PROVING THE CONSTRUCTAL VALIDITY OF MENTAL HEALTH SCALE MODIFICATIONS

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PROVING THE CONSTRUCTAL VALIDITY OF MENTAL HEALTH SCALE MODIFICATIONS

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Abstract: The covid 19 pandemic has hurt students' mental health. So, it requires a mental health scale that can quantify the latent variables to measure. This study aims to prove the constructive validity of the modified mental health scale. The scales used were modified from mental Health scales consisting of PHQ-9, GAD-7, and WEMWBS scales. Of the respondents who were willing to fill in this scale were 73 students. Proof of the validity of this scale is carried out by CFA analysis. A single-order CFA analysis was used to prove the construct validity of the variables of anxiety with 6 items, depression with 5 items, and well-being with 7 items. CFA analysis of order two is used to see the relationship of the three latent variables on the CFA of one order. The Fit model criteria for CFA used p-values from Chi-Square > 0.05, RMSEA < 0.08. and Factor loading > 0.3. The R program with Package Lavaan is used to calculate the CFA analysis. The results of the analysis of anxiety, depression, and well-being scales were obtained values of 0.346, 0.311, and 0.268 respectively. furthermore, the RMSEA was 0.029, 0.048, and 0.063, respectively. Next. The result of CFA order two has a p-value of =0.051 and RMSEA = 0.066. The results of this analysis prove that the modified mental health scale has the validity of a fit construct with empirical data from the measurements.

Keywords: *Anxiety, Depression, well-being, Mental Health, Construct Validity, and CFA.*

1. INTRODUCTION

The COVID-19 pandemic has resulted in the closure of schools. This closure impacts the educational system and can affect the quality of learning, teacher performance, the development of knowledge, and student skills. The shift from face-to-face learning to online learning is the main solution to keep the learning going. This transition is not an easy thing to do (Munastiwi & Puryono, 2021). The transition leads to increased anxiety (Bloom et al., 2020; Simamora, 2020; Son et al., 2020), and Depression (Prayogi et al., 2020; Sahu, 2020).

The direct impact of the pandemic is to increase anxiety symptoms (Ayyala et al., 2020; Duraku & Hoxha, 2020; Fauziyyah et al., 2021), Depression(Abadi, 2011; Islam et al., 2020; Son et al., 2020), In addition, covid also decreases well-being compared to before covid(Chen & Lucock, 2022). The increasing anxiety, and depression, as well as the decline in well-being, indicate the occurrence of disorders in mental health in an individual.

mental health is a condition in which the individual feels prosperous and comfortable or a condition in which the individual feels calm when acting. a person who can move well indicates that the individual has a good basic logical condition (Jacob & Sanjaya, 2018). Good mental health is characterized by how the individual knows his potential and can develop it(Aziz, 2015). Furthermore, an individual is not prosperous, indicating that there is a disorder in his mental health (Flannery et al., 2017).

Research on Mental health as a result of covid 19 has been conducted at several universities. Kecojevic et al., (2020) in their study of 162 college students experienced high mental health stress, depression, and high anxiety. A survey in Hong Kong on 255 students found the impact of covid-19 increased depression at a high level (Sun et al., 2020). A survey of students across the UK found that 58% had mental health, 14% improved and 28% were the same as before covid (Hewitt, 2020). Furthermore, Son et al., (2020) conducted an interview survey to determine the impact of covid 19 on students and the urgent need to develop interventions and prevention strategies. The results of these studies show the severity of negative covid effects on students 'mental health.

Information updates related to students' mental health need to always be carried out, especially by the college. This awareness will provide the latest information to prevent mental health risks and improve the mental health of students. This awareness stirred researchers to take mental health measurements in our students. The scales the researchers used were modifications of the Generalized Anxiety Disorder-7 (GAD-7), Patient Health Questionnaire-9 (PHQ-9), and The Warwick-Edinburgh Mental Well-being Scale (WEMWBS).

This study aims to prove the validity of the constructs of the mental health scales that researchers have modified. Proof of the validity of the construct is carried out by CFA analysis. The R program is used to lead the CFA. In addition, information related to the reliability of each scale is also displayed.

