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Original Article

Fall prevention among older adults in KSA: Role of physical therapy

Ghadah M. Algudairi, EHHA [1] and Abeer M. Alrashed, PhD *

Department of Health Administration, College of Business Administration, King Saud University, Riyadh, KSA

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الملخص

أهداف البحث: يمثل السقوط والإصابات المرتبطة به بين كبار السن مشكلة صحية عامة متزايدة. وبالرغم من تعدد العوامل والأمراض المصاحبة المرتبطة بالسقوط، إلا أن اضطرابات التوازن والمشي تعد من أكثر الأسباب شيوعا. يتمتع أخصائيو العلاج الطبيعي بخبرة جيدة في مجال تقييم وإدارة مخاطر السقوط. هدفت هذه الدراسة إلى تقييم الخدمات المقدمة من العلاج الطبيعي للوقاية من سقوط كبار السن.

طرق البحث: خلال شهري نوفمبر وديسمبر 2021، تم مشاركة استبيان إلكتروني مع أخصائيي العلاج الطبيعي العاملين في مناطق مختلفة في المملكة العربية السعودية. شمل الاستبيان الخصائص الديموغرافية والمهنية، والمعرفة بعوامل الخطر والممارسات تجاه الوقاية من السقوط لدى كبار السن، وخدمات الوقاية في القسم، والعوائق التي تحول دون الوقاية من السقوط.

النتائج: شملت الدراسة 289 معالجا. كانت أهم عوامل خطر السقوط المعروفة هي اضطرابات التوازن والمشي، وضعف الإدراك، والعجز الحسي والإدراكي، والمخاطر البيئية. وكانت الممارسات الأكثر شيوعا هي السؤال عن تاريخ السقوط، وتحديد عوامل خطر السقوط، وتثقيف المرضى حول استراتيجيات الوقاية. وكانت أكثر خدمات الوقاية التي يقدمها القسم شيوعا هي تدريب المشي، وتمارين القوة والتوازن، والتثقيف حول الوقاية من السقوط. ارتبطت المعرفة الأكبر لأخصائيي العلاج الطبيعي بشكل كبير بعدة ممارسات وخدمات ولكن ليس مع الخصائص الديموغرافية والمهنية ولا مع عوائق الخدمة.

الاستنتاجات: تؤكد النتائج الحالية وجود معرفة جيدة ولكن ممارسات دون المستوى الأمثل بين أخصائيي العلاج الطبيعي. تستدعي عوائق الوقاية المحددة إعادة هيكلة عاجلة للخدمات مع التركيز بشكل خاص على تثقيف الموظفين والمرضى.

الكلمات المفتاحية: الوقاية من السقوط؛ طب الشيخوخة؛ كبار السن؛ العلاج الطبيعي؛ المملكة العربية السعودية

Abstract

Objectives: Falls and fall-related injuries among older adults are a growing public health concern. Although multiple factors and co-morbidities are associated with falls, balance and gait disorders are among the most common causes. Physical therapists have expertise in fall-risk assessment and management. The purpose of this study was to assess the fall prevention services provided by physical therapists to older adults.

Methods: During November and December 2021, an online survey was shared with physical therapists working in various regions in KSA. The survey covered demographic and professional characteristics, knowledge of risk factors, fall prevention practices in older populations, physical therapy departmental preventive services, and barriers to fall prevention.

Results: A total of 289 therapists were included in the analysis. The primary fall risk factors were balance/gait disorders, impaired cognition, sensory/perceptive deficits, and environmental hazards. The most frequent practices were asking about fall history, identifying fall risk factors, and educating patients on prevention strategies. The most frequent preventive services provided were gait training, strength and balance exercises, and fall prevention education. Greater knowledge among physical therapists was significantly associated with several practices and services, but not with demographic and professional characteristics, or service barriers.

Conclusion: Our findings indicated favorable knowledge but suboptimal practices among physical therapists. The identified prevention barriers underscore an urgent need

* Corresponding address: Department of Health Administration, College of Business Administration, King Saud University, P.O. Box 103735, 11616, Riyadh, KSA.

E-mail: abirashd@ksu.edu.sa (A.M. Alrashed)

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[1] Currently: Senior physical therapist, Physical therapy department, Security Forces Hospital, Riyadh, KSA.

