# Revalidation of Reliability and Validity of the Post-Traumatic Stress Disorder Checklist-civilian Version among High-risk Pregnancy Women

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## Abstract

**Objective:** To examine the validity and reliability of the Post-Traumatic Stress Disorder Checklist-Civilian version (PCL-C) among high-risk pregnancy women and to determine the scale's stability. **Methods:** The Post-traumatic Stress Disorder Checklist-Civilian version was administered to 200 women with high-risk pregnancies who were rechecked around 1～3 months postpartum. Furthermore, 50 women with high-risk pregnancies in this population were subjected to a second examination 2 weeks later. The validity and reliability of the scale were assessed using a thorough evaluation strategy. This approach included analyzing the properties of the scale items as well as assessing their structural validity, convergent validity, discriminant validity, and internal consistency. **Results:** The total PCL-C scale exhibited a Cronbach's α of 0.972, a folded-in reliability coefficient of 0.95, and a retest reliability of 0.975, respectively. The validated factor analysis showed an excellent structural goodness-of-fit ($x^2$/df=1.713, RMSEA=0.047, GFI =0.902 CFI =0.979, TLI= 0.973, IFI=0.979); Each Estimate >0.5, the mean-variance of variance AVE> 0.5. Furthermore, the combined reliability (CR) > 0.8 demonstrates an optimal scale convergent validity. Each dimension has a significant correlation ($p<0.01$), the absolute value of the correlation coefficient is <0.5, and all of them are smaller than the square root of the corresponding AVE, which indicates the scale data's discriminant validity is ideal. **Conclusion:** The PCL-C scale is reliable and has a stable structure. It can be used to measure the status of postpartum PTSD in high-risk pregnant women, which can help assess the psychological outcome of high-risk pregnant women.

**Keywords:** PTSD; High-Risk Pregnancy Women; Scale; Reliability; Revalidation.

## Introduction

High-risk pregnancies are those in which complications, comorbidities, or other high-risk causative factors occur during pregnancy, which may cause harm to the mother and fetus or lead to obstructed labor, seriously endangering the health of the mother and child, or may lead to the occurrence of adverse maternal pregnancy outcomes, and which are of a high degree of risk.[1] Pregnancy and childbirth are major stressful events for women, and women experience complex psychological changes and psychosomatic problems during pregnancy, childbirth, and the postnatal period. For women with high-risk pregnancies, there are also stress disorders, which have a severe impact on maternal psychosomatic health. Postpartum trauma stress disorder (PTSD) is a stress disorder that manifests as a delayed psychotic physiological reaction in women who have experienced the trauma of childbirth.[2,3] It has been reported that PTSD occurs in about 9.4% to 16.3% of pregnant women after delivery.[4] It often lasts for 6 to 12 months or even longer after delivery, Impacting not just

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the mental and physical condition of the mother but also the formation and upkeep of the mother-infant bond and the overall balance within the family.[5-8] In current times, international academic researchers have directed a growing focus on postpartum stress disorder in women with high-risk pregnancies. A variety of evaluation scales have been developed, such as the Urban Birth Trauma Scale (BiTS)[9] and the PTSD-SS self-rating scale.[10,11] Weathers *et al*.[12] designed a Post-traumatic stress disorder Checklist-Civilian version(PCL-C), a high-quality, comprehensive, easy-to-use assessment tool. The scale has been evaluated by different groups of people with good reliability and validity, and the text has been transcribed into other languages and utilized in various places.[13-17] In a study conducted by Chinese scholar Yang *et al*.[18], the civilian version of the Posttraumatic Stress Disorder Checklist (PCL-C scale) was applied to survey findings on PTSD among Chinese medical students. The findings indicated that the scale had high levels of reliability and validity.

Chinese scholars Jiang Chao et al. have Chineseised the PCL-C scale with the authorization of the original authors. Due to the adjustment of the scale structure in the process of sinicization, the structure of the sinicized scale is different from that of the original scale. Therefore, to evaluate the PCL-C scale, it is also necessary to validate the factor structure obtained from the previous sample with another sample to demonstrate the stability of the factor structure. Accordingly, the current study was conducted by the scale's recommended conditions of use to re-evaluate the reliability of the PCL-C, providing a research tool for future research on postpartum PTSD in Chinese women with high-risk pregnancies.

