



Evaluating the Psychometric Properties of Cohen's Perceived Stress Scale in the Context of Filipino College Students in the Height of the COVID-19 Pandemic

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Authors' contributions

This work was carried out in collaboration among all authors. Authors RDE and MR, together with the supervision of a statistician, designed the study, performed the statistical analysis, and managed the analyses of the study. Authors AR, JG and EWS managed the informed consent and necessary documents. Authors ADR, JJZ and TKT managed the literature searches. Furthermore, author RDE organized and advised the researchers for minor changes. All authors read and approved the final manuscript.

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ABSTRACT

The COVID-19 pandemic undeniably affected the Philippine archipelago, particularly the education sector, bringing varied stress experiences among Filipino learners. Numerous studies have been conducted to assess the level of stress among students throughout the country using the perceived stress scale. Hence, the objective of this study was to evaluate the psychometric properties (reliability and validity) of the English version of the 14-item Perceived Stress Scale (PSS-14) in the context of Filipino university students at the height of the COVID-19 pandemic. The data of 200 undergraduate students sampled through purposive sampling who completed the PSS-14 were used for the analyses. The researchers employed Cronbach's Alpha ($\alpha > 0.7$) to evaluate the internal consistency of the scale, and Pearson Correlation to assess the validity of items. Moreover, ethical standards were principally addressed. The results showed that the internal consistency ($\alpha = 0.81$) of the PSS-14 was acceptable. Pearson Correlation Coefficient for items demonstrated a low to high association; statistically significant below 0.05 and critical values was less than the R-value. Hence, PSS – 14 was gleaned as a valid scale. The psychometric properties of PSS – 14 were potent and vigor in the provision of insights in the pursuit of estimating the extent of perceived stress in the context of Filipino university students. Thus, a call to action was addressed to the school's mental health practitioners, guidance counselors, and authorities to craft intervention programs in order to mediate the adverse effects brought by the COVID-19 pandemic on Filipino learners.

Keywords: Perceived stress scale; reliability analysis; validity; COVID-19; filipino students.

1. INTRODUCTION

Within the lens of behavioral science, stress was regarded as any circumstance that makes it difficult for an individual to adapt to a new environment and maintain a condition of equilibrium between him and the outside world (Humphrey, Yow & Bowen, 2000). In regards, one of the psychometrically sound scales used to assess the perceived stress was the Perceived Stress Scale (PSS) which was a 14-item scale based on the transactional perspective [1]. This was meant to say that the PSS was based on the internal perceptions of the respondents as this scale would ask them whether their lives appeared to be unpredictable, unmanageable, or overloaded, instead of focusing on a single occurrence [2].

In relation to what has been noted, numerous studies have been conducted in the Philippines utilizing the Perceived Stress Scale prior to the COVID-19 pandemic, especially in various educational institutions, to assess the level of stress among Filipino learners [3,4,5]. One study conducted among Filipino nursing students revealed that using the perceived stress scale as one of the tools for assessing stress levels, nursing students suffered from stress [4]. It also noted that stress related to workload, assignments, and patient care were the most prevalent stress factors [4]. Meanwhile, another study conducted among Filipino middle school

and high school students revealed that, using the Perceived Stress Scale, there was a significant relationship between perceived stress and the lifestyle choices of Filipino adolescents [5]. In comparison to their male counterparts, female subjects were found to be significantly better able to control and manage their perceived stress, as well as have a healthier lifestyle choice. Thus, this emphasizes the need for developing and properly implementing school-based healthy lifestyle programs and prevention among adolescents [5]. On the other hand, a research conducted towards Filipino medical students utilizing the Perceived Stress Scale as one of its methods revealed that while their overall functional health and well-being are good, mental health is less developed than physical health [3]. Thus, it was undeniable to pronounce that college life in Philippines was definitely a stressful one primarily composed of students in their late adolescent years [6].

