Full Length Research Paper

Development and Validation of a Measure for Psychological Distress

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Abstract

Psychological distress is characterized as an emotional state of suffering that impairs an individual's ability to cope with a specific set of circumstances. People who experience psychological distress typically receive insufficient diagnosis and/or treatment. Care providers in particular need a reliable, fast, and valid screening tool for psychological distress to overcome the challenges. This has undoubtedly raised the need for screening tools that are simple to use, comprehensible, repeatable, dependable, and effective. A seventeen-item diagnostic tool called the Redeemer's University Psychological Distress Scale (RUPDS) was validated among caregivers in selected hospitals in Ile-Ife, Osun State, Nigeria. The initial 29 items of the Redeemer's University Psychological Distress Scale were developed. Then, eight expert opinions, with at least 10 years of experience in the field were consulted regarding the items. Twenty-six items were kept after applying the 75% item inclusion. The sampling adequacy KMO value was .87, falling within the suggested range of 0 to 1. Significant BTS was observed (X^2= 1296.08, *df*= 325, *p* =.00). As a result, the Principal Components Analysis (PCA) was carried out and the results validated the factorability of the correlation matrix. After several steps, a final set of 17 viable items was obtained for use in item refinement. Significant positive correlation coefficients were observed between RUPDS and K10 (*r*= .61, *p*= .000). This finding made Redeemer's University Psychological Distress Scale (RUPDS) valid as a diagnostic tool for measuring psychological distress among the Nigerian population. It is advised that the Redeemer's University Psychological Distress Scale be used not only in Nigeria but also in other nations with comparable sociocultural contexts, as it was designed with the Nigerian sociocultural context in mind.

Keywords: Psychological distress, scale development, psychometrics, caregivers, Nigeria.

INTRODUCTION

The DSM-5 TR defines psychological distress as a collection of subjective symptoms within an individual's internal psychological realm that are commonly regarded as distressing, perplexing, or atypical (DSM-5 TR, 2022; Reta et al., 2020). Psychological distress (which is also referred to as mental distress) has the capacity to explain alterations in behavior, have adverse effects on an individual's emotional state, and impact their interpersonal connections. Various stressful life experiences, such as bereavement, sleep deprivation, chronic stress, substance misuse, interpersonal aggression, and accidents, have been identified as potential triggers of psychological distress (Pinquart & Duberstein, 2010; Schwarzer & Luszczynska, 2013).

Psychological distress is characterized as an emotional state of suffering that impairs an individual's ability to cope with a specific set of circumstances (Qiu et al., 2020). It is typified by symptoms of anxiety (such

as restlessness, feeling tense, and somatic symptoms) and depression (such as loss of interest, sadness, and hopelessness) (Viertiö et al., 2021). Sustaining psychological distress can have a negative impact on one's worldview, cognition, and self-image. People who experience psychological distress are more prone to display a variety of negative emotional states (such as anger, guilt, and negative self-perceptions) as well as an incapacity to successfully manage stressors in their lives (APA, 2022; Reta et al., 2020).

Research findings revealed that psychological distress is not a contagious disease like the common cold. Psychological distress describes the unpleasant feelings or emotions that an individual may have when such an individual feel overwhelmed. These emotions and feelings can get in the way of daily living and affects how an individual reacts to the people around them. Some of these stressors could be traumatic experiences, major life events, everyday stressors such as workplace stress, family stress, health issues and relationships amongst others (Barber, et al., 2011).

Primary care givers are often under time constraints, yet they still want to provide their patients with the best care possible. This place them at high risk of experiencing psychological distress, but poorly sensing the presence of such as a result of the demanding pressure from the task of care provision. All these makes detecting psychological distress challenging. Undoubtedly, the need for screening tools that are simple to use, comprehensible, repeatable, dependable, and effective is required. A seventeen-item diagnostic tool called the Redeemer's University Psychological Distress Scale (RUPDS) was thus validated among caregivers in selected hospitals in Ile-Ife, Osun State, Nigeria.

Justification for this study

Despite the high prevalence and potentially dangerous consequences, such as a decreased quality of life, a variety of physical symptoms, maladaptive personality traits, and an increased risk of dying from cardiovascular, cerebrovascular, and suicide causes, psychological distress has not received much attention as a mental health issue. Effective therapy has been significantly hampered by incomplete or inaccurate assessment (Qiu et al., 2020). According to Turner et al. (2020), people who experience psychological distress typically receive insufficient diagnosis and/or treatment. Care providers in particular need a reliable, fast, and valid screening tool for psychological distress to overcome the challenges.

