

Rasch Analysis

1-Psychometric evaluation of the depression, anxiety, and stress scale-21 (DASS-21) among Chinese primary and middle school teachers

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Abstract

Background Teachers in high-stress roles face increasing psychological distress such as anxiety and depression, underscoring the need for validated assessment instruments. Given the current absence of a comprehensive, designated, and time-efficient scale capable of evaluating depression, anxiety, and stress among the teacher population, the Depression, Anxiety, and Stress Scale-21 (DASS-21) presents itself as a promising alternative. Despite the widespread application of the DASS-21 for assessing psychological distress across various populations, its validity among teachers, along with questions about its factor structure and its potential property of time equivalence, remain unverified. This study endeavors to address these considerations by investigating the psychometric properties of the DASS-21 specifically within the population of Chinese primary and middle school teachers. Methods Cross-sectional ($n = 9,030$) and longitudinal surveys ($n = 1,642$) were conducted using a non-probability sampling method. In addition to the DASS-21, the Chinese version of Chinese Teachers' Job Burnout Questionnaire (CTJBO) was utilized to evaluate the criterion validity of this scale. Three different approaches, namely confirmatory factor analysis, Rasch analysis, and network analysis, were employed to evaluate internal reliability, construct validity, as well as time invariance of the DASS-21. Results The DASS-21 demonstrated a high degree of internal consistency (Cronbach's $\alpha > 0.85$) as well as excellent convergent validity, despite poor discriminant validity as determined by average variance extracted. Confirmatory factor analysis and network analysis further supported convergent validity. The three-factor structure outperformed one- and two-factor alternatives, establishing time invariance. Rasch analysis at the item level identified six inappropriate items within the anxiety and stress subscales, which were subsequently removed. Network analysis presented a better revised network. Regression analysis with emotional exhaustion as the criterion provided logical and accurate results. Conclusion The DASS-21 was found to be a reliable and valid tool for measuring the mental health of teachers over time. To assess the instrument's psychometric properties, a combination of confirmatory factor analysis, Rasch analysis, and network analysis was utilized, which proved effective and is recommended for evaluating contentious instruments. Based on the results of the study, researchers and healthcare professionals are recommended to use the DASS-21 for assessing teachers' psychological distress. However, certain items identified in the study may need to be removed to enhance the instrument's appropriateness for this specific population.

Keywords

Author Keywords

Psychometric properties The DASS-21 School teachers Rasch model Network analysis

Keywords Plus



Rasch Analysis

NETWORK ANALYSIS PSYCHOLOGICAL DISTRESS RASCH ANALYSIS FIT
INDEXES INVENTORY SYMPTOMS CRITERIA BURNOUT



Rasch Analysis

2-Rasch Analysis for Instrument Development: Why, When, and How?

**By Boone, WJ (Boone, William J.) [1] Source CBE-Life Sciences Education Volume 15 Issue 4
DOI 10.1187/cbe.16-04-0148 Article Number rm4 Published DEC 1 2016 Indexed 2016-12-01 Document Type Article**

Abstract

This essay describes Rasch analysis psychometric techniques and how such techniques can be used by life sciences education researchers to guide the development and use of surveys and tests. Specifically, Rasch techniques can be used to document and evaluate the measurement functioning of such instruments. Rasch techniques also allow researchers to construct "Wright maps" to explain the meaning of a test score or survey score and develop alternative forms of tests and surveys. Rasch techniques provide a mechanism by which the quality of life sciences-related tests and surveys can be optimized and the techniques can be used to provide a context (e.g., what topics a student has mastered) when explaining test and survey results.



Rasch Analysis

3-Psychometric Properties of the Insomnia Severity Index and Its Comparison With the Shortened Versions Among the General Population

By Chung, SC (Chung, Seockhoon) [1] ; Ahmed, O (Ahmed, Oli) [2] , [3] ; Cho, EL (Cho, Eulah) [1] ; Bang, YR (Bang, Young Rong) [1] ; Ahn, J (Ahn, Junseok) [1] ; Choi, H (Choi, Hayun) [4] ; Um, YH (Um, Yoo Hyun) [5] ; Choi, JW (Choi, Jae -Won) [6] ; Kim, SJ (Kim, Seong Jae) [7] ; Jeon, HJ (Jeon, Hong Jun) [8] , [9] (provided by Clarivate) Source PSYCHIATRY INVESTIGATION Volume 21 Issue 1 Page 9-17 DOI 10.30773/pi.2023.0189 Published JAN 2024 Indexed 2024-04-16 Document Type Article

