Research Paper

Reliability and Validity of the Adapted Persian Version of the Physical Activity Scale for Individuals With Physical Disabilities

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ABSTRACT

Objectives: The main objective of this study was to culturally adapt the original English version of the Physical Activity Scale For Individuals with Physical Disabilities (PASIPD) for the Persian-speaking patients with Lower-Limb Amputations (LLAs) and to evaluate its reliability and construct validity.

Methods: This research was a multicenter cross-sectional and repeated measure study. The cultural adaptation process was conducted according to an accepted international guideline. A total of 197 Persian-speaking individuals with LLA were recruited to investigate the reliability and validity of the PASIPD. Reliability analyses were assessed by Cronbach α and the Pearson product-moment correlation coefficient. The Association between the PASIPD scores and the prosthetic limb user survey of mobility scores was examined to evaluate the convergent validity of the PASIPD. Known-groups validity was assessed based on sex, amputation causes, and amputation levels.

Results: The PASIPD had an acceptable internal uniformity (the Cronbach α of 0.68) and test-retest reproducibility (r=0.70). There was a small correlation between the PASIPD and prosthetic limb user mobility survey (r=0.26; P<0.001). Some items of PASIPD could discriminate individuals with different causes of amputation and sex. Factor analysis extracted four main factors that explained 65.4% of the variance.

Discussion: The Persian version of the PASIPD has acceptable reliability and validity for assessing the physical activity of persons with LLAs.

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Highlights

- The Persian version of the physical activity scale for individuals with physical disabilities had adequate internal uniformity and test-retest repeatability.

- The Persian version of the physical activity scale for individuals with physical disabilities could discriminate individuals with different causes of amputation and sex.

- The Persian version of the physical activity scale for individuals with physical disabilities presented small convergent validity.

Plain Language Summary

In this study, the physical activity scale for individuals with physical disabilities was successfully adapted and validated in the Persian language. In a clinical setting, it proved to be a practical measure for evaluating the average hours of daily physical activity of people with unilateral lower limb amputation during leisure time, household, and work-related activities.

1. Introduction

Regular physical activity is vital for preserving fitness, health, and living standards [1]. It can regulate weight, improve mental health and vitality, and control heart diseases and type 2 diabetes [2]. Physical activity can help people with physical disabilities achieve independence and do their daily activities [3].

Lower Limb Amputation (LLA) causes several physical activity problems, such as gait abnormalities [4], decreased gait velocity [5], and activities of daily living [6]. Previous studies have revealed that physical activity is important for the gait efficiency of people with LLA, affecting their health-related quality of life [7, 8].

An essential purpose of the rehabilitation program is to return people with LLAs to the community and activities of daily living through prescribing a suitable prosthesis. Prescribing a prosthesis can improve the indoor and outdoor walking abilities of people with LLA, helping them return to vocational, leisure, and work-related activities [9]. These activities might be essential in making them feel happier [10]. Previously published studies are limited to evaluating the physical activities of individuals with lower limb amputation. Recent studies have established that many individuals with lower limb amputation engage in low-intensity physical activities [11, 12]. For these people, physical activity is possibly equally important as the general population. Because individuals with lower limb amputation are at considerable risk for ongoing cardiovascular disease, comorbidities, and mortality [13], standard and valid tools are needed for their accurate evaluations in a clinical setting and to understand better the functional performance and mobility of people with LLAs while using prostheses.

Different self-reported tools such as the prosthesis evaluation questionnaire [14], the Prosthetic Limb User Survey Of Mobility (PLUS-MTM) [15], and the locomotor capabilities index [16] have been prepared to investigate the evaluation outcomes of people with LLAs. The prosthesis evaluation questionnaire [14] evaluates the prosthesis and prosthesis-related quality of life. It has four domains of functional, mobility, psychosocial, and health aspects. The PLUS-MTM [15] examines the perceived ability of people with lower-limb amputations in various physical functions, from basic ambulation to complex tasks while using their lower limbs. The locomotor capabilities index [16] assesses the ambulatory proficiencies with a prosthesis and the level of independence to do the daily activities in people with LLAs. However, there is no item in these questionnaires to evaluate the average hours of daily physical activity of people with lower-limb amputations. Therefore, a standard, valid, and reliable tool for individuals with a physical disability, such as lower limb amputation, is required to assess the average daily activities associated with the tasks' intensity. This measure can help prosthetists accurately assess the extent of an individual's daily physical activity in each visit.

