Adapting and Validating the Covid Anxiety Scale-7 (CAS-7) in Indonesia

Gilda Thiefanee[1], Asteria Devy Kumalasari[2]
Faculty of Psychology, Universitas Padjajaran, Indonesia

gilda21002@mail.unpad.ac.id

Abstract

There has been a lack of anxiety assessments designed explicitly in the context of COVID-19, particularly screening tools that are easy to understand for diverse demographics and easily administered to accommodate Indonesia's large population. CAS-7 has proven to be an effectively administrable, reliable, and valid assessment to measure pandemic-related anxiety among the Indian population. This study aimed to adapt and validate CAS-7 to provide a reliable and valid screening tool to timely identify citizens of Indonesia suffering from pandemic-related anxiety and assign them suitable interventions. There were 1,121 subjects from 29 provinces participated in the study. Factorial validity was tested with Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) in JASP 15.0.0. while convergent validity, test-retest reliability, and internal reliability were tested with Pearson product-moment correlation coefficient, intraclass correlation coefficient, and Cronbach's alpha in SPSS 25. The adaptation of CAS-7 has proven to be a satisfactory, reliable, and valid screening tool for identifying citizens of Indonesia suffering from pandemic-related anxiety, with changes made in item arrangement and factor interpretation.

Keywords: adaptation, pandemic-related anxiety measurement, reliability, validity

Abstrak

Terdapat kekurangan penilaian kecemasan yang dirancang secara eksplisit dalam konteks COVID-19, khususnya alat skrining yang mudah dipahami untuk beragam demografi dan mudah diadministrasikan untuk mengakomodasi populasi Indonesia yang besar. CAS-7 telah terbukti sebagai alat ukur yang dapat diadministrasikan secara efektif, dapat diandalkan, dan valid untuk mengukur kecemasan terkait pandemi di antara populasi India. Penelitian ini bertujuan untuk mengadaptasi dan memvalidasi CAS-7 untuk menyediakan alat skrining yang dapat diandalkan dan valid untuk mengidentifikasi secara tepat waktu penduduk Indonesia yang menderita kecemasan terkait pandemi dan memberikan intervensi yang sesuai. Terdapat 1.121 subjek dari 29 provinsi yang berpartisipasi dalam penelitian ini. Validitas faktorial diuji dengan Exploratory Factor Analysis (EFA) dan Confirmatory Factor Analysis (CFA) di JASP 15.0.0. Sementara validitas konvergen, reliabilitas tes-retes, dan reliabilitas internal diuji dengan koefisien korelasi product-moment Pearson, koefisien korelasi intraklas, dan Cronbach's alpha di SPSS 25. Adaptasi CAS-7 telah terbukti menjadi alat skrining yang memuaskan, reliabel, dan valid untuk mengidentifikasi masyarakat Indonesia yang menderita kecemasan terkait pandemi, dengan perubahan yang dilakukan pada susunan item dan interpretasi factor.

Kata kunci: *adaptasi, pengukuran kecemasan terkait pandemi, reliabilitas, validitas*

Introduction

The prevalence of anxiety has consistently risen during pandemics, ranging from the SARS outbreak (Cheng, 2004; Vijaya et al., 2005), avian influenza (Van den Bulck & Custers, 2009), the swine flu (Jones & Salathé, 2009), to ebola (Acharibasam et al., 2021; Bah et al., 2020; Jalloh et al., 2018). Anxiety symptoms felt during the swine flu were also found to last after the pandemic was over (Wheaton et al., 2012) and are predicted to happen again during the COVID-19 pandemic (Brooks et al., 2020; Zvolensky et al., 2020). Studies discovered that high pandemic-related stress was associated with a rise in cases of general stress, sleep disturbances, self-harm ideations, and suicides (Roy et al., 2021; Secor et al., 2020; Shrestha, Siwakoti, Singh, & Shrestha, 2021; Xiao, Zhang, Kong, Li, & Yang, 2020). Furthermore, research done outside of Indonesia noted that subjects with high pandemic-related anxiety harbour significant potential to carry out extreme measures from fear of getting infected, ranging from hoarding supplies such as masks, disinfectants, or food (Oosterhoff & Palmer, 2020; Tse et al., 2021; Wang & Hao, 2020), to spreading conspiracy theories about Covid-19 (Šrol et al., 2021).

Although active cases had experienced a significant decline in 2022, Indonesia has been receiving a significant increase in numbers since December 2023 along with the surfacing of new variants: Omicron XBB 1.5, Omicron subvariant EG2, and Omicron subvariant EG5 (Arlinta, 2023; Binekasri, 2023; Kementerian Kesehatan RI, 2024). A suitable screening tool adjusted to assess pandemic-related anxiety during the re-emergence of COVID-19 contagions could greatly raise awareness of the urgency of rising anxiety cases among the Indonesian public and serve as the basis of necessary intervention programs for preventive and curative care. Previous research on pandemic-related anxiety in Indonesia commonly utilized measures constructed without the context of the pandemic, such as Depression, Anxiety, and Stress Scale or DASS-21 (Hamka & Yusuf, 2023; Ilahi et al., 2021), DASS-42 (Pertiwi, Moeliono, & Kendhawati, 2021), Hamilton Rating Scale for Anxiety or HRS-A (Hastutiningtyas et al., 2022), and Zung Self-Rating Anxiety Scale or SRAS (Conia & Nurmala, 2022) to measure anxiety levels. Meanwhile, some other studies employed descriptive surveys and questionnaires (Fitria & Ifdil, 2020; Martini et al., 2021; Rusman et al., 2021). Therefore, there was a lack of anxiety assessments designed explicitly in the context of COVID-19, particularly screening tools that are easy to understand for diverse demographics and easily administered to accommodate Indonesia's large population.