## Research Methodology

### Research Population

This study adopted a cross-sectional survey to evaluate high-risk pregnant women who were receiving postnatal examinations at a tertiary hospital's postnatal clinic in Jiangsu Province. The study was conducted from January 2024 to May 2024. The inclusion criteria: ① age greater than 18 years; ② vaginal delivery or cesarean section; ③ ability to read and write questionnaires; ④voluntary participation in this study. Standard of exclusion**:** ① Currently pregnant; ②Stillbirth during delivery or postnatal fetal death; ③ Infant with significant illness, disability, or death; ④ Recent major stressful events such as the death of next of kin, divorce; ⑤ Previous cognitive impairment or history of depression, PTSD and other mental illnesses; ⑥ Those who do not want to participate in this study.

Women completed the questionnaire themselves after giving informed consent. In general, the requirements for the root scale measurement study stipulate that the sample size should be tenfold the number of entries on the scale, which has 17 entries. Thus, the minimum sample size for this study is 170 individuals. A total of 205 women with high-risk pregnancies who met the inclusion criteria were surveyed in this study, and 200 valid questionnaires were collected, representing a validity rating of 97.6%. The questionnaire was re-tested two weeks later as an online questionnaire.

### Instrumentation

#### Questionnaire for General Information

By conducting a thorough examination of existing literature and seeking advice from experts, we developed a comprehensive questionnaire for gathering general information., which includes ① Socio-demographic information of the research subjects, including age, education, marital status, family income, etc. ② Maternity data of the study population, including time of delivery, number of deliveries, mode of delivery, presence of epidural anesthesia, satisfaction with delivery, quality of post-partum sleep, history of adverse pregnancy and childbirth, pre-pregnancy chronic and infectious diseases, and pregnancy comorbidities. ③ Neonatal data, including the presence of preterm birth, breastfeeding, early mother-infant contact, and neonatal admission to the intensive care unit due to illness.

#### Post-traumatic Stress Disorder Checklist-Civilian version, PCL-C

The scale consists of 17 components and is divided into three dimensions: repeated experience symptoms (5 items), avoidance and numbing symptoms (7 items), and hypervigilance symptoms (5 items). The scale was assessed using a five-point Likert scale, where 1 indicated "never," and 5 indicated "almost always." The total scale score was calculated by dividing the cumulative score of all items on the scale by the total number of items. Dimension scores are obtained by dividing the sum of the scores of the entries in each dimension of the scale by the total number of entries in that dimension. PTSD was considered to exist when any entry scored more than 3. PTSD was diagnosed if the patient had one trauma re-experiencing symptom, three persistent avoidance symptoms, and two symptoms of heightened alertness.[5]

### Statistical Methods

SPSS27.0 software was used for item analysis and confidence test; Amos26.0 software was used for the validity test. The test level $\alpha = 0.05$.

*Item Analysis Methods:* ① Critical Ratio (CR) According to the total scores of the subjects, the subjects were classified into two groups, designated as low and high, respectively. The low group comprised the initial 27% of subjects, with the remaining 27% comprising the high group. The independent samples t-test was used to determine the decision value or critical ratio for each measurement item and to examine whether the measurement items could distinguish between subjects of different levels. Deletion criteria: critical ratio CR value ($t<3$), or $P>0.05$, the question item can be considered for deletion. ② Correlation coefficient method Pearson's correlation analysis method was employed to assess the correlation between the scores of each item and the total score of the scale. Items with a Pearson correlation coefficient (r) greater than 0.4 and a P-value less than 0.05 were considered to have a statistically significant association with the total score and were retained for further analysis.[19]

*Reliability Test:* In this study, the scale's reliability was judged from three aspects.[20] That is, internal consistency (Cronbach's α), retest reliability, and split-half reliability

to evaluate the scale's reliability, and the value of >0.7 indicates that the scale has a good correlation index.

*Validity Test:* The study's validity was evaluated using a confirmed factor analysis.

