

Original Article

Psychometric properties of the Iranian version of the Copenhagen Burnout Inventory

Elham Javanshir¹, Iman Dianat^{1*}, Mohammad Asghari-Jafarabadi^{2,3}¹Department of Occupational Health and Ergonomics, Tabriz University of Medical Sciences, Tabriz, Iran²Road Traffic Injury Research Center, Tabriz University of Medical Sciences, Tabriz, Iran³Department of Statistics and Epidemiology, Tabriz University of Medical Sciences, Tabriz, Iran

ARTICLE INFO

Article History:

Received: 23 Jan. 2019

Accepted: 9 Apr. 2019

ePublished: 25 May 2019

Keywords:

Burnout, Iran, Psychometrics

*Corresponding Author:

Iman Dianat,
Department of Occupational
Health and Ergonomics,
Tabriz University of Medical
Sciences, Tabriz, Iran
Email: dianati@tbzmed.ac.ir

Abstract

Background: The Copenhagen Burnout Inventory (CBI) is a commonly used tool for evaluation of job burnout in three (personal, work-related and client-related) domains. The aims of this study were to translate and investigate the psychometric properties of the Iranian (Persian) CBI.**Methods:** A total of 750 employees of different occupations (from educational centres, healthcare, industrial settings, and social services) participated in this descriptive methodological study. A forward-backward procedure was applied and content validity was evaluated by a panel of 10 experts. Exploratory and confirmatory factor analyses were used for construct validity. The internal consistency (using Cronbach's alpha), test-retest reliability (using intraclass correlation coefficient – ICC), and feasibility (using ceiling and floor effect) were also assessed for this tool.**Results:** Content validity of the Persian CBI was established. Three-factor structure of the Persian CBI was supported by the factor analysis, and this confirmed the construct validity of the instrument. The internal consistency (Cronbach's alpha ranged from 0.82 to 0.90) and test-retest reliability (ICC ranged from 0.85 to 0.95) were excellent and there was no ceiling or floor effect.**Conclusion:** The Persian CBI is a valid and reliable measurement tool for burnout in the Iranian context.**Citation:** Javanshir E, Dianat I, Asghari-Jafarabadi M. Psychometric properties of the Iranian version of the Copenhagen Burnout Inventory. Health Promot Perspect. 2019;9(2):137-142. doi: 10.15171/hpp.2019.19.

Introduction

Occupational burnout has many negative consequences in family, social and individual life as well as in organizations and work environments, and is a key factor associated with absenteeism, job cracks, sequential delays, various complaints, job changes, and interpersonal conflicts with colleagues.¹⁻³ Burnout has different definitions, but the most commonly used is “a state of physical, emotional, or mental exhaustion caused by long-term involvement in situations that are emotionally demanding”.¹ The concept of burnout was introduced in the psychosocial literature during the 1970s. Freudenberger³ and Maslach & Jackson⁴ were two investigators who independently introduced this concept. According to Maslach and Jackson: “burnout is a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who do ‘people work’ of some kind”. However, according to this definition, burnout is limited to human service work and its associated factors (e.g., high emotional load).² Burnout syndrome

was initially introduced for the service professions (e.g., healthcare workers, teachers, etc) and has been generally evaluated through Maslach Burnout Inventory (MBI).⁵ The MBI has been developed to assess burnout syndrome based on three consequences: emotional exhaustion, depersonalization, and lack of personal fulfilment.^{6,7} However, such a condition is only associated with stressful working conditions independent of the relationship with other people.³

Fatigue and emotional exhaustion seems to be the main concepts of burnout.¹⁻⁷ The Danish National Institute of Occupational Health identified constraints in the use of MBI for evaluation of burnout.⁸ This institute reviewed the literature and conducted a pilot test using MBI, and finally developed a new instrument, namely Copenhagen Burnout Inventory (CBI), which allows measuring burnout in different settings (not just the service professions) with higher accuracy than MBI.² The new tool overcomes the limitations of MBI and satisfies the need to measure burnout suitably.² The hypothesis for developing CBI

was that burnout syndrome is a phenomenon that is characterized by a core of exhaustion (both physical and psychological).⁹ This exhaustion develops across different life domains (e.g., personal sphere, work experience and interaction with clients), and these domains correspond to the three subscales that constitute the CBI (e.g., personal burnout, work-related burnout, and client-related burnout).²