2. METHOD

This type of research is quantitative research. The data used in the study is primary data. Data were taken from several study programs at STKIP PGRI Pacitan. Many respondents participated, namely 73. The data contains information about students' mental health in the new normal period. The mental health scale used is a modification of the existing scale. The Mental Health Scale consists of scales that measure symptoms of anxiety, depression, and well-being. Furthermore, these three latent variables are described in the following sections.

2.1 Generalized Anxiety Disorder-7 Scale

Generalized anxiety disorder (GAD) is one of the frequent types of mental disorders(Spitzer et al., 2006). He developed a measurement scale to identify GAD and evaluate its reliability and validity. GAD 7 consists of 7 items. The increase in GAD symptoms in a person often occurs in conjunction with the symptoms of Depression(Grover et al., 2020).

2.2 Patient Health Questionnaire-9

The Patient Health Questionnaire (PHQ) is a diagnostic scale for measuring general mental disorders (Grover et al., 2020). PQ-9 is an international standard scale for measuring depression (Shiratori et al., 2022). PHQ-9 is a depression module consisting of 9 items and was developed first with a response of 0 to 3. This scale has good reliability and validity, suitable for measuring the symptoms of major depression (Grover et al., 2020).

2.3 The *Warwick-Edinburgh Mental Well-being Scale (WEMWBS)*

The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) is an ordinal scale consisting of 14 items. . This scale measures positive symptoms in individuals, this becomes a differentiator with other mental health scales (Stewart-Brown et al., 2009). Items include various aspects of mental well-being (feelings of optimism, cheerfulness, and relaxation). Responses in the form of Likert scales consist of 'No time'; 'Rarely'; 'Some time'; 'Often' and 'All the time. (Stewart-Brown et al., 2009). This scale has good content validity and high reliability of retests (Grover et al., 2020). In this study, modifications were made on all three scales. The construct is obtained in table 1 below.

Table1. Mental Health Scales

Latent Variable		Items
Anxiety	X_1	I'm not interested in studying
	X_2	I find it difficult to concentrate when learning takes place
	X_3	I find it difficult to concentrate when doing work
	X_4	I easily feel anxious when doing tasks
	X_5	I find it difficult to relax in learning
	X_6	I easily feel restless when studying in class
	X_7	I often feel annoyed during online learning
	x_8	I often feel unable to control the important things in my life
	X_9	I often feel nervous when learning online
Depression	X_{10}	I often feel stressed in dealing with tasks online
	X_{11}	I often can't cope with the tasks I face
	X_{12}	I have experienced a lot of positive changes in learning
	x_{13}	I am sure that with my abilities, I can solve the problems that are being faced and achieve the target I want
	x_{14}	I feel what I experience is in accordance with what I want
well-being	X_{15}	I feel better than my friends in terms of mastery of lecture material.
	X_{16}	I think about every assignment given by the lecturer.
	x_{17}	I make the best use of time for positive things
	x_{18}	I can only focus on one task until it is finished, then do other tasks.

The constructed model in table 1 must be empirically proven so that the validity of the construct can be proved. Proof of the validity of this construct was carried out using the analysis of confirmatory factors (CFA) (Retnawati, 2016). The match of the theoretical construct model with empirical data was decided using a p-value value of chi-Square greater than 0.5, RMSEA value < 0.08 minimum factor loading for each item >0. 4 (KILIÇ et al., 2020; Retnawati, 2016). A one-order CFA is performed to prove the validity of each latent variable, and a two-order CFA is used to prove the overall validity of the construct in the mental Health variable model. CFA calculations were performed using the R program with Lavaan packages (Rosseel, 2012).

3. RESULT

Proving the validity of the construct is carried out by proving whether the constructed model in the other that has been constructed is fit with the empirical data obtained. Proof of validity by CFA is carried out by determining a CONSTRUCT MODEL that is FIT for each latent variable. In this process, the removal of items is very likely to occur. Item deletion can be done by deleting items that have the smallest loading factor of each proven latent variable. For more details, the results of the CFA analysis using the R program are explained as follows.

