easy it is to walk in an area, influence engagement in physical activity outside the home. This has not been studied in older adults residing in urban settings. Additionally, it is not known how perceived walkability is associated with falls. Therefore, the purpose of this study was to first describe the perceptions of neighborhood walkability in urban-dwelling older adults based on recent fall history and then examine associations between recent falls and neighborhood walkability constructs after controlling for fall risk factors.

Methods: Urban-dwelling older adults (N = 132) 65 years and older without cognitive dysfunction or uncontrolled comorbidity completed a survey assessing health status, physical activity, and walkability using the Neighborhood Environment Walkability Scale-Abbreviated. Group assignment was based on recent fall history. Between-group comparisons of demographic and walkability constructs were completed using analysis of variance. Logistic regression was used to examine associations between walkability constructs and recent falls after controlling for covariates.

Results and Discussion: Poorer perception of land use was significantly associated with recent falls. Questions assessing the ease of walking to a store or transit stop may be valuable in understanding fall risk in older adults living in urban settings.

Conclusions: Perceptions of neighborhood walkability are lower in urban-dwelling older adults with a history of falling.

Key Words: accidental falls, neighborhood walkability, physical activity

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CLINICAL HIGHLIGHTS

- Urban-dwelling older adults may avoid walking outdoors if they perceive that walking in their neighborhood is too effortful or risky.
- Older adults with a recent fall perceive that it is difficult to safely and easily access public transit and stores from their homes.
- Neighborhood walkability, including the built environment, must be considered when prescribing walking as a mode of physical activity for older adults.
- To improve adherence to walking programs, therapists should provide information on specific local resources where it is safe to walk.

INTRODUCTION

Falls are the leading cause of injury-related morbidity and mortality among adults 65 years and older, and 1 in 4 older people falls each year.[1,2] The medical cost for fatal and nonfatal falls was estimated to be $50 billion, with Medicare recipients accounting for $28.9 billion of these costs.[2,3] Falls are influenced both by intrinsic risk factors such as strength, reaction time, sensation, age, poor vision, and chronic conditions and by extrinsic risk factors such as environmental surfaces, the lack of handrails or grab bars, improper assistive device use, and other external tripping hazards.[4-6]

Physical activity is a necessary component to a healthy lifestyle and reduces fall risk and incidence in older adults.[7-9] Intrapersonal and interpersonal factors contribute to engagement in physical activity.[7] For example, an older adult's perception of their health is recognized as a leading barrier to participating in physical activity.[10,11] In the United States, walking is the most commonly reported form of physical activity completed, with national estimates indicating that 42% of adults engage in leisure-time walking while 28% walk for transportation purposes.[12] The built environment of an area in which a person resides, such as their neighborhood, also influences engagement in physical activity with regard to whether safe and convenient outdoor

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spaces or resources are available for individuals to be physically active.[11]

Neighborhood walkability is the rating of how easy it is to walk in an area and is composed of a number of environmental and social factors including land use mix (the diversity of residential, commercial, and recreational buildings or businesses in a designated land area), street connectivity, residential density (how many people live in a designated area), the presence of walking or cycling facilities, crime, and safety.[13,14] Perceptions of neighborhood walkability influence participation in physical activity outside the home.[15,16] Some neighborhood walkability constructs such as residential density, land use mix, crime, and street connectivity have specifically been identified to influence decisions regarding engagement in outdoor physical activity.[17] For example, neighborhoods with adequate sidewalks or parks make it easier to engage in physical activity outside the home.[10] Additionally, living in a neighborhood with higher ratings of walkability translates into better health-related outcomes such as reduced obesity and decreased incidence of diabetes in adults.[10,11,17,18] However, walkability is influenced by socioeconomic factors, as higher walkability ratings are often found in high-income neighborhoods due to having better maintained outdoor conditions to facilitate walking.[18] In lower-income neighborhoods, older adults report that outdoor walking is more often performed for a designated purpose as a means of transportation (eg, walking from home to a store) and less often as a leisurely activity (eg, walking around the block).[12] This is especially important as outdoor walking is reportedly the most common form of physical activity for older adults.[15,19]