The seventeen-item Redeemer's University Psychological Distress Scale (RUPDS) was developed to assess the level of psychological distress symptoms in research and clinical contexts. According to Naragon-Graney (2019), given the rising prevalence of psychological distress among Nigerians due to issues like poverty, unemployment, insurgencies, and insecurity, there is a need for a standardized anxiety diagnostic instrument to identify psychological distress in the country's citizens. More precise statistics and helpful policy recommendations will result from this.

This emphasizes the need for an indigenous scale to measure psychological distress among Nigerians, as the most commonly used standardized psychological distress scales in the country are imported and, at most, validated by Nigerian authors before usage. Nigerians place a high value on distinctive sociocultural elements, which these imported scales usually ignore. The author set out to create and evaluate an indigenous Psychological Distress Scale version in light of this history.

Research Method

This study is a cross-sectional design among informal caregivers (caregivers who are members of clients' family) in three selected Hospitals in Ile Ife, South-western Nigeria.

Participants

The sample size computation was based on the table of sample size determination given by Glenn (1992). Based on a 95% confidence level, ± 10% precision levels, and p = 0.5 for 2000, a sample size of 95 was established (Glenn, 1992). To account for attrition, a sample size 120 willing participants was used for the EFA. Purposive sampling technique was used to sample 120 participants (caregivers) and 118 samples (44 male and 74 female) were found valid from the population for the RUPDS EFA at Seventh Day Adventist Hospital Ile Ife, Alafiatayo Hospital Ile Ife, and Obafemi Awolowo University Teaching Hospital, Ile Ife, Osun State, Nigeria. The age range was between 18 and 67 years (*Mean* = 33.42; *SD* = 12.78). The demographic characteristics of respondents based on marital status revealed that 53.4%, 44.1%, and 2.5% were single, married, and widowed respectively. Furthermore, 11.9% of the respondents were unemployed, 46.6% were self-employed, 40.7% were employed, and .8% of respondents were students. Sampling for the reliability and concurrent validity, a sample of one hundred and twelve (112) caregivers was purposively selected at another three hospitals namely: Seventh Day Adventist Hospital, Obafemi Awolowo University Teaching Hospital Complex and *PsychCare*

Rehabilitation Centre all in Ile-Ife, Osun State, Nigeria. Forty eight Male and sixty four Female respondents were selected using a cross-sectional approach. The participants were between the ages of 17 years and 60 years (*Mean*= 28.27; *SD*= 11.28). The demographic characteristics of respondents based on the marital status revealed that 67.9% were single while 32.1% of the participants were married. Furthermore, 12.5% of respondents were unemployed, 13.4% of respondents were self-employed, and 16.1% of respondents were employed, while 58.0% of respondents were students. The psychometric properties of the Redeemer's University Psychological Distress Scale (RUPDS) were determined using the data collected.

Only informal caregivers who were physically present at the chosen hospitals met the inclusion and exclusion criteria. By accounting for potential inaccuracies in the responses brought on by caregivers who were absent when the instrument was administered, this inclusion was intended to produce valid research results. Additionally, the study only included caregivers who agreed to complete and submit the questionnaires to the researcher. By using this inclusion criterion, the researcher was able to make sure that all potential volunteers were informed about the study's objectives and motivated to provide truthful answers.

Instruments

The participants completed the 10-item Kessler Psychological Distress Scale (K10) and the Redeemer's University Psychological Distress Scale (RUPDS). The K10 was rated on a five-point Likert scale, which indicated the extent to which the respondents had experienced each of the 10 symptoms during the previous month, such as "sad or depressed" and "feeling tired out for no good reason." There are five response categories on the scale, ranging from 0 (never) to 4 (always). A total score between 0 and 40 was calculated by adding together the items; higher scores denoted higher levels of psychological distress.

Statistical Analysis

Cronbach's alpha coefficient was conducted to test the reliability, and Pearson correlation analysis was used to determine the concurrent validity of the scale.