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for restructuring services, particularly emphasizing staff and patient education.

Keywords: Fall prevention; Geriatric; KSA; Older adults; Physical therapy

Introduction

Globally, the aging population is increasing.[1] Notably, KSA is approaching its highest historical rate, as the population is predicted to reach approximately 40 million in 2050, and 25% will be 60 years or older.[2] Additionally, life expectancy has been projected to reach 81.8 years in 2045–2050.[2]

Worldwide, falls are a major health concern for individuals 65 years or older, and have notably contributed to their morbidity, hospitalization, and mortality.[3] The World Health Organization (WHO) defines a fall as "an event which results in a person coming to rest inadvertently on the ground, floor or other lower level."[4] Every year, one in three adults older than 64 years have at least one fall, 30% of whom experience moderate to severe injuries interfering with their ability to continue living in the community, requiring hospitalization, and increasing the risk of death.[5]

Falls account for more than half of all injury-related hospitalizations among older adults; the major underlying causes of hospital admission include hip fractures, traumatic brain injuries, and upper limb injuries.[4] According to the United Nations Population Fund, approximately 20% of older adults die within 1 year after a hip fracture.[6] Falls and their consequences are responsible for substantial preventable health care costs.[5]

The WHO recommends replacing curative care models with models providing integrated care for older adults, to promote well-being and to minimize disability through several interventions, including prevention of falls and related injuries, and promotion of physical activity.[7,8] Both the American Geriatrics Society and the British Geriatrics Society recommend that all adults older than 64 years be screened annually for a history of falls or any walking or balance impairments.[9]

Periodic screening and appropriate assessments can help identify older people at risk of falls and any underlying causes. Such practices help decrease the negative effects of falls by providing appropriate interventions.[5] A multifactorial fall risk assessment should be conducted to achieve this goal, including assessment of individuals' comorbidities, perceived functional ability, and fear of falling; a comprehensive physical assessment of gait, balance, mobility level, and lower extremity function; and a neurological examination consisting of cognitive evaluation, lower extremity peripheral nerve testing, and testing of proprioception, reflexes, cortical function, extrapyramidal function, and cerebellar function.[5,9]

Fall risk assessments are all essential components of physical therapy (PT) examinations. Physical therapists are experts in this field, who are trained in assessing and managing risk factors such as strength and balance impairment, gait, activities of daily living limitations, home hazards, feet, and footwear.[10] Several interventions have been recommended to support the role of PT in fall prevention among older adults. For example, the Clinical Practice Guideline of the National Institute for Health and Care Excellence recommends a strength and balance training program, whereas the guidelines of the American Geriatrics Society and the British Geriatrics Society recommend strength, balance, coordination, and gait training.[10]

Although the favorable effects of PT in preventing falls are well recognized worldwide, limited evidence of therapists' knowledge and practice patterns in fall prevention is available.[1] A local observational study conducted in the southern region of KSA has assessed knowledge of fall prevention among nurses, physicians, and physical therapists. Although the study participants were considerably knowledgeable (80%), the findings might have been skewed by the knowledge of the nurses, physicians, or both.[11]

Our study was aimed at determining the current roles of PT in managing falls among older populations. The measurements involved assessment of therapists' knowledge of fall risk factors, their fall prevention practices, and their perceptions of organizations' roles in fall prevention.

Materials and Methods

A descriptive cross-sectional study was conducted, and data were gathered through a web-based self-administered questionnaire distributed to registered physical therapists in the Saudi Commission for Health Specialties. The survey was available from November 10th to December 3rd of 2021.

The study questionnaire consisted of four parts. The first part gained informed consent to participate in this study. The second part gathered data on demographic variables including age, gender, nationality, region or city, type of hospital, practice setting, qualification, subspecialty, and years of clinical experience.

The third part of the questionnaire comprised a 25-item tool used from a previous study,[1] which was used to assess therapists' knowledge of the WHO fall-prevention strategy and other fall-prevention strategies, as well as practice patterns in fall prevention. First, the participants were asked to assign an importance level for each of the eight fall risk factors by using a five-point Likert scale, with 1 indicating "not at all important" and 5 indicating "very important." The participants were then asked to rank each of the 11 fall prevention practices from 1 to 5 on the Likert scale. Finally, participants were asked about their frequency of job-related contact with individuals 65 years or older.

