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Cross-Cultural Adaptation of the Godin-Shephard Leisure-Time Physical Activity Questionnaire for Arabic Population and Testing its Psychometric Properties

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Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Background: Physical activity during leisure time is essential to promote health, owing to the decreased physical activity in mechanized working environments. The present study aimed to cross-culturally modify the Godin Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ) into Arabic and to assess its psychometric properties.

Material/Methods: We conducted this study in various standardized stages. At each stage, the corrections were made by an expert committee. In the initial stage, the English version of the GSLTPAQ was translated into Arabic and then back-translated into English. In the second stage, we ensured the content validity by collecting the opinion of 10 professionals in the medical field. Finally, in the third stage, the Arabic version was applied to the Saudi population to check its test-retest reliability, face validity, internal consistency, and concurrent validity.

Results: For the Arabic version of the GSLTPAQ, we evaluated the content validity by involving 10 experts, and it was found to be excellent. The scale was applied to 150 office workers in the university to assess psychometric properties. The scale showed remarkable internal consistency (0.99) and high test-retest reliability (0.88). We evaluated the concurrent validity by comparing it with the Copenhagen City Heart Study Leisure Time Physical Activity Questionnaire, and it was shown to have an excellent validity of 0.86 (<0.001).

Conclusions: After conducting the careful process of translations, we adapted and created the Arabic version of the GSLTPAQ. It was found to have excellent content validity, test-retest reliability, internal consistency, and concurrent validity.

Keywords: **Medicine, Arabic • Sedentary Behavior • Surveys and Questionnaires**

Abbreviations: **GSLTPAQ** – Godin-Shephard Leisure-Time Physical Activity Questionnaire; **CCHSLTPAQ** – Copenhagen City Heart Study Leisure Time Physical Activity Questionnaire; **BT** – back translation; **ICC** – intraclass correlation coefficient

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Background

The current mechanization of occupations and the existence of the COVID-19 pandemic decrease the physical activity levels at work and promote various health-related issues due to physical inactivity [1]. People spend most of the day in their occupation, and a lack of physical activity at the workplace promotes negative health-related issues among workers. This is known as a pandemic of physical inactivity [2]. Current ergonomic practices are designed to ensure enough physical activity to create good working conditions. However, people now choose their leisure time to engage in physical activity and to enhance their health [3].

The Godin Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ) is a standardized measure of physical activity levels during leisure time [4]. This is a short and easily applicable scale for use with the general population, and the examiner applying this scale does not require formal medical training. The GSLTPAQ has been applied widely in various diseased populations in oncology [5] and neurology [6]. It has been validated in children and adolescents and is used in these populations [7,8]. The GSLTPAQ has been extensively validated using the measure of the maximum amount of oxygen your body can utilize during exercise (VO₂ max) for classifying people into 2 categories: insufficiently active and active [9]. The scale has been translated into Portuguese and validated in Brazil [5,10], and the components of the scale have even been translated into the Kinyarwanda language for use in Rwanda [11].

The GSLTPAQ measures 3 components: strenuous exercise (eg, running), moderate exercise (eg, fast walking), and mild exercise (eg, yoga). The questionnaire has a description of these 3 components, with an example of activities under each. We asked the participants to read each component carefully and write the number of times they did that exercise per week. Based on the number of times they did strenuous, moderate, or mild exercises, the GSLTPAQ leisure score index was calculated. The numbers of each type of exercise are multiplied further by constant numbers for each type of activity. For strenuous exercise, the number of times is multiplied by 9; for moderate exercise, it is multiplied by 5, and for mild exercise, by 3. For example, if the participants report they had done 2 sessions of strenuous exercise, 3 sessions of moderate exercise, and 4 sessions of mild exercise, their activities were multiplied by the constant numbers as follows: the number of sessions of strenuous exercise was multiplied by 9 ($2 \times 9 = 18$), the number of sessions of moderate exercise was multiplied by 5 ($3 \times 5 = 15$), and the number of sessions of mild exercise was multiplied by 3 ($4 \times 3 = 12$). We added these resulting 3 scores to calculate the GSLTPAQ leisure score index: $18 + 15 + 12 = 45$. If the GSLTPAQ leisure score index total scores were 24 and above, the participants were considered active, between 14 to

23 were considered moderately active, and less than 14 were considered insufficiently active [4].