The Physical Activity Scale For Individuals with Physical Disabilities (PASIPD) is a self-reported measure

that assesses the average hours of daily physical activity [17]. It evaluates the activity of daily living of individuals with a physical disability during leisure time, as well as domestic and work-related activities. The PASIPD is applied for individuals with spinal cord injury, cerebral palsy, low-back pain, whiplash injury, lower limb amputation, and Parkinson disease. Also, its psychometric characteristics have been assessed in different languages [18-22]. The results of these studies revealed that the PASIPD has acceptable reliability and validity.

This study aimed to translate and cross-culturally adapt the PASIPD into the Persian language and evaluate its psychometric characteristics in persons with unilateral LLA. LLA is a detrimental incident that can change an individual's life and is perceived as "one of the major causes of permanent disability" [23]. A critical part of the rehabilitation program following lower limb amputation is evaluating individuals to participate in usual physical activity for physical, mental, and psychosocial well-being [24].

2. Materials and Methods

Study participants

This research was a cross-sectional study. The Ethics Committee of Iran University of Medical Sciences approved this research (No.: 1398.879). Data collection was conducted face-to-face or online from July 2019 to June 2020. The inclusion criteria were being a community-dwelling Persian-speaking person with unilateral LLA, having a minimum of 18 years old, having the ability to read and understand the Persian language, and having worn the present prosthesis for a minimum of three months [25].

All cases signed written consent forms before filling out the questionnaires. For those participants that filled the online questionnaires, the consent was achieved through ticking a statement of consent which was included at the beginning of the survey.

Translation and cultural adaptation

The corresponding author contacted the original developers of PASIPD before conducting the research to achieve approval for translating it.

Using an internationally accepted guideline proposed by Beaton et al. [26], the translation and cultural adaptation procedures were conducted in five stages.

First, the original English version of PASIPD was translated to Persian separately by two experienced translators. In the second stage, two translators and the research team compared the two translated versions and prepared a consensus. In the third stage, the Persian version attained from the previous stage was back-translated into English by two separate translators. Any differences in translations were taken care of with consensus. An expert committee, including the translators and four certified prosthetists, reviewed all the translations to prepare a pre-final P-PASIPD (Persian version of PASIPD).

The back-translated version of the questionnaire was then sent to the original developer of the PASIPD. After achieving proof from the original developer, the final P-PASIPD was used for reliability and validity study.

The pre-final P-PASIPD draft was randomly assessed on 30 Persian-speaking people with unilateral LLAs. Using a 5-point Likert scale, the participants were asked to rate items of the questionnaire. The aim was to identify and address potential deficiencies, such as incorrect spelling of phrases, culturally inappropriate words, ambiguity, or difficulty in understanding the content. All participants understood the questionnaire items correctly. Finally, the final version of the P-PASIPD was prepared by the expert committee to evaluate its reliability and validity.

Study Instruments

The PASIPD

The original version of the PASIPD was prepared by Washburn et al. [17] to measure the physical activity level of persons with different physical disabilities, including cerebral palsy, stroke, low-back pain, postpolio, spinal cord injury, and locomotor disabilities. This tool is a 13-item self-reported measure. Its items are in three domains of leisure time (items 1 to 6), housework activities (items 7 to 12), and work-related activities (item 13). According to Washburn et al. [17], its total score is predetermined by multiplying the mean hours per day of each item with a relevant metabolic equivalent of task (MET) value and adding the values of items of 2 to 13. In each item, the activity intensity has been classified as never, seldom (1-2 days per week), sometimes (3-4 days per week), often (5-6 days per week) and how many hours of activity per day the individuals have had physical activity (<1 h, 1-2 h, 2-4 h, and >4 h for items 2 to 12; and , 1 h, 1-4 h, 5-8 h, >8 h for item 13). There is no score for item one. The PASIPD total score ranges from 0 MET hours per day (lowest) to 199.5 MET hours per day (highest).

The PLUS-M™

The PLUS-M is a self-reported measure that evaluates the ability of adults with lower limb amputations to move independently from one place to another using prosthesis over the past 7 days. The original English version of this measure was prepared by Hafner et al. [15]. The items of the PLUS-M cover movements that range from walking a short distance over even ground to a long distance over uneven ground.

