

Psychometric Properties of the Indonesian Version of Impact of Event Scale-Revised Questionnaire During COVID-19 Pandemic

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Abstract

Background: COVID-19 is a respiratory infection that caused by SARS CoV-2. A health-related disaster may result in a wide range of mental consequences, including PTSD. IES-R is a self-reported instrument, and it corresponds to DSM-IV symptoms of PTSD. However, there were scarce data about the validation of the Indonesian version of IESR.

Aim: The purpose of this study was to validate the IES-R in Indonesian adult population by comprehensively and systematically assessing the epidemiological evidence about PTSS during COVID-19 pandemic.

Methods: This was a cross-sectional study. The IES-R questionnaire was translated from English to Indonesian, back-translated. All health workers were excluded to avoid biased result. Pearson correlation and Cronbach's alpha coefficients to determine the validity and reliability of the questionnaire.

Results: A total of 234 Indonesian-speaking adults completed the survey. The Indonesian IES-R had proven to be a valid ($r = 0.756 - 0.938$, $p = 0.000$) and reliable (alpha coefficient: 0.858-0.868) measure for PTSS in a sample of Indonesian adult during COVID-19 pandemic. In addition, the final model which consisted of 3 subscales with 20 items demonstrated acceptable factor loadings.

Conclusion: The results of this study suggested IESR is valid and reliable to be used in Indonesian population especially during pandemic.

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Introduction

Coronavirus Disease 2019 (COVID-19), previously known as 2019 novel coronavirus is a respiratory infection that caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS CoV-2).^{1,2} In late-December 2019, the first case of Coronavirus Disease 2019 (COVID-19) was confirmed in Wuhan, China.³ On 30 January 2020, the World Health Organization declares COVID-19 to be a public health emergency of international concern.⁴ Since then, the number of cases continues to increase globally, including Indonesia and thus declared as a pandemic on 11 March 2020.⁵ Based on the World Health Organization (WHO) data on 7th August 2021, there were 3,607,863 cases, and 2.8% case fatality rate across the country.⁶ The first case of COVID-19 in Indonesia was confirmed in 2 March 2020.⁷ The physical distancing and local quarantine were commenced on 10 April 2020 in the capital city of Jakarta and followed by other provinces in Indonesia.⁸ COVID-19 affects many aspects, including daily activities, healthcare sector,⁹⁻¹⁶ and the most vital one, the country's economy.¹⁷ In addition, due to the surge of COVID-19 case in Indonesia in early July, further measure called Community Activities Restriction Enforcement or *Pemberlakuan Pembatasan Kegiatan Masyarakat di Indonesia* is taken by the government by further limiting more activities in the society. This event later affected the mid-low economic status which relied on daily income for living.

Several policies were issued to break the transmission chain of COVID-19 which also lead to alteration of daily routine most people during COVID-19 pandemics. These include policy of physical distancing, self-isolation, local quarantine or the transition, tax relief, social assistance, business closure, safety protocol in public, postponed holiday, and worship regulation.¹⁸ According to World health organization (WHO), continuous changes might affect mental health as social determinant is critical influence for an individual. This determinant however very directly corresponding with

policy including income, education, and services.¹⁹

A disaster (including health-related disaster) may result in a wide range of mental and physical consequences.²⁰ Based on DSM-IV, Post-Traumatic Stress Disorder (PTSD) characterized by 3 different cluster of symptoms, which includes re-experiencing, avoidance, and hyperarousal.²¹ The study following MERS²²⁻²⁴ and SARS²⁵⁻²⁷ pandemic showed the occurrence of Post-Traumatic Stress Symptoms (PTSS) within health workers, quarantined patients in a hospital, and the society. One of the study during MERS outbreak in Korea, showed the occurrence of PTSS in 40% of the sample.²² Thus, it is really important for early identification to prevent further mental health alterations, especially during quarantine time.^{28,29} The growing worries and threats, especially in this COVID-19 situation, have heightened the awareness of disaster as a potentially important determinant of population mental health to highlight areas that need additional study in Indonesian population.