Meanwhile, as the world was combatting the pandemic resurgence caused by the 2019 novel coronavirus, all aspects were heavily affected particularly the school settings [7]. In the Philippines, the COVID-19 pandemic had a major effect on higher education institutions as a result of the increasing number of cases during the mid- year of 2020 that resulted on the decision of the Commission on Higher Education (CHED) to resort for online learning [8]. Thus, due to the social distance norms and fear of infection, the

typical youth-related experiences have been interrupted or modified [9]. Furthermore, the "new normal," including online classrooms and extracurricular school events, restricted movement and socializing, disruptions of major social functions and leisure events, and an uncertain future outlook, might have an impact on the students' psycho-emotional development [10]. As a result, the repercussions of the pandemic and other scenarios in 2020 might have a significant impact on college students' transition to adulthood [11].

Moreover, this study was anchored to the transactional theory of stress by Lazarus and Folkman [12]. The transactional stress theory of Lazarus and Folkman is one of the theories that explores at how people adapt to stressors. Primary, secondary, stress, and adaptation evaluation structures were included in the Folkman transactional model. The person may describe their initial assessment of the situation as either threatening or, alternatively, harmless. Meanwhile, the person's course of action in relation to the situation or environment was examined in the second stage, also known as the secondary evaluation. The perception of risk and its severity relied on the possibilities that the individual believed they had, and this is connected to the knowledge that the environment, life experiences, and individual traits had produced. Reassessing and reevaluating a person's position may be aided by new information. In regards, our social engagements have decreased as a result of COVID-19, causing psychological suffering [13]. According to Brodeur et al. [14], the pandemic had a significant impact on our mental health and increased web searches for divorce, loneliness, anxiety, and despair. Additionally, other research shown that epidemic and post-epidemic conditions might result in physical conditions like migraines and headaches as well as psychological issues including stress, anxiety, and stigma [15,16,17,18,19].

In regards to what has been iterated, numerous studies have been conducted using the Perceived Stress Scale to reveal the stress level among Filipino learners during the COVID-19 pandemic [20,21,22]. Thus, these would be a great opportunity to undergo validation on the well-known measure of perceived stress called the PSS. The PSS was available in 14, 10, and 4-item versions and had become one of the most widely used non-invasive measures of

subjective stress in psychophysical health studies [23]. Specifically, the 4- and 10-item versions were subsets of the 14-item scale's items which were reported as reliable and as valid as the original version of the Perceived Stress Scale [23]. In retrospect, the PSS was also already translated into several other languages wherein its psychometric properties were assessed in a variety of populations [24,25,26].

Hence, considering that stress plays an essential role in the holistic development of college learners and the fact that numerous studies have been administered to assess the perceived stress among Filipino learners during the COVID-19 situation, the psychometric properties of the test that measured stress across cultural settings must be considered. Therefore, the aim of this study was to investigate the reliability and validity of the English version of the 14-item PSS among samples of college students, and in this case, at the University of Mindanao Digos College, an established higher education institution on Mindanao Island in the Philippines.

2. METHODOLOGY

2.1 Participants

This validation study was administered among undergraduate students of the University of Mindanao Digos College, an established higher education institution of Mindanao Island, Philippines. The imposed criteria in the process of selecting the participants were centralized on the following requirements: (1) the participant shall be an enrolled student of University of Mindanao Digos College in the Academic Year 2021- 2022, and (2) the participant shall not be taking a Psychology program. The exclusion of students enrolled in Psychology program was in the pursuit of the researchers to extinguish or at least reduce bias during the course of test administration.

Moreover, the participants were favored in pursuance to the principles of purposive sampling. As Alchemer [27] suggested, researchers shall utilize purposive sampling if there is a desire to target a specific population subgroup, provided that these participants meet the imposed criteria. The respective respondents who were chosen in this validation study were all residence within the vicinity of Davao del Sur province. Hence, all were reached through online distribution of questionnaires enclosed in Google forms.