All survey questions utilized a 5-point Likert scale ranging from 1 to 5, in which 1 demonstrates the worst condition (inability to do work) and 5 the best condition (ability to do work without difficulty). The raw total score of the PLUS-M is obtained by summing up the responses to each item. Raw scores range from 12 to 60. However, we need a PLUS-M t-score to report the values of this questionnaire. T-scores are valid and comparable measures of mobility. T-scores range from 21.8 to 71.4 for the 12-item short-form PLUS-M.

Reliability

The internal uniformity and test/re-retest study applying the Cronbach α and Pearson correlation coefficient (r) were used to assess the reliability of the P-PASIPD. According to Cohen's formula, to attain a power of 0.8, ICC > 0.5, α=0.05, and an effect size of 0.25 [27], we randomly chose 30 participants to complete the P-PASIPD twice with a two-week interval.

Convergent Validity

All participants were requested to respond to the Persian form of PLUS-M (unpublished results) beside the PASIPD to calculate the convergent validity of the P-PASIPD. In this case, the total and item scores of the PASIPD were compared with the t-score of the PLUS-M.

Known-Groups Validity

The known-groups validity of the P-PASIPD was investigated regarding the participants' sex, cause of amputation, and level of amputation. Data from previous studies suggest that the amputee's sex [28], level of amputation, and cause of amputation [29] can affect their level of physical activity.

Statistical analysis

Descriptive information was presented as mean, standard deviation, missing answers, interquartile ranges, and extent of ceiling and floor effects. If more than 15% of participants give the best or worst possible score on a questionnaire, a ceiling or floor effect has occurred [30]. The proposed value for the Cronbach α to be acceptable is 0.45 to 0.98 [31]. The Pearson correlation coefficient was used to assess the test-retest reliability.

To investigate the relationship between the PASIPD and PLUS-M questionnaires, the Spearman correlation coefficient was performed. Considering the way of relationship, the following criteria were utilized [32]: strong (r>0.75), moderate (0.50<r<0.75), small (0.25<r<0.50), and little to no correlation (r<0.25). The Mann-Whitney and Kruskal-Wallis tests were applied to investigate the known-groups validity of PASIPD.

For factor analysis, the principal component analysis with varimax rotation was applied to 12 questions of the P-PASIPD. Before conducting principal component analysis, the suitability of values was checked by Bartlett's test of sphericity (<0.05) and the Kaiser-Meyer-Olkin test (>0.5) [33]. Factor extraction was performed by calculating factors with an eigenvalue of 1.0 or higher. All analyses were carried out in SPSS software, v. 20. A P value of 0.05 was considered statistically significant.

3. Results

Translation and cultural adaptation

The PASIPD was adapted and validated for the Persian language. In item 2, "walking the dog shopping" was omitted because this activity is not common in the popular culture of many parts of Persian. In item 3, "use of a standing frame" was replaced with "yoga and walking in the forest." In item 4, "softball" was replaced with "jogging on even ground." In item 5, "off-road pushing" was replaced with "jogging on uneven ground." In item 6, "wheelchair push-ups" was replaced with "sitting up or uphill walking." All of these changes were made under the supervision of the original developer of the PASIPD.

The participants' characteristics

A total of 197 people with lower limb amputation (168 men and 29 women) were included in this study. Their Mean±SD age was 43.84±12.51 years (range: 19-72 y). The Mean±SD time since amputation and wearing the current prosthesis were 253.24±159.57 months (range: 12-660 mo) and 62.16±71.70 months (range: 3-448 mo), respectively. Characteristics of the studied population are reported in Table 1.

Table 1. Demographic and clinical characteristics of the studied population (N=197)

Variables		No. (%)
Cause of amputation	Dysvascular	27(14)
	Trauma	156(79)
	Cancer	6(3)
	Congenital	8(4.1)
Level of amputation	Transfemoral	46(23.4)
	Knee disarticulation	11(5.6)
	Transtibial	124(62.9)
	Ankle disarticulation	9(4.6)
	Partial foot	3(1.5)
	Transpelvic	2(1)
	Missing	2(1)
Occupational status	Working	157(79.6)
	Unemployed	15(7.6)
	Student	6(3)
	Homemaker	17(8.6)
	Missing	2(1)
Family status	Married	148(75.1)
	Living with relatives	24(12.2)
	Living alone	25(12.7)
Educational status	High school	123(62.4)
	University	73(37)
	Missing	1(0.5)

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No significant ceiling effect was observed in the items and total score of the P-PASIPD. However, the P-PASIPD items showed significant floor effects (ranging from 19.3% to 83.3%) (Table 2).