Approximately 400 million people worldwide have Arabic as their primary language, and the typical Arabic-speaking person's capacity to read and communicate in English is limited. Physical inactivity is a common issue among the Arabic population, leading to many health-related problems [12]. If we convert the commonly used leisure-time physical activity questionnaires into Arabic, it will help health care professionals and individuals know about physical activity levels. Owing to globalization, the Arabic population is engaged in the modern job market, which has resulted in their focusing less on cultural values. Without the availability of questionnaires such as the GSLTPAQ in Arabic, it will make it difficult for management and organizations to comprehend the level of physical activity during leisure time among their employees and take the necessary actions related to this issue. Our primary objective in this study was to cross-culturally adapt the GSLTPAQ to the Arabic population and test the psychometric properties, such as reliability and validity, for Arabic versions.

Material and Methods

The authors obtained approval from the Institutional Ethics Committee of the Deanship of Scientific Research at the King Khalid University to conduct the study (approval no. ECM#2020-3207). We organized this study into 2 stages. In the first stage, we converted the English version of the GSLTPAQ into the Arabic version of the GSLTPAQ. In the second stage, we assessed the psychometric properties, such as test-retest reliability, face validity, internal consistency, and concurrent validity, for the Arabic version of the GSLTPAQ.

Translation and Cross-cultural Adaptation

We followed the guidelines recommended by Beaton et al [13] for translation and adapted the scale cross-culturally. We performed this translation and adapted the scale cross-culturally in the following 6 stages.

Preliminary Translation

The study included 2 bilingual translators who we recognized for their native-level proficiency in Arabic and expertise in English. The first translator was a physical therapy professor, and the second was a native Arabic language expert without any medical background. We described the study's aim to the translators and then asked them for their valuable contributions to the adaptation process. We provided them sufficient time to fully comprehend the scale and subsequently perform the translation function and create a translated version.

Combining of Translations

After completing the translation process, the translators notified the authors and finalized the Arabic version of the GSLTPAQ. Then, we met with the translators to combine their translation results. We named the translation done by the language specialist as “T1” and the translation done by medical specialist as “T2”. After the team’s discussion, the authors and translators formed a single Arabic version scale for the GSLTPAQ, based on T1 and T2.

Back Translation

In the back-translation stage, we selected 2 new translators who were bilingual in English and Arabic, in addition to the initial translators. Neither of these translators had any medical education but were native English speakers. We communicated with these translators separately, and both translators performed their translations independently. Therefore, we called their translations “BT1” and “BT2”.

Expert Committee

In this step, we formed a panel consisting of authors, co-workers, and the 4 translators and discussed the translation and back-translation process. The panel discussed the findings of translations. Finally, the authors formulated a pre-final version of the Arabic version of the GSLTPAQ, with the committee members’ consensus for the testing process.

Testing of the Pre-Final Version

In this stage, we carefully selected 50 participants who were office workers at our university and were determined by using convenience sampling to test the pre-final Arabic version of the GSLTPAQ. We ensured that all the participants could speak both Arabic and English. First, all participants were provided with the Arabic GSLTPAQ forms and were asked to fill them out. Later, we provided the original English version of the GSLTPAQ to the participants for comparison. All participants reported the questions in both forms and made no dissimilarity in the reporting. They all said there were no differences in the questionnaire’s original English and Arabic versions. Two evaluators assessed this information; one was a language expert, and the other was a therapist. They interviewed each participant about questions, and their answers were discussed with the committee. Data collected from these participants were not used for the psychometric properties analysis of the Arabic version of the GSLTPAQ.

Submission of the Final Version

After completing the construction of Arabic versions of the GSLTPAQ, the expert committee approved the final version of

the survey. Then, we sent the GSLTPAQ tool to the committee with all the information stages to formulate the Arabic version of the GSLTPAQ.

Psychometric Property Analysis

Content Validity

We sent the final approved version of the GSLTPAQ Arabic form to 10 bilingual physical therapists with doctorate degrees; they had at least 10 years of teaching and clinical experience. We provided all 10 professionals with the validity form, a consent form for their participation, the original English GSLTPAQ, and the Arabic version of GSLTPAQ to perform a validity assessment. The format for this assessment consisted of a 5-point Likert scale ranging from 1 (not acceptable) to 5 (excellent), through which the professionals rated all the items in the GSLTPAQ. For the validation process, the evaluators were provided with sufficient time to understand, analyze, and rate the form; we used the answers from the evaluators for the content validity assessment.

Participants

Using convenient sampling, we included 150 participants of both sexes, aged between 30 and 70 years, who were office workers and could read, write, and speak Arabic. We calculated the sample size by using the ClinCalc.com sample size calculator software. Based on a previous study’s mean values of GSLTPAQ scores, we used the anticipated mean, alpha values of 0.05, and power at 80%, and got a sample size of 150. Participants with diabetes, hypertension, psychological conditions, and neurological conditions, and those who were uncooperative or illiterate were excluded from the study. We performed the study at the Department of Medical Rehabilitation, College of Applied Medical Sciences of the university, and the study duration was 1 year.