There were several tools available for PTSD screening using from an interview and self-reported instrument.³⁰⁻³⁹ Impact of Event Scale-Revised (IES-R) is a self-reported instrument and it corresponds to DSM-IV symptoms of PTSD.⁴⁰ This instrument is widely used for PTSS screening in a lot of mental health study in similar setting during previous SARS and MERS outbreak. It has been translated as well as validated into different languages, including Malay,⁴¹ Chinese,⁴² Persian,⁴³ Japanese,⁴⁴ Swedish,⁴⁵ French,⁴⁶ and Korean.⁴⁷ The Malay versions of the IES-Rm has the internal consistency reliability ranged from 0.605 to 0.845 with internal validity ranged from 0.71-0.73.⁴¹ There was scarce data about the validation of the Indonesian version of IES-R. Thus, the purpose of this study was to validate the IES-R in Indonesian adult population.

Materials and Methods

Sample and Procedure

This was a validity and reliability test of the Indonesian version of IES-R. Initially, the questionnaire was translated from English to Indonesian by two independent translators and afterwards, it was back translated to English by another two independent translator for health professional review.⁴⁸⁻⁵⁰ The data of this review were collected within the restriction period in Indonesia from April 21st to May 10th, 2020. The survey was distributed via online questionnaire to Indonesian adults across the country. All health workers were excluded from this study to avoid biased results stressful conditions during the COVID-19 pandemic.^{51,52} The survey was given in the Indonesian language with a total of 4 sections: informed consent, demographic data, and IES-R questionnaire in the Indonesian language. A total of 234 Indonesian-speaking adults completed the survey. Furthermore, we obtained e-statement of informed consent from all participants.

Instruments

Indonesian Version of the IES-R comprises 22 items that measure the subscales such as intrusion symptoms (dreams about the event), avoidance symptoms (effort to avoid reminders of the event), and hyperarousal symptoms (feeling watchful and on guard) concerning a particular life-threatening event for PTSD screening. Participants rated on a 5-point linear scale to show their experiences during the preceding 7 days. The total score on the IES-R ranges between 0 and 88. Selected items were totalled to create the 3 subscales such as intrusion, avoidance, and hyperarousal which correspond with PTSD criteria in DSM-IV. To fulfil the purpose of this review, samples were requested to complete the Indonesian translation of IES-R concerning the COVID-19 pandemic in Indonesia. Appendix A provides the Indonesian version of IES-R and appendix B provides the English version of IESR.

Statistical analysis for Validity and Reliability

To determine its' construct validity, the existing data were checked for its distribution using the 1-sample K-S test. Pearson correlation was done using bivariate correlation to show correlation between each subscale in the questionnaire. *r*-value of 0-0.25; 0.26-0.5; 0.51-0.75; 0.76-1 were classified as not correlated; weakly correlated; moderately correlated; strongly correlated; perfectly correlated respectively. Data with abnormal distribution and had *r*-value 0.80 were excluded from the analysis. Measures of Sampling Adequacy (MSA) and the Bartlett test of sphericity were done to classify variables with a strong correlation between items using data reduction factor analysis which included KMO, Barlett's and Anti-image tests to calculate MSA of each item. Items with MSA < 0.05 were excluded from the analysis process. The next process was extraction by a principal component method and Cattell's scree test. In this step, items with eigenvalue ≥ 1 were extracted and proceed to the component matrix analysis to show where each item included in the three subscales, marked by loading factor ≥ 0.5 . Rotation analysis was used to reassure the result.^{53,54} Cronbach's alpha coefficients were calculated using the reliability analysis to measure the internal reliability for each subscale. The cut-off of high internal reliability was 0.7.^{55,56}

Results

Description of the sample

The total of 234 Indonesian adults from all provinces across the country had completed the survey, 179 (60.9%) were men and 115 (39.1%) were women. Mean age of the samples was 37.19 ± 11.284 years old. In addition, the mean score of intrusion, avoidance, and hyperarousal subscales were 10.432 ± 6.75 , 11.401 ± 6.12 , and 7.874 ± 4.65 respectively. The mean score of depression, anxiety, and stress subscales were 11.03 ± 4.071 , 10.55 ± 3.63 , and 11.46 ± 4.314 respectively. The other demographics data of the samples are described in Table 1.