Among others, measures specifically testing pandemic-related anxiety were the Coronavirus Anxiety Scale (CAS) constructed and tried out by Lee (2020) in North America, as well as the Covid-19 Anxiety Scale-7 (CAS-7) constructed and tried out by Chandu et al. (2020) in India. Both were based on accumulating and selecting previous studies or scales with less than ten items. Even so, CAS was a unidimensional instrument and only measured physiological symptoms. At the same time, CAS-7 was comprised of the factors of fear of social interaction and illness anxiety, as well as measuring the affective, cognitive, and physiological aspects of pandemic-related anxiety.

CAS-7 was assembled by selecting items measuring pandemic-related anxiety from 13 previous scales, such as Coronavirus Anxiety Scale (Lee, 2020a), Obsession with COVID-19 Scale (Lee, 2020b), Fear of COVID-19 Scale and its seven adaptations into Hebrew, Bengali, two versions of Turkish, Russian, Italian, and Arabic (Ahorsu et al., 2020; Alyami et al., 2020; Bitan et al., 2020; Haktanir et al., 2020; Reznik et al., 2020; Satici et al., 2020; Soraci et al., 2020), COVID-19 Phobia Scale (Arpaci et al., 2020), COVID Stress Scales (Taylor et al., 2020), and Covid-19 Peritraumatic Distress Index (Costantini & Mazzotti, 2020; Qiu et al., 2020). Four assessments were established from diagnostic criteria of illness anxiety and specific phobias in the Diagnostic and Statistical Manual of Mental Disorders-V (DSM-V) or International Classification of Diseases-11 (ICD-11) (Arpaci et al., 2020; Lee, 2020a, 2020b; Qiu et al., 2020). On the other hand, the Fear of COVID-19 Scale (Ahorsu et al., 2020; Alyami et al., 2020; Bitan et al., 2020; Haktanir et al., 2020; Reznik et al., 2020; Satici et al., 2020; Soraci et al., 2020) was constructed by selecting items from 30 previous assessments measuring fear, and the Covid Stress Scales (Taylor et al., 2020) was built on a review of preceding researches during earlier pandemics (Taylor, 2019). This synthesis of diagnostic guides and measures shows pandemic-related anxiety as persistent

feelings of fear and anxiety caused by worries of getting infected by Covid-19 and characterized by affective, cognitive, and physiological symptoms. Therefore, CAS-7 had proven to be an effectively administrable, valid, and reliable assessment to measure pandemic-related anxiety among the Indian population. This study aims to adapt CAS-7 to provide a reliable and valid screening tool to timely identify citizens of Indonesia suffering from pandemic-related anxiety and assign them suitable interventions.

Methods

This study adapted the Covid-19 Anxiety Scale-7 (CAS-7) by Chandu et al. (2020), which is comprised of the factors of fear of social interaction and illness anxiety identified from exploratory factor analysis. CAS-7 had excellent test-retest reliability with an intraclass correlation coefficient (ICC) of 0.91 and acceptable internal reliability with Cronbach's alpha of 0.736. CAS-7 was a questionnaire in the form of semantic differential scales ranging from 1 ("Extremely Worried/Always") to 4 ("Not Worried At All/Never") to minimise risks of acquiescence bias (Hinz et al., 2007), with sample items such as "How afraid are you of acquiring COVID-19 when going into the public?" and "How anxious are you getting when knowing information on COVID-19?". The adaptation process follows the guidelines the International Test Commission (2017) provided and summarised into these stages.

1. Pre-conditioning stage, in which the lead researcher contacted Dr. Viswa Chaitanya Chandu as the lead researcher of the initial study "Development and Initial Validation of the COVID-19 Anxiety Scale" (Chandu et al., 2020) to inquire about the original format and permission to adapt CAS-7 into Bahasa Indonesia.Forward translation stage, in which two translators with minimum TOEFL scores of 610 and at least four years of experience translating Psychometric measures were employed to transcribe items in CAS-7 from English to Bahasa Indonesia. A panel of 3 Psychology postgraduate students synthesised both forward translation results.
2. Backward translation, in which a translator with minimum TOEFL scores of 610, at least four years of experience translating Psychometric measures, and at least two years living in a country with English as its primary language was employed to transcribe the synthesized translation from Bahasa Indonesia to English.
3. Peer review stage, in which three Psychology postgraduate students compared the synthesized forward translation, the backward translation, and the original measure by its language and resemblances of meaning.
4. In the expert judgment stage, a panel of nine psychologists examined the readability and consistency of each item concerning the measure's construct (Azwar, 2012). Quantitative appraisals were calculated using Aiken's V (Aiken, 1980) and Lawshe's Content Validity Ratio (Lawshe, 1975).
5. The readability test stage, in which five participants partook in filling out the final draft of the questionnaire and answering a cognitive interview to evaluate if the instructions, items, and layout in their entirety could be easily understood while also identifying any differences between the participants' comprehension and the meaning assigned by the researcher (Peterson et al., 2017). All five participants had no background in Psychology or Psychometry and had never seen CAS-7 before participating in the readability test.
6. In the Trial stage, the questionnaire was distributed online as a Google Form to Indonesian citizens aged 18 and above from 22nd October to 21st November 2021. The questionnaire began with an informed consent explaining the research's purpose and procedure, participants' criteria, data privacy, and the main researcher's contact information for participants to report should they encounter problems when filling out the questionnaire. An adaptation of the General Anxiety Disorder-7 (GAD-7) scale into Bahasa Indonesia by Onie et al. (2020) was included to analyze convergent validity. One thousand one hundred twenty-one participants from 31 provinces aged 18-74 (mean 33.47; SD 9.43) with a female majority (638 or 56.91%) consented to participate in the trial, as seen in Table 1.