Reliability

The P-PASIPD had a satisfactory internal uniformity (the Cronbach α=0.68) (Table 2). The total score of the P-PASIPD showed moderate test-retest association (r=0.7). For each item, the r values ranged from 0.45 (for item 11) to 0.87 (for item 10).

Factor analysis

A total of four components were extracted for P-PASIPD with eigenvalues higher than 1 as factor 1 (items 2, 3, 4, 5, 6), factor 2 (items 7, 8, 12), factor 3 (items 9, 10, 13), and factor 4 (items 10, 11, 13) (Figure 1 and Table 2).

Convergent Validity

The total P-PASIPD score and the t-score of PLUS-M were 19.25±22.01 (range 0.00 to 128.79) and 50.09±8.74

Table 2. Descriptive statistics and results of the factor loading and reliability analyses

PASIPD Items	Mean±SD	Cronbach α If Item Deleted	Test-retest Reliability r (p)	%		Factor Loading			
				Ceiling	Floor	1	2	3	4
Q3 (Light sports)	0.94±0.51	0.36	0.49(0.005)	0.00	46.7	0.860	-	-	-
Q5 (Vigorous sports)	0.96±0.43	0.36	0.53(0.002)	0.00	50.3	0.824	-	-	-
Q4 (Moderate sports)	0.80±0.31	0.36	0.58(0.001)	0.00	61.9	0.813	-	-	-
Q6 (Resistance training)	0.84±0.35	0.36	0.59(0.0001)	0.00	57.9	0.691	-	-	-
Q2 (Leisure activities)	1.19±0.81	0.37	0.49(0.005)	0.00	19.3	0.607	-	-	-
Q7 (Light housework)	1.14±0.61	0.37	0.56(0.001)	0.00	44.7	-	0.892	-	-
Q8 (Heavy housework)	1.96±0.49	0.37	0.52(0.002)	0.00	55.3	-	0.749	-	-
Q12 (Caring another person)	1.21±0.68	0.38	0.50(0.004)	0.00	36.00	-	0.652	-	-
Q9 (Home repair)	0.62±0.22	0.37	0.83(0.0001)	0.00	57.9	-	-	0.828	-
Q10 (Lawn work)	0.49±0.14	0.38	0.87(0.0001)	0.00	74.1	-	-	0.783	-
Q13 (Occupational)	2.12±0.95	0.35	0.50(0.004)	0.00	62.4	-	-	0.493	-
Q11 (Gardening)	0.53±0.13	0.38	0.45(0.009)	0.00	83.8	-	-	-	0.784
Total	22.01±19.25	0.68	0.70 (0.0001)	0.00	1.5	-	-	-	-
Eigenvalue	-	-	-	-	-	3.508	1.827	1.473	1.041
% Variance	-	-	-	-	-	29.23	15.22	12.27	8.67
% Cumulative variance	-	-	-	-	-	29.23	44.45	56.73	65.41

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PASIPD: physical activity scale for individuals with physical disabilities; SD: standard deviation; Q: question.

Factor 1: Light sports, moderate sports, vigorous sports, resistance training, and leisure activities

Factor 2: Light housework, heavy housework, and caring for another person

Factor 3: Home repair, lawn work, and occupation

Factor 4: Gardening

(range 25.50 to 71.40), respectively. The results of the correlational analysis are presented in Table 3.

Known-Groups Validity

According to Table 4, there is a significant difference in items 6 (P=0.03), 7 (P<0.01), 8 (P<0.01), 9 (P<0.01), 10 (P=0.009), 12 (P=0.007), and 13 (P=0.03) of the P-PASIPD between men and women with lower-limb amputations. Moreover, there is a significant difference in the scores of items 7 (P=0.001), 8 (P=0.03), and 13 (P=0.01) between individuals with different amputation causes (Table 4). However, the total score and each item of PASIPD were not able to differentiate between individuals with different amputation levels (P>0.05) (Table 4 and Figure 2).

4. Discussion

This project aimed to investigate the psychometric properties of the P-PASIPD questionnaire in persons with lower limb amputation. It was found that the P-PASIPD has acceptable reliability, and there is a small relationship between the P-PASIPD and PLUS-M questionnaires' total scores. Moreover, some subscales of the P-PASIPD could discriminate between individuals with respect to their sex and cause of amputation.