Procedure for Internal Consistency, Test-Retest Reliability, and Concurrent Validity

We received written informed consent from the participants who were willing to participate in the study and met the inclusion criteria. Therefore, we included the participants according to inclusion and exclusion criteria. The evaluator provided the Arabic version of the GSLTPAQ to all the literate participants, who were thus able to read, speak, and write in Arabic. The evaluator instructed the participants to read the scale carefully and then to record the number of sessions they did of strenuous, moderate, and minimal exercise in a week (7 days). The authors used the data obtained through the surveys to statistically analyze test-retest reliability and internal consistency. The evaluator allowed a 10-min break, and, afterward, all the

participants filled out a Copenhagen City Heart Study Leisure Time Physical Activity Questionnaire [14] (CCHSLTPAQ) to assess concurrent validity. The same evaluator was present for all the participants during the administration of the GSLTPAQ and CCHSLTPAQ.

Within 1 week, the Arabic version of the GSLTPAQ was re-administered to all 150 participants, who filled out the scale based on the same evaluator's instructions. No participants were shown the initial form they had filled 1 week prior; this lack of comparison ensured test-retest reliability.

Statistical analysis

We used SPSS statistics version 24.0 (IBM Corp, Armonk, NY, USA) for data analysis. The average (mean) and standard deviation of the demographic characteristics and the first and second ratings of the Arabic version of GSLTPAQ scores were analyzed via univariate analysis using descriptive statistics. The authors used the Shapiro-Wilk test to measure the normality of the variables. We used the content validity index to assess the content validity of the Arabic version of the GSLTPAQ. The method of the content validity index calculation proposed by Yusoff was used in this study. As per Yusoff's article, any values greater than 0.83 were acceptable to say that the questionnaire had content validity. The formula proposed for the scale-level content validity index was the sum of item-level content validity index scores divided by the number of items [15]. To evaluate the test-retest reliability, we used the intraclass correlation coefficient (ICC). Koo et al suggested recommendations for reporting the ICC while performing reliability research. They proposed that ICC values <0.5 denote poor reliability, values between 0.50 to 0.75 denote moderate reliability, values between 0.75 to 0.9 denote good reliability, and values >0.90 denote excellent reliability [16]. The internal consistency of the Arabic version of GSLTPAQ was analyzed using Cronbach's alpha, and acceptable values of alpha ranged from 0.70 to 0.95 [17]. We used the Pearson correlation coefficient to evaluate the concurrent validity of the Arabic edition of the GSLTPAQ compared with the scores of the CCHSLTPAQ. The rule for interpreting the Pearson correlation coefficient was as follows: 0.90 to 1.00 denoted very high correlation, .70 to .90 denoted high positive correlation, .50 to .70 denoted moderate correlation, .30 to .50 denoted low positive correlation, and .00 to .30 denoted negligible correlation [18].

Results

Translation

During the translation of the English version of the GSLTPAQ, the Arabic translators experienced difficulty translating a few

Table 1. Demographic characteristics, sex distribution, and mean and standard deviations for height, weight, body mass index (BMI), Godin Shephard Leisure-Time Physical Activity Questionnaire (GSLTPQ), and Copenhagen City Heart Study Leisure Time Physical Activity Questionnaire (CCHSLTPAQ) value scores.

| Variable | Mean±standard deviation |
|---|-------------------------|
| Total number of participants | 150 |
| Sex distribution | 78 Men 72 Women |
| Age (Years) | 46.64±10.24 |
| Height (m) | 1.64±0.07 |
| Weight (kg) | 68.74±5.14 |
| BMI (kg/m ²) | 25.42±3.64 |
| GSLTPAQ (leisure score index, first measurement) | 28.94±12.66 |
| GSLTPAQ activity score | 2.42±0.77 |
| CCHSLTPAQ activity score | 2.54±1.06 |
| GSLTPAQ (leisure score index, second measurement) | 29.58±12.33 |

words, such as skiing and skating; they could not find exact corresponding Arabic words initially, but after discussing with experts, they were able to obtain the exact words. Similarly, the word "rapidly" was replaced with the word "fast". The phrase became "like a fast heartbeat" rather than "heart beats rapidly". Some questions were difficult to understand because they were translated from English to Arabic; for easier understanding, we used different words with the same general meaning in particular questions. For example, the phrasing "mild exercise: in the original English version of section 3 became "light exercise" in the Arabic version of the GSLTPAQ. We have included the new, completed Arabic version of the GSLTPAQ in **Appendix 1**.