7. In the retest stage, the lead researcher contacted 100 participants, with 67 consenting to retake the questionnaire on Google Forms from 23rd to 24th November 2021, with the interval between the initial trial and retest ranging from 14 to 22 days. The questionnaire also began with an informed consent explaining the purpose and procedure of the research, criteria for participants, and data privacy, along with the main researcher's contact information for participants to report should they encounter problems when filling out the questionnaire.
8. In the analysis stage, factorial validity was tested using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) in JASP 15.0.0. while convergent validity, test-retest reliability, and internal reliability were tested with Pearson product-moment correlation coefficient, intraclass correlation coefficient, and Cronbach's alpha in SPSS 25.

Materials and methods should make readers be able to reproduce the experiment. Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described. Do not repeat the details of established methods.

Table 1. Demographics of Participants in the Initial Trial

Category	Frequency (N=1,121)
Gender	
Female	638 (56.91%)
Male	483 (43.09%)
Age	
18-19	14
20-29	450
30-39	445
40-49	115
50-59	83
60-69	12
$\geq$70	2
Education	
Junior High Graduate	3
Senior High Graduate	233
Diploma Degree	195
Bachelor's Degree	636
Master's Degree	54
Marriage Status	
Married	704
Unmarried	404
Widowed	9
Divorced	4
Religion	
Buddha	107
Hindu	18
Islam	424

Catholic	201
Christian	371
History of Positive COVID-19 Diagnosis	
Yes	240
No	881
History of Positive COVID-19 Diagnosis on Significant Others	
Yes	531
No	590
Current Physiological or Psychological Illnesses	
Yes	50
No	1071
Vaccinated Against COVID-19 (At Least By First Dose)	
Yes	1091
No	30

Sources: Personal data (2021).

Results and Discussion

Content Validity

Content validity tests were needed to know if every item measures the same variable as its intended purpose. Expert judgment and cognitive interview results were examined to assess content validity from professionals in psychology and non-experts with no background in the field. Minimum Aiken's V and Lawshe's CVR scores of 0.81 and 0.78 were required for nine expert reviewers and a 1% margin of error (Aiken, 1980; Lawshe, 1975). Therefore, the attached scores for the translated items ranging from 0,83-1.00 for Aiken's V and 0.78-1.00 for Lawshe's CVR showed the adaptation's content validity as acceptable. The cognitive interview showed that every translated item consistently measured the same variable as the intended construct, with every participant stating that all items were easy to understand. Feedback on word choice and example symptoms were added to the final version of the questionnaire before continuing with the trial stage.

Convergent Validity

The higher the correlation between the adapted measure and another established measure with similar constructs, the higher the adapted measure's convergent validity is (American Educational Research Association et al., 2014). To assess convergent validity, an adaptation of Generalized Anxiety Disorder Assessment-7 (GAD-7) into Bahasa Indonesia by Onie et al. (2020) was included in the trial with permission. GAD-7 was deemed a suitable comparison for its similar purpose as a screening instrument for anxiety symptoms without the context of COVID-19. Its construct was also based on diagnostic criteria in DSM-IV, and its total item is identical to that of CAS-7. The GAD-7 adaptation had good internal reliability with a MacDonald's Omega score of 0.809 and high predictive validity to a previous adaptation of Hopkins Symptom Checklist Scale-25 into Bahasa Indonesia (Turnip & Hauff, 2007). Pearson product-moment correlation coefficient (PPMCC) was used to analyze the correlation between the adaptation of CAS-7 and GAD-7, resulting in the correlation coefficient of $r = 0.762$ ($p < 0.001$) which fulfils the criteria by Carlson and Herdman (2012) on r of 0.70 or above as recommendable before continuing with the trial stage.

Factorial Validity

Kaiser-Meyer-Olkin test (KMO) and Bartlett's Test of Sphericity were utilized to estimate the eligibility of samples by identifying the significance of intervariable correlation and redundancy between the variables before commencing with factor analysis. Analysis shows great to superb KMO scores ranging from 0.833 to 0.920 for all items (Dodge, 2008) and a significant correlation from Bartlett's Test of Sphericity ($p < 0.001$) (Bartlett, 1951). Exploratory factor analysis (EFA) in JASP 15.0.0 was done to identify intervariable correlations with the potential to form new item factors since Confirmatory Factor Analysis (CFA) showed several differences in factor structure and factor loading between the trial results and the initial scale. As seen in Table 2, the original 2-factor structure and all items are maintained with changes solely made in item arrangement according to factor loadings, or how much each indicator explains the latent construct of the scale, ranging above the cut-off category from 0.587-0.936 (Reise et al., 2000; Stevens, 2012), which differs from the original version with items 1, 4, 5, 6, to 7 in Factor 1 and items 2 to 3 in Factor 2 (Chandu et al., 2020). Communalities, or the proportion of variance in each variable that the factors can explain, range from 0.411 to 0.733 above the cut-off requirement from Beavers et al. (2013).