*Structural Validity:* A confirmed factor analysis (CFA) was conducted utilizing maximum likelihood estimation. The following indicators and criteria were employed to evaluate model fit:[21-23] That is, ① $X^2$/df:0～2 indicates that the model is well simulated; ② A Root Mean Square Error of Approximation (RMSEA) value between 0.05 and 0.08 suggests that the model is a good fit; ③ Fitting indices GFI, CFI, IFI, TLI, NFI>0.9, the model is well adapted; *Convergent Validity:* Estimate is required to be greater than 0.5, and the CR> 0.7, the greater, the better; AVE> 0.5. *Discriminant Validity:* Correlation coefficients of the latent variables<0.5, and the AVE square root is more significant than any correlation coefficient.

# Results

## General Information on Women with High-risk Pregnancies

Survey respondents were under 35 years of age (72.5%), with education mainly above high school (53.5%), full-term babies (88%), and married (89.5%). The monthly household income exceeded 6,000 RMB (63.5%), 78.8% of the mothers were primigravid women, the mode of delivery was predominantly normal vaginal delivery (73.4%), epidural anesthesia analgesia for the delivery of the mothers (53%), satisfaction with the delivery (77%), newborns were breastfed (69.5%), newborns had no early maternal-infant contact (64.5%), and newborns were not hospitalized (77.5%). The proportion of women who had a normal vaginal delivery (73.4%), who had epidural anesthesia during delivery (53%), who were satisfied with the delivery (77.0%), who breastfed their newborns (69.5%), who had mother-infant contact in the early days of the newborn's life (64.5%), who did not have their newborns admitted to a care unit (84.5%), who had poor postnatal sleep (56%), who had poor pregnancy and childbirth histories (19%), who suffered from chronic illnesses (10.5%), and who suffered from complications in the course of pregnancy (16.5%),. The results are shown in Table 1.

**Table 1: General Information about the Respondents and Related Information (N=200).**

| Variable | Frequency | Percentage (%) |
|---|---|---|
| **Age (Years)** | | |
| < 35 | 145 | 72.5 |
| ≥ 35 | 55 | 27.5 |
| **Premature** | | |
| Yes | 24 | 12 |
| No | 276 | 88 |
| **Education** | | |
| High school diploma and below | 93 | 46.5 |
| Specialist diploma or above | 107 | 53.5 |
| **Marriage Status** | | |
| Married | 179 | 89.5 |
| Divorced | 21 | 10.5 |
| **Monthly Household Income (RMB)** | | |
| < 6000 | 73 | 36.5 |
| ≥6000 | 121 | 63.5 |
| **Primary Production** | | |
| Yes | 97 | 48.5 |
| No | 103 | 51.5 |
| **Primipara** | | |
| Natural vaginal delivery | 103 | 51.5 |
| Cesarean section | 97 | 48.5 |
| **Epidural Analgesia** | | |
| Yes | 106 | 53 |
| No | 94 | 47 |
| **Childbirth Satisfaction** | | |
| Yes | 155 | 77.5 |
| No | 45 | 22.5 |
| **Breast Feeding** | | |
| Yes | 139 | 69.5 |
| No | 71 | 30.5 |
| **Early Mother-infant Skin Contact Period** | | |
| Yes | 129 | 64.5 |
| No | 71 | 35.5 |
| **Newborn Babies Admitted to the Intensive Care Unit** | | |
| Yes | 129 | 15.5 |
| No | 71 | 84.5 |
| **Postpartum Sleep Quality** | | |
| Good | 88 | 44.0 |
| Bad | 112 | 56.0 |
| **History of Adverse Pregnancy** | | |
| Yes | 38 | 19.0 |
| None | 162 | 81.0 |
| **Chronic Disease** | | |
| Yes | 21 | 10.5 |
| None | 179 | 89.5 |
| **Complication of Pregnancy** | | |
| Yes | 33 | 16.5 |
| None | 167 | 83.5 |

## Item Analysis

(1) *Critical Ratio:* The discrepancy between the two groups in each instance was identified utilizing two independent samples t-tests. The results showed that all entries, CR>3 and P<0.001, were statistically significant. The particular outcomes are illustrated in Table 2.