Table 1. Demographics of the Participant

Background of the respondents (n=200)	
	Value
DEPARTMENT	N (%)
Department of Teaching Education	68 (34.0)
Department of Criminal Justice Education	49 (24.5)
Department of Arts and Sciences	18 (9.0)
Department of Accounting Education	20 (10.0)
Department of Technical Program	19 (9.5)
Department of Business Administration	26 (13.0)
GENDER	N (%)
Female	100 (50.0)
Male	100 (50.0)
MEAN AGE (SD)	20.84 (1.481)
AGE MEAN PER GENDER (SD)	
Female	20.79 (1.416)
Male	20.90 (1.547)

Table 1 revealed the demographics of this validation study. The sample comprised 200 undergraduate students from University of Mindanao Digos College (UMDC) with a mean age of 20.8 years (SD=1.48). Specifically, an equal number of male sample (n=100, 50%) with a mean age of 20.9 years (SD=1.55), and female sample (n=100,50%) with a mean age of 20.8 years (SD=1.42) accounted the total number of samples used (n=200). Furthermore, respondents were mainly accumulated from the Department of Teaching Education and the Department of Criminal Justice Education, accounting 34 % (n=68) and 24.5 % (n=49). These were succeeded by the Department of Business Administration with 13 % (n=26), Department of Accounting Education with 10 % (n=20), Department of Technical Programs with 9.5 % (n=19), and the Department of Arts and Sciences with 9 % (n=18).

2.2 Instrument

In this validation study, the researchers have utilized the 14-item English version of the Perceived Stress Scale from Cohen et al. [1]. The Perceived Stress Scale (PSS) was developed to assess how stressful certain situations in a person's life. The items were created to gauge how overburdened, unpredictable, and unmanageable the life events of the respondents. These three difficulties were at the heart of the stress experience. A number of questions about current levels of experienced stress were also included on the scale. On a 5-point Likert scale, target participants would grade

statement items, with reported significantly greater perceived stress.

The scale's questions inquired about feelings and thoughts during the previous month. In each case, the respondents would be asked to indicate how frequently he/she felt or thought a specific emotion or thought a certain way with 1 being the lowest and 5 being the highest. Although some of the questions were similar, there were some differences that one should be aware of. There were seven items reverse-keyed particularly item numbers 4, 5, 6, 7, 9, 10, and 13 respectively. Items must be added in order to consolidate the final score. Hence, each statement item should be treated as a separate question.

2.3 Design and Procedure

2.3.1 Securing Permission

In this validation study, the researchers have ascertained to secure and consolidate the permissions of the target respondents through the provision of informed consents. In these informed consents, the rights of the respondents were acknowledged to have the choice to either accept or refuse to partake in the test administration. The informed consent was presented in the Google Form in a comprehensive manner wherein the terms and conditions were completely discussed such as the purpose, benefits, and risks. In retrospect, the researchers have made sure the clarity and preciseness of the reasons in the informed consent why the validation study was needed to

be conducted, and the accompanying sense of urgency of administrating the study.

2.3.2 Instrument Distribution

The distribution of the research instruments was addressed through online platform particularly in Google Form medium in pursuance to a safe and secured administration of the test. Since the archipelago was still in combat against the COVID – 19, the face-to-face test administration was not considered; hence resorting to online distribution of the instruments was the best option for this reason. The Google Forms were sent via the social media application called Messenger in each of the respondent's Messenger account during the working hours of weekdays. The researchers have avoided delivering Google Forms in non- working hours, holidays and during the weekends. Meanwhile, all queries coming from the respondents were substantially addressed which were mostly about their concerns on the instability of their internet.

2.3.3 Data Collation and Processing

As the researchers have met the standard minimum sample size of 200 responses gathered from the distributed Google Forms, the data were then collated and arranged in the Microsoft Excel. The demographic profiles of the respondents which served as the imposed criteria were categorized such as the names (optional), sex, age, college department, course program, and year level. Furthermore, these categorizations of the respondents' demographic profiles were accompanied by their responses on each of the 14 item statements of the English version of the Perceived Stress Scale in a 5 point-Likert scaling format. The researchers have rechecked and ascertained the finalized and irrevocable presentation of data in the Microsoft Excel in the pursuit of obtaining an accurate process of encoding. The data were then sent to the research adviser to undergo reevaluation prior to delivering the data set to the statistician for data analysis.