Contrary to the original English version of the PASIPD [17], in which principal component analysis revealed the presence of 5 distinct factors of physical activity, our analysis indicated 4 factors. In the original English

Table 3. The Relationship Between the PASIPD and PLUS-M Questionnaires (N=197)

Items	T-score PLUS-M		
	Correlation coefficient (r)	95% confidence interval	P
PASIPD total	0.26	(0.13 to 0.41)	0.001
Q2 (Leisure activities)	0.23	(0.08 to 0.36)	0.001
Q3 (Light sports)	0.30	(0.13 to 0.43)	0.001
Q4 (Moderate sports)	0.35	(0.22 to 0.47)	0.001
Q5 (Vigorous sports)	0.32	(0.19 to 0.45)	0.001
Q6 (Resistance training)	0.21	(0.06 to 0.34)	0.003
Q7 (Light housework)	0.04	(-0.10 to 0.20)	0.55
Q8 (Heavy housework)	0.13	(-0.20 to 0.31)	0.05
Q9 (Home repair)	0.17	(0.01 to 0.31)	0.01
Q10 (Lawn work)	0.18	(0.04 to 0.32)	0.01
Q11 (Gardening)	0.17	(0.06 to 0.31)	0.01
Q12 (Caring another person)	0.04	(-0.13 to 0.20)	0.57
Q13 (Occupational)	0.15	(0.03 to 0.26)	0.03

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PASIPD: physical activity scale for individuals with physical disabilities; PLUS-M: prosthetic limb user survey of mobility; Q: question.

version [17], the light and moderate sports were loaded in one factor and vigorous sports and resistance training in another factor. In addition, leisure activities were loaded with a different factor. However, in our study, the light sports, moderate sports, vigorous sports, resistance training, and leisure activities were loaded in one factor. This finding is not unusual because most people with LLA who use a prosthesis do not participate in a specific sports activity.

Our findings showed that the P-PASIPD's total score has an acceptable internal consistency. This finding is

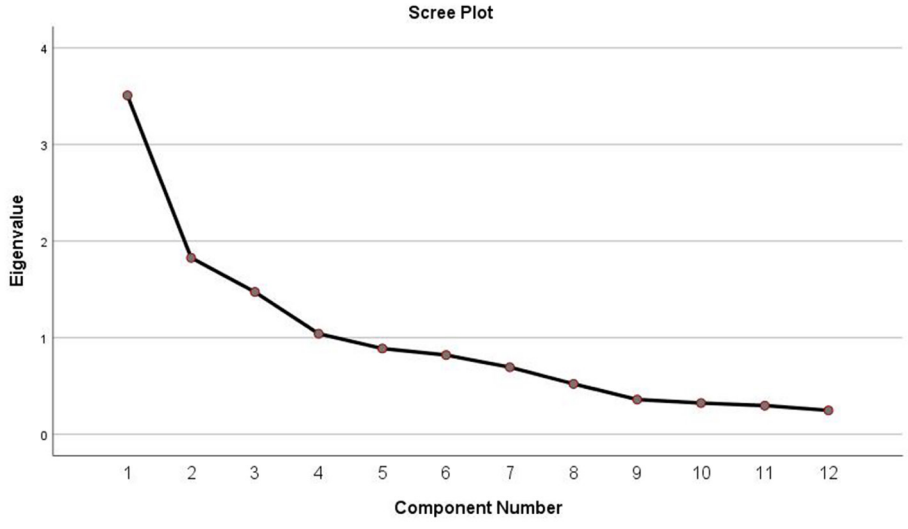

Figure 1. The scree plot of the Persian version of the PASIPD total score.

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Table 4. Known-Groups Validity of the Persian PASIPD