**Table 2: The Determination Value of each Item of the PCL-C Scale (N=200).**

| Item | CR Value | Item | CR value |
|---|---|---|---|
| 1 | 11.876*** | 10 | 12.495*** |
| 2 | 10.115*** | 11 | 10.872*** |
| 3 | 9.76*** | 12 | 11.49*** |
| 4 | 13.519*** | 13 | 11.154*** |
| 5 | 10.752*** | 14 | 12.621*** |
| 6 | 13.75*** | 15 | 11.736*** |
| 7 | 13.453*** | 16 | 11.473*** |
| 8 | 9.78*** | 17 | 10.32*** |
| 9 | 12.639*** | | |

Note: ***: P<0.001.

(2) *Correlation Coefficient Method:* The correlation coefficient (r) between the scores of each item and the total score was calculated using Pearson's correlation coefficient (r). The results indicated that the correlation between the scores of all items and the overall score was statistically significant, surpassing a threshold of 0.3.(P<0.001), so all items were retained. The specific results are presented in Table 3. Pearson correlation analysis was performed on each item and other items in its dimension, and the correlation coefficient of elements inside the dimension was computed. The correlation coefficients of the items in the repeated experience dimension varied between 0.759 to 0.807. All the items in the Avoidance Anhedonia dimension had correlation coefficients between 0.545 and 0.797. The correlation coefficients of each item in the hypervigilance symptom dimension ranged from 0.637 to 0.819.

**Table 3: Pearson Correlation Coefficient between each Item Score and Total PCL-C Scale Score (N=200).**

| Item | Correlation Coefficient (r) | Item | Correlation Coefficient (r) |
|---|---|---|---|
| 1 | .870** | 10 | .773** |
| 2 | .869** | 11 | .845** |
| 3 | .870** | 12 | .836** |
| 4 | .885** | 13 | .791** |
| 5 | .851** | 14 | .832** |
| 6 | .874** | 15 | .854** |
| 7 | .864** | 16 | .850** |
| 8 | .766** | 17 | .827** |
| 9 | .697** | | |

Note: ***: P<0.001; **: P<0.01.

## Reliability Test

① *Internal Consistency:* The study found that the Cronbach's α value for the entire scale was 0.972, indicating a high level of internal consistency across all measurements. The Cronbach's α coefficients for the individual dimensions range from 0.924 to 0.951. The exhaustive results are presented in Table 4.

**Table 4: PCL-C Scale Internal Consistency and Retest Reliability Results (N=200).**

| Item | Cronbach's α | Test-retest Reliability |
|---|---|---|
| Total score of PCL-C | 0.972 | 0.975 |
| Repeated experience symptoms | 0.951 | 0.940 |
| Avoidance of numbness symptoms | 0.933 | 0.938 |
| Symptoms of increased alertness | 0.924 | 0.939 |

② *Retest Reliability:* The retest reliability of the total scale of this study's results, administered to part of the population at 2-week intervals, was 0.975. Table 4 illustrates these findings.

③ *Split-half Reliability:* The PCL-C scale consists of 17 questions, and the scale entries are in two parts in accordance with the parity of the serial number. The αreliability value of the 9 questions in the first part is 0.955. The α reliability value of the 8 questions in the second part is 0.942. The folded half reliability value is 0.95, which is higher than 0.9, indicating that the reliability of the PCL-C scale is good. Detailed information is given in Table 5.

**Table 5: PCL-C Scale Split-half Reliability (N=200).**

| Cronbach's α | | Spearman-Brownian Coefficient |
|---|---|---|
| Part I (9 questions) | Part II (8 questions) | |
| 0.955 | 0.942 | 0.95 |

*Validity Test:* The confirmatory factor analysis yielded the results.