Table 2. Factor Loading, Uniqueness, and Communality from Exploratory Factor Analysis

Item	Factor 1	Factor 2	Uniqueness	Communality
1	0.756		0.468	0.532
2	0.678		0.415	0.585
5	0.760		0.468	0.532
7	0.587		0.589	0.411
3		0.936	0.267	0.733
4		0.794	0.288	0.712
6		0.649	0.310	0.690
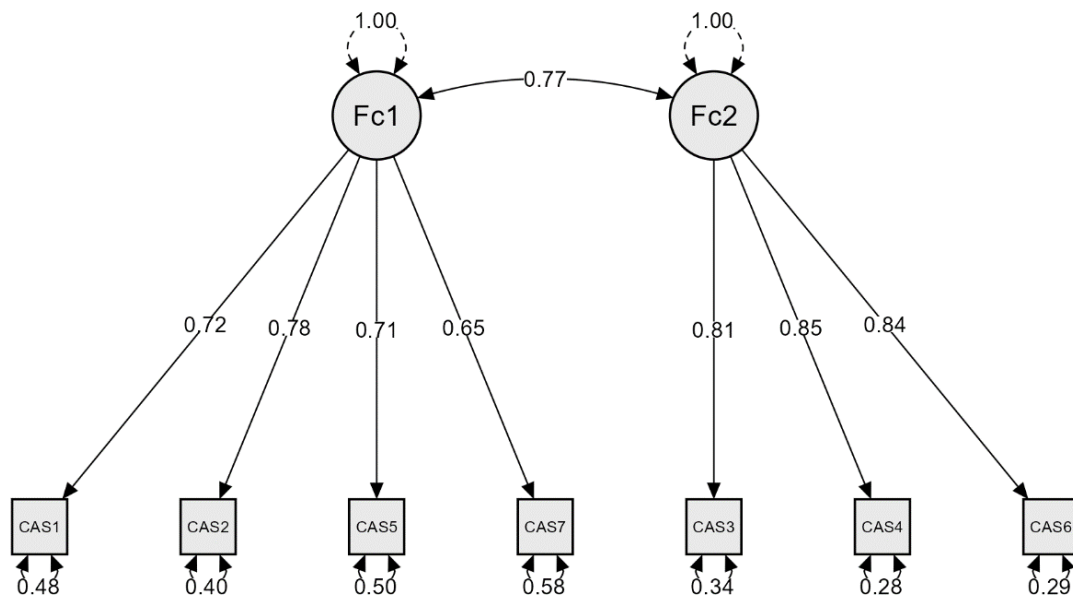
Source: personal data (2021)

Figure 1. CAS-7 Model Plot

In Figure 1, the EFA results were evaluated, leading to the redefinition of Factor 1 as "Fear of Contagion." This adjustment was made due to the inclusion of items specifically addressing concerns about contracting COVID-19, such as fears related to physical contact in public spaces, violations of

social distancing norms, and transmission through respiratory secretions (World Health Organization, 2020). Additionally, it encompassed apprehensions about having already contracted the virus (Baldi & Savastano, 2021).

Furthermore, Factor 2 was reclassified to "Fear of Pandemic-Related Information or Thoughts" for its scope of items related to fears of acquiring information or having thoughts related to COVID-19, which manifested into sleep problems, avoidant behaviour, and physiological symptoms ranging from accelerated heart rate/heart racing, dizziness, to sweating (American Psychiatric Association, 2013; Arora et al., 2020). These factors differed from the original scale's "fear of social interaction" and "illness anxiety" factors, which time differences in data collection could mainly cause. Approximately nineteen months spanned between the original scale's trial stage, which was conducted in February and March 2020 before India's nationwide lockdown was implemented (Gettleman & Schultz, 2020), in comparison with the current adaptation's trial stage, which was conducted in October and November 2021 after the Indonesian government had issued large-scale social restrictions since the beginning of the year while a rapid acceleration of active Covid-19 cases severely burdened the nation's healthcare system by June until August 2021 (Tenda et al., 2021). In these two time frames, the public focus shifted from intangible fears of social interaction and illness anxiety about an emerging disease, mainly told through mass media and initial social distancing, into fears of contagion and pandemic-related information or thoughts as the death toll rose and the virus underwent various variants (Centers for Disease Control and Prevention, 2023; Team Verywell Health, 2023).

Factorial validity analysis commenced with CFA to confirm if the adaptation fit the measure's hypothesized ideal. Several fit indices served as guidelines to determine if the adaptation reached model fit as seen on Table 3, such as (1) Goodness-of-Fit Index (GFI), (2) Standardized Root Mean Square Residual (SRMR), (3) Root Mean Square Error of Approximation (RMSEA), (4) Comparative Fit Index (CFI), (5) Normed Fit Index (NFI), (6) Tucker-Lewis Index (TLI), (7) Incremental fit index (IFI), (8) Relative Fit Index (RFI), and (9) Parsimonious Normal Fit Index (PNFI) (Ghozali, 2017; Hooper et al., 2008; Hu & Bentler, 1999; Schumacker & Lomax, 2010; Tanaka, 1993; West et al., 2012). The χ^2 goodness of fit test was not included due to its sensitivity to large samples (Babyak & Green, 2010; Sarmento & Costa, 2019). The adaptation fulfils all cut-off criteria in each fit index, indicating a good fit.

Table 3. Confirmatory Factor Analysis

Category	Fit Indices	Cut-Off Criteria	Result Estimates	Description
Absolute Fit	Goodness of fit index (GFI)	≥0.90-0.95	0.975	Good fit
	Standardized Root Mean Square Residual (SRMR)	≤0.05	0.031	Good fit
	Normed fit index (NFI)	≥0.95	0.972	Good fit
Incremental Fit	Incremental fit index (IFI)	≥0.90	0.976	Good fit
	Tucker-Lewis Index (TLI)	≥0.90-0.95	0.96	Good fit
	Relative Fit Index (RFI)	≥0.95	0.955	Good fit
Parsimonious Fit	Parsimonious Normal Fit Index (PNFI)	0.60 – 0.90	0.602	Good fit
Noncentrality-Based Fit	Root mean square error of approximation (RMSEA)	0.05-0.08	0.079	Good fit
	Comparative fit index (CFI)	≥0.90-0.95	0.976	Good fit

Test-Retest Reliability

Test-retest reliability examined the consistency of the adaptation against time distance and its replicability in future uses, with a higher correlation between the initial trial and retest results signifying higher test-retest reliability. Intraclass correlation coefficient (ICC) in two-way mixed effects, absolute agreement, single rater/measurement with 95% confidence interval was commonly utilized to test the

correlation (Matheson, 2019; Paiva et al., 2014; Park et al., 2018), and the analysis finds good reliability with a score of 0.813 (p < 0.001) (Koo & Li, 2016).