2.3.4 Sample Size

The sample size used was 200 based from the guidelines for the respondent-to-item ratio of ten-times rule [28] which posited that a minimum sample size would be determined through multiplying the number of questionnaire items by 10. In this validation study, the total number of items of the scale was 14 which were multiplied by 10 to gain a minimum sample size of 140.

However, the researchers decided to increase the minimum sample size to 200 as this was a fair amount of sample size in contrast to 140 which was considered poor [29]. Furthermore, Kline [30] stressed that a sample size of 200 was regarded as appropriate and moderate in non-complex researches. Nevertheless, given the wide range of questionnaire forms in used, it was also acknowledged that there were no absolute guidelines regarding the sample size required to verify a questionnaire [31]. The respondent-to-item ratios were only used to bolster the justification for a large sample size when necessary.

2.3.5 Statistical Analyses

In this validation study, a statistician was designated for the data analysis in examining the psychometric properties of the PSS-14 in terms of its reliability and validity. A software program called Statistical Package for the Social Sciences (SPSS) was utilized in order to statistically measure the psychometric properties of the scale through the provided data set. In particular, the reliability of the PSS-14 was evaluated through examining its internal consistency. As emphasized by Tang et al. [32], internal consistency referred to the extent to which all of the items in a test measured the same notion or construct, and thus linked to the test's inter-relatedness. Hence, the internal consistency of the items was assessed through the utilization of the Cronbach's Alpha ($\alpha > 0.7$) which would indicate the strength of the association between items [33]. Finally, the corrected item-total correlation ($> r = .30$), and the Cronbach's Alpha ($\alpha > 0.7$) if item was deleted were also reported [34].

Meanwhile, construct validity of the PSS-14 was assessed through the utilization of Pearson product-moment correlation to measure the strength of a linear association between variables and was denoted by r (Laerd Statistics, 2021). To contextualize in this validity study, the calculations were done through significantly correlating each scale's item to the total of each item using the Pearson correlation coefficient. Hence, one way to assess the validity of each item was through examining the value of significance. The significant value obtained by the Sig. (2-tailed) was compared under 0.05 level of confidence ($p < 0.05$) to determine if the item was valid [35]. Lastly, another technique adopted to scout up the validity of items was through comparing the R-values with respect to the

critical values under Pearson product coefficient at 0.05 level of confidence. R- values should exceed the critical values to pronounce that the scale's items were valid; otherwise, it would indicate the opposite interpretation [36,37].

2.3.6 Ethical Considerations

The researchers made sure to adhere to the ethical standards and protocols set in conducting the research and gathering the data from the participants. In order to serve the best interest of ethical standards of this validation study, the application of the following ethical principles was addressed in order to protect the human subjects.

Informed consent was provided through Google Forms as an online medium towards the target test takers amidst the ongoing transmission of COVID – 19 in the public. Provision of informed consent was the most important part of any ethical process. Therefore, the researchers have made sure that the test takers have completely understood the study's purpose, benefits, and risks prior to making a decision of whether they would agree or decline to partake in the test administration. Thus, the researchers have secured the permission of the test takers without any exercise of pressure or coercion as these consents were given on their own volition and accord.

Avoidance of any form of physical or mental damage was seriously observed and complied during the course of test administration. The researchers have taken into account all the possible outcomes of the validation study and weighed the risks against the benefits. Moreover, the nature of administering the test was through online platform to abate the risks of being infected by the existing novel Corona virus in the public. At the same time, physical, social, and psychological harm, as well as all other types of harm, were kept to a bare minimum. Hence, no any incident associated with harm-induced by test administration was reported.

The researchers have ascertained that the respondents were fully aware that they had an option to opt-in or out of the validation study at any given time should they feel uncomfortable or violated. As well, the researchers have assured that the test takers were fully informed on the terms and conditions of the study prior to their decision to partake in the test administration. Finally, the researchers made it clear to the

participants that they were free to answer the survey questionnaires without any pressure or coercion.

