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THE CULTURAL ADAPTATION, RELIABILITY AND VALIDITY OF THE TURKISH VERSION OF THE SIMPLE PHYSICAL ACTIVITY QUESTIONNAIRE IN COMMON MENTAL DISORDERS

ORIGINAL ARTICLE

ABSTRACT

Purpose: This study aims to evaluate the validity and reliability of the Turkish version of the Simple Physical Activity Questionnaire (SIMPAQ-T) in patients with common mental disorders.

Methods: A total of eighty-one patients (mean age: 40.14±13.05 years) were included in this study. The SIMPAQ-T was used to evaluate the participants' physical activity levels and sedentary behaviors. To be used as descriptive data, DSM-5 Level 1 Cross-Cutting Symptom Measure-Adult was used to evaluate mental health symptomatology. International Physical Activity Questionnaire-Short Form (IPAQ-SF) and Brief Psychiatric Rating Scale (BPRS) were used to test the validity of the questionnaire.

Results: The items of the SIMPAQ-T exhibited excellent intercorrelation coefficient (ICC) values (time spent in bed (0.93 (95% CI: 0.90-0.96)), sedentary time 0.87 (95% CI: 0.80-0.92), walking time 0.98 (95% CI: 0.98-0.99), exercise time 0.99 (95% CI: 0.99-0.99), and incidental activity time 0.95 (95% CI: 0.92-0.97)). The SIMPAQ-T was moderately correlated with IPAQ-SF in terms of sedentary (rho=0.641, p=0.001) and walking time (rho=0.564, p=0.001), indicating good construct validity. However, the BPRS had a significant correlation with only the sedentary time of the SIMPAQ (rho=0.246, p=0.022), indicating convergent validity was poor.

Conclusion: The SIMPAQ-T is semantically and linguistically adequate to quickly assess physical activity level and sedentary behavior in patients with common mental disorders.

Keywords: Mental Disorders, Physical Activity, Sedentary Behavior, Questionnaire

YAYGIN RUHSAL BOZUKLUKLARDA TÜRKÇE BASİT FİZİKSEL AKTİVİTE ANKETİ'NİN KÜLTÜREL ADAPTASYON, GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Bu çalışmanın amacı, sık görülen ruhsal bozukluğu olan hastalarda Basit Fiziksel Aktivite Anketi (BFAA)'nin Türkçe versiyonunun geçerlik ve güvenirliğini değerlendirmektir.

Yöntem: Bu çalışmaya toplam seksen bir hasta (ortalama yaş: 40,14±13,05 yıl) dâhil edildi. Katılımcıların fiziksel aktivite düzeylerini ve sedanter davranışlarını değerlendirmek için BFAA'nın Türkçe versiyonu kullanıldı. Tanımlayıcı veri olarak kullanılmak üzere ruh sağlığı semptomatolojisini değerlendirmek için DSM-5 Birinci Düzey Kesitsel Belirti Ölçeği Türkçe Erişkin Formu, ölçeğin geçerliliğini test etmek için ise Uluslararası Fiziksel Aktivite Anketi-Kısa Formu (UFAA-KF) ve Kısa Psikiyatrik Değerlendirme Ölçeği (KPDÖ) kullanıldı.

Sonuçlar: BFAA'nın maddeleri için mükemmel interkorrelasyon katsayısı (ICC) değerleri tespit edildi (yatakta geçirilen süre: 0,93 (95% CI: 0,90-0,96); sedanter geçirilen süre: 0,87 (95% CI: 0,80-0,92); yürüme süresi: 0,98 (95% CI: 0,98-0,99); egzersiz süresi: 0,99 (95% CI: 0,99-0,99) ve diğer aktivitelerle geçirilen süre: 0,95 (95% CI: 0,92-0,97)). Sedanter geçirilen süre (rho=0,641, p=0,001) ve yürüme süresi (rho=0,564, p=0,001) açısından UFAA-KF ile orta düzeyde ilişkili bulunan BFAA'nın iyi yapı geçerliğine sahip olduğu gösterildi. Bununla birlikte, KPDÖ'nün, BFAA'nın yalnızca sedanter geçirilen süre maddesi ile anlamlı bir korelasyona sahip olması (rho=0,246, p=0,022), yapı geçerliğinin zayıf olduğunu gösterdi.