So far, several studies have been conducted on the validity and reliability of the CBI in different countries. Psychometric evaluation of the CBI in Spain among four different occupational groups (teachers, healthcare workers, industry workers, and social service staff) showed that this tool is a reliable tool for measuring occupational burnout.¹⁰ Other studies in China, South Africa, New Zealand, Portugal, Brazil, Italy and Malaysia have also shown the validity and reliability of this tool.¹¹⁻¹⁷ Nevertheless, the validity and reliability of the CBI in other languages and cultures has yet to be determined. This is the case for Iranian language. It should be noted that although a recent study has been conducted on the psychometric properties of this tool in Iran, it only considers nursing population (e.g., service professions).¹⁸ Therefore, additional studies seem to be necessary to characterize the psychometric properties of this tool for other occupational groups, particularly for industrial workers. Therefore, the aim of this paper was to examine the acceptability, reliability and construction validity of the Iranian version of three CBI scales in workers of different occupations.

Materials and Methods

Study design, setting, and participants

This descriptive methodological study was conducted during a 6-month period (January to June, 2018) in the city of Tabriz-Iran. The study population consisted of workers within four organizations of different types: educational areas (administrative staff, teachers, support staff), social work centres (residential and non-residential), healthcare centres (a primary care unit and a group of hospital residents) and workers within the industry sector. A total of 750 participants were selected using a multistage stratified random sampling technique. The number of participants from educational areas, social work centres, healthcare centres, and industry sector were 189, 190, 187, and 184, respectively. Being a full-time employee with at least 1-year job tenure and having no chronic mental/physical problem (determined by self-report) were considered as inclusion criteria for the study. Data were collected using the Iranian version of the CBI. Demographic details of the study participants (age, gender, and educational level) were also recorded.

Copenhagen Burnout Inventory

The CBI was developed by Kristensen et al during the Danish longitudinal study of burnout among employees in the human service sector.² The CBI is a 19-item tool for

measuring burnout in three domains including personal (6 items), work-related (7 items), and client-related domains (6 items). The personal burnout has six questions (questions 1–6), which are related to prolonged physical and psychological exhaustion. The work-related burnout has seven questions (question 7–13), which are associated with the long-term physical and psychological exhaustion in an individual due to his/her work. The client-related burnout has six questions (questions 14–19) which are related to the long-term physical and psychological exhaustion due to the individual's work with clients.

For the personal burnout, each item has a 5-point Likert scale format as: "Always", "Often", "Sometimes", "Seldom", and "Never/almost never". If the participant answers less than three questions, then the respondent is classified as non-responder. Item scoring is as follows: Always = 100, Often = 75, Sometimes = 50, Seldom = 25, and Never/almost never = 0. Total score for this scale is calculated as the average of the scores on the items. Therefore, the total score ranges from 0 to 100, with the lowest score indicating the desired and the highest score indicating an undesirable situation.

For the work-related burnout, there are two answer formats. The response format for first three questions is as: "To a very high degree", "To a high degree", "Somewhat", "To a low degree", and "To a very low degree". The response format for last four questions is as: "Always", "Often", "Sometimes", "Seldom", and "Never/almost never". If less than four questions have been answered by the respondent, it is classified as non-responder. The scoring system for this scale is the same as for the first scale.

There are also two response formats for the client-related burnout. The response format for first four questions is as: "To a very high degree", "To a high degree", "Somewhat", "To a low degree", and "To a very low degree". The response format for last two questions is as: "Always", "Often", "Sometimes", "Seldom", and "Never/almost never". If less than three questions have been answered by the participant, it is classified as non-responder. The scoring system for this scale is the same as for the two previous scales.