The fourth part of the questionnaire measured physical therapists' perceptions of organizations' roles in fall prevention, by using a tool adapted from a doctoral thesis.[12] This part consisted of six questions assessing the organization's fall prevention practices for older patients, two open-ended questions asking about the barriers to providing recommended evidence-based fall prevention services; and a ninth general question.

Statistical analysis

Data are presented as frequencies and percentages for categorical variables, and as means and standard deviations (SDs) for continuous variables. The answers to knowledge, practice, and service questions were used to create relative scores. The scores were then transformed to a scale of 100 for ease of interpretation. Because no standard cut-off score is available to demarcate high from low knowledge, we divided the participants into two groups with a cut-off at the median knowledge score (greater than the median, or at or below the median). Demographic and professional characteristics, practices, physical therapy departmental services, and barriers were compared between groups. The chi-square or Fisher exact test, as appropriate, was used to determine significant differences in categorical variables between groups. Student's t-test or the Mann–Whitney test, as appropriate, was used to determine significant differences in continuous variables between groups. All p-values were two-tailed, and a p-value <0.05 was considered significant. SPSS (version 25.0. Armonk, NY: IBM Corp) was used for statistical analysis.

Results

A total of 289 physical therapists were included in the analysis. Table 1 shows their demographic and professional characteristics, according to knowledge level (median or below versus above the median). The median knowledge score was 86.3%; 152 therapists had scores at or below the median, whereas 137 therapists had scores above the median. Overall, most respondents were Saudis, from the central region, who were working in governmental hospitals and had an average of 8.8 ± 7.2 years of clinical experience. No demographic or professional characteristics were significantly associated with knowledge level.

Fall prevention knowledge among physical therapists

Table 2 presents the participants' knowledge of both fall risk factors and prevention practices. The top recognized risk factors (very important or fairly important) were balance/gait disorders (89.6%), impaired cognition (82.7%), sensory/perceptive deficits (82.4%), and environmental hazards (79.2%).

The top fall prevention practices, ranked as the first strategy by most therapists, were balance training (82.0%), gait training (76.1%), education (70.2%), and strengthening exercises (57.8%). In contrast, the following three practices were not a priority for most respondents: referral to other health professionals (highest ranking: second; 29.4%), and increased range of motion and nutrition (highest ranking: third; 31.1% and 26.6%, respectively; Table 2).

Finally, the top-ranked causes associated with falls in older patients, as reported by the participants, were balance/gait problems (28.4%), stroke (20.1%), and bone and joint diseases (19.0%; Figure 1).

Table 1: Demographic and professional characteristics of physical therapists, by knowledge of fall prevention in older patients (N = 289).

	Knowledge score groups		Total (N = 289)	p-value
	Median or below[a] (n = 152)	Above median[a] (n = 137)		
Age (years)				
Mean ± SD	32.6 ± 7.8	33.1 ± 7.6	32.8 ± 7.7	0.635
<25	8 (5.3%)	13 (9.5%)	21 (7.3%)	0.367
25–34	92 (60.5%)	71 (51.8%)	163 (56.4%)	
35–44	40 (26.3%)	40 (29.2%)	80 (27.7%)	
≥45	12 (7.9%)	13 (9.5%)	25 (8.7%)	
Gender				
Male	85 (55.9%)	61 (44.5%)	146 (50.5%)	0.053
Female	67 (44.1%)	76 (55.5%)	143 (49.5%)	
Nationality				
Saudi	131 (86.2%)	126 (92.0%)	257 (88.9%)	0.118
Non-Saudi	21 (13.8%)	11 (8.0%)	32 (11.1%)	
Region				
Central	89 (58.6%)	73 (53.3%)	162 (56.1%)	0.145
Eastern	18 (11.8%)	15 (10.9%)	33 (11.4%)	
Western	11 (7.2%)	23 (16.8%)	34 (11.8%)	
Northern	18 (11.8%)	16 (11.7%)	34 (11.8%)	
Southern	16 (10.5%)	10 (7.3%)	26 (9.0%)	
Type of hospital				
Government	66 (43.4%)	53 (38.7%)	119 (41.2%)	0.618
Private	46 (30.3%)	43 (31.4%)	89 (30.8%)	
Military	24 (15.8%)	20 (14.6%)	44 (15.2%)	
University	16 (10.5%)	21 (15.3%)	37 (12.8%)	
Qualification				
Bachelor's degree	99 (65.1%)	76 (55.5%)	175 (60.6%)	0.096
Master's degree	37 (24.3%)	42 (30.7%)	79 (27.3%)	