① *Structural Validity:* A scale was subjected to confirmed factor analysis (CFA). The findings indicate that the model's coefficients are presented in Table 6. The $X^2$/df value is 1.713, below the threshold of 3, suggesting an ideal match. The RMSEA value is 0.060, falling within the acceptable range of 0.5 to 0.8, indicating an adequate fit. The GFI (Goodness of Fit Index) is 0.902, exceeding the threshold of 0.9, indicating a highly satisfactory fit. The Comparative Fit Index (CFI) value is 0.979, indicating a strong fit since it is above the threshold of 0.9. Similarly, the Incremental Fit Index (IFI) value is also 0.979, above the 0.9 threshold, indicating an excellent fit. The Tucker-Lewis Index (TLI) has a value of 0.973, which exceeds the threshold of 0.9. This indicates that the findings of the model fit well. Similarly, the Normed Fit Index (NFI) has a value of 0.952, also beyond the threshold of 0.9. This suggests that the model fit of the scale is better, demonstrating excellent structural validity.

**Table 6: Model Fit Coefficient (N=200).**

| X2/df | RMSEA | GFI | CFI | IFI | TLI | NFI |
|---|---|---|---|---|---|---|
| 1.713 | 0.060 | 0.902 | 0.979 | 0.979 | 0.973 | 0.952 |

*Convergent Validity:* The results of this study showed that all standardized estimates from 0.666～0.902, their combined reliability CR ranged from 0.921～0.947, and the squared difference extracted AVE ranged from 0.668 ～0.78, as shown in Table 7.

**Table 7: Convergent Validity (N=200).**

| | Indicators | Std Estimate | CR | AVE |
|---|---|---|---|---|
| | 1. Recurring and disturbing memory, thinking or pictures of a distressing event?? | 0.882 | | |
| | 2. Recurring troubling dreams caused by the experiencing of a stressful event? | 0.870 | | |
| RS | 3. Did a stressful event suddenly happen and feel again (like you experienced it again)? | 0.882 | 0.947 | 0.78 |
| | 4. If something reminds you of a stressful event, do you get very upset? | 0.902 | | |
| | 5. Have a physical reaction (such as palpitations, dyspnea, sweating) When something reminds you of a stressful event? | 0.879 | | |
| | 6 Avoid remembering or talking about past stressful events or avoid creating feelings associated with them. | 0.906 | | |
| | 7. Avoid the activities and situations that remind you of that stressful event. | 0.875 | | |
| | 8. Can't remember the importance of stressful experiences? | 0.735 | | |
| ANS | 9. Losing interest in the activities you enjoyed in the past? | 0.666 | 0.933 | 0.668 |
| | 10. Do you sometimes feel distant or disconnected from other people? | 0.770 | | |
| | 11. Feelings of numbness or inability to love someone close to you? | 0.869 | | |
| | 12. Feel like your future will be suddenly interrupted for some reason? | 0.872 | | |
| | 13. Difficulty falling asleep or difficulty waking up quickly? | 0.790 | | |
| | 14. Anger or an outburst of anger? | 0.840 | | |
| SIA | 15. Hard to focus on attention? | 0.861 | 0.921 | 0.70 |
| | 16. Excessive alert or alert status? | 0.862 | | |
| | 17. Sensory neuroticism or easy to startle? | 0.827 | | |

Note: RS=Repeated experience symptoms; ANS=Avoidance of numbness symptoms; SIA= Symptoms of increased alertness; CR=Compostie reliability; AVE=Average variance extracted.

*Distinguishing Validity:* The study's findings indicate that the correlation coefficients for the dimensions range from 0.436 to 0.493, with a significance level of p<0.01, and the AVE square root is higher than any of the individual absolute values of the correlation coefficients at 0.78 ～0.834. Specific results are in Table 8.

**Table 8: Distinguishing Validity (N=200).**

| Variable | Symptoms of Increased Alertness | Avoidance of Numbness Symptoms | Repeated Experience Symptoms |
|---|---|---|---|
| Symptoms of increased alertness | 0.834 | | |
| Avoidance of numbness symptoms | 0.454** | 0.826 | |
| Repeated experience symptoms | 0.493** | 0.436** | 0.78 |
| AVE | 0.70 | 0.668 | 0.608 |

Note: *: p<0.05;**:p<0.01, and the diagonal is the square root of AVE.