Table 1. Distribution of demographic variables of the respondents.

Variable	% (n)	Mean	SD
Marital Status			
Never Married	32.05 (75)		
Married	63.24 (148)		
Widow or Widower	4.7 (11)		
Gender			
Men	63.67 (149)		
Women	36.32 (85)		
Last Education			
Elementary	0.4 (1)		
Junior High School	2.1 (5)		
Senior High School	22.2 (52)		
Diploma	11.5 (27)		
Bachelor	55.1 (129)		
Master	8.54 (20)		
Age		37.19	11.284
The Impact of Event Scale-Revised			
Intrusion subscale		10.432	6.75
Avoidance subscale		11.401	6.12
Hyperarousal subscale		7.874	4.65
Total Score		29.71	16.288
Depression, Anxiety, Stress Scale-21			
Depression subscale		11.03	4.071
Anxiety subscale		10.55	3.630
Stress subscale		11.46	4.314

Data Distribution

Collected data were analysed before continuing to the next analysing process. All sub-scales data were distributed normally ($p > 0.05$).

Internal Validity and Reliability

During the process of translating back from Indonesian to English, no significant changes were found between the initial text

and the translated text. Pearson correlations were done between the subscales and the total score was high and significant ($p = 0.000$) (Table 2). Total Cronbach's coefficients were 0.90 which indicated that Indonesian IES-R had good reliability. Cronbach's Alpha; intrusion subscale = 0.868, avoidance subscale = 0.867, hyperarousal subscale = 0.858.

Table 2 Correlations between the IES-R subscale and total score

Variable	Intrusion	Avoidance	Hyperarousal
Intrusion	-----	-----	-----
Avoidance	0.756	-----	-----
Hyperarousal	0.835	0.796	-----
Total Score	0.938	0.917	0.931

All correlations were significant at the 0.001 level (2-tailed)

Principal Component Analysis of the IES-R

To assess the construct validity of the Indonesian version IES-R questionnaire, a principal component analysis (PCA) was done on the 22 items of the questionnaire. It was found that 3 components had eigenvalues > 1.0. Cattell's scree test was performed to determine the number of components to be extracted. Furthermore, a PCA using an orthogonal-varimax rotation was then performed (Table 3). Factor loading of 0.50 was considered as significant. The solution which explained

55.5 % of the variance, generated a hyperarousal subscale (items 4,10,15,18,19,21), avoidance subscale (items 5,7,8,11,12,13,17), and intrusion subscale (items 1,2,3,6,9,14,16). Factor items 20 and 22 did not load on any of the three factors and thus excluded from the questionnaire. Therefore, a PCA was performed without these items and increasing the variance explained to 59%. The final Indonesian version of IES-R is attached in appendix A.

Table 3. Principal component analysis (varimax rotation) of the Indonesian translation of the IES-R