Item Generation for Redeemer's University Psychological Distress Scale (RUPDS)

The initial 29 items of the Redeemer's University Psychological Distress Scale were developed based on the clinical characteristics of psychological distress in the DSM TR and ICD as well as a Focus Group Discussion among eight caregivers of Alafiatayo Hospital, Ile Ife, Osun State, Nigeria (seven females; one male). Then, eight expert opinions, (seven clinical psychologists, and one industrial/organizational psychologist) with at least 10 years of experience in the field were consulted regarding the items. The expert technique is appropriate for content validity when paired with the above-described thorough identification process, which is the rationale behind using the face validity method (Nunnally, 1978). The Content Validity Ratio (CVR) of a Yes/No nominal scale was used to assess the items. Using a Yes/No scale, the researcher simply counted the number of Yes and No answers for each question to determine the percentages, which allowed for data analysis. Twenty-six items were kept after applying the 75% item inclusion.

Item Refinement

An Exploratory Factor Analysis (EFA) was performed on the 26 RUPDS items. Factors having eigenvalues greater than one were extracted at the initial stage of the EFA process. The statistics for factors with eigenvalues greater than one were then extracted. Stevens (2009) recommended the lowest factor loading of 0.40.

Exploratory Factor Analysis

Pallant (2005) states that for factor analysis to be deemed appropriate, the Bartlett's Test of Sphericity (BTS) must be significant ($p < 0.05$) and have a Kaiser-Meyer-Olkin (KMO) index range of 0 to 1, with a minimum value of 0.06 for adequate factor analysis. The tests' results are shown in Table 1

Table 1: *Summary of Kaiser-Meyer-Olkin (KMO) and Bartlett's Test Sphericity (BTS) on the factorability of the 26-item measure for Redeemer's University Psychological Distress Scale (RUPDS)*

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.87
BTS	Approx. Chi-Square	1296.08
	Df	325
	Sig.	.00

As summarized in Table 1, the sampling adequacy KMO value was .87, falling within the suggested range of 0 to 1. Significant BTS was observed (X^2= 1296.08, df= 325, p =.00). As a result, the Principal Components Analysis (PCA) was carried out and the results validated the factorability of the correlation matrix. Five components were identified with eigenvalues > 1 according to the main component extraction method's test; the summary is shown in Table 2.

Table 2: *The Principal Component Extraction Method's Test Indicated Five Components Extracted with Eigenvalues*

Components	Eigenvalues	% of variance	Cumulative %
1	9.441	36.313	36.313
2	2.455	9.440	45.753
3	1.557	5.988	51.742
4	1.274	4.899	56.640
5	1.195	4.595	61.235

Table 2 provides a summary of the five components that were extracted, as each of the items put on these components had an eigenvalue greater than 1. The percentage range of 36.313 to 4.595 corresponds to the eigenvalues of the five components, which vary from 9.441 to 1.195. Items in the other four components were loaded many times, leaving only one dimension intact, leading to a complicated or stand-alone structure. The eigenvalues of the included component accounted for 36.3 percent of the total variance.
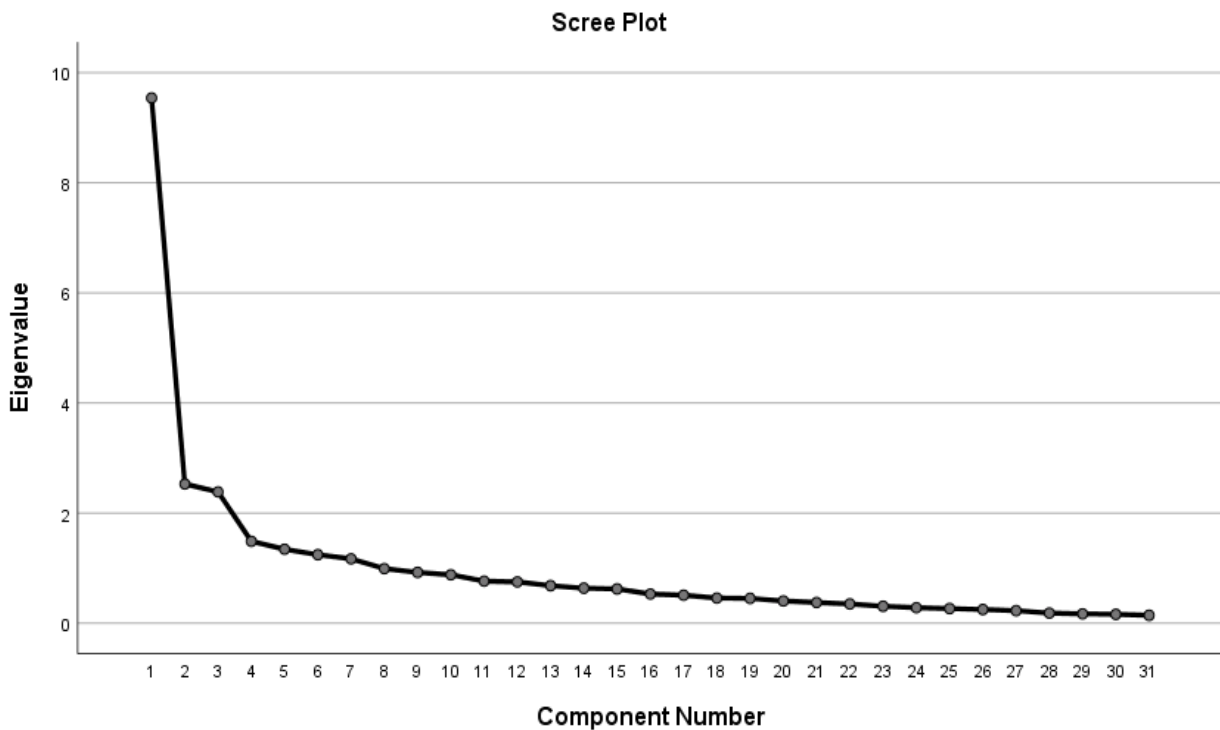