Tartışma: BFAA, sık görülen ruhsal bozukluğu olan hastalarda fiziksel aktivite düzeyini ve sedanter davranışı hızlı bir şekilde değerlendirmek için anlamsal ve dilsel olarak yeterlidir.

Anahtar Kelimeler: Ruhsal Hastalıklar, Fiziksel Aktivite, Sedanter Davranış, Anket

INTRODUCTION

Regular physical activity reduces risk of developing premature death, cardiovascular diseases, ischemic stroke, type II diabetes, colon, and breast cancer (1). Moreover, the effectiveness of physical activity in preventing and treating common mental disorders (CMD) is referred to in various reviews and guidelines (2,3). It has been shown that patients with CMD have been found prone to be physically inactive and at a high risk of obesity and other metabolic syndromes (4). Therefore, assessing physical activity level of patients with CMD seems to first step for reducing mortality and morbidity related to physical inactivity.

Growing evidence has been supporting the effectiveness of regular physical activity in CMD (5,6). However, the type, frequency, duration, and intensity of physical activity specific to a mental disorder have not yet been determined (7,8). This uncertainty brings the necessity of evaluating and monitoring the level of physical activity in patients with CMD. Many studies used different measurement outcomes to assess physical activity (9,10,11). However, the physical activity questionnaires available in the literature have been mainly developed for healthy individuals, besides the reliability of International Physical Activity Questionnaire (IPAQ) in patients with CMD was low (12,13). The Simple Physical Activity Questionnaire (SIMPAQ) seems to overcome these limitations (14). The five-item SIMPAQ was developed to evaluate physical activity and sedentary behavior in patients with CMD. The SIMPAQ evaluates the time spent in bed overnight, sedentary activities, walking, exercising and engaging incidental activities. The validity and reliability study of SIMPAQ was completed with 1010 patients diagnosed with mental disorders in 43 centers from 23 countries (14). Completing SIMPAQ was found to be fast and easy, also it can be reliably and validly administered (15). As there is no validated Turkish questionnaire that evaluate physical activity and sedentary behavior in patients with CMD, this study aimed to perform the Turkish cultural adaptation, validity, and reliability of SIMPAQ in patients with CMD.

METHODS

Study design

This study was conducted in İstanbul University-Cerrahpaşa from June 2020 to August 2020. The written approval was received from the hospital administration to perform this study. The ethical approval was obtained from the Noninvasive Clinical Research Ethics Committee of İstanbul University-Cerrahpaşa, (Approval date: 07/02/2020 and Approval number: 21683). Each participant was informed about the study procedure, which was carried in conformity with the Declaration of Helsinki, and then they also provided written informed consent to participate in this study. Data used in analyses was collected with a face-to-face interview technique by one clinician and one physiotherapist. This observational study was registered in ClinicalTrials.gov (NCT04443374).

Participants

All participants who had been diagnosed as having major depression, bipolar disorder, anxiety disorder, schizophrenia or alcohol, and substance addiction according to DSM-5 or ICD were recruited from the psychiatry department of Bakirkoy Prof Mazhar Osman Training and Research Hospital for Psychiatry. The eligibility criteria were as follows: (1) aged between 18 and 60 years, (2) being an outpatient at the facility that the study carried out, (3) able to read to read and write in Turkish; (4) able to follow simple instructions; and (5) having no visual visual and hearing disability. The participants who have following characteristics were excluded: (1) had cognitive impairment, (2) had significant. musculoskeletal, neurologic, or cardiovascular disorders that limit physical activity, (3) had an eating disorder.

Translation and cross-cultural adaptation

Permission for this cross-cultural translation study was obtained from Rachel Morell, the second author of the article and study coordinator of the original version of SIMPAQ (14). This process was executed by considering the report of the International Society of Pharmacoeconomics and Outcomes (ISPOR) named the Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) (16).