The CBI was converted into Persian (Iranian language) using a forward-backward translation process. The forward translation was performed by two specialists in the field of psychology. The back translation was performed by two specialists in the field of language. The English back-translation was then reviewed and checked for clarity and wording. The final questionnaire was revised based on the feedback from a sample of 30 participants through a pilot study.

With regard to qualitative evaluation, the questionnaire was reviewed for content validity by an expert panel of 10 specialists in the fields of psychologists, ergonomists, and occupational health. In addition, two sets of questions (based on 4-point scale response format) were delivered to the expert panel members for quantitative evaluation. One set included questions regarding relevancy, clarity and simplicity of the items (for calculation of content validity

index – CVI) and another set was related to the necessity of each item (for calculation of content validity ratio – CVR). CVI and CVR values > 0.79 and 0.62, respectively, were considered appropriate considering the number of expert panel members.¹⁹

Statistical analysis

Statistical analysis was carried out with SPSS 21.0 (IBM Inc., Armonk, NY, USA) and AMOS 18. P values less than 0.05 were considered statistically significant. Stability reliability and internal consistency of the scale (performed on a sample of 30 subjects during a two-week interval) were evaluated using intraclass correlation coefficient (ICC) and Cronbach’s α, respectively. Considering the nature of the analysis, two-way mixed, consistency and an average measure ICC was used. For both the stability reliability and internal consistency, values ≥0.7 was considered good.²⁰ Ceiling and floor effects were evaluated using percentage of scores at the boundaries of the scaling.²¹ Structure of the measure was assessed by exploratory factor analysis (EFA) using principal axis factoring extraction procedure and direct oblimin rotation with Kaiser normalization. The number of extracted factors was determined using the scree plot method. Bartlett’s test of sphericity, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and total variance explained were used to assess model sufficiency.²² KMO values higher than 0.7, significant values of the Bartlett’s test of sphericity (<0.05), and factor loadings ≥0.3 were considered for interpretation.²³ Confirmatory factor analysis (CFA) was applied to assess the fit between EFA extracted model and observed data (asymptomatic covariance matrix = weighted matrix; input matrix = covariance matrix). The fit of the model

was evaluated using various fit indices including root mean square error of approximation (RMSEA) (< 0.08), χ² / df (< 5), adjusted goodness of fit index (AGFI) (> 0.9), goodness of fit index (GFI), and comparative fit index (CFI).

Results

Sample characteristics

A total of 750 subjects participated in the study (438 males, 58.4%; 312 females,41.6%). The missing items ranged between 0.13% and 0.67%, which were deleted list wise. The age of participations ranged from 20 to 61 years (mean = 45.3 years; SD = 5.2 years). The majority of participants were married (n = 604, 80.5%). Among them, 11.7% (88) had primary school education, 2.4% (18) had secondary school education, 24.6% (185) had diploma, 19.5% (146) had undergraduate degree, and 41.8% (313) had postgraduate degree. In terms of the occupation, 189 (25.2%) were teachers, 186 (24.8%) were healthcare employees, 184 (24.5%) were industrial employees, and 190 (25.3%) were in social services.

Content validity

The scores of CVI and CVR of the Persian version of CBI are presented in Table 1. According to these results, CVI ranged between 0.91 and 1.00, and CVR ranged between 0.85 and 1.00, which indicates satisfactory results for each item and also for the Persian version of CBI.

Construct validity

Exploratory factor analysis

The results showed that the KMO measure of sampling accuracy was 0.941, which justifies the sufficiency of