(*continued on next page*)

Table 1 (*continued*)

	Knowledge score groups		Total (N = 289)	p-value
	Median or below[a] (n = 152)	Above median[a] (n = 137)		
Doctor of physical therapy degree	11 (7.2%)	7 (5.1%)	18 (6.2%)	
PhD or equivalent	5 (3.3%)	12 (8.8%)	17 (5.9%)	
Subspecialty				
General	53 (34.9%)	50 (36.5%)	103 (35.6%)	0.273
Musculoskeletal	53 (34.9%)	38 (27.7%)	91 (31.5%)	
Neurological	20 (13.2%)	21 (15.3%)	41 (14.2%)	
Geriatric	3 (2.0%)	7 (5.1%)	10 (3.5%)	
Cardiopulmonary	4 (2.6%)	4 (2.9%)	8 (2.8%)	
Sports injuries	2 (1.3%)	7 (5.1%)	9 (3.1%)	
Women's health	6 (3.9%)	1 (0.7%)	7 (2.4%)	
Pediatrics	4 (2.6%)	3 (2.2%)	7 (2.4%)	
Other	7 (4.6%)	6 (4.4%)	13 (4.5%)	
Practice setting				
Inpatient	18 (11.8%)	18 (13.1%)	36 (12.5%)	0.277
Outpatient	70 (46.1%)	56 (40.9%)	126 (43.6%)	
Inpatient and outpatient	54 (35.5%)	60 (43.8%)	114 (39.4%)	
Home health	8 (5.3%)	2 (1.5%)	10 (3.5%)	
Other	2 (1.3%)	1 (0.7%)	3 (1.0%)	
Years of clinical experience				
Mean ± SD	8.6 ± 7.2	9.1 ± 7.2	8.8 ± 7.2	0.716
<5	55 (36.2%)	48 (35.3%)	103 (35.8%)	0.437
5–10	51 (33.6%)	38 (27.9%)	89 (30.9%)	
>10	46 (30.3%)	50 (36.8%)	96 (33.3%)	

[a] Median = 86.3%.

Fall prevention practices among physical therapists

Table 3 shows fall prevention practices by participants' knowledge level. Overall, most therapists (43.2%) spent 30–45 min with older patients per visit. Non-WHO fall prevention strategies were more frequently used than the WHO strategy. Among study participants, the most frequently used practices were asking about fall history, identifying risk factors, and educating patients on prevention strategies.

Table 2: Knowledge of fall risk factors and prevention among physical therapists (N = 289).