3.1 Proving anxiety construct validity an

Table 2. The first CFA Results for anxiety construct with 6 items

Test statistics	21.013
Degrees of freedom	9
P-value (Chi-square)	0.013
RMSEA	0.136

Table 2 shows the P-value =0.013 < 0.05 and RMSEA=0.136 >0.08, this result shows the BHWA Model Not FIT. Before the fit model, the factor loading value of each item shows > 0.4, after the removal of 2 items, namely items X_1 and X_3, the FIT model is obtained as in table 3.

Table 3. The second CFA Results for anxiety with 4 items

Test statistics	2.123
Degrees of freedom	2
P-value (Chi-square)	0.346
RMSEA	0.029

Table 3 explains that the FIT model of anxiety construct has been achieved. This result is evidenced by the value of p-value = 0.346 >0.05 and RMSEA = 0.029 <0.08. Furthermore, the loading factor of each observation variable or item can be seen in figure 1. The Fit model for anxiety constructs suggests that the validity of anxiety constructs is evident.

Figure 1 describes the factor loading value of each item from the anxiety construct. Items 2, 4, 5, and 6 respectively have loading factors of 0.51, 0.87, 0.87, and 0.61. Errors from each input successively have values of 0.74, 0.24, 0.24, and 0.63.

3.2 Proving the *validity* of the Depression construct

Table 4. CFA Results for Depression construct with 5 items

Test statistics	6.080
Degrees of freedom	5
P-value (Chi-square)	0,299
RMSEA	0.055

Table 4 describes the results of the CFA analysis for the Depression construct. The p-value value =0.299 > 0.05 and RMSEA=0.055 < 0.08. this value is obtained before deleting the 9th item (X_9) with a loading factor of 0.129 even though the model is FIT.

Table 5. CFA Results for Depression construct with 4 items

Test statistics	2,334
Degrees of freedom	2
P-value (Chi-square)	0.311

RMSEA	0.048

Table 5 describes the results of the CFA analysis for the Depression construct. The value =0.311 > 0.05 and RMSEA=0.048 < 0.08. this value is obtained after removing the 9th item (X_9) with a loading factor of 0.129 even though the model is FIT.

In figure 2, you can see that the 7th, 8th, 10th, and 11th items respectively have factor loading values of 0.43, 0.89, 0.4, and 0.55. The Errors of each item are 0.82, 0.21, 0.84, and 0.70 respectively. The highest factor loading value belongs to item 8 (X_8), so the latent variable Depression is more pronounced by item 8, than other observation variables (items). The CFA results in table 5 and figure 2 prove the validity of the control of the latent variable Depression is met.

3.3 Proving the validity of the anxiety construct

Table 6. CFA Results for Well Being constructed with 7 items

Test statistics	19.783
Degrees of freedom	14
P-value (Chi-square)	0.137
RMSEA	0.076

In table 6, the value of p-value = 0.137 > 0.05 and RMSEA = 0.076 < 0.08. these results show that the model is fit, but two items have a loading factor below 0.3. these items are the 15th and 18th items, respectively having loading factors of 0.25 and 0.09. Both items should be removed, according to the criteria from the final section on the discussion of methods. After removal, the results are obtained as in table 7.

Table 7. CFA Results for 5-item Well Being construct

Test statistics	6.417
Degrees of freedom	5
P-value (Chi-square)	0.268
RMSEA	0.063

Table 7 explains that the values of p-value= 0.268 > 0.05 and RMSEA=0.063<0.08. these results prove the construct validity of the Well Being variable.

In figure 3, it can be seen that the loading factor values for items 12, 13, 14.16 and 17 respectively are 0.63, 0.76, 0.4, 0.43, and 0.42. The errors of each item are said to have values of 0.06, 0.4, 0.84, 0.82, and 0.82. This result shows that the 13th item made the largest contribution when compared to other items.

3.4 Proving the validity of the Mental-Health construct

The results in table 8 show the value of p-value = 0.051 > 0.05 and RMSEA = 0.066 < 0.08. This result proves the FIT model. These results explain the mental-health construct as a single unit of the latent variables of anxiety, depression, and well-being proven to fit with empirical data derived from data collection.

Table 8. CFA Results for the Mental-Health

Test statistics	81.266
Degrees of freedom	62

P-value (Chi-square)	0.051
RMS	0.066

Figure 4 shows the loading factor of each latent variable with a mental-health latent variable. The value of the negative loading factor in this latent variable is maintained to see the relationship of the well-being variable with other latent variables.