Unmaintained external environments such as the lack of resting places, high curbs, poor street conditions, dangerous crossroads, and the lack of pedestrian zones create barriers for physical activity and impact walkability.[20] For older adults, locations that lack safe street connectivity minimize opportunities to walk to grocery stores or shopping malls and have resulted in increased reports of loneliness and depression.[20] These environmental barriers may also prohibit participation in outdoor physical activity, contributing to an increased likelihood that older adults remain inside, thus impacting opportunities to meet national physical activity guidelines.[20]

Environmental hazards also contribute to falls, specifically outdoor falls while walking.[19] Uneven walking surfaces such as broken sidewalks or brick paving and the presence of curves or slopes in the landscape increase older adults' fear of falling.[19] Additionally, older adults reportedly feel unsafe when walking outside if others are using the sidewalk for recreation (eg, cyclists or skateboarders).[19,21] Collectively, these external factors, which comprise some walkability constructs, may contribute to engagement in outdoor physical activity and, potentially contribute to falls.

The relationship between neighborhood walkability and its influence on health became a national public health issue in so much that assessing the walkability of communities was highlighted by the United States Surgeon General in 2015. At that time, a report, *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities,* was created with the goal of developing a culture that supports walking for all Americans.[22,23] Furthermore, other walking campaigns and programs have been created and promoted at the national level through groups like the Centers for Disease Control through the *Active People, Healthy Nation* initiative and the *America Walks* program, the Arthritis Foundation (*Walk With Ease* program), and through the *Every Body Walk! Collaborative*, which includes over 100 participating organizations including the American Association of Retired Persons (AARP), which encourage walking as a safe form of physical activity at any age.[24-26] For health care professionals, specifically physical therapists who prescribe exercise as a part of healthy living, programs such as *Exercise is Medicine*® from the American College of Sports Medicine (ACSM) recommend that prescriptions for physical activity be written and information on available local resources and/or support systems be provided to increase compliance and adherence to the recommendations.[27]

Walkable communities and their impact on health became relevant for the physical therapy profession as a result of 2 motions passed at the 2016 meeting of the House of Delegates (HOD) of the American Physical Therapy Association (APTA).[28,29] Of the original two motions, one motion, *Association's role in advocacy for prevention, wellness, fitness, health promotion, and management of disease and disability* HOD P06-16-05-06, drew attention to APTA's role while the other motion, *Physical therapists' role in prevention, wellness, fitness, health promotion, and management of disease and disability* HOD P06-16-06-05, highlighted the roles of physical therapists in advocating for prevention, wellness, fitness, health promotion, and management of disease and disability.[28,29] To promote safe physical activity and active forms of transportation for individuals and populations of all ages and abilities, both motions included language describing the role of the association or physical therapists in identifying how the built environment, or neighborhood, influences physical activity. These motions have facilitated deeper consideration as to how physical therapist practice should consider the larger context of the built environment in which we live, work, and exercise, to address the APTA's vision statement of "Transforming society by optimizing movement to improve the human experience."[30] Although many physical therapists may not be acutely involved in community design, walking is often recommended by physical therapists as a mode of physical activity within a structured exercise program. Therefore, understanding how the built environment influences engagement in physical activity and/or contributes to injury is of importance to maintaining the health and well-being of therapists' patients and clients.

Considering that the built environment is an external risk factor for falls, assessing relationships between falls and perceptions of walkability is needed in urban-dwelling older adults. Beyond public health campaigns created to

promote walking as a mode of physical activity, physical therapists play an integral role in recommending and prescribing walking as part of a healthy lifestyle. To increase physical activity, an older adult may be encouraged by his/her therapist to begin a walking program, and if the walkability of the environment is not considered, the older adult may not initiate this health-promoting activity. Studies indicate that although components of walkable communities, such as street design, encourage walking, more research is needed to understand older adults' perceptions of walking as a mode of physical activity and specifically for those who have chosen to age in place in urban settings where resources for changing the built environment may be limited.[31] Therefore, the purpose of this study was to first describe the perceptions of neighborhood walkability of urban-dwelling older adults based on recent fall history and then examine associations between falls and neighborhood walkability constructs after controlling for fall risk factors. We expect that perceptions of neighborhood walkability will be significantly lower in older adults with a recent fall history.