	Very important	Fairly important	Important	Slightly important	Not at all important
Knowledge of fall risk factors					
Balance/gait disorders	244 (84.4%)	15 (5.2%)	24 (8.3%)	3 (1.0%)	3 (1.0%)
Muscle weakness	177 (61.2%)	50 (17.3%)	55 (19.0%)	3 (1.0%)	4 (1.4%)
Environmental hazards	159 (55.0%)	70 (24.2%)	48 (16.6%)	9 (3.1%)	3 (1.0%)
Postural hypotension	150 (51.9%)	67 (23.2%)	63 (21.8%)	6 (2.1%)	3 (1.0%)
Sensory/perceptive deficits	166 (57.4%)	72 (24.9%)	43 (14.9%)	4 (1.4%)	4 (1.4%)
Multiple medications	114 (39.4%)	85 (29.4%)	64 (22.1%)	22 (7.6%)	4 (1.4%)
Impaired cognition	168 (58.1%)	71 (24.6%)	34 (11.8%)	13 (4.5%)	3 (1.0%)
Foot/footwear problems	136 (47.1%)	73 (25.3%)	58 (20.1%)	15 (5.2%)	7 (2.4%)
	Rank first	**Rank second**	**Rank third**	**Rank fourth**	**Rank fifth**
Knowledge of fall prevention practices					
Balance training	237 (82.0%)	11 (3.8%)	23 (8.0%)	3 (1.0%)	15 (5.2%)
Environmental adaptation	135 (46.7%)	40 (13.8%)	92 (31.8%)	11 (3.8%)	11 (3.8%)
Referral to other health professionals	62 (21.5%)	85 (29.4%)	77 (26.6%)	38 (13.1%)	27 (9.3%)
Strengthening exercises	167 (57.8%)	22 (7.6%)	75 (26.0%)	9 (3.1%)	16 (5.5%)
Gait training	220 (76.1%)	16 (5.5%)	33 (11.4%)	5 (1.7%)	15 (5.2%)
Modifying footwear	127 (43.9%)	49 (17.0%)	80 (27.7%)	19 (6.6%)	14 (4.8%)
Education	203 (70.2%)	19 (6.6%)	47 (16.3%)	8 (2.8%)	12 (4.2%)
Increasing range of motion	81 (28.0%)	62 (21.5%)	90 (31.1%)	33 (11.4%)	23 (8.0%)
Endurance training	84 (29.1%)	75 (26.0%)	79 (27.3%)	33 (11.4%)	18 (6.2%)
Visual training	133 (46.0%)	62 (21.5%)	60 (20.8%)	14 (4.8%)	20 (6.9%)
Nutrition	74 (25.6%)	71 (24.6%)	77 (26.6%)	35 (12.1%)	32 (11.1%)

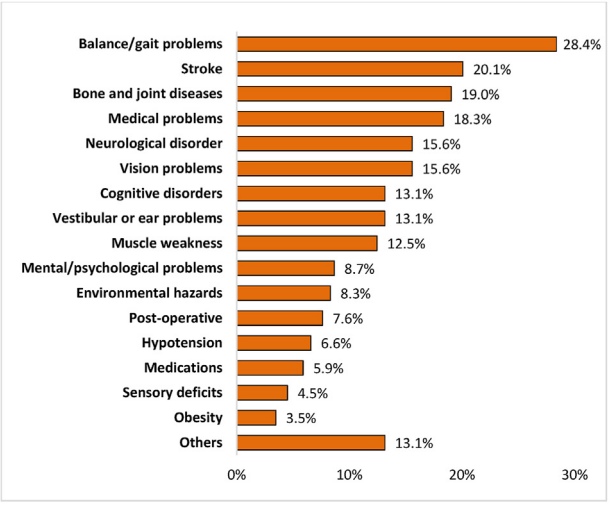

Figure 1: Causes of falls in older patients, as indicated by physical therapists.

Finally, more knowledgeable therapists showed significantly better performance (overall score of 73.4%) than less knowledgeable therapists. Specifically, having greater knowledge was associated with documenting risk factors during the initial patient assessment as well as referring patients to other health professionals as part of the treatment plan (Table 3).

Fall prevention services in physical therapy departments

The most frequent departmental preventions, as reported by the participants, were gait and assistive devices training, and strength and balance exercises (Table 3).

The participants' perceptions significantly differed regarding department prevention services (an overall score of 73.6%). Specifically, views differed regarding the review and management of medications affecting balance, as well as fall prevention education.

Barriers to fall prevention

The perceptions among the study participants matched the findings regarding barriers to fall prevention among older patients. The most important factors were lack of awareness of services (50.2%) and lack of availability of services in the community (24.9%). Participants also agreed on the barriers to the departmental fall prevention services. The top barriers were lack of staff education/training/awareness (32.5%), lack of interest/policy (22.5%), and lack of equipment/support (20.0%; Table 4).

Table 3: Fall prevention practices and services, measured in relation to physical therapists' knowledge of fall prevention in older patients (N = 289).