3.5 Proving the reliability of the scale

To prove the reliability of the scale can be done using the Coefficient Alpha Cronbach (Retnawati, 2014). In table 9, the level of reliability is determined by using opinions from Hair (Hair et al., 2018). Reliability scores of the anxiety, Depression, Well-Being, and Mental-Health variables were 0.81, 0.65, 0.64, and 0.74, respectively.

Table 9. Coefficient of reliability

Latent variables	Reliability Coefficient (Cronbach alpha)	Reliability level
Anxiety	0.81	Very Good
Depression	0.65	Moderate
Well-Being	0.65	Moderate
Mental-Health	0.74	Good

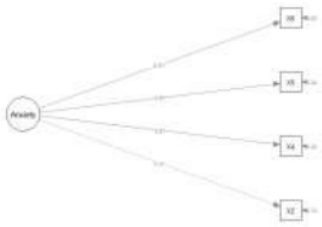

Figure1. FIT model for Anxiety construct

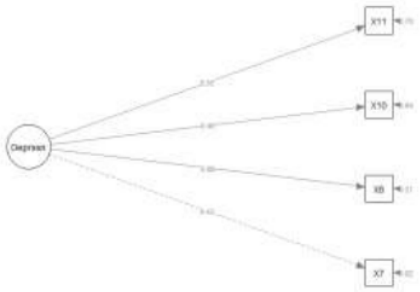

Figure2. FIT Model for Depression Construct

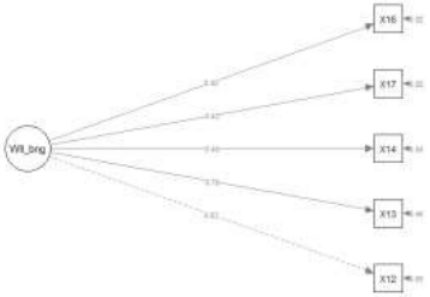

Figure 3. FIT model for well-Being Construct

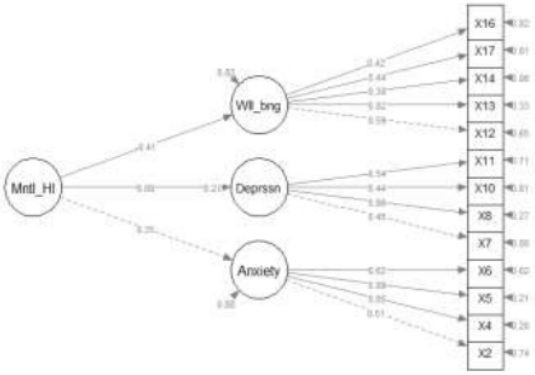

Figure 4. FIT Model for Mental Health Construct

4. DISCUSSION

The results of the CFA analysis of one order in each latent variable construct model above explain that the modified item can measure the latent variable that must be measured. These results prove the constructive validity of the scales of anxiety, depression, and well-being.

The value of the loading factor indicates the extent to which the item can explain its effect on the measured latent variable. For example, the square of the factor loading item to 2 = $(0.51)^2$ = 0.2601, this result shows that about 26.01% of the latent variable of anxiety can be described by item 2 and about 74% (error value) is described by another variable. Interpretation in that way applies to all of the above items.

Factor loading can also be used to access certain symptoms in the form of negative or positive information. This information can be used by teachers to act to prevent and address certain conditions that may occur. For example, the scale of anxiety and depression is a scale that measures the negative symptoms that occur. the highest factor loading value provides information that is a priority that must be addressed by the teacher. conversely, well-being scales measure positive symptoms. Low factor scores are a priority for teachers to overcome. First, on the scale of worry. Items 4 and 5 have the largest loading factor values at the worry. These results show that students find it easy to feel anxious and difficult to relax. This information can be used by teachers to be able to immediately overcome the anxiety and difficulty of relaxing that occurs in students. Second, on the Scale item Depression. Item 8 (figure 2) has a loading factor = 0.89 which is the largest loading factor compared to other factors. These results show the inability of students to take advantage of the opportunity to participate in important events they experience. This information helps teachers take Actions that can reduce the feelings experienced by students or information related to item 8 is a top priority to overcome by the teacher. third, on the well-being scale item. The 13th item (in figure 3) has a loading factor of 0.78 and is the largest of the other items on the well-being variable. This information explains that students still have confidence in their abilities or high self-efficacy, even though they are experiencing anxiety and depression. This information leads the teacher to increase the value of other items on the wellbeing variable.