The researchers took precautions to ensure that any of the subject's identifying information could not be linked to personal responses. The researchers also addressed confidentiality by concealing the identities of the participants. Researchers have always considered the psychological and social consequences that a breach of confidentiality may have on subjects. To protect participants, the researchers have educated them on their rights and employed all possible coding systems that they deemed appropriate in the research study.

3. RESULTS AND DISCUSSION

3.1 Reliability

Table 2 divulged the reliability analysis of PSS – 14. Cronbach's Alpha coefficients were utilized to evaluate the internal consistency of the scale. In regards, the results illuminated a reliability coefficient of 0.813 for the PSS – 14. In the same fashion, the Cronbach's Alpha if item deleted was reported; .799 (Item 1), .798 (Item 2), .802 (Item 3), .786 (Item 4), .798 (Item 5), .814 (Item 6), .798 (Item 7), .806 (Item 8), .803 (Item 9), .808 (Item 10), .798 (Item 11), .803 (Item 12), .804 (Item 13), and .800 (Item 14). Meanwhile, the corrected item total correlations were .473 (Item 1), .479 (Item 2), .423 (Item 3), .644 (Item 4), .476 (Item 5), .276 (Item 6), .480 (Item 7), .374 (Item 8), .409 (Item 9), .349 (Item 10), .483 (Item 11), .416 (Item 12), .395 (Item 13), and .453 (Item 14) respectively. Finally, Corrected Item – Total Correlation Coefficients were gleamed as ranging from .276 (Item 6) to .644 (Item 4).

The psychometrics of the English version of the 14-itemed Perceived Stress Scale (PSS-14) were explored in the context of Filipino university students, and the findings suggested that the PSS-14 questionnaire had potential in assessing perceived stress among Filipino students. The analyses, in particular, revealed a good report on the PSS-14's internal consistency. Moreover, the Pearson correlation demonstrated an outstanding relationship; despite the fact that the correlation's strength varied from low to strong, PSS-14 items were still susceptible of assessing the same construct of perceived stress among students.

Table 2. Reliability Result

Reliability Analysis of PSS – 14		
Corrected Item- Total Correlation		Cronbach's Alpha if Item Deleted
ITEM_1	.473	.799
ITEM_2	.479	.798
ITEM_3	.423	.802
ITEM_4	.644	.786
ITEM_5	.476	.798
ITEM_6	.276	.814
ITEM_7	.480	.798
ITEM_8	.374	.806
ITEM_9	.409	.803
ITEM_10	.349	.808
ITEM_11	.483	.798
ITEM_12	.416	.803
ITEM_13	.395	.804
ITEM_14	.453	.800

Cronbach`s Alpha = 0.813 (acceptable)

Note: The score of items 4, 5, 6, 7, 9, 10, and 13 were reversed. A response of “always” suggests low perceived stress. PSS – 14: Item 4. In the last month, how often have you dealt successfully with irritating life hassles?; Item 5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?; Item 6. In the last month, how often have you felt confident about your ability to handle your personal problems?; Item 7. In the last month, how often have you felt that things were going your way?; Item 9. In the last month, how often have you been able to control irritations in your life?; Item 10. In the last month, how often have you felt that you were on top of things?; Item 13. In the last month, how often have you been able to control the way you spend your time?

Cronbach Alpha coefficient for the PSS - 14 was found to be within the acceptable range set by Cronbach [34]. Furthermore, the PSS-14 exhibited a high- reliability coefficient that was compatible and conforming with the findings of other researchers [33](Peterson, 1997). In this regard, the usability and portrayal of the internal consistency of PSS-14 in estimating perceived stress among Filipino samples coincided with the evidences from Japanese samples [38], on Greek samples [24], on Chinese samples [39], and on Malaysian samples [40].