	Knowledge score groups		Total (N = 289)	p-value
	Median or below[a] (N = 152)	Above median[a] (N = 137)		
Time spent with older patients per visit (minutes)				
0–15	1 (0.7%)	1 (0.7%)	2 (0.7%)	0.136
15–30	39 (26.0%)	22 (16.1%)	61 (21.3%)	
30–45	66 (44.0%)	58 (42.3%)	124 (43.2%)	
45–60	39 (26.0%)	51 (37.2%)	90 (31.4%)	
>60	5 (3.3%)	5 (3.6%)	10 (3.5%)	
Practice strategy used by physical therapists				
WHO fall prevention strategy	85 (55.9%)	79 (57.7%)	164 (56.7%)	0.765
Other fall prevention strategy	113 (74.3%)	107 (78.1%)	220 (76.1%)	0.454
Practices during initial patient assessment				
Asking about fall history	136 (89.5%)	126 (92.0%)	262 (90.7%)	0.466
Identifying risk factors for falling	137 (90.1%)	124 (90.5%)	261 (90.3%)	0.913
Documenting risk factors for falling	121 (79.6%)	122 (89.1%)	243 (84.1%)	0.028
Practices in treatment plan				
Documenting risk factors for falling	120 (78.9%)	119 (86.9%)	239 (82.7%)	0.076
Referring patients to other health professionals	74 (48.7%)	89 (65.0%)	163 (56.4%)	0.005
Educating patients about fall prevention strategies	133 (87.5%)	127 (92.7%)	260 (90.0%)	0.142
Overall practice score	70.4% ± 17.6%	76.8% ± 17.9%	73.4% ± 18.0%	0.001
Preventive services provided by department				
Individual assessment of fall risk factors, with recommendations for follow-up	116 (76.3%)	105 (76.6%)	221 (76.5%)	0.948
Strength and balance exercises	140 (92.1%)	125 (91.2%)	265 (91.7%)	0.790
Home assessment and improvements in home safety	60 (39.5%)	65 (47.4%)	125 (43.3%)	0.172
Review and management of medications affecting balance	56 (36.8%)	71 (51.8%)	127 (43.9%)	0.010
Gait training and training on the use of assistive devices, such as canes and walkers	143 (94.1%)	126 (92.0%)	269 (93.1%)	0.481
Fall prevention education	114 (75.0%)	121 (88.3%)	235 (81.3%)	0.004
Overall prevention service score	70.9% ± 17.0%	76.7% ± 16.5%	73.6% ± 17.0%	0.003

[a] Median = 86.3%.

Table 4: Barriers to fall prevention, by physical therapists' knowledge of fall prevention in older patients (N = 289).

	Knowledge score groups		Total (N = 289)	p-value
	Median or below [a] (N = 152)	Above median[a] (N = 137)		
Reasons for patients not participating in fall prevention practices				
Lack of awareness of services	80 (52.6%)	65 (47.4%)	145 (50.2%)	0.379
Lack of availability of services in the community	34 (22.4%)	38 (27.7%)	72 (24.9%)	0.292
Transportation	16 (10.5%)	12 (8.8%)	28 (9.7%)	0.612
Cost	10 (6.6%)	10 (7.3%)	20 (6.9%)	0.810
Cultural barriers	10 (6.6%)	9 (6.6%)	19 (6.6%)	0.997
Other	2 (1.3%)	3 (2.2%)	5 (1.7%)	0.671
Reasons reported for departments not providing one or more fall prevention practices				
No	119 (78.3%)	99 (72.3%)	218 (75.4%)	0.235
Yes	33 (21.7%)	38 (27.7%)	71 (24.6%)	
Reasons for departments not providing one or more fall prevention practices				
Lack of staff education/training/awareness	8 (40.0%)	5 (25.0%)	13 (32.5%)	0.311
Lack of equipment/support	4 (20.0%)	4 (20.0%)	8 (20.0%)	>0.99
Lack of interest/policy	5 (25.0%)	4 (20.0%)	9 (22.5%)	>0.99
Lack of patient need/awareness	3 (15.0%)	1 (5.0%)	4 (10.0%)	0.605
Lack of time/work overload	3 (15.0%)	3 (15.0%)	6 (15.0%)	>0.99
Other	3 (15.0%)	4 (20.0%)	7 (17.5%)	>0.99
Awareness of other agencies or organizations promoting fall prevention in older adults in the community				
No	95 (62.5%)	86 (62.8%)	181 (62.6%)	0.962
Yes	57 (37.5%)	51 (37.2%)	108 (37.4%)	

[a] Median = 86.3%.