METHODS

Design

Older adults (≥65 years) who lived in or around Flint, Michigan, were recruited to participate. This location was chosen due to its proximity to the research team. Recruitment occurred at 2 medically underinsured health clinics via flyers posted in the clinic. Participants were first screened with inclusion and exclusion criteria and then were taken into a quiet room at the clinic to complete a paper survey. Participants were included if they were 65 years or older, lived in the Flint area in either a home or apartment, were able to walk with or without an assistive device, were able to communicate in English, and received medical services at the health clinic. Those who lived in assistive living facilities, nursing homes, or other environments where medical care was provided were excluded from participating. In addition, those who were unable to achieve a score greater than 4 on the Mini-Cog,[16] had a serious illness requiring medical care, or had a medically uncontrolled comorbidity that would impact participant recall or their ability to engage in physical activity outside the home such as end-stage renal disease, late-stage cancer, congestive heart failure, uncontrolled diabetes, respiratory disease requiring the use of supplemental oxygen, or were diagnosed with Alzheimer's disease or another progressive cognitive impairment were excluded from the study.[32-34] Comorbidity information was gathered by self-report and confirmed through the electronic health record at the health clinic. If necessary, consultation with the medical provider was completed to clarify whether the participant's comorbidity was considered uncontrolled. All participants provided written informed consent. This study was approved by the Institutional Review Board at the University of Michigan. To meet inclusion criteria, the Mini-Cog© was used to screen for the presence of cognitive impairment and includes a 3-item recall and the clock drawing test.[32,33] The Mini-Cog© was chosen because it is a quick screening tool used to detect mild deficits in cognitive function of which performance is less biased by low education and literacy as compared with other measures of cognition.[32]

Demographic data gathered included fall history in the 4 weeks prior to the survey (yes/no), assistive device use (yes/no), and height and weight (via self-report) to calculate body mass index (BMI) (kg/m^2). General health information obtained in the survey included the presence of sensory impairments (vision problems or numbness in the feet [yes/no]) and medication use (taking >3 medications per day [yes/no]). Physical activity was measured through 2 questions. The first question assessed whether participants exercised at least 30 minutes per day on most days of the week (yes/no). The second question assessed whether the participant had completed moderate-level physical activity in the 6 months prior to the study.[35] The Veterans RAND-12 (VR-12) was completed to assess the extent that health limited physical ability.[35]

The Neighborhood Environment Walkability Scale-Abbreviated (NEWS-A) assessed perceptions of neighborhood walkability. The NEWS-A is composed of 6 subscales of which 5 subscales were used in this study; the aesthetics subscale was not included.[36] The walkability constructs measured were land use mix, street connectivity, walking/cycling facilities, pedestrian/traffic safety, and crime safety. NEWS-A has moderate to high test-retest reliability with established factorial and criterion validity.[36-39] Items used by the subscale are found in Table 1. A 4-point Likert scale was used to answer NEWS-A items, with a rating of 1 being "strongly disagree" to 4 being "strongly agree." Each subscale was composed of several items and average scores (mean, standard deviation) were calculated for each group accordingly.[36] The land use mix subscale included 6 items; reverse coding was used on the items concerning hilly streets and canyons/hillsides. The street connectivity subscale included 3 items. Five items were each included in the walking/cycling facilities and the pedestrian/traffic safety subscales. Four items were used in the crime safety subscale with reverse coding completed on items concerning high crime rate, feeling unsafe during the day, and feeling unsafe at night.[38,40]

Fall incidence (yes/no) was measured with one question that asked whether participants had fallen in the 4 weeks prior to the survey and were coded as 1 = falls, 0 = no falls. A fall was defined as an event that resulted in the person coming to rest inadvertently on the ground or floor or other lower level.[42]

Analysis

Group assignment was by fall history and participants were assigned to either the recent fall group or no-fall group. Based on previous research using the NEWS-A tool, a sample size of 51 was needed per group to power the study at 80%. Demographics were described for each group using measures of central tendency (mean, standard deviation, or frequency). Between-group comparisons were completed using analysis of variance (ANOVA) for continuous variables or χ^2 for categorical variables. Effect sizes were