At least 7-days after the first session, the participants answered the SIMPAQ-T for the second time to assess test-retest reliability. All processes were carried out according to the instruction manual provided at the official website of SIMPAQ (http://www.simpaq.org/wp-content/uploads/2016/07/SIMPAQ-manual-4.1.pdf). The last two physical activity examples in question "4A", intentionally left blank in the original questionnaire, were filled as "football and basketball" due to being culturally the most relevant two sports branches to provide Turkish cultural adaptation. If needed, other corrections for cultural adaptation were noted according to 10 patients' feedbacks, in which the SIMPAQ-T was priorly applied.

Outcome measures

Demograhic and clinical information of participants were recorded. Also, exercise habit of the participants was questionned.

SIMPAQ

The SIMPAQ, which was developed to assess 24-hour physical activity and sedentary behavior in the last 7-days of patients with CMD, is a valid and reliable questionnaire. It consists of five items that are answered by self-reported. The time spent in bed, sedentary activities, walking, exercising and incidental activities are recorded in box 1, box 2, box 3, box 4, and box 5, respectively. This detailed investigation of the time spent on every activity captures even small amounts of change in physical activity. The total time reported in the five boxes should be approximately 24 hours (>18 hours or <30 hours). This self-checked feature for the time of the SIMPAQ helps the examiner detect the patients with CMD who overestimates and underestimates physical activity level. To calculate the total time spent with moderate-vigorous physical activity (MVPA) (hours per week), the time spent in walking (box 3) and exercising (box 4) are summed. (14).

International Physical Activity Questionnaire-Short Form (IPAQ-SF)

The IPAQ-SF is a 7-item self-report questionnaire using to measure physical activity in the last 7-days. IPAQ-SF evaluates the time spent in walking, moderate and vigorous activities, and sitting within a week (17). The Turkish version of IPAQ-SF (IPAQ-SF-T), a reliable and valid instrument, was used in the present study (17).

Brief psychiatric rating scale (BPRS)

The BPRS, which is 18-item quantitative scale, has been used to assess the degree of psychiatric symptoms (19). Each item is scored with a seven-point scale from 0 to 6. The lower scores obtained from BPRS mean lower severity of symptoms. The Turkish version of BPRS was used in the present study (20).

DSM-5 level 1 cross-cutting symptom measure-adult (DSM XC)

The DSM XC is a self-reported questionnaire developed based on DSM-5 criteria by the American Psychiatric Association to measure the severity or frequency of the 23 symptoms related to 13 mental problems (21). Respondents rate their symptoms, considering for the last two weeks, with five points from 0 to 4. Having a score of 2 or higher in most domains, except substance use (score of 1 or higher), indicates clinical mental health problems. The Turkish version of the DSM XC has been reported to be a reliable and valid questionnaire to measure mental health symptomatology (22).

Sample size analysis

A priori calculation was performed according to recommendations for reliability studies (23). By determining the intraclass correlation coefficient (ICC) as 0.40, and alpha as 0.05, it was calculated that 75 patients were required. However, if the drop rate was taken at approximately 10%, 84 patients were adequate to reach 0.95 power.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) 20.0 (SPSS Inc., Chicago, IL, USA) was used to perform statistical analysis. Descriptive statistics included frequency, and the percentage for nominal variables and mean and standard deviation for continuous variables were calculated. The Kolmogorov–Smirnov test was used to test for the normal distribution of data. The ICC was calculated using a two-way mixed-model under consistency. Values ≥ 0.4 were considered satisfactory (ICC = 0.81–1.0, excellent; 0.61–0.80, very good; 0.41–0.60, good; 0.21–0.40, fair; and 0.00–0.20, poor). Spearman correlation coefficient was used to test content and construct validity. The content validity of the SIMPAQ-T was analyzed based on