Figure 1: *Scree Plot of Redeemer's University Psychological Distress Scale (RUPDS)*

The scree plot in Figure 1 revealed that only one component was retained with the elbow curve reflected after the first component. Guided further with the possibility of having just one valid component, items in the other four components identified by the PCA were critically reviewed.

Table 3: *Component Matrix of 26 Items of Redeemer's University Psychological Distress Scale*

Component Matrix a

	1	2	3	4	5
			Component		
1. I feel worried	.598				
2. I feel sluggish	.587		.612		
3. I feel irritable or unpleasant	.567				
4. I feel tensed or wound up	.456				-.576
5. I feel moody	.682				
6. I avoid social situations	.519				
7. I feel unsecured with people around me	.573				
8. I feel life is not worth living	.525				
9. I feel pains all over my body	.596				
10. I feel sleepless at night	.581				
11. I feel hopeless of the future	.468				
12. I feel comfortable staying alone	.593				
13. I feel tired and helpless	.784				
14. I do not have appetite	.783				-.534
15. I feel dizzy and lightheaded			.757		
16. I feel restless	.530	.542			
17. I feel I have failed myself	.590				
18. I feel palpitations	.575				
19. I feel so bad of my life	.595				
20. I feel unhappy	.634				
21. I feel nothing is working out for me	.623				
22. I feel I have too much load on me		.616			
23. I feel I cannot meet up with life demands	.605		.502		
24. I feel nervous	.602				
25. I feel am not strong enough to cope with daily tasks	.521				-.542
26. I feel my environment is not conducive for my success				.701	

Extraction Method: PCA.
a. 5 components extracted.

The 26-item RUPDS measure's principal component matrix analysis is summarized in Table 3 which shows five extracted components with eigenvalues greater than one. Table 3 displays how the 26 elements are loaded among the five components. As envisaged, most items loaded on the first component. Items in the other four components either loaded twice or ended up a single item component, thus leaving only one component intact, while others were structures with complicated or stand-alone items.

Reliability of the Redeemer's University Psychological Distress Scale

The Redeemer's University Psychological Distress

Scale items showed discriminatory values according to the Corrected Item-Total Correlations (Point-Biserial) method. Values ranging from 0 to 0.19 represent inadequate discrimination, 0.2 to 0.39 suggest adequate discrimination, and > 0.4 indicate exceptionally good discrimination. A five-point Likert scale was employed because opinions, beliefs, and attitudes were assessed using the Redeemer's University Psychological Distress Scale. To be clear, the Likert response format was used because all RUPDS questions are declarative statements (DeVellis, 2003). The items on the Redeemer's University Psychological Distress Scale, as shown in Table 4, are all greater than 0.4, suggesting excellent discrimination and the absence of any unclear or perplexing questions for participants.

