The Rasch Analysis of New Perceived Wellness Survey-Short Form for Vocational High School Students in Indonesia

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Abstract

It is vital to have a standardized measuring instrument to assess an Indonesian vocational high school student's wellness. The test can be useful for operationalizing meaning, mapping profiles, and designing and developing guidance and counseling programs to improve high school students' wellness. Given its rapid development and superior psychometric qualities, the Perceived Wellness Survey Full Length Version (PWS-FL) 36 items is a valuable assessment instrument. However, due to the vast quantity of items, participants may be hesitant to complete them. The purpose of this study is to adapt and investigate the psychometric features of the New Perceived Wellness Survey Short Form (PWS-SF) for vocational high school students in Indonesia. The reduction in the number of items is hoped to preserve the excellent psychometric features of this wellness assessment tool. A total of 829 state vocational high school students were incidentally selected study participants. Technically, the data was analyzed utilizing item response theory using the Rasch model. The findings indicate that the new PWS-SF has a 36.7% empirical raw variance explained by measures, as well as item, person, and Cronbach's alpha reliability index values of 1.00,.73, and.74. This implies that the new PWS-SF for vocational high school students has strong psychometric qualities and can provide valid, reliable, and effective wellness assessment tools in Indonesian culture. This instrument's findings can be utilized to design guidance and counseling programs aimed at improving the wellness of vocational high school students.

Keywords: assessment, mental health, perceived wellness survey, rasch analysis, wellness.

1. Introduction

Every human being aims and desires a multidimensional healthy life, known as wellness. This is also an significant issue and paradigm of counseling in the future, but tends to be overlooked in counselor preparation standards and codes of ethics (Brubaker & Sweeney, 2022). On the other hand, COVID-19 pandemics and endemics bring rapid changes, are unpredictable, and become ecological disasters with significant impacts on anxiety, social isolation, loneliness, stress, depression, impaired wellness and well-being, death, economic decline, and the order of human life around the world (Nikolis, Wakim, Adams, & Do, 2021).

Case management for COVID-19 undoubtedly, it is necessary to address psychological illnesses and issues, including wellness and well-being, in addition to physical healing from the virus-caused illness. According to students, wellness is more significant than physical health. Nonetheless, the mental health of students has not been adequately addressed by the government (Budianti et al., 2018) and researchers have not taken this issue seriously. During the COVID-19 epidemic, schools did not demonstrate sufficient competence or motivation to promote student and parent wellness (Calvert, Lane, McQuilkin, Wenner, & Turner, 2022) and have received little attention from scholars. During the COVID-19 epidemic, schools did not demonstrate adequate capacity or motivation to promote student and parent wellness (Calvert, Lane, McQuilkin, Wenner, & Turner, 2022). Indeed, since 1947, the World Health Organization (WHO) has defined health as something more than only the absence of disease or illness. WHO reaffirmed and highlighted in 1964 that optimal health is a comprehensive state of health that includes physical, mental, and social dimensions, as well as happiness, rather than the absence of negative characteristics such as disease, illness, or weakness (Anspaugh, Hamrick, & Rosato, 2011). Perceived wellness theory states that health is holistic and multidimensional, encompassing psychological, emotional, social, physical, spiritual, and intellectual well (Adams, Bezner, & Steinhardt, 1997; Adams T. B., Bezner, Drabbs, Zambarano, & Steinhardt, 2000).

According to empirical studies, millennials' wellness and intellectual, social, spiritual, emotional, physical, and psychological health are generally fairly good (Lee, Lee, & Cheng, 2019). However, during the COVID-19 pandemic, international student wellness tends to drop (Nikolis, Wakim, Adams, & Do, 2021; McDaniel, Dionne, & Regan, 2021; Spurr, Walker, Squires, & Redl, 2021; Franzidis & Zinder, 2019). According to an Indonesian study, wellness and the social, environmental, emotional, intellectual, physical, career, creative, and financial health dimensions of college students are somewhat healthy, however the cultural and spiritual wellness dimensions are healthier (Mamesah & Herdi, 2021; 2022). According to recent research, the COVID-19 pandemic significantly improves a number of psychological and mental health/wellness conditions (Fiorillo & Gorwood, 2020; Shreffler, Petrey, & Huecker, 2020; Bansal, et al., 2020). Indeed, physical, intellectual, and emotional wellness has a significant positive impact on subjective happiness, life satisfaction, and individual quality of life (Choi, Lee, & Ahn, 2014). Wellness is a powerful and significant predictor of reduced anxiety and depression in individuals (Kalkbrenner, 2023). Wellness has a significant negative correlation with affective distress and school counselor burnout (Fye & Rainey, 2022). As a result, schools, particularly guidance and counseling teachers/counselors, should play a more active role in measuring wellness and implementing guidance and counseling programs to improve student wellness (Herdi & Hidayat, 2013).

On this basis, the availability of standard measuring assessment tool to determine the wellness of vocational high school students in Indonesia is critical. This tool can help operationalize meaning, map profiles, and design guidance and counseling programs for vocational high school students in Indonesia and other countries. It can also identify and test the determinants and impacts of their wellness. The lengthy version of the Perceived Wellness Survey (PWS; 36 items) is an effective assessment tool due to its speedy development and excellence psychometric features (Adams, Bezner, & Steinhardt, 1997; Adams T. B., Bezner, Drabbs, Zambarano, & Steinhardt, 2000). However, the sheer amount of items may make individuals reluctant to

complete them. The purpose of this study is to adapt and test the psychometric features of the New Perceived Wellness Survey-Short Form (New PWS-SF) for vocational high school students from Indonesian culture. This is useful for integrating into large surveys, combining with other instruments, using in different organizational and professional contexts, applying the New PWS-SF to more diverse research and populations, reducing administration time and other aspects of practical work, and helping practitioners and researchers design and develop mental health guidance and counseling programs. The reduction in the number of PWS questions is likely to preserve the unique psychometric features of this wellness evaluation tool.