Table 1. Demographic Characteristics and General Assessment Data of the Patients

Characteristics (N= 81)	M±SD
Age (years)	40.14±13.05
BMI (kg/m²)	24.44±2.68
< 18.5 [n (%)]	1 (2.1)
18.5–24.9[n (%)]	15 (31.3)
25.0–29.9 [n (%)]	15 (31.3)
≥ 30.0 [n (%)]	17 (35.4)
Gender [n (%)]	
Female	30 (37)
Male	51 (63)
Smoking Status [n (%)]	
Smoker	58 (71.6)
Non-smoker	23 (28.4)
Education (years)	8.62±3.87
Diagnosis [n (%)]	
Psychiatric comorbidity	3 (3.7)
Schizophrenia only	19 (23.5)
Bipolar disorder only	22 (27.2)
Depressive disorder only	23 (28.4)
Anxiety disorder only	11 (13.6)
Obsessive-compulsive disorder only	3 (3.7)
Psychotropic Medication [n (%)]	
Yes	76 (93.8)
No	5 (6.2)
Exercise Habit [n (%)]	
Yes	1 (1.2)
No	80 (98.8)
Screen Time (hours/day)	4.19±1.93
DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure	
Depression	3.98±2.17
Anger	2.17±1.61
Mania	0.22±0.89
Anxiety	5.51±2.86
Somatic Symptoms	1.41±1.92
Suicidal Ideation	0.13±0.46
Psychosis	0.54±1.31
Sleep Problems	1.77±0.82
Memory	0.83±1.05
Repetitive Thoughts and Behaviors	0.79±1.61
Dissociation	0.54±0.92
Personality Functioning	1.62±2.02
Substance Use	2.17±1.61
International Physical Activity Questionnaire - Short Form	
Sedentary (minutes)	247.40±143.13
Walking (minutes)	586.37±402.98
Moderate Physical Activity (minutes)	3.33±3.00
Vigorous Physical Activity (minutes)	0.00±0.00
Brief Psychiatric Rating Scale	14.25±7.56
Simple Physical Activity Questionnaire	
Box 1: Time in Bed (minutes)	537.40±141.92
Box 2: Sedentary Time (minutes)	471.11±168.13
Box 3: Walking Time (minutes)	127.40±94.57
Box 4: Exercise Time (minutes)	2.96±16.84
Box 5: Incidental Activity Time (minutes)	305.18±239.52
Total Moderate-Vigorous Physical Activity (minutes)	130.37±94.76

Note. BMI: body mass index, M: mean, SD: standard deviation.

its correlation with the IPAQ-SF. Correlation with the BPRS was used to assess the construct validity. Strength of correlations was interpreted as 0.00–0.30 negligible correlation; 0.30 to 0.50 weak correlation; 0.50 to 0.70 moderate correlation; 0.70 to 0.90 strong correlation; 0.90 to 1.00 very strong correlation (24). 0.05 was considered the level of significance.

RESULTS

No difficulties were encountered while finding the most proper Turkish words. Participants did not report any problem in understanding questions. The participants completed the SIMPAQ-T approximately in 10 minutes. Eighty-one adults with a mean age of 40.14±13.05 years were included. The characteristics of the participants are present in Table 1. All participants were outpatients,

Table 2. Test-retest Reliability of The SIMPAQ-T

SIMPAQ-T Items	M±SD [95 % CI] (N=81)	Test-retest reliability ICC [95% CI]
Box 1: Time in bed		
First Assessment	8.76±2.20 [8.22-9.25]	0.93 [0.90-0.96]
Second Assessment	8.91±2.35 [8.38-9.43]	
Box 2: Sedentary time		
First Assessment	8.01±2.89 [7.37-8.63]	0.87 [0.80-0.92]
Second Assessment	7.83±2.81 [7.25-8.43]	
Box 3: Walking time		
First Assessment	2.10±1.61 [1.77-2.48]	0.98 [0.98-0.99]
Second Assessment	2.13±1.58 [1.81-2.50]	
Box 4: Exercise time		
First Assessment	0.02±0.01 [0.00-0.07]	0.99 [0.99-0.99]
Second Assessment	0.02±0.01 [0.00-0.07]	
Box 5: Incidental activity time		
First Assessment	5.09±3.82 [4.28-5.94]	0.95 [0.92-0.97]
Second Assessment	5.15±3.97 [4.30-6.03]	

Note. CI: confidence interval, ICC: intraclass correlation coefficient, M: mean, SIMPAQ-T: Turkish version of the simple physical activity questionnaire.

and more than half of the participants was male (63%), current smokers (71.6%). Among the participants with single diagnosis, the most frequent condition was depression (28.4%), followed by bipolar (27.2%) and schizophrenia (23.5%). The mean screen time was 4.19±1.93 hours in a day, and only one patient had an exercise habit. With IPAQ-SF, 11 participants (13.6%) were inactive, 60 (74%) were minimally active, and 10 (12.3%) were active.