Furthermore, these data results suggested that the PSS-14 items attained strong interconnections and consistency among each other, implying that they were capable of evaluating similar construct [24,38,39,40]. Besides, when it came to the corrected item-total correlation, only item 6 failed to qualify on the recommended correlation coefficient, which meant to say that the items 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, and 14 were higher than the recommended correlation coefficients ($> r = .30$) signifying that majority of the PSS-14 items were justifiably appropriate to be included in the scale [30,41]. On the other note, Cronbach Alpha of the PSS-14 was not compromised if any items

were deleted on the scale; interestingly, deleting item 6 would increase the Cronbach's Alpha from 0.813 to 0.814. Hence, deletion of item 6 could be considered to make the scale more reliable.

The results divulging the reliability of items in the Perceived Stress Scale when assessed in the context of undergraduate students at UM Digos College during the height of the COVID-19 pandemic testified that the PSS-14 was a reliable and valid scale for measuring perceived stress among the respondents. In short, PSS-14 could measure the perceived stress among the respondents. This was in line with a study by Canillo et al. [20] that looked at mental health and perceived stress as the key indicators of the wellbeing of selected college online students in the Philippines during the COVID-19 pandemic. It was shown that there is a strong negative correlation between perceived stress and mental health, indicating that students' mental health declines as perceived stress increases and vice versa. Meanwhile, in another local study conducted by del Rosario et al. [22] about perceived stress as predictors of depressive symptoms among Polytechnic University of the Philippines academic scholars during the COVID-19 pandemic, it was divulged that there

was a significant positive relationship between perceived stress and depressive symptoms, which means that as the perceived stress increases, the depressive symptom increases as well.

These findings were also coherent with the transactional stress theory of Lazarus and Folkman [12]. To contextualize this study, the repercussions of the COVID-19 pandemic brought sudden, unanticipated lockdowns that resorted to online modes of learning. However, many students, including professors, have spoken out against online learning for a variety of reasons. The reality was that numerous higher education institutions in the Philippines, both private and public colleges and universities, were unprepared to meet the challenges [11]. Therefore, stress results when the demands of our internal and external environments outweigh our available resources. When situational demands outweigh available resources, stress can take many different forms, including acute, episodic or intermittent, and chronic stress, all of which can lead to bodily and mental problems [12].

3.2 Validity

Table 3 reported the validity analysis of PSS - 14. The validity of items was explicated by correlating each item to its total. Hence, by executing this, the construct of the scale was assessed by looking at the value of significance and comparing the R-values with respect to the critical values under Pearson Product Coefficient at 0.05 level of significance. Pearson Correlation Coefficient for item 4 (.716**) demonstrated a strong or high association; statistically significant below 0.05, and critical value was less than the R-value. Meanwhile, items 1 (.569**), 2 (.583**), 3 (.532**), 5 (.578**), 7 (.576**), 9 (.505**), 11 (.579**), 12 (.523**), 13 (.501**), and 14 (.561**) demonstrated a moderate association; statistically significant below 0.05, and critical values were less than the R-value. Finally, items 6 (.403**), 8 (.489**), and 10 (.460**) acquired a low to moderate correlation; statistically significant below 0.05, and critical values were less than the R-value.

Finally, the Pearson Correlations of all the items of PSS-14 yielded significant values under 0.05 level of significance, and critical values were revealed as smaller than R-values, implying that the items and scale were legitimate if the requirements specified by numerous authors

were met [36,37]. Specifically, item 4 got the strongest association among the 14 items, items 1, 2, 3, 5, 7, 9, 11, 12, 13, 14 garnered moderate association, and items 6, 8, and 10 attained low to moderate association. Thus, signifying that if each item of the scale was correlated to its summations, then most of the items were considered valid, however it did not disaffirm the possibility that few of the items could be revisited and revised.