Figure 8 shows the results of the CFA second order. The results of the analysis prove the validity of the construct of the mental health variable. The loading factor of well-being is marked negative and two other variables are positive. These results explain that there is a mental health disorder in students. Well-being should have a positive relationship with latent mental health and negative variables with other variables. one who has low well-being indicates a mental disorder in themselves (Flannery et al., 2017; Manita et al., 2019). In addition, these results show that well-being variables have a negative relationship with latent variables of worry and depression. Based on the value of the loading factor, the main concern is the depression variable. This variable is a top priority for teachers to top.

Based on the results of proving reliability in table 9. The modified scales have consistency at moderate levels for Depression and Well-Being scales, are great for anxiety scales and are great for mental health.

5. CONCLUSION

Based on the results of the analysis and discussion above. It can be concluded that the modification scale of mental health has the validity of the construct fulfilled after some item is issued. This modification scale can be made to take mental health measurements. The weakness in this study is the number of samples that are not many so that subsequent studies to prove the consistency of measurements can be done with bigger samples.

REFERENCES

Abadi, A. M. (2011). A New Fuzzy Modeling for Predicting Air Temperature in Yogyakarta. *The IceMATH*, xx–xx. http://staffnew.uny.ac.id/upload/132128276/penelitian/paper+agus+ICeMATH2011.pdf

Ayyala, R. S., Taylor, G. A., & Callahan, M. J. (2020). Stresses and anxieties in the time of the COVID-19 pandemic — what we can learn. *Pediatric Radiology*, *50*(8), 1052–1054. https://doi.org/10.1007/s00247-020-04727-9

Aziz, R. (2015). Aplikasi Model RASCH dalam Pengujian Alat Ukur Kesehatan Mental di Tempat Kerja. *Psikoislamika : Jurnal Psikologi Dan Psikologi Islam*, *12*(2), 29. https://doi.org/10.18860/psi.v12i2.6402

Bloom, D. A., Reid, J. R., & Cassady, C. I. (2020). Education in the time of COVID-19. *Pediatric Radiology*, *50*(8), 1055–1058. https://doi.org/10.1007/s00247-020-04728-8

Chen, T., & Lucock, M. (2022). The mental health of university students during the COVID-19 pandemic: An online survey in the UK. *PLOS ONE*, *17*(1), e0262562. https://doi.org/10.1371/journal.pone.0262562

Duraku, Z. H., & Hoxha, L. (2020). Impact of the COVID-19 Pandemic on Education and Wellbeing of Teachers, Parents, and Students. *Impact of the COVID-19 Pandemic on Education and Wellbeing*, *April*.

Fauziyyah, R., Awinda, R. C., & Besral, B. (2021). Dampak Pembelajaran Jarak Jauh terhadap Tingkat Stres dan Kecemasan Mahasiswa selama Pandemi COVID-19. *Jurnal Biostatistik, Kependudukan, Dan Informatika Kesehatan*, *1*(2), 113. https://doi.org/10.51181/bikfokes.v1i2.4656

Flannery, H., Glew, S., Brewster, A., & Christie, D. (2017). Measuring Outcomes of Psychological Well-Being within Paediatric Health Settings. *Healthcare*, *6*(1), 1. https://doi.org/10.3390/healthcare6010001

Grover, S., Sahoo, S., Mehra, A., Avasthi, A., Tripathi, A., Subramanyan, A., Pattojoshi, A., Rao, Gp., Saha, G., Mishra, K., Chakraborty, K., Rao, N., Vaishnav, M., Singh, O., Dalal, P., Chadda, R., Gupta, R., Gautam, S., Sarkar, S., … Janardran Reddy, Y. (2020). Psychological impact of COVID-19 lockdown: An online survey from India. *Indian Journal of Psychiatry*, *62*(4), 354. https://doi.org/10.4103/psychiatry.IndianJPsychiatry_427_20

Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). Multivariate Data Analysis, Multivariate Data Analysis. In *Multivariate Data Analysis*.