Items	Sex		Cause of Amputation				Level of Amputation			
	Men (n=168)	Women (n=29)	Congenital (n=8)	Trauma (n=156)	Dysvascular (n=27)	Cancer (n=6)	TF (n=46)	Knee (n=11)	TT (n=124)	Ankle (n=9)
2 (Leisure activities)	101.51	84.48	115.88	100.53	84.22	103.33	92.51	99.50	94.77	115.94
P	0.13			0.43				0.68		
3 (Light sports)	100.39	90.95	106.81	98.46	97.33	110.25	91.04	120.27	95.50	88.06
P	0.38			0.92				0.38		
4 (Moderate sports)	98.72	100.64	109.38	98.27	101.15	94.42	85.83	104.95	98.38	93.67
P	0.84			.92				0.43		
5 (Vigorous sports)	100.89	88.05	95.88	101.82	85.07	92.58	102.68	107.68	92.56	84.33
P	0.22			0.49				0.50		
6 (Resistance training)	102.29	79.93	99.63	98.32	99.11	115.42	102.64	116.41	91.15	93.44
P	0.03			0.88				0.27		
7 (Light housework)	87.97	159.16	169.88	93.04	111.90	87.25	88.86	75.73	100.25	78.17
P	0.0001			0.001				0.22		
8 (Heavy housework)	89.38	154.76	143.81	94.92	111.46	89.33	88.99	79.05	100.01	86.78
P	0.0001			0.03				0.36		
9 (Home repair)	104.70	62.81	76.75	102.09	81.65	107.17	96.89	93.05	97.39	55.00
P	0.0001			0.14				0.09		
10 (Lawn work)	101.86	79.16	86.19	100.73	90.77	90.42	89.53	102.23	96.58	92.50
P	0.009			0.55				0.72		
11 (Gardening)	100.02	89.74	83.00	99.48	93.44	115.50	90.60	97.86	96.63	91.78
P	0.15			0.32				0.76		
12 (Caring for another person)	94.61	124.43	114.13	96.42	106.54	112.00	87.55	90.00	98.25	105.00
P	0.007			0.62				0.62		
13 (Occupational)	102.08	81.17	84.44	104.54	79.54	62.00	93.20	128.59	92.85	103.39
P	0.03			0.01				0.11		
Total score	96.03	116.19	119.25	99.07	91.22	105.08	95.32	123.91	92.70	100.33
P	0.07			0.66				0.34		

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PASIPD: Physical activity scale for individuals with physical disabilities; TF: Transfemoral; TT: Transtibial. The results are reported as mean ranks and P-values.

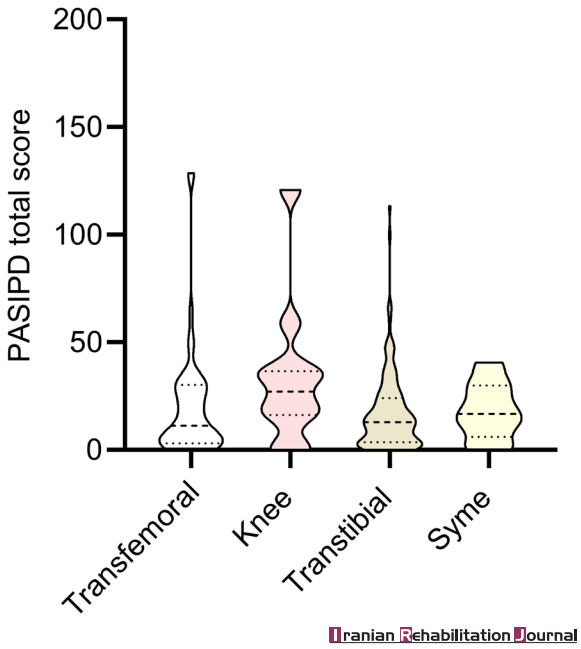

Figure 2. Violin plots of the Persian version of the PASIPD total scores between individuals with different amputation levels

The middle, lower and upper horizontal dash lines indicate the median, 1st quartile, and 3rd quartile values, respectively (P>0.05).

similar to the Dutch [18], Turkish [21], French [22], and Bahasa Malaysian [20] versions. However, the range of the Cronbach α for PASIPD items in the original English [17], Canadian [19], Dutch [18], Bahasa Malaysian [20], and Turkish [21] versions were higher than the Persian version (0.37-0.65, 0.49-0.72, 0.59-0.64, 0.60-0.69, 0.35-0.38, and 0.24-0.66, respectively).

One possible reason for this discrepancy is that they had studied the Canadian [19] version on people with Parkinson disease and the Dutch [18] and Malaysian [20] versions on individuals with spinal cord injury.

The original English [17] and Turkish [21] versions studied people with different types of physical disabilities. However, we examined the psychometric properties of the PASIPD in persons with LLA. The functional capabilities and level of physical activities might be completely different between individuals with Parkinson disease, spinal cord injury, auditory impairments, cerebral palsy, and LLA.