Finally, only 37.4% of the physical therapists were aware of other agencies or organizations promoting fall prevention among older people in the community (Table 4).

Correlations among study variables

Figure 2 shows the Spearman correlation coefficients. The correlation between therapists' knowledge and preventive practices was not significant ($r = 0.069$, $p = 0.244$). However, the therapists' practices and departmental services showed a moderate positive monotonic correlation ($r = 0.452$, $p < 0.001$).

Discussion

This study was conducted to assess the status of fall prevention among older patients, as perceived by physical therapists in KSA. Two of the most common fall risk factors were found to be balance/gait disorders and impaired cognition. These findings are comparable to those previously reported to be important biological fall risk factors among older people in the United Kingdom.[13]

Our findings are supported by prior studies reporting environmental hazards as an important risk factor contributing to almost one-third of falls among older populations.[14–16] Environmental hazards include inappropriate floors or rugs, unsafe walkways, or related issues such as poor lighting.[15] Biological risk factors might not be modifiable, and therefore might not be easily prevented or controlled. Nonetheless, appropriate measures can be taken to prevent environmental hazards. An intervention in the United States had successfully decreased the fall rate through a brief home hazard removal program.[16]

In agreement with findings from a local study, our participants had knowledge of fall prevention and associated risk factors among older patients,[11] although their mean knowledge score was slightly higher for risk factors than for prevention practices. This finding was somewhat in agreement with those from a study in Nigerian physiotherapists, 89% of whom rated their knowledge of fall prevention as high, but only 64% of whom rated their prevention practice as high.[1]

Unexpectedly, physical therapists' knowledge has been found to be lower in countries such as the United States and Australia, where only approximately one-third of therapists have been reported to perceive their knowledge as high.[17,18] Although physical therapists in developed countries might be expected to be more knowledgeable than those in less developed countries, the reported differences might be due to variations across studies in terms of sample size, the types of questions asked, or use of the study tool. If the differences are considered valid, Western physical therapists might tend to explore less than those in developing countries. However, the findings of the current study must be interpreted cautiously, because they are based on a convenience sample of licensed therapists.

Our participants considered balance and gait training, education, and strengthening exercises to be the most prevalent prevention practices for older patients. These findings are consistent with those in the literature. For example, in an assessment project in the Netherlands using PT for improving gait, balance, and functional strength has been found to prevent as many as 40% of falls.[19] Additionally, several reviewed studies have indicated that physical activity and leisure exercises are effective methods to maintain intact balance control, prevent falls, and improve health and quality of life among older people.[20,21] Another review study has