## Discussion

This study aimed to validate the Chinese version of the PCL-C scale for assessing postpartum stress disorder in high-risk pregnant women. The reliability of the scale was assessed using various measures, including the entry decision value, correlation between initial and total scores, internal consistency, split-half reliability, and re-test reliability. The validation of the scale was conducted through factor analysis, and the validation process was scientifically sound.

### *The PCL-C Scale has Good Differentiation among High-risk Pregnancy Women*

In this study, critical ratios were used to analyze scale items, and critical ratios of 17 items ranged from 7.760 to 15.203, with significant statistical differences observed between the high and low groupings (all P<0.001). When the CR value reaches a

significance effect more significant than 3, it indicates that the measurement items have a certain discriminatory ability.[24] In this study, the CR values of all items reached the significance level. They were greater than 3, showing that items on this scale have good discriminatory power in assessing postpartum PTSD in women with high-risk pregnancies. The correlations of the values of each item with the total values of the scale and the correlations of the items within each dimension were all greater than 0.4 (P<0.001), so all entries were retained.

### The PCL-C Scale has Good Reliability among High-risk Pregnancy Women

Reliability mainly evaluates the scale's stability, precision, and consistency, i.e., the degree of variability of the measured values caused by random errors during measurement. Indicators that mainly examine the consistency between items, such as Cronbach's α >0.7, are acceptable, and some researchers recommend 0.8 as a criterion for evaluating the consistency of the overall scale. In this study, the Cronbach's α of the PCL-C scale was 0.972, indicating that the overall internal consistency was high, indicating that the internal consistency of the scale was better in the population of women with high-risk pregnancies. Repeated experience symptoms, avoidance numbness, symptoms of increased alertness had Cronbach's α of 0.951, 0.933, and 0.924, respectively. Retest reliability is the external consistency reliability, which reflects the stability of the questionnaire. The higher the retest reliability, the more stable the measurement results are. The correlations of the values of each item with the total values of the scale and the correlations of the items within each dimension were all greater than 0.4 across time in a population of mothers with high-risk pregnancies.[25,26] The correlation coefficients between the entries within each dimension ranged from 0.545 to 0.819, indicating that the entries within each dimension have a certain degree of correlation reflecting the same measurement theme.

### The PCL-C Scale has Good Validity among High-risk Pregnancy Women

Validity reflects the accuracy, validity, and correctness of the scale. Structural, convergent, and discriminant validity are commonly used validity evaluation indexes. The factor structure of PCL-C was further validated by using validated factor analysis. The results showed that the CFI, AGFI, and NFI in this model met the good fit criterion, and they were all above 0.80, which reached an acceptable level, so the model can be considered well-adapted.[27] Therefore, the factor structure of the PCL-C scale is stable. The three latent variables of repetition of experience, avoidance, numbness and heightened alertness correspond to factor loadings greater than 0.5 for each topic, indicating that each latent variable highly represents the theme to which it belongs. Furthermore, the AVE of each latent variable was over 0.5, and the combined reliability CR was over 0.8, indicating ideal convergent validity. The criteria of Hooper *et al.*[28] and Fornell and Larcker[29] were met: factor loadings > 0.5 and ideally > 0.7; CR > 0.6 and AVE > 0.5. The results of the discriminant validity study showed that there was a significant correlation between Repeated experience, increased alertness, and avoidance of numbness (p<0.01); in addition, the correlation coefficient has an absolute value below 0.5, and all values are below the square root of the corresponding AVE. This implies that each latent variable has a certain correlation with the others and a certain degree of differentiation between them. Nevertheless, it suggests that the scale's data has a high level of discriminant validity.

### Summary

This study revalidated the PCL-C in a population of high-risk pregnant mothers, and validation results showed that the scale had good reliability and validity. It may be used as an assessment tool for postnatal PTSD in high-risk pregnancies. However, the sample selected in this study was limited to a certain city, so there may be selection bias in the selection of the sample. It is suggested that relevant information may be collected in different provinces in future studies.