Table 4: *Item - Total Statistics of Redeemer's University Psychological Distress Scale*

Reliability Statistics

Cronbach's Alpha	N of Items
.93	17

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I feel worried	41.00	300.100	.347	.926
I feel irritable or unpleasant	41.54	296.101	.427	.925
I feel moody	41.15	297.753	.401	.926
I avoid social situations	41.09	292.305	.445	.925
I feel unsecured with people around me	41.68	288.221	.622	.923
I feel life is not worth living	42.07	286.894	.717	.921
I feel pains all over my body	41.46	286.851	.629	.922
I feel sleepless at night	41.35	284.679	.613	.923
I feel hopeless of the future	42.09	288.155	.654	.922
I feel comfortable staying alone	40.74	295.669	.329	.928
I feel tired and helpless	41.70	287.086	.620	.923
I feel I have failed myself	41.93	287.894	.597	.923
I feel palpitations	41.88	291.385	.598	.923
I feel so bad of my life	42.02	291.549	.654	.923
I feel unhappy	41.64	288.433	.703	.922
I feel nothing is working out for me	42.01	292.787	.625	.923
I feel nervous	41.22	291.050	.585	.923

Table 4 also displays the item-total statistics and Cronbach's alpha for the 17 items that make up the Redeemer's University Psychological Distress Scale. The scale had a 0.93 reliability coefficient.

Table 5: *The 95% Confidence Interval of cutoff point determination for Redeemer's University Psychological Distress Scale by gender*

	Group Sample	Individual Male	Individual Female
Margin of Error	2.19	4.67	2.29
Sample size	112	33	51
Sample mean	18.27	24.39	14.31
Standard deviation	11.8	13.69	8.34
95% Confidence Interval	18.27 (95% CI 16.1 to 20.5)	24.39 (95% CI 19.7 to 29.1)	14.31 (95% CI 12 to 16.6)
Cut off point	≥ 30	≥ 38	≥ 23

The RUPDS cut-off points are presented in Table 5 above. To find it, the 95% Confidence Interval (CI) approach was applied. The group population mean, with 95% confidence, is summarized in Table 5 above. The analysis was based on 112 samples (18.27 [95% CI 16.1 to 20.5]); 33 samples (24.39 [95% CI 19.7 to 29.1]) provided a mean for the male population between 19.7 and 29.1, and 51 samples (14.31 [95% CI 12 to 16.6]) produced a mean for the female population between 12 and 16.6 respectively. For each group and gender category, the mean score plus one standard deviation was used to calculate the cut-off points. Based on the results, the group, male, and female samples' corresponding cut-off points (norms) were ≥ 30, ≥ 38, and ≥ 23.

Concurrent Validity of RUPDS

The concurrent validity technique was used to validate the Redeemer's University Psychological Distress Scale (RUPDS) and determine its link with the current measure: Kessler's 10-item Psychological

Distress Scale (K10) (Kessler, 1996). Significant positive correlation coefficients were observed between RUPDS and K10 ($r = .61$, $p = .000$). This finding made Redeemer's University Psychological Distress Scale (RUPDS) valid as a diagnostic tool for measuring psychological distress among the Nigerian population.

Table 6: *Final Draft of RUPDS*

S/N	ITEMS	Never	Sometimes	Occasionally	Often	Always
1.	I feel worried	0	1	2	3	4
2.	I feel irritable or unpleasant	0	1	2	3	4
3.	I feel moody	0	1	2	3	4
4.	I avoid social situations	0	1	2	3	4
5.	I feel unsecured with people around me	0	1	2	3	4
6.	I feel life is not worth living	0	1	2	3	4
7.	I feel pains all over my body	0	1	2	3	4
8.	I feel sleepless at night	0	1	2	3	4
9	I feel hopeless of the future	0	1	2	3	4
10	I feel comfortable staying alone	0	1	2	3	4
11	I feel tired and helpless	0	1	2	3	4
12	I feel I have failed myself	0	1	2	3	4
13	I feel palpitations	0	1	2	3	4
14	I feel so bad of my life	0	1	2	3	4
15	I feel unhappy	0	1	2	3	4
16	I feel nothing is working out for me	0	1	2	3	4
17	I feel nervous	0	1	2	3	4

Table 6 is the final draft of the seventeen-item RUPDS.