The descriptive statistics of the SIMPAQ-T items related to first and second sessions are shown in Table 2. The SIMPAQ-T items exhibited excellent ICC values. The ICC2,1 was 0.93 (95% CI: 0.90-0.96), 0.87 (95% CI: 0.80-0.92), 0.98 (95% CI: 0.98-0.99), 0.99 (95% CI: 0.99-0.99), 0.95 (95% CI: 0.92-0.97) for time spent in bed, sedentaryly, walking, exercise, and incidental activity, respectively. The SIMPAQ-T showed adequate reliability (Table 2).

The time spent in sedentarly according to IPAQ-SF was significantly correlated with items of the SIMPAQ-T, except for the walking time, with a correlation coefficient ranging from 0.262 to 0.641, indicating good construct validity ($p<0.05$). However, the walking time of the IPAQ-SF was significantly correlated with the walking time of the SIMPAQ-T, and moderate physical activity of the IPAQ-SF was significantly correlated with the exercise time of the SIMPAQ-T (rho=0.564, p=0.001, and rho=0.587, p=0.001, respectively).

In addition, the BRPS had a significant correlation with only the sedentary time of the SIMPAQ-T (rho=0.246, p=0.022), indicating convergent validity was poor (Table 3).

Table 3. Correlation between the SIMPAQ-T, Brief Psychiatric Rating Scale and International Physical Activity Questionnaire - Short Form

SIMPAQ-T (N=81)	International Physical Activity Questionnaire - Short Form				Brief Psychiatric Rating Scale (r (p))
	Sedentary (r (p))	Walking (r (p))	Moderate physical activity (r (p))	Vigorous physical activity (r (p))	
Time in bed	0.275 (0.012)*	0.068 (0.597)	0.026 (0.835)	-	0.068 (0.574)
Sedentary time	0.641 (0.001)**	-0.065 (0.555)	0.005 (0.968)	-	0.246 (0.022)*
Walking time	0.134 (0.241)	0.564 (0.001)**	0.022 (0.833)	-	-0.091 (0.397)
Exercise time	-0.262 (0.015)*	-0.167 (0.156)	0.587 (0.001)**	-	0.088 (0.455)
Incidental activity time	-0.579 (0.001)**	-0.104 (0.342)	-0.035 (0.761)	-	-0.165 (0.152)

Note. SIMPAQ-T: Turkish version of the simple physical activity questionnaire. *p<.05. **p<.01.

DISCUSSION

The aim of this study was to perform cultural adaptation and to evaluate the validity and reliability of the SIMPAQ-T in patients with CMD. The SIMPAQ-T showed adequate test-retest reliability and construct validity. The ICC2,1 was 0.93, 0.87, 0.98, 0.99, and 0.95 for the time spent in bed, sedentary, walking, exercise, and incidental activity, respectively. The test-retest reliability of SIMPAQ-T was excellent, while the results obtained from the original study of SIMPAQ have shown good reliability with the ICC2,1 values in a range between 0.63 and 0.76 (14).

Mental disorders were associated with unhealthy lifestyle behaviors (25), such as tobacco smoking. In this study, 71.6% of the patients with CMD, who were mainly diagnosed with major depression (28.4%), bipolar disorder (27.2%), and schizophrenia (23.5%), were found to be smoking. Moreover, physical inactivity and non-communicable diseases (NCD) such as hypertension and obesity are highly prevalent in patients with CMD (26). Most patients with major depression and schizophrenia have not met the recommended physical activity level (4, 27). Similarly, the highest rate (74%) was minimally active according to the IPAQ-SF score, and there was only one patient exercised regularly in this study. Due to being one of the driving modifiable risk factors for NCD (28), screening and monitoring physical inactivity in psychiatric practice is critical for patients with CMD. In this point of view, the SIMPAQ-T will help researchers and clinicians to detect even a small amount of change in the physical activity of patients with CMD within a short time.