Table 1. Neighborhood Environment Walkability Scale-Abbreviated Subscales and Items

NEWS-A Subscale	Survey Items Used
Land use mix	I can do most of my shopping at local stores.
	Stores are within easy walking distance of my home.
	There are many places to go within easy walking distance from my home.
	It is easy to walk to a transit stop (bus, train) from my home.
	The streets in my neighborhood are hilly, making my neighborhood difficult to walk in.
	There are many canyons/hillsides in my neighborhood that limit the number of routes for getting from place to place.
Street connectivity	The distance between intersections in my neighborhood is usually short (≤100 y; the length of a football field or less).
	There are many 4-way intersections in my neighborhood.
	There are many alternative routes for getting from place to place in my neighborhood (I don't have to go the same way every time).
Walking/cycling facilities	There are sidewalks on most of the streets in my neighborhood.
	The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks).
	There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to.
	Sidewalks are separated from the road/traffic in my neighborhood by parked cars.
	There is a grass/dirt strip that separates the streets from the sidewalks in my neighborhood.
Pedestrian/traffic safety	There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood.
	There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighborhood.
	There are crosswalks and pedestrian signals to help walkers cross busy streets in my neighborhood.
	The crosswalks in my neighborhood help walkers feel safe crossing busy streets.
	When walking in my neighborhood, there are a lot of exhaust fumes (such as from cars and buses).
Crime safety	My neighborhood streets are well lit at night.
	There is high crime rate in my neighborhood.
	The crime rate in my neighborhood makes in unsafe to go on walks during the day.
	The crime rate in my neighborhood makes it unsafe to go on walks at night.

Abbreviation: NEWS-A, Neighborhood Environment Walkability Scale-Abbreviated.

calculated using Cohen's *d* and values may be interpreted as small (0.2), medium (0.5), or large (≥0.8) effects.[43,44] Perceptions of neighborhood walkability by group were first compared for each subscale using ANOVA. Then, for walkability constructs that differed by group, comparisons of each individual subscale item were completed using ANOVA. Logistic regression analyses were performed to examine associations between neighborhood walkability constructs and falls. The outcome variable was recent falls (coded as 1 = recent falls, 0 = no falls). Covariates controlled for in regression modeling included variables previously reported to be associated with falls: age, physical activity, vision impairment, medications, and BMI. All data were analyzed using Statistical Package for the Social Sciences version 26 (IBM Corp, Armonk, New York). Significance was set at $P < .05$.

RESULTS

A total of 132 surveys were completed with 45.4% reporting falling one or more times in the 4 weeks prior to the survey and thus were assigned to the recent fall group. Those who fell had a higher BMI (μ = 33.57 kg/m^2, SD = 8.86) ($P < .001$) and were mostly female (73.30%) ($P = .050$). Recent fall group participants had greater reports of vision problems (61.70%), numbness in feet (58.60%), polypharmacy (86.40%), and assistive device use (38.30%) ($P < .009$). Groups did not differ in age, gender, ethnicity, marital status, or education. From the VR-12, overall health significantly limited all activities such as lifting, bending, climbing stairs, and walking in the recent fall group ($P < .005$) with the exception of bathing and dressing where groups were not significantly different. Engagement in physical activity was not significantly different between groups in either completion of moderate-intensity physical activity or exercising at least 30 minutes/day. Complete demographic and health-related information of participants can be found in Table 2.

Of the 5 walkability constructs, land use mix was the only one that was significantly different between groups (Cohen's $d = 0.45$, $P = .012$), with participants in the recent fall group generally having a lower perceived rating (μ = 2.54, SD = 0.65) than the no-fall group (μ = 2.84, SD = 0.68) (Table 3). When individual items in the land use mix subscale were assessed, only 2 items differed between the groups. Those in

Table 2. Demographic, Physical Activity, and Health-Related Variables[a]