DISCUSSIONS

This research serves to create and validate the RUPDS. In clinical and research settings, the scale gauges the intensity of psychological distress symptoms. The steps in the scale development process have been suggested by a variety of sources. For example, Lynn (1986) suggested a two-phase approach. The process entailed creating an initial pool in the first step and validating it in the second (item performance evaluation of the instrument). The proposals from Price (2017) and Crocker and Algina (1986) were followed by Furr (2011) with five phases, Streiner et al. (2015) with seven steps, and DeVellis (2003) with eight steps. The majority of this research share four primary characteristics: validity investigations, reliability studies, item refining, and item production. These steps were taken in the RUPDS development process.

The clinical features of psychological distress were reviewed using the DSM-5 and the ICD-11. The development of items relevant to the agreed subjects resulted in the production of the twenty-nine items that were used for scale purification. As suggested by Flynn and Pearcy (2001) and Pecheux and Derbaix (1999), reliability analysis and EFA were used in tandem to purify the Redeemer's University Psychological Distress Scale. The content validity of the first items produced by the authors was verified by a group of experts. Streiner et al. (2015) state that content validity in the relevant construct reflects current knowledge. It also demonstrates the instrument's viability and practicability, which is a crucial indicator of its validity (DeVon et al., 2007).

The RUPDS's creation laid the groundwork for more research into the instrument's reliability and validity. There was a 0.93 Cronbach's alpha. This result suggests that the Nigerian population's understanding of the construct (Streiner, 2003) is quite homogeneous and unidimensional. To put it another way, Cronbach's alpha was not too high to make some items redundant (Lai et al., 2013). As a result, the high alpha score suggests that the RUPDS is very reliable. Concurrent validity

technique was used to verify the Redeemer's University Psychological Distress Scale, as recommended by Cronbach and Meehl (1955). The RUPDS and one standardized scale measuring psychological distress in the general population were positively correlated. Based on its EFA and good psychometric properties, the Redeemer's University Psychological Distress Scale is a suitable measure of psychological distress among adolescents and adults in Nigeria and other countries with similar sociocultural situations.

CONCLUSION AND RECOMMENDATIONS

The 17-item RUPDS demonstrated strong internal consistency and validity scores to assess psychological distress, according to the study's findings. According to this investigation, the Redeemer's University Psychological Distress Scale is valid and trustworthy for use with Nigerians. The scale is gender-sensitive and can be self-administered both individually and in group research, according to norms for the group and individual (male and female) samples.

As a result, in therapeutic settings, it is advised as a diagnostic tool for psychological distress in adults and adolescents. To gather data on psychological distress among the general population and support the development of policies in the field of mental healthcare, it can also be used to evaluate psychological distress in group research settings. It is advised that the Redeemer's University Psychological Distress Scale be used not only in Nigeria but also in other nations with comparable sociocultural contexts, as it was designed with the Nigerian sociocultural context in mind.

Limitations of the study

This research was carried out within the unique psycho-sociocultural framework of the Nigerian populace. Generalizing the results and applying this scale to other communities with distinct sociocultural characteristics should be done with caution in the absence of scale re-validation.

Conflict of Interest: None is declared by authors

REFERENCES

Ae-Ngibise, K.A., Doku, V.C.K., Asante, K.P., & Owusu-Agyei, S. (2015). The experience of caregivers of people living with serious mental disorders: a study from rural Ghana. *Global Health Action.*8: 10. doi: 10.3402/gha.v8.26957.

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). https://doi.org/10.1176/appi.books.9780890425787

Cascardi, M. (2016). From Violence in the Home to Physical dating violence victimization: the mediating role of psychological distress in a Prospective Study of Female Adolescents. *Journal of Youth and Adolescence.*45(4):777-92. doi: 10.1007/s10964-016-0434-1.

Crocker L., & Algina J. (1986). Introduction to classical and modern test theory. *New York, NY: Holt*, Rinehart & Winston.

Cronbach L., & Meehl P. (1955). Construct validity in psychological tests. *Psychol Bull.* 52(4):281 302. https://doi.org/10.1037/h0040957

DeVellis RF. Scale development: Theory and applications. Applied social research methods series. Vol. 26. 2nd ed. Thousand Oaks, CA: Sage; 2003.