Internal Reliability

Internal reliability was examined to evaluate how consistently each item measure the same construct by evaluating inter-item correlation. Among several methods, Cronbach's alpha was the most commonly used (Azwar, 2012; Murphy & Davidshover, 2001) and resulted in a score of 0.873, thus indicating good internal reliability.

Conclusion

The adaptation remains multidimensional, and all seven items remain unaltered, with changes made in item arrangement and factor interpretation. The adaptation has been tested for content validity, convergent validity, factorial validity, test-retest reliability, and internal reliability. In conclusion, the adaptation of CAS-7 is proven to be a satisfactorily reliable and valid screening tool to identify citizens of Indonesia suffering from pandemic-related anxiety. In addition, the reinterpreted factors are analogous to other research, which also identified fear of being infected by COVID-19 and fear of information regarding COVID-19 among common sources of pandemic-related anxiety in the Indonesian population (Sitohang et al., 2021; Swarjana et al., 2022; Valentina et al., 2023). The result of every test would identify specific concerns as well as suitable interventions for each individual, where cases focusing on the fears of being infected by COVID-19 would benefit most from interventions which emphasize physical and breathing exercises or cognitive behavioural therapy (Bonardi et al., 2022; Handayani, 2022; He et al., 2023), while cases focusing on the fears of information regarding Covid-19 would benefit most from interventions which emphasize psychoeducation through curating verifiable sources of information and social support (Handayani, 2022; Maullasari & Fiana, 2020).

Nevertheless, this study's limitations include the disproportionate participant distribution across regions, notably a concentration in Banten (15.68%) and Jakarta (14.61%), and the absence of ethnicity data in the questionnaire. Future investigations should address these shortcomings by ensuring more equitable participant representation across provinces and incorporating measures to account for cultural diversity.

References

Acharibasam, J. W., Chireh, B., & Menegesha, H. G. (2021). Assessing anxiety, depression and insomnia symptoms among Ebola survivors in Africa: A meta-analysis. *PLOS ONE*, *16*(2). https://doi.org/10.1371/JOURNAL.PONE.0246515

Ahorsu, D. K., Lin, C.-Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The Fear of COVID-19 Scale: Development and initial validation. *International Journal of Mental Health and Addiction*, 9. https://doi.org/10.1007/S11469-020-00270-8

Aiken, L. (1980). Content validity and reliability of single items or questionnaires. *Educational and Psychological Measurement*, *40*(4), 955–959.

Alyami, M., Henning, M., Krägeloh, C. U., & Alyami, H. (2020). Psychometric evaluation of the Arabic version of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, 14. https://doi.org/10.1007/S11469-020-00316-X

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for Educational and Psychological Testing*. Washington, DC: American Educational Research Association.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). American Psychiatric Association. Retrieved from

https://www.psychiatry.org/psychiatrists/practice/dsm

Arlinta, D. (2023, December 15). Kasus Covid-19 mencapai 1.499 penderita, naik hampir 300 kasus dalam sehari - Kompas.id. Retrieved January 15, 2024, from https://www.kompas.id/baca/humaniora/2023/12/15/sebanyak-1499-kasus-aktif-covid-19-dilaporkan-naik-hampir-300-kasus-dalam-sehari

Arora, A., Jha, A. K., Alat, P., & Das, S. S. (2020). Understanding coronaphobia. *Asian Journal of Psychiatry*, *54*, 102384. https://doi.org/10.1016/J.AJP.2020.102384

Arpaci, I., Karataş, K., & Baloğlu, M. (2020). The development and initial tests for the psychometric properties of the COVID-19 Phobia Scale (C19P-S). *Personality and Individual Differences*, *164*, 110108. https://doi.org/10.1016/J.PAID.2020.110108

Azwar, S. (2012). *Reliabilitas dan Validitas* (4th ed.). Yogyakarta: Pustaka Pelajar.

Babyak, M. A., & Green, S. B. (2010). Confirmatory factor analysis: An introduction for psychosomatic medicine researchers. *Psychosomatic Medicine*, *72*(6), 587–597. https://doi.org/10.1097/PSY.0B013E3181DE3F8A

Bah, A. J., James, P. B., Bah, N., Sesay, A. B., Sevalie, S., & Kanu, J. S. (2020). Prevalence of anxiety, depression and post-traumatic stress disorder among Ebola survivors in northern Sierra Leone: a cross-sectional study. *BMC Public Health*, *20*. https://doi.org/10.1186/S12889-020-09507-6

Baldi, E., & Savastano, S. (2021). Fear of contagion: One of the most devious enemies to fight during the COVID-19 pandemic. *Disaster Medicine and Public Health Preparedness*, *15*(4), e8–e9. https://doi.org/10.1017/DMP.2020.338

Bartlett, M. (1951). The effect of standardization on a Chi-square approximation in factor analysis. *Biometrika*, *38*(3–4), 337–344. https://doi.org/10.1093/biomet/38.3-4.337

Beavers, A., Lounsbury, J., Richards, J., Huck, W., Skolits, G., & Esquivel, S. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research and Evaluation*, *18*(1). https://doi.org/10.7275/qv2q-rk76

Binekasri, R. (2023, December 31). Kasus Covid RI naik di Nataru 2024, tak cuma varian baru. Retrieved January 15, 2024, from https://www.cnbcindonesia.com/tech/20231231091838-37-501574/kasus-covid-ri-naik-di-nataru-2024-tak-cuma-varian-baru