The findings highlighting the validity of items in the Perceived Stress Scale when assessed in the context of undergraduate students of UM Digos College at the height of the COVID-19 pandemic signified that the PSS-14 was a reliable and valid instrument in measuring the perceived stress among the aforementioned respondents. Thus, this implied that the PSS-14 contained items that really measure what it purports to measure, which was in this case, the perceived stress of the study's respondents. These findings were supported by a survey conducted by Cao et al. in 2020, which involved 7143 college students and discovered that 25% of them were experiencing significant anxiety as a result of the strain of online learning. Additionally, research results suggested that the COVID-19 pandemic may be having psychological consequences on both learners and the wider populace, including anxiety, fear, and worry. During the COVID-19 crisis, certain students may be more likely to experience social isolation and the emergence of mental health issues. This was especially true for those who lived alone, had fewer personal interactions with close family members and friends, had less social support, and had a more difficult time integrating into a student social network. The results were also reflected in the study of Guillena and Guillena [21], which examined the perceived stress, self-efficacy, and mental health of first-year college students in the Philippines during the COVID-19 pandemic. It was extrapolated from this study's findings that students who experienced high levels of stress would likely exhibit poor mental health.

These results were also supported by Lazarus and Folkman's [12] transactional stress theory. The COVID-19 pandemic was already distressing for the learners, which helps to put this study in context. The epidemic and the switch to online learning had already had an impact on the learners' mental health. The results of several investigations carried out in the Philippines [20,21,22] also supported this. When

Table 3. Validity result

Validity of the Items Using the Critical Values of Pearson Product (N=200)			
Items		Total	Critical
ITEM_1	Pearson Correlation	.569**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_2	Pearson Correlation	.583**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_3	Pearson Correlation	.532**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_4	Pearson Correlation	.716**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_5	Pearson Correlation	.578**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_6	Pearson Correlation	.403**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_7	Pearson Correlation	.576**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_8	Pearson Correlation	.489**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_9	Pearson Correlation	.505**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_10	Pearson Correlation	.460**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_11	Pearson Correlation	.579**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_12	Pearson Correlation	.523**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_13	Pearson Correlation	.501**	Less than r value
	Sig. (2-tailed)	.000	
ITEM_14	Pearson Correlation	.561**	Less than r value
	Sig. (2-tailed)	.000	

Note: A p-value less than 0.05 (typically ≤ 0.05) is statistically significant

presented with a stressor, an individual reacts with their environment according to Lazarus and Folkman's [12] transactional stress theory. Given that a person's response to the stressor changed as the stressor's nature changed, and as a result, the person's assessment of it changed, the interaction was dynamic and bidirectional. Consequently, in this case, the COVID-19 pandemic was the stressor (i.e., stimulus or event) that could be considered central if it was perceived to have immediate, adverse effects on the self, uncontrollable if it was perceived to be outside of one's own control, and threatening if it was perceived as anxiety-inducing and having adverse effects.

4. CONCLUSION

The PSS-14 was shown to be a reliable scale with acceptable validity, allowing it to efficiently quantify student perceived stress. Using the Cronbach alpha, a satisfactory reliability coefficient was obtained in this investigation.

Item 6 got the lowest item correlation; however, including this item did not cause an adverse impact on the robustness of the scale. In general, the PSS-14 demonstrated strong psychometrics, was easy to fill out and understand, and could elicit useful information in the context of Filipino university learners.

Moreover, this validation study of the Perceived Stress Scale, concluding that this instrument was still a reliable and valid scale in the context of Filipino university students, was valid proof that the PSS-14 was not just psychometrically sound to be of use during non-covid situations among academic institutions in the Philippines, but as well as during covid situations, which were supported by a number of studies conducted throughout the archipelago.

Withal, the transactional theory of stress by Lazarus and Folkman [12] also affirmed the experiences of Filipino undergraduate students during the insurgence of the COVID-19

pandemic. The varied experiences of stress among the learners brought by the impact of the COVID-19 pandemic had taken their toll on the economic, social, mental, and personal aspects of the individuals.

Thus, a call to action is addressed to schools' mental health practitioners, guidance counselors, and authorities to create programs designed for improving and boosting the mental health of their learners. Future studies were also encouraged with this type of academic inquiry to broaden the knowledge and explore more the issue of mental health, not just among the students but among other stakeholders involved in academic institutions.

CONSENT

All authors declare that 'written informed consent was obtained from the participants.

ETHICAL APPROVAL

As per international standard or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX A

Perceived Stress Scale Cohen et al. [1]

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the **last month**. In each case, you will be asked to indicate by selecting how often you felt or thought a certain way among the given choices.