Abstract

Objective The aim of this study was to explore the psychometric properties of the Insomnia Severity Index (ISI) based on modern test theory, such as item response theory (IRT) and Rasch analysis, with shortened versions of the ISI among the general population. **Methods** We conducted two studies to evaluate the reliability and validity of the shortened versions of the ISI in a Korean population. In Study I, conducted via online survey, we performed an exploratory factor analysis (n=400). In Study II, confirmatory factor analysis (CFA) was conducted (n=400). IRT and Rasch analysis were performed on all samples. Participants symptoms were rated using the ISI, Dysfunctional Beliefs and Attitudes about Sleep-16 items, Dysfunctional Beliefs about Sleep-2 items, Patient Health Questionnaire-9 items, and discrepancy between desired time in bed and desired total sleep time. **Results** CFA showed a good fit for the 2 -factor model of the ISI (comparative fit index=0.994, Tucker-Lewis index=0.990, root -meansquare -error of approximation=0.039, and standardized root -mean -square residual=0.046). The 3 -item versions also showed a good fit for the model. All scales showed good internal consistency reliability. The scale information curve of the 2 -item scale was similar to that of the full-scale ISI. The Rasch analysis outputs suggested a good model fit. **Conclusion** The shortened 2 -factor ISI is a reliable and valid model for assessing the severity of insomnia in the Korean population. The results are needed to be explored further among the clinical sample of insomnia. Psychiatry Investig 2024;21(1):9-17

Keywords

Author Keywords

[Validation study](#)[Insomnia](#)[Sleep](#)[Reliability and validity](#)

Keywords Plus

[VALIDATIONSCALE](#)



Rasch Analysis

4-Psychometric Validation of the Bangla Fear of COVID-19 Scale: Confirmatory Factor Analysis and Rasch Analysis

By Sakib, N (Sakib, Najmu) [1] , [2] ; Bhuiyan, AKMI (Bhuiyan, A. K. M. Israfil) [1] ; Hossain, S (Hossain, Sahadat) [3] ; Al Mamun, F (Al Mamun, Firoj) [1] , [3] ; Hosen, I (Hosen, Ismail) [1] , [3] ; Abdullah, A (Abdullah, Abu Hasnat) [1] , [3] ; Sarker, A (Sarker, Abedin) [1] , [3] ; Mohiuddin, MS (Mohiuddin, Mohammad Sarif) [4] ; Rayhan, I (Rayhan, Istihak) [5] ; Hossain, M (Hossain, Moazzem) [6] ; (provided by Clarivate) Source INTERNATIONAL JOURNAL OF MENTAL HEALTH AND ADDICTION Volume 20 Issue 5 Page 2623-2634 DOI 10.1007/s11469-020-00289-x Published OCT 2022 Early Access MAY 2020 Indexed 2020-05-11 Document Type Article

Abstract

The recently developed Fear of COVID-19 Scale (FCV-19S) is a seven-item uni-dimensional scale that assesses the severity of fears of COVID-19. Given the rapid increase of COVID-19 cases in Bangladesh, we aimed to translate and validate the FCV-19S in Bangla. The forward-backward translation method was used to translate the English version of the questionnaire into Bangla. The reliability and validity properties of the Bangla FCV-19S were rigorously psychometrically evaluated (utilizing both confirmatory factor analysis and Rasch analysis) in relation to socio-demographic variables, national lockdown variables, and response to the Bangla Health Patient Questionnaire. The sample comprised 8550 Bangladeshi participants. The Cronbach alpha value for the Bangla FCV-19S was 0.871 indicating very good internal reliability. The results of the confirmatory factor analysis showed that the uni-dimensional factor structure of the FCV-19S fitted well with the data. The FCV-19S was significantly correlated with the nine-item Bangla Patient Health Questionnaire (PHQ-90) ($r = 0.406$, $p < 0.001$). FCV-19S scores were significantly associated with higher worries concerning lockdown. Measurement invariance of the FCV-19S showed no differences with respect to age or gender. The Bangla version of FCV-19S is a valid and reliable tool with robust psychometric properties which will be useful for researchers carrying out studies among the Bangla speaking population in assessing the psychological impact of fear from COVID-19 infection during this pandemic.