Bitan, D. T., Grossman-Giron, A., Bloch, Y., Mayer, Y., Shiffman, N., & Mendlovic, S. (2020). Fear of COVID-19 scale: Psychometric characteristics, reliability and validity in the Israeli population. *Psychiatry Research*, *289*, 113100. https://doi.org/10.1016/J.PSYCHRES.2020.113100

Bonardi, O., Wang, Y., Li, K., Jiang, X., Krishnan, A., He, C., … Thombs, B. D. (2022). Effects of COVID-19 mental health interventions among children, adolescents, and adults not quarantined or undergoing treatment due to COVID-19 infection: A systematic review of randomised controlled trials. *The Canadian Journal of Psychiatry*, *67*(5), 336–350. https://doi.org/10.1177/07067437211070648

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, *395*(10227), 912–920. https://doi.org/10.1016/S0140-6736(20)30460-8

Carlson, K. D., & Herdman, A. O. (2012). Understanding the impact of convergent validity on research results. *Organizational Research Methods*, *15*(1), 17–32. https://doi.org/10.1177/1094428110392383

Centers for Disease Control and Prevention. (2023). CDC museum COVID-19 timeline. Retrieved from https://www.cdc.gov/museum/timeline/covid19.html

Chandu, C., Pachava, S., Vadapalli, V., & Marella, Y. (2020). Development and initial validation of the COVID-19 Anxiety Scale. *Indian Journal of Public Health*, *64*, S201-204.

https://doi.org/10.4103/ijph.IJPH

Cheng, C. (2004). To be paranoid is the standard? Panic responses to SARS outbreak in the Hong Kong Special Administrative Region. *Asian Perspective*, *28*(1), 67–98.

Conia, P. D. D., & Nurmala, M. D. (2022). Gambaran tingkat kecemasan pada mahasiswa penyintas Covid-19 saat menghadapi kembali proses pembelajaran. *Jurnal Penelitian Bimbingan Dan Konseling*, *7*(1), 12–20.

Costantini, A., & Mazzotti, E. (2020). Italian validation of CoViD-19 Peritraumatic Distress Index and preliminary data in a sample of general population. *Rivista Di Psichiatria*, *55*(3), 145–151. https://doi.org/10.1708/3382.33570

Dodge, Y. (2008). *The Concise Encyclopedia of Statistics*. *The Concise Encyclopedia of Statistics*. Heidelberg: Springer-Verlag Berlin. https://doi.org/10.1007/978-0-387-32833-1

Fitria, L., & Ifdil, I. (2020). Kecemasan remaja pada masa pandemi Covid -19. *Jurnal EDUCATIO: Jurnal Pendidikan Indonesia*, *6*(1), 1–4. https://doi.org/10.29210/120202592

Gettleman, J., & Schultz, K. (2020). Coronavirus in India: Modi orders total lockdown of 21 days. Retrieved April 24, 2024, from https://www.nytimes.com/2020/03/24/world/asia/india-coronavirus-lockdown.html

Ghozali, I. (2017). *Structural Equations Model Concepts and Application with Amos 24 Program*. Semarang: Agency Publisher UNDIP.

Haktanir, A., Seki, T., & Dilmac, B. (2020). Adaptation and evaluation of Turkish version of the fear of COVID-19 Scale. *Death Studies*, 1–9. https://doi.org/10.1080/07481187.2020.1773026

Hamka, & Yusuf, M. (2023). Spiritualitas, kecemasan, dan stres selama pandemi COVID-19. *Jurnal Psikologi Islam Dan Budaya*, *6*(1), 47–54. https://doi.org/10.15575/jpib.v6i1.14145

Handayani, K. D. (2022). Mental health problems in the midst of the Covid-19 pandemic: Increasing anxiety disorder problems and how to handle them. *Contagion: Scientific Periodical of Public Health and Coastal Health*, *4*(2), 56–66. Retrieved from https://jurnal.uinsu.ac.id/index.php/contagion

Hastutiningtyas, W. R., Rosdiana, Y., & Ngonggo, M. (2022). Kecemasan masyarakat dalam menghadapi virus Corona (Covid-19) di kota Malang. *Nursing News : Jurnal Ilmiah Keperawatan*, *6*(1), 1–6. https://doi.org/10.33366/NN.V6I1.2449

He, J., Lin, J., Sun, W., Cheung, T., Cao, Y., Fu, E., … Tsang, H. W. H. (2023). The effects of psychosocial and behavioral interventions on depressive and anxiety symptoms during the COVID-19 pandemic: a systematic review and meta-analysis. *Scientific Reports*, *13*(19094). https://doi.org/10.1038/s41598-023-45839-0

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, *6*, 53–60.

Hu, L. T., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Ilahi, A. D. W., Rachma, V., Janastri, W., & Karyani, U. (2021). The level of anxiety of students during the Covid-19 pandemic: Tingkat kecemasan mahasiswa di masa pandemi Covid-19. *Proceding of Inter-Islamic University Conference on Psychology*, *1*(1).

International Test Commission. (2017). *The ITC Guidelines for Translating and Adapting Tests* (2nd ed.). Retrieved from https://www.intestcom.org/

Jalloh, M. F., Li, W., Bunnell, R. E., Ethier, K. A., O'Leary, A., Hageman, K. M., … Redd, J. T. (2018). Impact of Ebola experiences and risk perceptions on mental health in Sierra Leone, July 2015. *BMJ*

Global Health, *3*(2). https://doi.org/10.1136/BMJGH-2017-000471

Jones, J. H., & Salathé, M. (2009). Early assessment of anxiety and behavioral response to novel swine-origin influenza A(H1N1). *PLOS ONE*, *4*(12).