Table 1. The scores of CVI and CVR of the Persian CBI

Item	Item content	CVI	CVR
Personal burnout			
1	How often do you feel tired?	0.97	1.00
2	How often are you physically exhausted?	1.00	1.00
3	How often are you emotionally exhausted?	1.00	1.00
4	How often do you think: “I can’t take it anymore”?	0.97	1.00
5	How often do you feel worn out?	0.93	1.00
6	How often do you feel weak and susceptible to illness?	1.00	1.00
Work-related burnout			
7	Is your work emotionally exhausting?	1.00	1.00
8	Do you feel burnt out because of your work?	1.00	1.00
9	Does your work frustrate you?	1.00	1.00
10	Do you feel worn out at the end of the working day?	1.00	1.00
11	Are you exhausted in the morning at the thought of another day at work?	0.97	1.00
12	Do you feel that every working hour is tiring for you?	0.97	1.00
13	Do you have enough energy for family and friends during leisure time?	1.00	1.00
Client burnout			
14	Do you find it hard to work with clients?	.091	1.00
15	Do you find it frustrating to work with clients?	1.00	1.00
16	Does it drain your energy to work with clients?	1.00	1.00
17	Do you feel that you give more than get back when you work with clients?	0.93	0.85
18	Are you tired working with clients?	1.00	1.00
19	Do you sometimes wonder how long you will be able to continue working with clients?	1.00	1.00

the model. The results of Bartlett's test of sphericity ($\chi^2(750) = 7821.185; P < 0.000$) was also in agreement with the KMOs.²² Three factors were obtained from the factor analysis as follows:

- Factor 1: feel tired (item: PB₁), physically exhausted (item: PB₂), feel weak and susceptible to illness (item: PB₆), emotionally exhausted (item: PB₃), feel worn out (item: PB₅), and cannot take it anymore (item: PB₄)
- Factor 2: energy to work with clients (item: CB₃), find it hard to work with clients (item: CB₁), frustrating to work with clients (item: CB₂), tired working with clients (item: CB₅), give more than get back (item: CB₄), and able to continue working with clients (item: CB₆)
- Factor 3: work frustrated (item: WB₃), feel burnt out (item: WB₂), feel worn out at the end of the work (item: WB₄), emotionally exhausting (item: WB₁), feel that every working hour is tiring (item: WB₆), and exhausted in the morning (item: WB₅).

The total variance explained was determined to be 62.96% (Factor 1 = 47.59%; Factor 2 = 9.64%, Factor 3 = 5.71%). One item (item: WB₇) with low communalities (<0.2) was deleted from the analysis, and therefore the results were revised after deleting this item. Factors and factor loading for each test item are presented in Table 2. It can be seen from this table that cut-off values are >0.3 for factor loadings, suggesting that all items strongly loaded on the Iranian version of CBI. One deleted item (item: WB₇) had small value in loadings. Moreover, factors were correlated, which justifies the use of direct oblimin rotation method (corr >0.3 among factors).

Table 2. Factors and factors loading for each test item^a

Item	Item description	Factor 1	Factor 2	Factor 3
PB ₁	Feel tired	0.855		
PB ₂	Physically exhausted	0.829		
PB ₆	Feel weak and susceptible to illness	0.710		
PB ₃	Emotionally exhausted	0.699		
PB ₅	Feel worn out	0.685		
PB ₄	Can't take it anymore	0.606		
CB ₃	Energy to work with clients		0.911	
CB ₁	Find it hard to work with clients		0.807	
CB ₂	Frustrating to work with clients		0.734	
CB ₅	Tired working with clients		0.689	
CB ₄	Give more than get back		0.360	
CB ₆	Able to continue working with clients		0.273	
WB ₃	Work frustrate			-0.901
WB ₂	Feel burnt out			-0.815
WB ₄	Feel worn out at the end of the work			-0.623
WB ₁	Emotionally exhausting			-0.600
WB ₆	Feel that every working hour is tiring			-0.536
WB ₅	Exhausted in the morning			-0.435

Extraction Method: Principal Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

^a Rotation converged in 8 iterations.

Ceiling and floor effects

The Persian version of the CBI showed no ceiling or floor effects. The results of ceiling and floor effect are presented in Table 3.