Variable	Recent Fall Group (n = 60)	No-Fall Group (n = 72)	*P* Value
Age, mean (SD), y	69.65 (4.64)	69.83 (5.33)	.835
Gender, female	73.30%	56.90%	.050
Ethnicity, African American	61.70%	80.60%	.121
Marital status			
Married	21.70%	19.70%	.938
Divorced or separated	36.60%	43.60%	
Education level, beyond high school	41.70%	44.40%	.932
BMI, mean (SD), kg/m^2	33.57 (8.86)	27.94 (5.41)	*<.001*
Health-related variables			
Vision problems	61.70%	59.70%	*.004*
Numbness in feet	58.60%	29.20%	*.001*
Medications, >3/d	86.40%	66.70%	*.009*
Assistive device use	38.30%	14.90%	*.006*
Physical activity			
Participate in Moderate-intensity physical activity in the past 6 mo	20.70%	34.70%	.105
Exercise at least 30 min/d	45.00%	43.70%	.879
Health-limited activities			
Bathing/dressing	31.70%	24.30%	.245
Lifting/carrying groceries	66.70%	49.30%	*.005*
Climbing 1 flight of stairs	76.70%	51.40%	*<.001*
Climbing several flights of stairs	79.70%	58.60%	*<.001*
Bending, kneeling, stooping	81.70%	56.30%	*<.001*
Walking 1 block	72.90%	46.50%	*.002*
Walking several blocks	80.00%	59.40%	*<.000*
Walking more than a mile	83.30%	63.80%	*<.001*

Abbreviations: BMI, body mass index; SD, standard deviation.
[a]Values shown are mean (SD) or percent.

the recent fall group more strongly agreed that transit stops for busses or trains were not as easy to walk to from their homes ($\mu = 2.73$, SD = 1.30) versus the no-fall group ($\mu = 2.12$, SD = 1.21) (Cohen's $d = 0.48$, $P < .050$). Also, recent fall group participants disagreed more that stores were within easy walking distance of their homes ($\mu = 1.70$, SD = 0.93) compared with no-fall group participants ($\mu = 2.15$, SD = 1.25) (Cohen's $d = 0.27$, $P < .050$).

Although other NEWS-A constructs were rated lower by the recent fall group—street connectivity ($\mu = 2.59$, SD = 0.82, Cohen's $d = 0.18$), pedestrian/traffic safety ($\mu = 2.51$, SD = 0.73, Cohen's $d = 0.21$)—groups were not statistically different ($P > .050$). Similarly, groups did not differ in perceptions of the availability of walking/cycling facilities (recent fall group: $\mu = 2.52$, SD = 0.82; no-fall group: $\mu = 2.47$, SD = 0.80, Cohen's $d = 0.06$, $P > .05$)

Table 3. Neighborhood Walkability Subscale-Abbreviated Scores in the Recent Fall (n = 60) and No Fall Groups (n = 72)[a]

Category	Recent Fall Group (n = 60)	No-Fall Group (n = 72)	*P* Value	95% Confidence Interval	Effect Size
Land use mix	2.54 (0.65)	2.84 (0.68)	*.012*	−0.53, −0.06	0.45
Street connectivity	2.59 (0.82)	2.74 (0.87)	.323	−0.44, 0.15	0.18
Walking/cycling facilities	2.52 (0.82)	2.47 (0.80)	.740	−0.24, 0.33	0.06
Pedestrian/traffic safety	2.51 (0.73)	2.66 (0.69)	.221	−0.40, 0.09	0.21
Crime safety	2.73 (0.98)	2.63 (0.91)	.544	−0.23, 0.43	0.11

[a]Values shown are mean (SD).

Table 4. Associations Between Walkability Constructs and Recent Falls in Urban-Dwelling Older Adults After Controlling for Age, Physical Activity, Vision Impairment, Medications, and Body Mass Index