Kementerian Kesehatan RI. (2024). Infeksi emerging. Retrieved 15th January, 2024, from https://infeksiemerging.kemkes.go.id/dashboard/covid-19

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, *15*(2), 155. https://doi.org/10.1016/J.JCM.2016.02.012

Lawshe, C. (1975). A quantitative approach to content validity. *Personnel Psychology*, *28*(4), 563–575.

Lee, S. (2020a). Coronavirus Anxiety Scale: A brief mental health screener for COVID-19 related anxiety. *Death Studies*, *44*(7), 393–401. https://doi.org/10.1080/07481187.2020.1748481

Lee, S. (2020b). How much "Thinking" about COVID-19 is clinically dysfunctional? *Brain, Behavior, and Immunity*, *87*, 97–98. https://doi.org/10.1016/j.bbi.2020.04.067

Martini, Muhammad Syahrul, & Andi Bunyamin. (2021). Tingkat kecemasan mahasiswa selama pandemi. *Indonesian Journal of Learning Education and Counseling*, *4*(1), 43–49. https://doi.org/10.31960/ijolec.v4i1.1240

Matheson, G. J. (2019). We need to talk about reliability: Making better use of test-retest studies for study design and interpretation. *PeerJ*, *2019*(5), 1–25. https://doi.org/10.7717/peerj.6918

Maullasari, S., & Fiana, A. L. (2020). Mental health with COVID-19: Health crisis intervention. *Journal of Advanced Guidance and Counseling*, *1*(2), 140–156. https://doi.org/10.21580/jagc.2020.1.2.5945

Murphy, K., & Davidshover, C. (2001). *Psychological testing: Principles and applications* (5th ed.). New Jersey: Prentice Hall.

Onie, S., Kirana, A. C., Mustika, N. P., Adesla, V., & Ibrahim, R. (2020). Assessing the predictive validity and reliability of the DASS-21, PHQ-9 and GAD-7 in an Indonesian Sample. https://doi.org/10.31234/osf.io/eqcm9

Oosterhoff, B., & Palmer, C. A. (2020). Attitudes and psychological factors associated with news monitoring, social distancing, disinfecting, and hoarding behaviors among US adolescents during the Coronavirus disease 2019 pandemic. *JAMA Pediatrics*, *174*(12), 1184–1190. https://doi.org/10.1001/JAMAPEDIATRICS.2020.1876

Paiva, C. E., Barroso, E. M., Carneseca, E. C., De Pádua Souza, C., Dos Santos, F. T., Mendoza López, R. V., & Ribeiro Paiva, S. B. (2014). A critical analysis of test-retest reliability in instrument validation studies of cancer patients under palliative care: A systematic review. *BMC Medical Research Methodology*, *14*(1). https://doi.org/10.1186/1471-2288-14-8

Park, M. S., Kang, K. J., Jang, S. J., Lee, J. Y., & Chang, S. J. (2018). Evaluating test-retest reliability in patient-reported outcome measures for older people: A systematic review. *International Journal of Nursing Studies*, *79*(June 2017), 58–69. https://doi.org/10.1016/j.ijnurstu.2017.11.003

Pertiwi, S. T., Moeliono, M. F., & Kendhawati, L. (2021). Depresi, kecemasan, dan stres remaja selama pandemi Covid-19. *JURNAL Al-AZHAR INDONESIA SERI HUMANIORA*, *6*(2), 72–77. https://doi.org/10.36722/sh.v%vi%i.497

Peterson, C. H., Peterson, N. A., & Powell, K. G. (2017). Cognitive interviewing for item development: Validity evidence based on content and response processes. *Measurement and Evaluation in Counseling and Development*, *50*(4), 217–223. https://doi.org/10.1080/07481756.2017.1339564

Qiu, J., Shen, B., & Zhao, M. (2020). Correction: A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General*

Psychiatry, *33*(2). https://doi.org/10.1136/GPSYCH-2020-100213CORR1

Reise, S., Waller, N., & Comrey, A. (2000). Factor analysis and scale revision. *Psychological Assessment*, *12*(3), 287–297.

Reznik, A., Gritsenko, V., Konstantinov, V., Khamenka, N., & Isralowitz, R. (2020). COVID-19 fear in Eastern Europe: Validation of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, 65. https://doi.org/10.1007/S11469-020-00283-3

Roy, A., Singh, A. K., Mishra, S., Chinnadurai, A., Mitra, A., & Bakshi, O. (2021). Mental health implications of COVID-19 pandemic and its response in India. *The International Journal of Social Psychiatry*, *67*(5), 587. https://doi.org/10.1177/0020764020950769

Rusman, A. D. P., Umar, F., & Majid, M. (2021). Kecemasan masyarakat selama masa pandemi COVID-19. *Jurnal Kesmas (Kesehatan Masyarakat) Khatulistiwa*, *8*(1), 10–18. https://doi.org/10.29406/JKMK.V8I1.2554

Sarmento, R. P., & Costa, V. (2019). Confirmatory factor analysis -- A case study. *Journal of Advanced Nursing*, *76*(9), 2209–2211. Retrieved from http://arxiv.org/abs/1905.05598

Satici, B., Gocet-Tekin, E., Deniz, M., & Satici, S. (2020). Adaptation of the Fear of COVID-19 Scale: Its association with psychological distress and life satisfaction in Turkey. *International Journal of Mental Health and Addiction*, 1–9. https://doi.org/10.1007/S11469-020-00294-0

Schumacker, R., & Lomax, R. (2010). *A Beginner's Guide to Structural Equation Modeling*. New York: Routledge.