Confirmatory factor analysis

According to the CFA analysis, the model fit was confirmed by the indices: $\chi^2/df = 4.38 < 5$; SRMR = 0.054 < 0.1; RMSEA = 0.067 < 0.08 and 90% HI: 0.073; CFI = 0.95 > 0.90; NFI = 0.93 > 0.90; GFI = 0.917 > 0.91; AGFI = 0.91 > 0.90; RFI = 0.92 > 0.9; and IFI = 0.95 < 1.^{20,24,25} Evaluation of the relationships between parameters and factors based on this model revealed that the items had significant loadings on the three factor solution (standardized factor loadings ranged between 0.34 and 0.86, as shown in Figure 1).

Moreover, correlations between factors were as follows: factor 1 and factor 2 ($r = 0.756; P < 0.001$); factor 1 and factor 3 ($r = 0.519; P < 0.001$); and factor 2 and factor 3 ($r = 0.641; P = 0.001$). The findings indicate that the EFA and CFA analyses confirm the models, and consequently the construct validity of this tool.

Reliability

Internal consistency reliability of the Persian CBI

Table 3. Results of ceiling and floor effect

Scale	Ceiling No. (%)	Floor No. (%)
Personal burnout	11 (1.5)	15 (2.0)
Work-related burnout	12 (1.6)	1 (0.1)
Client burnout	10 (1.3)	12 (1.6)

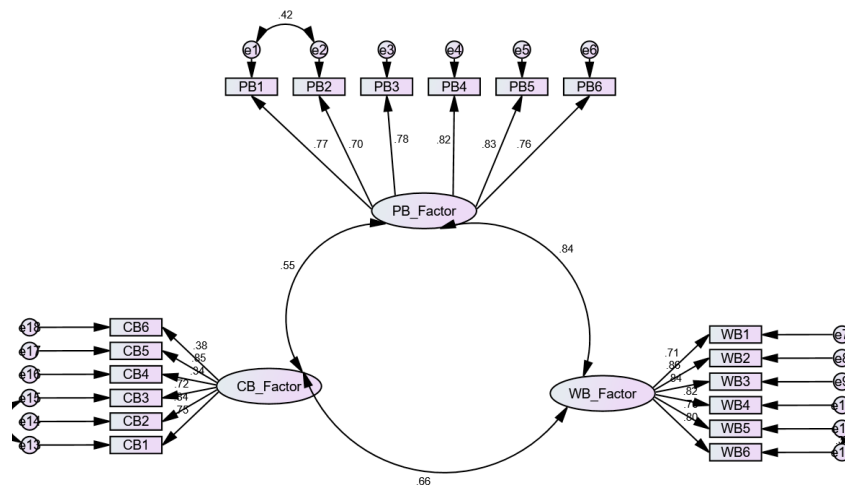


Figure 1. Relations between items and factors and between factors (from confirmatory factor analysis). All relations between factors and items as well as between the factors were significant ($P < 0.05$).

(evaluated using Cronbach’s α coefficient) was 0.90, 0.82, and 0.88 for Factor 1, Factor 2, and Factor 3, respectively, which is satisfactory. Test-retest reliability (evaluated by ICC) of this tool was also good (value for the whole tool was 0.95, and for the Factor 1, Factor 2 and Factor 3 were 0.95, 0.85 and 0.89, respectively).

Discussion

The aim of this study was to examine the acceptability, reliability and construct validity of the Iranian version of the CBI among workers of different occupations. With regard to the importance of occupational burnout issue, which has many negative consequences for the families, society and organizations, more studies on this issue have important implications in terms of health and wellbeing as well as design and management of working systems. Nevertheless, this issue has not received adequate attention in Iran. This may be, partly, due to the lack of valid and reliable specific tools for measurement of occupational burnout in the country. This emphasizes the need for reliable and valid instruments to evaluate occupational burnout for Persian-speaking populations.