Another finding of this study was that the total score of the P-PASIPD has a moderate test-retest reliability. Item 11 (gardening) had the lowest test-retest reliability, which may indicate that people with LLA in Iran do these activities occasionally. Therefore, doing gardening activities that are mentioned in the questionnaire is less relevant to their real conditions. Gardening is not common among the ordinary people of many parts of Iran and the Persian-speaking regions of the middle-east. In the Turkish version [21], the achieved test-retest reliability was excellent, with an ICC value of 1.0. One possible explanation could be related to the differences in the period separating test and retest in the two studies. This study's period separating test and retest was 14 days. However, in the Turkish version [21], this time interval was 1-3 days.

Significant floor effect was observed in items of the P-PASIPD. This finding indicates that the expected level of physical activity in the items of PASIPD is higher than the ability of persons with LLA. The PASIPD evaluates the average potency of various kinds of activities. It uses a MET-based criterion on able-bodied individuals without considering the types of inability, level, and severity of injury [17]. Therefore, the MET values may vary between individuals with different types or severity of disabilities and those with the able-bodied condition.

The study results indicate a slight relationship between the t-scores of the PLUS-M questionnaire and the total score of the P-PASIPD. This finding generally supports the work of other studies in this area that used accelerometer-based measures to evaluate the convergent validity of the PASIPD [34-36]. A reason might be the different objectives of these instruments. Each item of the PASIPD includes various activities to offer individuals an idea of the possible PAs. This questionnaire measures the physical activity of persons with various physical disabilities based on the number of days per week and hours per day. However, the PLUS-M measures the individual's perceived ability to move from one place to another using their main prosthesis. Perhaps the most related tool to the PASIPD questionnaire items is the physical activity and disability survey [37]. However, the Persian version of this questionnaire is not available. That is why we used the PLUS-M to check the convergent validity of the PASIPD. It should be noted that the relationship between the PASIPD and accelerometer for a patient with cerebral palsy, myelomeningocele, and spinal cord injury was 0.22 to 0.30 [35]. Future research needs to be done to investigate the convergent validity of the PASIPD.

In some studies, it has been reported that the level of physical activity in individuals with the non-vascular cause of amputation is up to twice as high as those with the vascular cause of amputation [38, 39]. This study has identified that in light housework, heavy housework, and occupational tasks, the level of physical activity in per-

sons with non-vascular amputation is significantly higher than in those with vascular amputation. The reason might be that individuals with vascular amputations have comorbidities compared to people with non-vascular amputations and are less active before the amputation [40].

Whyte et al. [41] found that women have more physical activity than men with lower limb amputations. The current study found that in resistance training, home repair, lawn work, and occupational tasks, the scores of men were higher than women. Nevertheless, in light housework, heavy housework, and caring for another person's activities, the scores of women were higher than men. A possible reason for this discrepancy is that in Iran, many people live in traditional families. Hence, indoor activities are managed mainly by women, and men are primarily engaged in outdoor activities.

Some authors have shown that the level of amputation can affect the level of physical activity of persons with LLA [42]. Those with transtibial amputation walk more steps per day than those with transfemoral amputation [42]. However, regarding the level of amputation, the P-PASIPD has been unable to discriminate between participants. This result was also supported by Littman et al.'s study [40].

Study Limitations

There were more men (86%) than women in the study. Therefore, the results cannot be generalized to all women with LLAs. However, the distribution of participants regarding their sex was in accordance with the general target people [43]. In addition, the physical properties of persons with bilateral LLAs differ from those with unilateral LLAs. This condition might limit the generalizability of using the P-PASIPD for those with bilateral LLAs. Finally, the data gathering process coincided with the spread of the coronavirus disease 2019 pandemic. Therefore, we could not conduct functional tests such as 2-minute or 6-minute walk tests to compare the outcomes of these functional examinations with the score obtained by PASIPD.

5. Conclusion

The Persian version of the PASIPD has acceptable reliability and validity. It is a practical measure for evaluating the physical activity of people with unilateral LLA.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Iran University of Medical Sciences (Code: 1398.879).

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Authors' contributions

Conceptualization, methodology, writing, review, and editing: All authors; Investigation: Mohaddeseh Asgari and Taher Babaee; Writing the original draft: Mohaddeseh Asgari, Taher Babaee, and Maryam Jalali; Resources: Taher Babaee; Supervision: Taher Babaee, Maryam Jalali, and Hassan Saeedi.

Conflict of interest

The authors declared no conflict of interest.

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