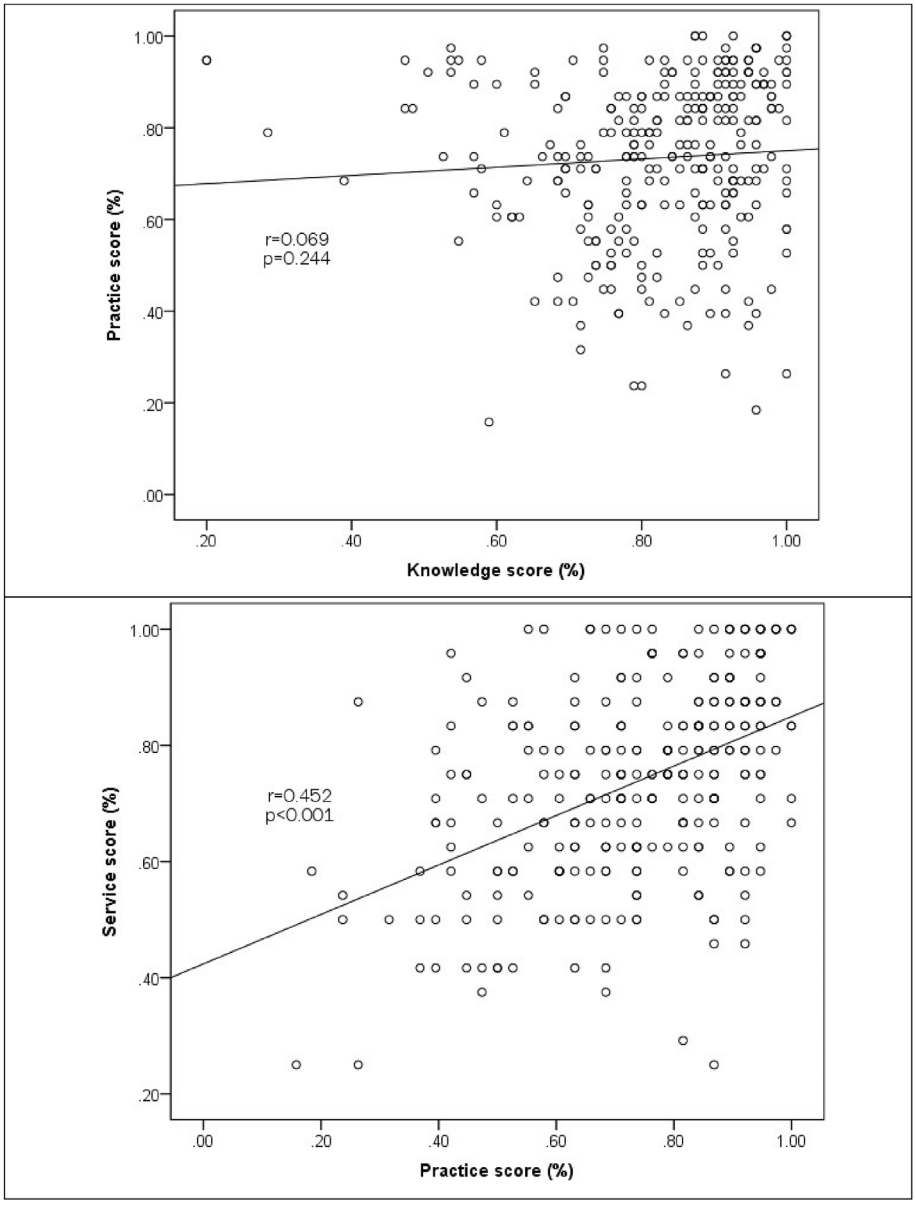

Figure 2: Spearman correlation between physical therapists' knowledge and practices regarding fall prevention in older patients and preventive services provided by the department.

concluded that exercise or PT prevents falls among community-dwelling older people at elevated fall risk.[22]

Finally, in our investigation of the barriers to fall prevention among older adults, time constraints were not among the listed barriers, in contrast to findings from a prior Australian study.[17]

Our study has several strengths, including that is the first of its kind, to our knowledge, attempting to determine physical therapists' perceived knowledge and practices regarding fall prevention among older adults across KSA. This study provides robust evidence on the current status: although therapists' knowledge was high overall, our findings indicated a need to develop training programs to improve practice. Identifying gaps in knowledge and practice would aid in the development of frameworks and strategies for improving PT practice.

Additionally, to achieve the study's objective, we used a published tool whose validity and reliability have been assessed in previous studies; however, the tool was not tested for cultural suitability. Finally, although the questionnaires were sent online, we obtained excellent responses from the study participants, with negligible missing information for any variable.

Conclusion

Although physical therapists had high levels of knowledge, this knowledge did not translate into practice. This finding highlights the need for designing training strategies for therapists. Academicians must place greater emphasis on practical knowledge, to develop a workforce of field-oriented professionals.

Departmental service design must align with current professional advancements. Geriatric care is relatively new to the Saudi healthcare system; therefore, greater efforts are necessary to appropriately address the needs of older populations within the service stream.

Interventions regarding biological and age-related risk factors may be challenging; however, cost-effective interventions such as educating family members to improve home environments would effectively aid in prevention. Older adults and their families should be informed of available community services, and access should be ensured by increasing the number of facilities or providing transportation for individuals in need.

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Conflict of interest

The authors declare that they have no conflict of interest.

Ethical approval

Principles of research ethics were emphasized; participants were invited to participate on a voluntary basis and their confidentiality was assured as no identifications or signatures were required to fill the survey. The IRB approval was granted by the research ethics committee in King Saud University (KSU-HE-21-699).

Author contributions

Ghadah M. Algudairi: conduction of the graduation project: Conceptualization, Methodology, Data curation, Writing- Original draft preparation. Abeer M. Alrashed: Supervision of the project: Visualization, Revision and Follow up, Writing- Reviewing and Editing. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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