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### Conflicting Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Credit Authorship Contributed Statement

Juan Zhu: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing - original draft. Prof. Dr. Faridah Mohd Said: Formal analysis, Methodology, Writing - review & editing, Data curation. Dr Chun Hoe Tan: Formal analysis, Methodology, Writing - review & editing, Data curation.

## References

1. Majella MG, Sarveswaran G, Krishnamoorthy Y, Sivaranjini K, Arikrishnan K, Kumar SG. A Longitudinal Study on High Risk Pregnancy and Its Outcome Among Antenatal Women Attending Rural Primary Health Centre in Puducherry, South India. Journal of education and health promotion. 2019; 8(1): 12. doi: https://doi.org/10.4103/jehp.jehp_144_18.
2. Vignato J, Georges JM, Bush RA, Connelly CD. Post-traumatic stress disorder in the perinatal period: A concept analysis. J Clin Nurs. 2017; 26(23-24): 3859-68. doi: https://doi.org/10.1111/jocn.13800.
3. Xiao X, binti Azhari A, Pey LM. Research on the Correlation Impact of Enterprise Financialization on Innovation Quality-Taking Newly Listed Enterprises as an Example. International Journal of Economics and Finance Studies. 2023; 15(2): 151-78. Available from: https://sobiad.org/menuscript/index.php/ijefs/article/view/1509.
4. Zhang D, Xu C. Research Status of Perinatal Posttraumatic Stress Disorder. Medical Journal of Wuhan University. 2018; 39(5): 846-49. doi: https://doi.org/10.14188/j.1671-8852.2017.0845.