Demographic Characteristics

A total of 150 office workers in the university contributed to the study, of whom 78 were men and 72 were women. **Table 1** shows the means and standard deviations of age, height, weight, basal metabolic index, and first and second scores of the GSLTPAQ and CCHSLTPAQ.

Content Validity, Internal Consistency, Test-Retest Reliability, and Concurrent Validity

The content validity of the GSLTPAQ was analyzed by utilizing the content validity index. The content validity assessment for

Table 2. Content validity, internal consistency alpha, test-retest reliability intraclass correlation coefficients (ICC) scores, and concurrent validity r value for the Arabic version of the Godin Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ).

| Psychometric properties | Arabic version of the GSLTPAQ |
|--|-------------------------------|
| Content validity (CVI) | 0.95 |
| Internal consistency (α) | 0.99 |
| Test-retest reliability ICC values (CI range) | 0.88 (0.87-0.89) |
| Concurrent validity r value (P value) (GSLTPAQ vs CCHSLTPAQ) | 0.86 (0.001) |

the strenuous, moderate, and light physical activity components and the total GSLTPAQ scores revealed excellent results. The study assessed the test-retest reliability in 150 office workers via the ICC. This ICC test also demonstrated excellent reliability values of 0.88 for the total GSLTPAQ score. According to Cronbach's alpha, we showed internal consistency with an r value of 0.86 ($P < 0.001$) for the total GSLTPAQ scores. Pearson correlation demonstrated strong correlations for the leisure-time physical activity scores between GSLTPAQ and CCHSLTPAQ. **Table 2** shows the content validity, internal consistency, test-retest reliability, and concurrent validity scores for the GSLTPAQ.

Discussion

The GSLTPAQ is a simple, validated scale for assessing leisure-time physical activity. We conducted this first study to adapt the scale for an Arabic-speaking population in Saudi Arabia and provided satisfactory psychometric properties. Many researchers validated the GSLTPAQ to classify healthy and diseased populations into active and insufficiently active categories [9,14,15].

The adapted Arabic version of the GSLTPAQ had a content validity index of 0.95 and test-retest reliability with an r value of 0.88. Similar results were found by Sao Joao et al in their study to adapt and make the Portuguese version of the GSLTPAQ cross-culturally. They followed a similar process proposed by Beaton et al, conducting content validity by the content validity index, and performing test-retest reliability using the ICC. They successfully translated the questionnaire, with an excellent content validity index greater than 0.9 and an excellent test-retest reliability r value of 0.84 [21]. Furthermore, the Turkish version of the GSLTPAQ was assessed for psychometric properties in the diabetic population. They included 300 Turkish patients with diabetes to evaluate the reliability

and validity. The content validity assessed by the content validity index showed good content validity of 0.82. They found excellent test-retest reliability, with an r value of 0.97 [22].

In the present study, to obtain concurrent validity, we compared the Arabic version of the GSLTPAQ with the self-reported scores of the CCHSLTPAQ and received an excellent r value of 0.86. Sao Joao et al analyzed the construct validity of the Brazilian version of the GSLTPAQ by comparing it with the Baecke habitual physical activity questionnaire components and self-reported measure of walking behaviors and found an r value of 0.02 to 0.62. These differences in validity may have been due to the differences in the types of scale chosen in the studies. The CCHSLTPAQ is a very similar scale to the GSLTPAQ, and both were created to assess physical activity during leisure time. Maybe this is why we obtained a higher validity than the previous studies [10].

Even though the sample size in the present study was appropriate, we performed the psychometric property assessment in healthy participants; further analysis should be established by applying it in a patient population. However, future studies can be done for the validity assessment with more sophisticated outcome measures, such as VO_2 max. Moreover, the GSLTPAQ is an essential piece of evaluation in understanding people's leisure-time physical activity. Finally, due to the scale's simplicity and the minimal time required to complete the assessment, the GSLTPAQ can be adapted to many other cultural backgrounds.

Conclusions

The Arabic version of the GSLTPAQ was successfully translated and adapted for the Arabic population. The scale had excellent content validity of 0.95, which was assessed by 10 researchers using the content validity index. The internal consistency evaluated by Cronbach's alpha was perfect, with an alpha value of 0.99. The ICC was used to calculate the test-retest reliability and showed outstanding reliability with an r value of 0.88. Finally, the concurrent validity was assessed by comparing it with the CCHSLTPAQ, and it showed very good validity, with a Pearson r value of 0.86. Overall, the Arabic version of the GSLTPAQ was shown to have excellent psychometric properties.