Original factors and items	Hyperarousal	Avoidance	Intrusion
Hyperarousal			
4	0.550 ^a	0.490	-0.020
10	0.598 ^a	0.438	0.14
15	0.698 ^a	0.291	0.429
18	0.625 ^a	0.304	0.257
19	0.618 ^a	-0.022	0.493
21	0.640 ^a	0.323	0.126
Avoidance			
5	0.495	0.513 ^a	0.27
7	0.205	0.610 ^a	0.259
8	0.266	0.534 ^a	0.429
11	0.140	0.764 ^a	0.478
12	0.425	0.509 ^a	0.494
13	0.055	0.502 ^a	0.005
17	0.356	0.595 ^a	0.045
22	0.032	0.421	0.365
Intrusion			
1	0.504	0.004	0.546 ^a
2	0.426	0.243	0.835 ^a
3	0.461	0.312	0.687 ^a
6	0.486	0.268	0.645 ^a
9	0.458	0.151	0.571 ^a
14	0.181	0.190	0.881 ^a
16	0.162	0.456	0.538 ^a
20	0.412	0.142	0.498
Eigenvalue	8.573	1.538	1.150
Total variance explained (%)	42.87	7.689	5.75

^aItems that have factor loading 0.50

Discussion

This study assessed the internal consistency, and construct validity of an Indonesian translation of the IES-R questionnaire in a sample of Indonesian adults in the COVID-19 pandemic situation. The result of the Indonesian translation of the IES-R was remarkable with good internal consistency and Cronbach's alpha ranging from 0.858 to 0.907. The test-retest data were not available for this study.

Three factors solutions were accepted for the IES-R in this study, which explains 55.5% of the total variance. Item 20 ("I had dreams about it") and item 22 ("I tried not to talk about it") did not load on any of the three factors of this study. In this study, we found six items in hyperarousal subscale, seven items in avoidance subscale, and seven items in intrusion subscale. In comparison with the theoretical eight items in intrusion subscale, eight items in avoidance subscale, and six items in arousal subscale. Other items loaded on the same factors in the theoretical model.

A similar study has been conducted in other countries and showed that IES-R is a reliable questionnaire and validly translated into those languages.⁴¹⁻⁴⁷ The Malay version of IES-R by Norhayati and Aniza showed satisfactory results.⁴¹ It has achieved content validity through the translation process. The confirmatory factor analysis showed a good fit and a good convergent validity, discriminant validity, internal reliability, and construct reliability. In comparison to Norhayati and Aniza study, this Indonesian version of IES-R shows similar result. The Indonesian IES-R has

Ethics Approval

Ethical approval was given by the Review Committee of Faculty of Medicine Pelita Harapan University (141/K-LKJ/ETIK/IV/2020.)

Human and Animal Rights

None.

Consent for Publication

Not applicable.

proven to be valid and reliable through internal consistency test and has good convergent validity. The item 20 and 22 were removed from the final questionnaire since they did not load any subscales.

The advantage of this study was it assesses principal component analysis for the Indonesian version of IES-R which was the first in Indonesia. This study also excluded medical personnel samples to avoid bias due to stressful conditions during the COVID-19 pandemic.⁵² On the other hand, the limitation of this study was a small number of samples in this study. Since it was a cross-sectional study, we were unable to examine other important psychometric properties such as reassurance of reliability or sensitivity which could change over time. Thus, a study in the other population with a higher number of populations was recommended to confirm the structure and testing its invariance across samples which might be due to data retrieval methods using online questionnaire and were not easily accessible to all social level in the community. This might add further evidence to support the Indonesian version of IES-R items.

In conclusion, the Indonesian IES-R had proven to be a valid and reliable tool to measure post-traumatic stress disorder in the sample of Indonesian adults during COVID-19 pandemic. The translation and validation of the IES-R into the Indonesian language filled the important gap in healthcare's ability to screen for PTSD symptoms among Indonesian populations. Also, this study provides a principal component analysis of the IES-R Indonesian Version.

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Conflict of Interest

The authors declares no conflict of interest, financial or otherwise.

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Appendix A. IES-R Indonesian Version (IES-R versi Bahasa Indonesia)

Instruksi: Di bawah ini adalah daftar kesulitan yang kadang-kadang dialami orang setelah peristiwa kehidupan yang penuh tekanan. Harap baca setiap item, dan kemudian tunjukkan betapa sulitnya setiap kesulitan bagi Anda **SELAMA HARI TUJUH KE BELAKANG** sehubungan dengan _____, yang terjadi pada _____. Seberapa banyak Anda tertekan atau terganggu oleh kesulitan-kesulitan ini?