	Walkability Construct	β	Regression Coefficient (SE)	Odds Ratio	95% CI	*P* Value
Model 1	Land use mix	−0.60	0.30	0.55	0.30, 1.00	*.048*
	Model p value < .005. Nagelkerke R^2 = 0.26. Model correctly identified older adults with or without falls at 70.4%.					
Model 2	Street connectivity	−0.42	0.24	0.66	0.41, 1.05	.081
	Model p value < .005. Nagelkerke R^2 = 0.27. Model correctly identified older adults with or without falls at 70.3%.					
Model 3	Walking/cycling facilities	−0.06	0.25	0.94	0.58, 1.52	.796
	Model p value < .005. Nagelkerke R^2 = 0.26. Model correctly identified older adults with or without falls at 70.4%.					
Model 4	Pedestrian/traffic safety	−0.16	0.29	0.86	0.49, 1.51	.594
	Model p value < .005. Nagelkerke R^2 = 0.25. Model correctly identified older adults with or without falls at 68.0%.					
Model 5	Crime safety	0.16	0.22	1.17	0.76, 1.80	.468
	Model p value < .005. Nagelkerke R^2 = 0.23. Model correctly identified older adults with or without falls at 70.7%.					

Abbreviations: CI, confidence interval; SE, standard error.

or crime (recent fall group: $\mu = 2.73$, SD = 0.98; no-fall group: $\mu = 2.63$, SD = 0.91, Cohen's $d = 0.11$, $P > .05$).

Logistic regression analyses revealed that, after controlling for age, physical activity, vision impairment, medications, and BMI, land use mix was the only neighborhood walkability construct significantly associated with recent falls ($\beta = -0.60$, odds ratio [OR] = 0.55, $P = .048$) (Table 4). Land use mix questions addressed the ease of walking to and the proximity of stores or transit stops from their homes. The inverse relationship indicates that as perceptions of land use mix decrease, falls increase. More specifically, as it became more difficult to walk to a bus or transit stop or store, the likelihood for falling increased.

After controlling for covariates, other neighborhood walkability constructs were not significantly associated with recent falls: street connectivity ($\beta = -0.42$, OR = 0.66, $P = .081$), walking/cycling facilities ($\beta = -0.60$, OR = 0.94, $P = .796$), pedestrian/traffic safety ($\beta = -0.16$, OR = 0.86, $P = .594$), and crime safety ($\beta = -0.16$, OR = 1.17, $P = .468$).

DISCUSSION

Neighborhood walkability influences engagement in physical activity outside the home and, subsequently, overall health.[14,17] Although walking has been encouraged as a mode of physical activity at national and community levels, studies describing urban-dwelling older adults' perceptions of walkability are lacking.[31] As physical therapists often prescribe walking as part of an exercise program, our results suggest that therapists should ask older adults living in urban settings about the walkability of the neighborhood or locations in which they live. Specifically, older adults with a recent fall history should be asked about their perceptions of whether it is easy to walk to a local transit stop and their perceived ease of walking to stores, as greater reported difficulty in performing either of these tasks was significantly associated with falls after controlling for covariates.

The perception of how land is used in a community, land use mix, was the only walkability construct significantly different between groups. On average, participants in the recent fall group indicated that it was not easy to walk to transit stops and that stores were not within easy walking distance of their homes. The availability and proximity of these community resources are important to assess when considering community walkability, particularly for those who walk outdoors as a mode of transportation. Previously, studies reporting associations between land use mix ratings and engagement in physical activity have identified that the lack of access to stores within one's environment is a barrier to engaging in physical activity.[17,21,45] However, in this study, participation in physical activity did not differ between groups suggesting that the built environment as reflected in the perceived ease of walking to community or transit resources should be considered when managing fall risk in urban-dwelling older adults.

Previous studies have reported that crime influences engagement in physical activity as well as neighborhood walkability, yet in this study perceptions of crime and safety were not different between groups and neither were associated with falls.[46,47] However, despite having no differences in physical activity completion between groups, other factors, which increase falls risk like numbness in feet, use of multiple medications, and vision problems, were significantly different between groups. Collectively, these data suggest that some intrinsic fall risk factors and not the walkability constructs of safety or crime are more likely to be associated with falls in older adults who reside in urban settings; however, further study is indicated.

Body mass index is significantly associated with perceptions of neighborhood walkability, especially in older adults in low-income neighborhoods.[12,18] Higher BMI is also associated with lower physical activity and increased fall incidence.[48-50] In this study, BMI was included in regression modeling as a covariate so that relationships between the walkability constructs and falls could be examined in

light of the reported associations of BMI and falls/physical activity. Regression analyses revealed BMI was consistently significantly associated with falls in each of the models, and often to a greater extent than the walkability constructs. These data suggest that, although perceptions of the built environment are associated with falls, general characteristics of health, like BMI and physical activity, should continue to be given appropriate attention when addressing fall risk management in this population.