The adaptation and translation process of SIMPAQ to the Turkish language has been accomplished successfully and correctly, as the high values of reliability of test-retest of SIMPAQ-T demonstrate (0.87-0.99). However, the reliability values of the SIMPAQ have been found in a lower range in the original study (0.63-0.76). Although SIMPAQ was found mostly unaffected from the cognitive capacity (14), higher reliability values in this study can be explained by that we excluded the patients with cognitive impairments to prevent misunderstanding and inconsistency. As the time interval between test and retest sessions is also critical for test-retest reliability (29), there were at least seven days between test and retest sessions in this study, similar to the original study of SIMPAQ (14). However, in the original study, the participants from the 23-countries had been recruited while our study was a single-center study. This variety of sociocultural background among the participants of the original study might also explain lower reliability values comparing to this study.

In the literature, the content validity of The SIMPAQ has been compared with Seven-Day Physical Activity Recall (7DPAR) (15), an accelerometer (14,15), and 2-min walk test (2MWT) (30). Spearman correlation coefficient between the exercise time in SIMPAQ and vigorous physical activity score of the 7DPAR was found 0.56 (15). Schilling et al. also found a correlation coefficient between self-reported MVPA in SIMPAQ and accelerometer-based MVPA 0.49 (15). However, Rosenbaum et al. have found 0.25 (14). Additionally, there were correlation coefficients in a range of 0.28 to 0.69 between 2MWT and SIMPAQ items. In this study, IPAQ-SF, a frequently used questionnaire and similar questioning with SIMPAQ, was used to assess construct validity. The SIMPAQ-T showed good construct validity, particularly between exercise time and moderate physical activity of the IPAQ-SF, with a correlation coefficient ranging from 0.262 to 0.641. Although the sedentary time of the IPAQ-SF was significantly correlated with items of the SIMPAQ-T, except for the walking time, the walking time of the IPAQ-SF was significantly associated with the walking time of the SIMPAQ-T.

The BPRS, one of the most frequently-used tools, provides a quick information about the possible presence and severity of various psychiatric symptoms in CMD (19). To evaluate divergent validity of the SIMPAQ-T, we needed a tool that assess a wide range of psychiatric symptoms such as BPRS. In this point of view, our findings showed that the divergent validity of the SIMPAQ-T was found poor, which was assessed with the BPRS score.

The most prominent limitation of this study was that the validation of SIMPAQ-T was not being performed versus an objective physical activity measurement tool such as an accelerometer. Although

SIMPAQ was well adapted and translated to the Turkish language, SIMPAQ-T was found reliable and valid for only patients with CMD, in this study. Using this questionnaire in other populations to assess physical activity is not recommended without a validation study. In addition, due to the absence of data related to vigorous physical activity, the validity of the SIMPAQ-T in intensity should be read with caution. On the other hand, SIMPAQ-T, with its detailed questioning structure, will overcome the limitations of the other questionnaires to determine the physical activity of inactive populations such as patients with CMD. The SIMPAQ will provide a quick and reliable assessment of patients with CMD's physical activity and sedentary behavior in scientific research and clinical practice.

In conclusion, the present study results show that SIMPAQ-T is adequate to evaluate physical activity level and sedentary behavior in patients with CMD. It demonstrated excellent test-retest reliability and good construct validity to evaluate patients with CMD. This questionnaire can be a critical instrument to provide a quick and reliable assessment of physical activity levels in scientific research and clinical environments.

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Author Contribution: Aybike Senel: Conceptualization, Methodology, Investigation, Writing-Original draft preparation, Visualization, Project administration. Tansu Birinci: Conceptualization, Methodology, Formal Analysis, Writing-Original draft preparation, Visualization. Derya Ipekcioglu: Conceptualization, Methodology, Writing-Reviewing and Editing, Project administration, Supervision. Umit H. Yesilkaya: Resources, Writing-Reviewing and Editing, and Supervision. Ebru Kaya Mutlu: Investigation, Writing-Reviewing and Editing, Resources.

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