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

1. In the last month, how often have you been upset because of something that happened unexpectedly?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

2. In the last month, how often have you felt that you were unable to control important things in your life?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

3. In the last month, how often have you felt nervous and “stressed”?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

4. In the last month, how often have you dealt successfully with irritating life hassles?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

6. In the last month, how often have you felt confident about your ability to handle your personal problems?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

7. In the last month, how often have you felt that things were going your way?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

8. In the last month, how often have you found that you could not cope with all the things that you had to do?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

9. In the last month, how often have you been able to control irritations in your life?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

10. In the last month, how often have you felt that you were on top of things?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

11. In the last month, how often have you been angered because of things that happened that were outside of your control?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

12. In the last month, how often have you found yourself thinking about things that you have to accomplish?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

13. In the last month, how often have you been able to control the way you spend your time?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

1=never; 2=almost never; 3=sometimes; 4=fairly often; 5=very often.

APPENDIX B

Permission Letter Addressed to Dr. O'Connor

MR. SHELDON COHEN
PSS Author
Carnegie Mellon University

Re: Request for Permission to Grant Utilization of the Perceived Stress Scale

Greetings!

I'm writing to you in reference to our Laboratory course requirement in Psychological Assessment (Psych 312/L).

As part of completing the said course, and in accordance with the ethical standards of psychological testing and assessment, we were tasked with assessing a psychometric test across cultures, and one way to do so is to obtain permission from the appropriate and respective authors for the utilization of the aforementioned scale. In this regard, I and my colleagues will evaluate the Cohen's Perceived Stress Scale (CPSS) in order to develop a cross-validated test norm using Filipino university sample wherein students' demographic data will be stratified by age, gender, and department.

Hence, we are writing to respectfully request permission to use your PSS questionnaire from your good office to cross-culturally assess perceived stress among Filipino college students at the University of Mindanao Digos College, Philippines.

With great honor and gratitude, we look forward to working with you on this humble request to substantiate our desire to pursue this academic task by collecting data. Without a doubt, your assistance will open the door to the next stage of the process, and we are confident that your assistance in our letter will have a significant impact on us in advancing our educational excursion at the university.

Furthermore, if you so desire, I am fully prepared, on behalf of my colleagues, to collaborate with you in order to conform with the various materials required for this validation and norming study. You can contact us as shown above, via the group's chosen email and contact.

Sincerely,



ANGELLI S. REPALDA
Student-Researcher

APPENDIX C

Permission Letter Addressed to UM Digos College

EDUARD L. PULVERA, MSIS

Dean of College
University of Mindanao Digos College

Re: Request for permission to conduct a validation study

Greetings!

I'm writing to you in reference to our Laboratory course requirement in Psychological Assessment (Psych 312/L).

As part of completing the said course, and in accordance with the ethical standards of psychological testing and assessment, we were tasked with assessing a psychometric test across cultures, and one way to do so is to obtain permission from the appropriate and respective authors for the utilization of the aforementioned scale. In this regard, I and my colleagues will evaluate the Cohen's Perceived Stress Scale (CPSS) in order to develop a cross-validated test norm using Filipino university sample wherein students' demographic data will be stratified by age, gender, and department.

Hence, we are writing to respectfully request permission if you may want to allow us in our study to cross-culturally assess perceived stress among Filipino college students at the University of Mindanao Digos College, Philippines.

With great honor and gratitude, we look forward to working with you on this humble request to substantiate our desire to pursue this academic task by collecting data. Without a doubt, your participation will open the door to the next stage of the process, and we are confident that your participation in our study will have a significant impact on us in advancing our educational excursion at the university.

Furthermore, if you so desire, I am fully prepared, on behalf of my colleagues, to collaborate with you in order to conform with the various materials required for this validation and norming study. You can contact us as shown above, via the group's chosen email and contact.

Sincerely,



ANGELLI S. REPALDA
Student-Researcher

Approved by:

EDUARD L. PULVERA, MSIS
Dean of College

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