This study is limited in that data are from one geographical region, which may have influenced participants' health, wellness, and willingness to participate in the survey. Some survey items were double-barreled questions where 2 concepts were asked in one question and it is unclear whether responses were made based on one or both parts of a question. For Likert items, a "neutral" or "choose not to answer" option was not available. Additionally, some questions on the survey may have been misinterpreted due to low literacy levels. The recent fall group was defined by not having a fall within the 4 weeks prior to the survey, which limits comparisons between this population and other studies, which include those with a history of falling as some participants may actually be fallers, but may not have fallen in the 4-week period. Additionally, falls may have been underreported or not remembered by participants and therefore future studies should include using a prospective fall diary to track falls over 12 months.[41] Physical activity data were gathered by self-report and may be under- or overreported. Not all the NEWS-A subscales were used; therefore, scores are not comparable to studies that have used all subscales. The NEWS-A tool measures neighborhood walkability and participants were not asked about their perceptions of completing walking activities that may have occurred outside of their neighborhood (ie, mall walking).

To have more accurate reporting of physical activity, future studies should include performance measures of mobility (eg, gait speed) and physical activity (eg, accelerometry) as well as use geo-mapping of the distance between home/store or home/transit stop to further understand relationships between neighborhood walkability, physical activity, and falls in older adults.

Consistent with the movement generated within the profession of physical therapy to consider how items like the built environment influence individual and community health, we provide suggestions for how results of this study might be used at the level of the patient or client interaction and at the level of the community within advocacy roles to improve community health. First, this study provides evidence that older adults' perceptions of walkability should be considered when walking is suggested as a mode of physical activity. Second, neighborhood walkability should be considered as a part of the management of fall risk for older adults living in urban settings and providers should ask questions about how easy the patient/client believes it would be to walk to a store or transit stop from their residence. If the patient indicates that it is difficult to walk to either of those locations, education about preventing falls should be provided, as results indicated that when it was difficult to walk to either of those 2 locations, risk for falling increased.[5] Further, when walking is included as part of a structured exercise program, physical therapists should discuss any environmental barriers that may prevent older adults from walking in their neighborhood.[27,51] Recommendations on how to avoid those barriers within the neighborhood and information about locations and/or groups within the community that promote safe opportunities for walking (eg, indoor malls, schools, parks, or programs) should be provided.[6,45] Lastly, therapists working in community or home-based settings might consider using information from various web-based walkability indexes, like Walk Score,[52] to become familiar with the walkability rating of the city or neighborhood in which their patient resides. Having this information can guide therapists to prescribe the best mode of physical activity for their patients or clients and may improve the adoption of walking as a regular form of physical activity by older adults when prescribed by a physical therapist.[27]

As a method of addressing the APTA's vision of "transforming society," physical therapists can also play a key role in improving health within a community through changes within the built environment by advocating for more walkable communities. For example, this could be something simple like communicating to city or municipality leadership about providing adequate lighting or crosswalks where needed to safely cross a street. Or therapists could participate in a larger advocacy effort to facilitate the development of walking paths or trails like those represented in the *Every Body Walk! Collaborative*.[25] At either the individual or community level, physical therapists have a unique opportunity to improve older adults' health by prescribing a walking program, and consideration of the walkability of the community is necessary for adherence to the program.

CONCLUSIONS

Our findings indicate that walkability, specifically land use mix, is significantly associated with falls in urban-dwelling older adults. Consistent with recommendations from the US Surgeon General and organizations like the Centers for Disease Control and Prevention and the AARP, we recommend that physical therapists ask questions about walkability, including questions about the proximity and ease of walking to stores or transit stops for older adults with a fall history. Our recommendations to improve adherence to a walking program parallel those of the ACSM of providing information on specific local resources where it is safe to walk, and we suggest that walkability, including the built environment, be considered when physical therapists prescribe walking as a mode of physical activity for older adults.

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