Keywords

Author Keywords

[COVID-19](#)[Coronavirus](#)[COVID-19 fear](#)[FCV-19S](#)[Bangla](#)[Fear of COVID-19 Scale](#)[Bangladesh](#)

Keywords Plus

[CLINICAL CHARACTERISTICS](#)[HEALTH-CARE](#)[ADAPTATION](#)[DEPRESSION](#)



Rasch Analysis

5-Evaluating the psychometric properties of the Chinese Depression Anxiety Stress Scale for Youth (DASS-Y) and DASS-21

By Cao, CH (Cao, Cui-hong) [1] , [2] ; Liao, XL (Liao, Xiao-ling) [3] ; Gamble, JH (Gamble, Jeffrey H.) [4] ; Li, LL (Li, Ling-ling) [5] ; Jiang, XY (Jiang, Xing-Yong) [6] ; Li, XD (Li, Xu-Dong) [7] ; Griffiths, MD (Griffiths, Mark D.) [8] ; Chen, IH (Chen, I-Hua) [9] ; Lin, CY (Lin, Chung-Ying) [10] , [11] , [12] , [13] (provided by Clarivate) Source CHILD AND ADOLESCENT PSYCHIATRY AND MENTAL HEALTH Volume 17 Issue 1 DOI 10.1186/s13034-023-00655-2 Article Number 106 Published SEP 7 2023 Indexed 2023-09-16 Document Type Article

Abstract

Background In recognizing the need for a reliable and valid instrument to assess psychological distress among children and adolescents, the present study translated the newly developed Depression Anxiety Stress Scale for Youth (DASS-Y) into Chinese, while also comparing its psychometric properties with those of the well-established DASS-21 within a primary and middle school demographic. **Methods** Utilizing a combination of convenience sampling and purposive sampling, a cohort comprising 1,507 primary and 1,131 middle school students was recruited. Rasch analysis, confirmatory factor analysis (CFA), and structural equation modeling (SEM) were used in the data analysis. **Results** Significant differences were observed between the DASS-Y and the DASS-21, notably within the anxiety subscale. The proportions of individuals with clinical mood disorders identified by the two scales demonstrated a significant disparity. Both scales, following an adjustment of responses, exhibited satisfactory internal consistency and convergent validity, with the acceptance of a three-factor structure. Furthermore, the DASS-Y showed superior discriminant validity relative to the DASS-21, providing more compelling evidence regarding concurrent validity. **Conclusion** Overall, the Chinese version of the DASS-Y demonstrated superior robustness to the DASS-21 in terms of psychometric properties. The findings provide initial evidence for the psychometric properties of the DASS-Y from another culture.

Keywords

Author Keywords

[Psychometric properties](#)[Children](#)[Adolescents](#)[DASS-Y](#)[DASS-21](#)

Keywords Plus

[SHORT VERSION](#)[VALIDATION](#)[BURNOUT](#)[TRANSLATION](#)[ADOLESCENTS](#)[STUDENTS](#)[CRITERIA](#)[MODELS](#)[CHILD](#)



Rasch Analysis

6-Development and Psychometric Validation of the EDE-QS, a 12 Item Short Form of the Eating Disorder Examination Questionnaire (EDE-Q)

By Gideon, N (Gideon, Nicole) [1] ; Hawkes, N (Hawkes, Nick) [2] ; Mond, J (Mond, Jonathan) [3] , [4] ; Saunders, R (Saunders, Rob) [1] ; Tchanturia, K (Tchanturia, Kate) [5] ; Serpell, L (Serpell, Lucy) [1] , [6] (provided by Clarivate) Source PLOS ONE Volume 11 Issue 5 DOI 10.1371/journal.pone.0152744 Article Number e0152744 Published MAY 3 2016 Indexed 2016-05-03

Document Type Article

Abstract

Objective

The aim of this study was to develop and validate a short form of the Eating Disorder Examination Questionnaire (EDE-Q) for routine, including session by session, outcome assessment.

Method

The current, 28-item version (6.0) of the EDE-Q was completed by 489 individuals aged 18-72 with various eating disorders recruited from three UK specialist eating disorder services. Rasch analysis was carried out on factors identified by means of principal component analysis, which in combination with expert ratings informed the development of an EDE-Q short form. The shortened questionnaire's reliability, validity and sensitivity was assessed based on online data collected from students of a UK university and volunteers with a history of eating disorders recruited from a national eating disorders charity aged 18-74 (N = 559).