Ethics Approval and Consent to Participate

The authors obtained approval from the university's research Ethics Committee to conduct the study (approval no. ECM#2020-3207). We obtained the participants' signed written consent form for participating in the research.

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References:

- Meyer SM, Landry MJ, Gustat J, et al. Physical distancing ≠ physical inactivity. *Transl Behav Med* [Internet]. 2021 Jan 7; Available from: <https://academic.oup.com/tbm/advance-article/doi/10.1093/tbm/ibaa134/6067279>
- Pratt M, Ramirez Varela A, Salvo D, et al. Attacking the pandemic of physical inactivity: What is holding us back? *Br J Sports Med* [Internet]. 2020;54(13):760-62
- Cheng W-J, Härmä M, Ropponen A, et al. Shift work and physical inactivity: Findings from the Finnish Public Sector Study with objective working hour data. *Scand J Work Environ Health*. 2020;46(3):293-301
- Godin G. The Godin-Shephard Leisure-Time Physical Activity Questionnaire. *Heal Fit J Canada*. 2011;4(1):18-22
- Amireault S, Godin G. The Godin-Shephard Leisure-Time Physical Activity Questionnaire: validity evidence supporting its use for classifying healthy adults into active and insufficiently active categories. *Percept Mot Skills*. 2015;120(2):604-22
- Sikes EM, Richardson EV, Cederberg KJ, et al. Use of the Godin leisure-time exercise questionnaire in multiple sclerosis research: A comprehensive narrative review. *Disabil Rehabil*. 2019;41(11):1243-67
- Sikes EM, Richardson EV, Cederberg KJ, et al. Use of the Godin leisure-time exercise questionnaire in multiple sclerosis research: A comprehensive narrative review. *Disabil Rehabil*. 2019;41(11):1243-67
- Zellner J, Schneider M. Adolescents and self-reported physical activity: An evaluation of the modified Godin leisure-time exercise questionnaire. *Int J Exerc Sci*. 2016;9(5):587-98
- Amireault S, Godin G. The Godin-Shephard Leisure-Time Physical Activity Questionnaire: Validity evidence supporting its use for classifying healthy adults into active and insufficiently active categories. *Percept Mot Skills* [Internet]. 2015;120(2):604-22
- João TMS, Rodrigues RCM, Gallani MCBJ, et al. Validity of the Brazilian version of the Godin-Shephard Leisure-Time Physical Activity Questionnaire. *Cad Saude Publica* [Internet]. 2015;31(9):1825-38
- Mukaruzima L, Adeniyi DA, Frantz JM. Leisure-time physical activity practices and the influencing factors among government office employees in Kigali, Rwanda. *Occup Heal South Africa*. 2020;26(1):3-7
- Sharara E, Akik C, Ghattas H, Makhlof Obermeyer C. Physical inactivity, gender and culture in Arab countries: A systematic assessment of the literature. *BMC Public Health*. 2018;18(1):1-19
- Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)*. 2000;25(24):3186-91
- Schnohr P. Physical activity in leisure time: impact on mortality. Risks and benefits. *Dan Med Bull*. 2009;56(1):40-71
- Yusoff MSB. ABC of content validation and content validity index calculation. *Resource*. 2019;11(2):49-54
- Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *J Chiropr Med*. 2016;15(2):155-63
- Tavakol M, Dennick R. Making sense of Cronbach's alpha. *Int J Med Educ*. 2011;2:53
- Mukaka MM. A guide to appropriate use of correlation coefficient in medical research. *Malawi Med J*. 2012;24(3):69-71
- Amireault S, Godin G, Lacombe J, Sabiston CM. Validation of the Godin-Shephard Leisure-Time Physical Activity Questionnaire classification coding system using accelerometer assessment among breast cancer survivors. *J Cancer Surviv*. 2015;9(3):532-40
- Snook EM, Motl RW, Gliottoni RC. The effect of walking mobility on the measurement of physical activity using accelerometry in multiple sclerosis. *Clin Rehabil*. 2009;23(3):248-58
- São-João TM, Rodrigues RCM, Gallani MCBJ, et al. Adaptação cultural da versão brasileira do Godin-Shephard Leisure-Time Physical Activity Questionnaire. *Rev Saude Publica*. 2013;47(3):479-87 [in Portuguese]
- Sari E, Erdoğan S. Adaptation of the Godin Leisure-Time Exercise Questionnaire into Turkish: The validity and reliability study. *Advances in Public Health*. 2016;2016:3756028

Appendix 1

Appendix 1 available from the corresponding author on request.