Flynn LR, Pearcy D. Four subtle sins in scale development: Some suggestions for strengthening the Current paradigm. *Int J Market Re*s. 2001;43(4):1–14. https://doi.org/10.1177/147078530104300404

Furr R., (2011). Scale construction and psychometrics for social and personality psychology. New Delhi: Sage.

Glenn I., (1992). Sampling the evidence of extension program impact. Program Evaluation and Organizational Development, IFAS, University of Florida; Available from https://edis.ifas.ufl.edu/publication/PD005#TOP

Kessler R., Barker P., Colpe L., Epstein J., Gfroerer J., & Hiripi E. (2003). Screening for serious mental illness in the general population. *Arch Gen Psychiary.* Feb;60(2):184-9

Koma, W., True, S., Biniek, J. F., Cubanski, J., Orgera, K., & Garfield, R. (2020). One in four older adults report anxiety or depression amid the COVID-19 pandemic. *Kaiser Health News.* https://www.kff.org/medicare/issue-brief/one-in-four-older-adults-report-anxiety-or-depressionamid-the-covid-19-pandemic/.

Lai C., Mak K., Watanabe H., Ang R., & Pang J. (2013). Psychometric properties of the internet addiction test in Chinese adolescents. *J Pediatr Psychol*;38(7):794–807.

Lynn M. (1986). Determination and quantification of content validity. *Nurs Res*;35:382–385. https://doi.org/10.1097/00006199-198611000-00017

Mohammadi M. (2020). Generalized anxiety disorder: prevalence, predictors, and comorbidity in children and adolescents. *J Anxiety Disord*;73:102234.

Naragon-Gainey, K. (2019). Affective models of depression and anxiety: Extension to within-person processes in daily life. *Journal of Affective Disorders*, 243, 241–248. https://doi.org/10.1016/j.jad.2018.09.061

Nunnally J. (1978). Psychometric theory. 2nd ed. New York, NY: McGraw-Hill.

Pallant, J. (2005). SPSS survival manual. (2nd ed). Open University Press.

Pecheux C., & Derbaix C. (1999). Mood and children: Proposition of a measurement scale. *J Econ Psychol*;20(5):571–590. https://doi.org/10.1016/S0167-4870(99)00025-2

Price L. (2017). Psychometric methods: Theory into practice. New York, NY: The Guilford Press.
Qiu J., Shen B., Zhao M., Wang Z., Xie B., Xu Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: Implications and policy recommendations. *Gen. Psychiatry*; 33:100213. doi: 10.1136/gpsych-2020-100213.

Reta Y., Ayalew M., Yeneabat T., Bedaso A. (2020). Social anxiety disorder among undergraduate students of Hawassa University, College of Medicine and Health Sciences. *Neuropsychiatr. Dis. Treat*; 16:571–577. doi: 10.2147/NDT.S235416.

Rettie, H., & Daniels, J. (2021). Coping and tolerance of uncertainty: Predictors and mediators of mental health during the COVID-19 pandemic. *American Psychologist*, 76(3), 427. https://doi.org/10.1037/amp0000710

Sederer, L. I. (2016). The social determinants of mental health. *Psychiatric Services*, 67(2), 234–235. https://doi.org/10.1176/appi.ps.201500232

Stevens J. (2009). Applied Multivariate Statistics for the Social Sciences. New Jersey, United States: Lawrence Erlbaum Associates.

Streiner D., Norman G., & Cairney J. (2015). Health measurement scale: A practical guide to their development and use. 5th ed. England: Oxford University Press.

Turner, A. I., Smyth, N., Hall, S. J., Torres, S. J., Hussein, M., Jayasinghe, S. U., Ball, K., & Clow, A. J. (2020). Psychological stress reactivity and future health and disease outcomes: A systematic review of prospective evidence. Psychoneuroendocrinology, 114, 104599. https://doi.org/10.1016/j.psyneuen.2020.104599

Viertiö S., Kiviruusu O., Piirtola M., Kaprio J., Korhonen T., Marttunen M., & Suvisaari J. (2021). Factors contributing to psychological distress in the working population, with a special reference to gender difference. BMC Public Health;21:611. https://doi.org/10.1186/s12889-021-10560-y.

Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, 96(3), 465–490. https://doi.org/10.1037/00332909.96.3.465