Results

A 12-item short form, the Eating Disorder Examination Questionnaire Short (EDE-QS) was derived. The new measure showed high internal consistency (Cronbach's $\alpha = .913$) and temporal stability (ICC = .93; $p < .001$). It was highly correlated with the original EDE-Q ($r = .91$ for people without ED; $r = .82$ for people with ED) and other measures of eating disorder and comorbid psychopathology. It was sufficiently sensitive to distinguish between people with and without eating disorders.

Discussion

The EDE-QS is a brief, reliable and valid measure of eating disorder symptom severity that performs similarly to the EDE-Q and that lends itself for the use of sessional outcome monitoring in treatment and research.

Keywords

Keywords Plus

[SELF-REPORT QUESTIONNAIRE](#)[QUALITY-OF-LIFE](#)[GENERALIZED ANXIETY DISORDER](#)[PATIENT-REPORTED OUTCOMES](#)[INTERVIEW](#)[VALIDITY](#)[RELIABILITY](#)[IMPAIRMENT](#)[INSTRUMENT](#)[FEEDBACK](#)

Rasch Analysis

7-Validation of the KOOS, JR: A Short-form Knee Arthroplasty Outcomes Survey

By Lyman, S (Lyman, Stephen) [1] ; Lee, YY (Lee, Yuo-Yu) [1] ; Franklin, PD (Franklin, Patricia D.) [2] ; Li, WJ (Li, Wenjun) [2] ; Cross, MB (Cross, Michael B.) [3] ; Padgett, DE (Padgett, Douglas E.) [3]
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Abstract

Medicare is rapidly moving toward using patient-reported outcome measures (PROMs) for outcomes assessment and justification of orthopaedic and other procedures. Numerous measures have been developed to study knee osteoarthritis (OA); however, many of these surveys are long, disruptive to clinic flow, and result in incomplete data capture and/or low followup rates. The Knee injury and Osteoarthritis Outcome (KOOS) physical function short-form (KOOS-PS), while shorter, ignores pain, which is a primary concern of patients with advanced knee OA.

Our objective was to derive and validate a short-form survey focused on the patient with end-stage knee OA undergoing TKA.

Using our hospital's knee replacement registry, we retrospectively identified 2291 patients with knee OA who underwent primary unilateral TKA and had completed preoperative and 2-year postoperative PROMs. We assessed 30 items from the 42-item KOOS that were quantitatively most difficult for patients to perform before TKA and qualitatively most relevant to patients with end-stage knee OA. Rasch analysis identified the KOOS, JR, a seven-item instrument, representing a single dimension, which we define as "knee health" because it reflects aspects of pain, symptom severity, and activities of daily living (ADL) including movements or activities that are directly relevant and difficult for patients with advanced knee OA. We assessed the internal consistency, external validity (versus KOOS and WOMAC domains), responsiveness, and floor and ceiling effects of the KOOS, JR. External validation was performed using calculated KOOS, JR scores in collaboration with a nationally representative joint replacement registry, the Function and Outcomes Research for Comparative Effectiveness in Total Joint Replacement (FORCE-TJR).

Internal consistency for the KOOS, JR was high (Person Separation Index, 0.84; and 0.85 [FORCE]), external validity against other validated knee surveys was excellent (Spearman correlation coefficient, rho 0.54-0.91), particularly for the KOOS pain (rho 0.89 [95% CI, 0.88-0.91] Hospital for Special Surgery [HSS]; and 0.91 [95% CI, 0.90-0.93] [FORCE]) and KOOS ADL (rho 0.87 [95% CI, 0.85-0.88] [HSS]; and 0.84 [95% CI, 0.81-0.87] [FORCE]). The KOOS, JR responsiveness (standardized response means, 1.79 [95% CI, 1.70-1.88] [HSS]; and 1.70 [95% CI, 1.54-1.86] [FORCE]) was high and floor 0.4-1.2% and ceiling (18.8-21.8%) effects were favorable.

The new short knee PROM, the KOOS, JR, provides a single score representing "knee health" as it combines pain, symptoms, and functional limitations in a single score. This short-form PROM is patient-relevant and efficient.

Level III, diagnostic study.

Keywords



Rasch Analysis

Keywords Plus

PATIENT-REPORTED

OUTCOMESVALIDITYOSTEOARTHRISSCORERESPONSIVENESSINSTRUMENTSRELIABILITY



Rasch Analysis