5. Forkus SR, Raudales AM, Rafiuddin HS, Weiss NH, Messman BA, Contractor AA. The Posttraumatic Stress Disorder (PTSD) Checklist for DSM-5: A Systematic Review of Existing Psychometric Evidence. Clin Psychol (New York). 2023; 30(1): 110-21. doi: https://doi.org/10.1037/cps0000111.
6. Cempaka L, Asiah N, David W. Effect of Fermentation on the bioactive compound of cocoa Beans: a systematic review and meta-analysis approach. Future of Food: Journal on Food, Agriculture & Society. 2023; 11(2): doi: https://doi.org/10.17170/kobra-202210056941.
7. Ghaleb MMS, Alshiha FA. Effects of Supply Chain Management Practices on Organizational Supply Chain Performance: A Mediated Moderated Model. International Journal of Construction Supply Chain Management. 2023; 13(2): 1-22. Available from: https://ijcscm.com/menu-script/index.php/ijcscm/article/view/230.
8. Seriwatana P. Contribution of foreign supervisor support to job satisfaction mediated by the perceived foreign co-worker discrimination: The moderating role of job tenure. International Journal of eBusiness and eGovernment Studies. 2022; 14(1): 204-24. Available from: https://sobiad.org/menuscript/index.php/ijebeg/article/view/954.
9. Ayers S, Wright DB, Thornton A. Development of a Measure of Postpartum PTSD: The City Birth Trauma Scale. Front Psychiatry. 2018; 9: 409. doi: https://doi.org/10.3389/fpsyt.2018.00409.
10. Sun M, Zhuang L. [Retracted] Effect of Cognitive Behavioral Therapy on Stress Disorder, Cognitive Function, Motor Function, and Daily Living Ability of Patients with a Traumatic Brain Injury. Emerg Med Int. 2022; 2022(1): 2375344. doi: https://doi.org/10.1155/2022/2375344.
11. Bashith A, Amin S, Nasith A, Indiyanto A, Florika VT. Implementation of the Integrated Living Laboratory Learning Model in Social Studies Education. Eurasian Journal of Educational Research. 2023; 108(108): 273-89. Available from: https://ejer.com.tr/manuscript/index.php/journal/article/view/1546.
12. Weathers FW, Litz BT, Herman DS, Huska JA, Keane TM. The PTSD Checklist: Reliability, Validity and Diagnostic Utility. In: Presented at the Annual Meeting of the International Society for Traumatic Stress Studies San Antonio, TX, October, 1993. 1993. Available from: https://www.researchgate.net/publication/291448760.
13. Carvalho T, Cunha M, Pinto-Gouveia J, Duarte J. Portuguese version of the PTSD Checklist-Military Version (PCL-M)-I: Confirmatory Factor Analysis and reliability. Psychiatry Res. 2015; 226(1): 53-60. doi: https://doi.org/10.1016/j.psychres.2014.11.055.
14. Wittmann L, Dimitrijevic A, Ehlers A, et al. Psychometric properties and validity of the German version of the Post-Traumatic Diagnostic Scale for DSM-5 (PDS-5). Eur J Psychotraumatol. 2021; 12(1): 1965339. doi: https://doi.org/10.1080/20008198.2021.1965339.
15. Artawan G, Suarta I. Learning the Indonesian Language: A Fact from International Students. Educational Sciences: Theory & Practice. 2022; 22(1): 90-100. Available from: https://jestp.com/menuscript/index.php/estp/article/view/1558.
16. Olvera-Fernandez J, Ocaña-Fernández A, Montes-Rodríguez R. Listening to Students through their Musical Preferences: Dialogical Gatherings, an Opportunity for Critical Music Education. Electronic Journal of Music in Education. 2023; (52): 178-95. doi: https://doi.org/10.7203/LEEME.52.27382.
17. Andriyanto OD, Subandiyah H, Hardika M. Ethic Values in Modern Javanese Literature Works: Identity and Character Education in the Digital Era. Eurasian Journal of Applied Linguistics. 2022; 8(3): 106-19. Available from: https://ejal.info/menuscript/index.php/ejal/article/view/378.
18. Yang XY, Yang HA, Liu QG, Yang LZ. The Research on the Reliability and Validity of PCL-C and Influence Factors. Chinese Journal of Health Psychology. 2007; 15(1): 6-9. doi: https://doi.org/10.3969/j.issn.1005-1252.2007.01.036.
19. Obilor EI, Amadi EC. Test for Significance of Pearson's Correlation Coefficient. International Journal of Innovative Mathematics, Statistics & Energy Policies. 2018; 6(1): 11-23. Available from: https://www.researchgate.net/publication/343609693.
20. Louangrath P. Reliability and Validity of Survey Scales. Int J Soc Res Methodol. 2018; 4(1): 50-62. doi: https://doi.org/10.5281/zenodo.1322695.
21. Ruscio J, Roche B. Determining the number of factors to retain in an exploratory factor analysis using comparison data of known factorial structure. Psychol Assess. 2012; 24(2): 282-92. doi: https://doi.org/10.1037/a0025697.
22. Babyak MA, Green SB. Confirmatory factor analysis: an introduction for psychosomatic medicine researchers. Psychosom Med. 2010; 72(6): 587-97. doi: https://doi.org/10.1097/psy.0b013e3181de3f8a.
23. Cole DA. Utility of confirmatory factor analysis in test validation research. J Consult Clin Psychol. 1987; 55(4): 584-94. doi: https://doi.org/10.1037/0022-006x.55.4.584.
24. Dai X-Y, Cao Y-W. Some Defects in Development and Revision of Psychological Rating Scales. Chinese Journal of Clinical Psychology. 2009; 17(5): 562-65.
25. Faming P. Medical Statistical Method and Realization of SPSS Software. Press of University of Science and Technology of China; 2018. Available from: https://www.jarhu.com/book-2120684.html.
26. Yan Y, Tong W. Medical Statistics. The Peoples Medical Publishing House; 2020.
27. Cuhls K. The Delphi Method: An Introduction. In: Niederberger M, Renn O, Eds. Delphi Methods In The Social And Health Sciences: Concepts, applications and case studies. Springer Fachmedien Wiesbaden; 2023:3-27. doi: https://doi.org/10.1007/978-3-658-38862-1_1.
28. Hooper D, Coughlan J, Mullen M. Structural Equation Modelling: Guidelines for Determining Model Fit. Electronic Journal of Business Research Methods. 2008; 6(1): 53-60. doi: https://doi.org/10.21427/D7CF7R.
29. Fornell C, Larcker DF. Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. J Mark Res. 1981; 18(3): 382-88. doi: https://doi.org/10.1177/002224378101800313.