Hewitt, R. (2020). Students' views on the impact of Coronavirus on their higher education experience in 2020/21. In *HEPI YouthSight (Policy Note 27)*.

Islam, M. A., Barna, S. D., Raihan, H., Khan, M. N. A., & Hossain, M. T. (2020). Depression and anxiety among university students during the COVID-19 pandemic in Bangladesh: A web-based cross-sectional survey. *PLOS ONE*, *15*(8), e0238162. https://doi.org/10.1371/journal.pone.0238162

Kecojevic, A., Basch, C. H., Sullivan, M., & Davi, N. K. (2020). The impact of the COVID-19 epidemic on mental health of undergraduate students in New Jersey, cross-sectional study. *PLOS ONE*, *15*(9), e0239696. https://doi.org/10.1371/journal.pone.0239696

KILIÇ, A., UYSAL, İ., & ATAR, B. (2020). Comparison of confirmatory factor analysis estimation methods on binary data. *International Journal of Assessment Tools in Education*, 451–487. https://doi.org/10.21449/ijate.660353

Manita, E., Mawarpury, M., Khairani, M., & Sari, K. (2019). Hubungan Stres dan Kesejahteraan (Well-being) dengan Moderasi Kebersyukuran. *Gadjah Mada Journal of Psychology (GamaJoP)*, *5*(2), 178. https://doi.org/10.22146/gamajop.50121

Munastiwi, E., & Puryono, S. (2021). Unprepared management decreases education performance in kindergartens during Covid-19 pandemic. *Heliyon*, *7*(5), e07138. https://doi.org/10.1016/j.heliyon.2021.e07138

Prayogi, A. R. Y., Hardini, P. P., Alamiyyah, M., Sari, K. I., Haqi, D. N., & Sari, J. D. E. (2020). Determinan Tingkat Depresi Mahasiswa pada Masa Pandemi COVID-19 (Studi Kasus Mahasiswa Universitas Airlangga Surabaya). *Jurnal CMHP*, *2*(2).

Retnawati, H. (2014). *Teori Respons Butir dan Penerapannya*.

Retnawati, H. (2016). *validitas dan reliabilitas dan karakteristik butir* (1st ed.). Parama Publising.

Rosseel, Y. (2012). Lavaan : An R Package for Structural Equation Modeling. *Journal of Statistical Software*, *48*(2). https://doi.org/10.18637/jss.v048.i02

Sahu, P. (2020). Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. *Cureus*. https://doi.org/10.7759/cureus.7541

Shiratori, Y., Ogawa, T., Ota, M., Sodeyama, N., Sakamoto, T., Arai, T., & Tachikawa, H. (2022). A longitudinal comparison of college student mental health under the COVID-19 self-restraint policy in Japan. *Journal of Affective Disorders Reports*, *8*, 100314. https://doi.org/10.1016/j.jadr.2022.100314

Simamora, R. M. (2020). The Challenges of Online Learning during the COVID-19 Pandemic: An Essay Analysis of Performing Arts Education Students. *Studies in Learning and Teaching*, *1*(2), 86–103. https://doi.org/10.46627/silet.v1i2.38

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study. *Journal of Medical Internet Research*, *22*(9), e21279. https://doi.org/10.2196/21279

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder. *Archives of Internal Medicine*, *166*(10), 1092. https://doi.org/10.1001/archinte.166.10.1092

Stewart-Brown, S., Tennant, A., Tennant, R., Platt, S., Parkinson, J., & Weich, S. (2009). Internal construct validity of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS): a Rasch analysis using data from the Scottish Health Education Population Survey. *Health and Quality of Life Outcomes*, *7*(1), 15. https://doi.org/10.1186/1477-7525-7-15

Sun, Y., Lin, S.-Y., & Chung, K. K. H. (2020). University Students' Perceived Peer Support and Experienced Depressive Symptoms during the COVID-19 Pandemic: The Mediating Role of Emotional Well-Being. *International Journal of Environmental Research and Public Health*, *17*(24), 9308. https://doi.org/10.3390/ijerph17249308

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