Internal consistency of the Persian CBI and also test-retest reliability of this tool were shown to be good. These findings are generally in agreement with the findings reported in previous research.^{2,12,18} The internal consistency reliability of the three factors of Persian CBI in our study using the Cronbach’s α was between 0.82 and 0.90, which is relatively similar to that reported by Mahmoudi et al (Cronbach’s α between 0.84 and 0.89) among nurses.¹⁸ Similarly, the ICC values in our study ranged between 0.85 and 0.95, which is similar to those reported by Mahmoudi et al (0.83–0.95).¹⁸ In addition to its good reliability, the results showed no floor or ceiling effect for the Persian CBI. This means that the Persian version of the CBI has no measuring limitation and reassures the practitioners of the validity of this instrument. Ceiling and floor effects of this instrument have not been explored in previous

research, and therefore it is not possible to compare the results in this context. Additionally, the content validity of the Persian CBI was approved by both qualitative (using expert panel members’ feedback) and quantitative (agreement between expert panel members and acceptable CVR and CVI values) assessments. Again, this finding is in agreement with the results reported in some previous studies.^{15,18}

Similar to finding of other studies, the three factors of the Persian CBI indicated good factor structure, suggesting that the three-factor model fit better than one- or two-factor model.^{2,11-17} This finding support differentiation of the three domains of this instrument. Nevertheless, our study showed a low factor loading for one of the items (WB₇) on the work-related burnout scale. According to the EFA model, this item was omitted from the work-related burnout scale because it had no significant correlation with other items. Contrary to this finding, Mahmoudi et al¹⁸ considered four factors for this tool and divided the work-related burnout into two separate subscales. Although a low loading was found for this item, the authors did not remove this item and added it to the personal burnout.

The findings of this study demonstrated that the Iranian adaptation of the CBI is a reliable and valid instrument for measurement of burnout in Persian-language populations. These findings provide further evidence that the CBI can be used and applied in countries other than the origin country. In line with previous reports, the items of this instrument demonstrated a high degree of discrimination capacity and reliability (internal consistency and homogeneity).^{10,14}

Conclusion

This study was aimed to validate the Iranian version of CBI for the Iranian language (Persian) populations and the results indicated high degrees of reliability, feasibility, and validity for the Persian CBI as a tool for measurement of

occupational burnout in workers of different occupations. The psychometric properties of the Persian version of the CBI and the original English version were consistent, which suggests that the Persian CBI can be used by Iranian researchers and practitioners for evaluation of occupational burnout in different workplace settings and environments.

Ethical approval

This study was approved by the ethics committee of the Tabriz University of Medical Sciences (IR.TBZMED.REC.1396.787).

Competing interests

The authors declare that they have no competing interests.

Disclaimer

The authors claim that no part of this manuscript has been copied from other sources.

Authors' contributions

EJ contributed to work design and data collection. ID contributed to the conception and work design as well as drafting the work. MAJ contributed to the analysis and interpretation of data.

Acknowledgments

The authors would like to acknowledge all subjects who participated in this study.