Secor, A., Macauley, R., Stan, L., Kagone, M., Sidikiba, S., Sow, S., … Sanderson, J. (2020). Original research: Mental health among Ebola survivors in Liberia, Sierra Leone and Guinea: results from a cross-sectional study. *BMJ Open*, *10*(5). https://doi.org/10.1136/BMJOPEN-2019-035217

Shrestha, R., Siwakoti, S., Singh, S., & Shrestha, A. P. (2021). Impact of the COVID-19 pandemic on suicide and self-harm among patients presenting to the emergency department of a teaching hospital in Nepal. *PLOS ONE*, *16*(4). https://doi.org/10.1371/JOURNAL.PONE.0250706

Sitohang, T. R., Rosyad, Y. S., & Rias, Y. A. (2021). Analisa faktor kecemasan pada masyarakat Indonesia bagian barat selama pandemic Covid-19 tahun 2020. *Jurnal Endurance: Kajian Ilmiah Problema Kesehatan*, *6*(2), 279–289. https://doi.org/10.22216/jen.v6i2.229

Soraci, P., Ferrari, A., Abbiati, F., Del Fante, E., De Pace, R., Urso, A., & Griffiths, M. (2020). Validation and psychometric evaluation of the Italian version of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, 1–10. https://doi.org/10.1007/S11469-020-00277-1

Šrol, J., Mikušková, E. B., & Čavojová, V. (2021). When we are worried, what are we thinking? Anxiety, lack of control, and conspiracy beliefs amidst the COVID-19 pandemic. *Applied Cognitive Psychology*, *35*(3), 720–729. https://doi.org/10.1002/ACP.3798

Stevens, J. (2012). *Applied multivariate statistics for the social sciences* (5th ed.). London, UK: Routledge.

Swarjana, I. K., Suyasa, I. G. P. D., & Nuryanto, I. K. (2022). Predictors of anxiety toward COVID-19 delta variant: A cross sectional study among healthcare providers in Java and Bali, Indonesia. *Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal)*, *17*(3), 204–211. https://doi.org/10.21109/kesmas.v17i3.6071

Tanaka, J. (1993). Multifaceted conceptions of fit in structural equation models. In K. Bollen & J. Long (Eds.), *Testing structural equation models*. Newbury Park, CA: Sage.

Taylor, S. (2019). *The Psychology of Pandemics: Preparing for the Next Global Outbreak of Infectious Disease*. Newcastle upon Tyne: Cambridge Scholars Publishing.

Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., & Asmundson, G. J. G. (2020). Development and initial validation of the COVID Stress Scales. *Journal of Anxiety Disorders*, *72*, 102232. https://doi.org/10.1016/j.janxdis.2020.102232

Team Verywell Health. (2023). A timeline of COVID-19 variants. Retrieved from https://www.verywellhealth.com/covid-variants-timeline-6741198

Tenda, E. D., Asaf, M. M., Pradipta, A., Kumaheri, M. A., & Susanto, A. P. (2021). The COVID-19 surge in Indonesia: what we learned and what to expect. *Breathe*, *17*(4). https://doi.org/10.1183/20734735.0146-2021

Tse, D. C. K., Lau, V. W., Hong, Y. yi, Bligh, M. C., & Kakarika, M. (2021). Prosociality and hoarding amid the COVID-19 pandemic: A tale of four countries. *Journal of Community and Applied Social Psychology*, 1–14. https://doi.org/10.1002/CASP.2516

Turnip, S. S., & Hauff, E. (2007). Household roles, poverty and psychological distress in internally displaced persons affected by violent conflicts in Indonesia. *Social Psychiatry and Psychiatric Epidemiology*, *42*(12), 997–1004. https://doi.org/10.1007/S00127-007-0255-3

Valentina, T. D., Nurcahyo, F. A., & Astiti, D. P. (2023). Source of anxiety and coping strategy in youth during the COVID-19 pandemic in Indonesia. *MEDIAPSI*, *9*(1), 14–28. Retrieved from https://doi.org/10.21776/ub.mps.2023.009.01.874

Van den Bulck, J., & Custers, K. (2009). Television exposure is related to fear of avian flu, an ecological study across 23 member states of the European Union. *European Journal of Public Health*, *19*(4), 370–374.

Vijaya, K., Low, Y., Chan, S., Foo, L., Lee, M., & Deurenberg-Yap, M. (2005). Behaviour of Singaporeans during the SARS outbreak: The impact of anxiety and public satisfaction with media information. *International Journal of Health Promotion and Education*, *43*(1), 17–22.

Wang, H. H., & Hao, N. (2020). Panic buying? Food hoarding during the pandemic period with city lockdown. *Journal of Integrative Agriculture*, *19*(12), 2916–2925. https://doi.org/10.1016/S2095-3119(20)63448-7

West, S., Taylor, A., & Wu, W. (2012). Model fit and model selection in structural equation modeling. In R. Hoyle (Ed.), *Handbook of structural equation modeling*. New York, NY: Guilford Press.

Wheaton, M., Abramowitz, J., Berman, N., Fabricant, L., & Olatunji, B. (2012). Psychological predictors of anxiety in response to the H1N1 (Swine Flu) pandemic. *Cognitive Therapy and Research*, *36*, 210–218.

World Health Organization. (2020, 13th December). Coronavirus disease (COVID-19): How is it transmitted? Retrieved 1st December, 2021, from https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-covid-19-how-is-it-transmitted

Xiao, H., Zhang, Y., Kong, D., Li, S., & Yang, N. (2020). The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Medical Science Monitor : International Medical Journal of Experimental and Clinical Research*, *26*, e923549-1. https://doi.org/10.12659/MSM.923549

Zvolensky, M. J., Garey, L., Rogers, A. H., Schmidt, N. B., Vujanovic, A. A., Storch, E. A., … O'Cleirigh, C. (2020). Psychological, addictive, and health behavior implications of the COVID-19 pandemic. *Behaviour Research and Therapy*, *134*, 103715. https://doi.org/10.1016/J.BRAT.2020.103715