	Tidak sama sekali	Sedikit	Sedang	Cukup Banyak	Sangat
1. Setiap pengingat membawa kembali perasaan tentang hal itu.	0	1	2	3	4
2. Saya kesulitan tidur.	0	1	2	3	4
3. Hal-hal lain terus membuat saya memikirkannya.	0	1	2	3	4
4. Saya merasa mudah tersinggung dan marah	0	1	2	3	4
5. Saya menahan rasa marah Saya ketika Saya memikirkannya atau diingatkan tentang hal itu.	0	1	2	3	4
6. Saya memikirkannya ketika saya tidak bermaksud demikian.	0	1	2	3	4
7. Saya merasa seolah-olah itu tidak terjadi atau tidak nyata.	0	1	2	3	4
8. Saya menjauh dari pengingat akan hal itu.	0	1	2	3	4
9. Gambar tentang hal itu muncul di pikiran saya.	0	1	2	3	4
10. Saya gelisah dan mudah kaget.	0	1	2	3	4
11. Saya mencoba untuk tidak memikirkannya.	0	1	2	3	4
12. Saya sadar bahwa saya masih memiliki banyak perasaan tentang hal itu, tetapi saya tidak berurusan dengan hal itu.	0	1	2	3	4
13. Saya tidak memiliki perasaan apa-apa tentang hal itu.	0	1	2	3	4
14. Saya menemukan diri saya bertindak atau merasa seperti saya kembali pada waktu itu.	0	1	2	3	4
15. Saya sulit tidur	0	1	2	3	4
16. Saya memiliki gelombang perasaan yang kuat tentang hal itu.	0	1	2	3	4
17. Saya mencoba menghapusnya dari memori saya.	0	1	2	3	4
18. Saya kesulitan berkonsentrasi.	0	1	2	3	4
19. Pengingat akan hal itu menyebabkan saya mengalami reaksi fisik, seperti berkeringat, sulit bernapas, mual, atau jantung berdebar-debar.	0	1	2	3	4
20. Saya merasa waspada dan berhati-hati.	0	1	2	3	4

Appendix B. IES-R English Version

Instructions: Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you DURING PAST SEVEN DAYS with respect to _____ (event) that occurred on _____ (date). How much have you been distressed or bothered by these difficulties?

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Any reminder brought back feelings about it.	0	1	2	3	4
2. I had trouble staying asleep.	0	1	2	3	4
3. Other things kept making me think about it.	0	1	2	3	4
4. I felt irritable and angry.	0	1	2	3	4
5. I avoided letting myself get upset when I thought about it or was reminded of it.	0	1	2	3	4
6. I thought about it when I didn't mean to.	0	1	2	3	4
7. I felt as if it hadn't happened or wasn't real.	0	1	2	3	4
8. I stayed away from reminders of it.	0	1	2	3	4
9. Pictures about it popped into my mind.	0	1	2	3	4
10. I was jumpy and easily startled.	0	1	2	3	4
11. I tried not to think about it.	0	1	2	3	4
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them	0	1	2	3	4
13. My feelings about it were kind of numb.	0	1	2	3	4
14. I found myself acting or feeling like I was back at that time	0	1	2	3	4
15. I had trouble falling asleep.	0	1	2	3	4
16. I had waves of strong feelings about it.	0	1	2	3	4
17. I tried to remove it from my memory.	0	1	2	3	4
18. I had trouble concentrating.	0	1	2	3	4
19. Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.	0	1	2	3	4
20. I had dreams about it.	0	1	2	3	4
21. I felt watchful and on-guard.	0	1	2	3	4
22. I tried not to talk about it.	0	1	2	3	4