References

- Lackritz JR. Exploring burnout among university faculty: incidence, performance, and demographic issues. *Teach Teach Educ.* 2004;20(7):713-29. doi: 10.1016/j.tate.2004.07.002.
- Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. *Work Stress.* 2005;19(3):192-207. doi: 10.1080/02678370500297720.
- Freudenberger HJ. The staff burn-out syndrome in alternative institutions. *Psychotherapy: Theory, Research & Practice.* 1975;12(1):73-82. doi: 10.1037/h0086411.
- Maslach C, Jackson SE. The role of sex and family variables in burnout. *Sex Roles.* 1985;12(7):837-51. doi: 10.1007/bf00287876.
- Eriksson Hallberg U. A thesis on fire: Studies of work engagement, Type A behavior and burnout [thesis]. Stockholm: Psykologiska Institutionen; 2005.
- Farber BA. *Stress and Burnout in the Human Service Professions.* New York: Pergamon Press; 1983.
- Schaufeli WB, Greenglass ER. Introduction to special issue on burnout and health. *Psychol Health.* 2001;16(5):501-10. doi: 10.1080/08870440108405523.
- Armon G, Shirom A, Shapira I, Melamed S. On the nature of burnout-insomnia relationships: a prospective study of employed adults. *J Psychosom Res.* 2008;65(1):5-12. doi: 10.1016/j.jpsychores.2008.01.012.
- Pines A, Aronson E. *Career burnout: Causes and cures.* New York: Free Press; 1988.
- Molinero Ruiz E, Basart Gomez-Quintero H, Moncada Lluís S. Validation of the Copenhagen Burnout Inventory to assess professional burnout in Spain. *Rev Esp Salud Publica.* 2013;87(2):165-79. doi: 10.4321/s1135-57272013000200006.
- Fong TC, Ho RT, Ng SM. Psychometric properties of the Copenhagen Burnout Inventory-Chinese version. *J Psychol.* 2014;148(3):255-66. doi: 10.1080/00223980.2013.781498.
- Yeh WY, Cheng Y, Chen CJ, Hu PY, Kristensen TS. Psychometric properties of the Chinese version of Copenhagen burnout inventory among employees in two companies in Taiwan. *Int J Behav Med.* 2007;14(3):126-33. doi: 10.1007/BF03000183.
- Smit AM. Psychometric properties of the Copenhagen Burnout Inventory in a South African context. University of Pretoria; 2011.
- Milfont TL, Denny S, Ameratunga S, Robinson E, Merry S. Burnout and wellbeing: Testing the Copenhagen burnout inventory in New Zealand teachers. *Soc Indic Res.* 2008;89(1):169-77. doi: 10.1007/s11205-007-9229-9.
- Campos JADB, Carlotto MS, Maroco J. Copenhagen Burnout Inventory-student version: adaptation and transcultural validation for Portugal and Brazil. *Psicol Reflex Crit.* 2013;26(1):87-97. doi: 10.1590/S0102-79722013000100010.
- Fiorilli C, De Stasio S, Benevene P, Iezzi DF, Pepe A, Albanese O. Copenhagen Burnout Inventory (CBI): A validation study in an Italian teacher group. *TPM Test Psychom Methodol Appl Psychol.* 2015;22(4):537-51. doi: 10.4473/TPM22.4.7.
- Andrew Chin RW, Chua YY, Chu MN, Mahadi NF, Wong MS, Yusoff MSB, et al. Investigating validity evidence of the Malay translation of the Copenhagen Burnout Inventory. *J Taibah Univ Med Sci.* 2018;13(1):1-9. doi: 10.1016/j.jtumed.2017.06.003.
- Mahmoudi S, Atashzadeh-Shoorideh F, Rassouli M, Moslemi A, Pishgooie AH, Azimi H. Translation and Psychometric Properties of the Copenhagen Burnout Inventory in Iranian Nurses. *Iran J Nurs Midwifery Res.* 2017;22(2):117-22. doi: 10.4103/1735-9066.205958.
- Waltz CF, Strickland OL, Lenz ER. *Measurement in Nursing Research.* 2nd ed. Philadelphia: F A Davis Co; 1991.
- Tinsley HE, Brown SD. *Handbook of Applied Multivariate Statistics and Mathematical Modeling.* New York: Academic Press; 2000.
- McHorney CA, Tarlov AR. Individual-patient monitoring in clinical practice: are available health status surveys adequate? *Qual Life Res.* 1995;4(4):293-307. doi: 10.1007/BF01593882.
- George D, Mallery P. *SPSS for Windows Step-by-Step: A Simple Guide and Reference.* 6th ed. Boston: Allyn & Bacon; 2006.
- Kline RB. *Principles and practice of structural equation modeling.* 2nd ed. New York: Guilford Press; 2005.
- MacCallum RC, Browne MW, Sugawara HM. Power analysis and determination of sample size for covariance structure modeling. *Psychol Methods.* 1996;1(2):130-49. doi: 10.1037/1082-989X.1.2.130.
- Marsh HW, Balla JR, Hau K. An evaluation of incremental fit indices: a clarification of mathematical and empirical properties. In: Marcoulides GA, Schumacker RE, eds. *Advanced Structural Equation Modelling: Issues and Techniques.* Mahwah, NJ: Erlbaum; 1996. p. 315-54.