This justification led to the following research questions: (1) is the New Perceived Wellness Survey-Short Form a valid tool for measuring the degree of wellness among Indonesian vocational high school students, and (2) is it a reliable tool for measuring the degree of wellness among Indonesian vocational high school students? The objective is to collect empirical data on the new PWS-SF's psychometric qualities for Indonesian vocational high school students. Since it focuses on creating a condensed version of the Perceived Wellness Survey for Indonesian vocational high school students, this study differs from others of a similar nature. A condensed form of the new PWS is intended to be more practical, efficient, and effective in its administration. It is anticipated that the quality of the psychometric qualities will be maintained when the number of items is reduced. This study is also unique in that the Rasch Model and the Item Response Theory approach were used to assess the psychometric features of the New PWS-SF.

2. Methods

The study followed the International Test Commission's instrument adaptation methods through the stages of preconditioning, adaptation, confirmation (empirical analysis), administration, scoring and interpretation, and documentation (Bartram, Hambleton, Gregoire, & Muniz, 2018). This technique was chosen because it was designed to adapt and validate the new PWS-SF for vocational high school students in Indonesian culture.

The adapted instrument is the New Perceived Wellness Survey-Short Form (New PWS-SF), which contains 18 items (Herdi & Yuningsih, 2023). The instrument's originality from the Perceived Wellness Survey (Adams, Bezner, & Steinhardt, 1997). The PWS consists of 36 items designed to assess six domains of wellness: psychological, emotional, social, physical, spiritual, and intellectual. This instrument is a six-level Likert scale with the following options: strongly agree (6), agree (5), slightly agree (4), somewhat disagree (3), disagree (2), and strongly disagree (1). Instruments are chosen using the following criteria: (1) designed by professionals based on strong theoretical ideas; and (2) validated in several countries with highly satisfactory psychometric qualities (Adams T. B., Bezner, Drabbs, Zambarano, & Steinhardt, 2000; Kaveh, Ostovarfar, Keshavarzi, & Ghahramani, 2016); (3) extensive application in wellness research in numerous nations; and (4) ease of licensing by its developers.

The research sample consisted of 829 Indonesian state vocational high school students chosen through incidental sampling. This technique was chosen for practical reasons; the population is not precisely known, and the process of choosing samples is more efficient and faster.

The data analysis technique employs the Item Response Theory (IRT) approach with Rasch Model Winsteps 3.73. It includes item fit testing (item measure, item fit order, and differential item functioning), instrument quality analysis (unidimensionality and rating scale), and reliability (test reliability, person reliability, and item reliability).

3. Result and Discussion

Result

Item Fit of the PWS-SF

The New Perceived Wellness Survey - Short Form (New PWS-SF) 18 items are examined utilizing measure item criteria, fit order items, and DIFs. Item measure is used to determine the item's difficulty level. The results revealed that the S18 item with +1.10 logit was the most difficult item to approve, while the S1 item with -.68 logit was the easiest item to approve by vocational high school students.

Fit order criteria is used to examine fit or infit items. The measurement results revealed that 14 of the 18 items were fit. This conclusion is based on meeting the criterion for Infit and Outfit MNSQ values within the permitted range (.5 MNSQ < 1.5). dan Pt-MCorr (0.4 < pt-MCorr.85) (Bond & Fox, 2015; Boone, Staver, & Yale, 2014; Linacre, 2019; Sumintono & Widhiarso, 2014; 2015; Herdi, Kartadinata, & Taufiq, 2019; Herdi & Yuningsih, 2023). The test did not employ the zstd outfit criteria (-2 < Zstd > +2) due to the vast number of participants. Table 1 presents a summary of the new PWS-SF test results.

Table 1. Item Fit Test Results of the New PWS-SF for Vocational High School Students

Item Nu.		Item	Item Fit Order				DIF						Decision
v. 36	v.18	Measure	Infit Mnsq	Outfit Mnsq	Outfit Zstd	Pt-MCorr	Sex	Age	Grade	City	Ethnic	Religious Aff	
S 1	S_1	-.68	1.08	.96	-.6	.44	.000	.019	.102	.245	.515	.744	Fit
S 3	S_2	-.34	.91	.91	-1.7	.45	.007	.359	.003	.004	.916	.893	Fit
S 8	S_3	-.13	.74	.77	-5.0	.45	.000	.900	.245	.249	.291	.363	Fit
S 10	S_4	-.16	.84	.84	-3.4	.49	.000	.970	.275	.057	.716	.566	Fit
S_{13}	S_5	-.36	.92	.93	-1.3	.44	1.00	.243	1.00	.494	.996	.575	Fit
S_{14}	S_6	.90	1.46	1.61	9.9	.21	.000	.217	.000	.064	.005	.404	Misfit
S_{15}	S_7	.02	1.00	1.01	.2	.39	.000	.833	.995	.011	.494	.733	Fit
S_{16}	S_8	-.18	.90	.89	-2.2	.45	.000	.289	.073	.915	.502	.913	Fit
S_{17}	S_9	.41	1.39	1.47	9.6	.24	.000	.946	.009	.004	.336	.791	Misfit
S_{18}	S_{10}	-.01	.55	.59	-9.9	.50	.200	.956	.894	.156	.904	.989	Fit
S_{19}	S_{11}	-.66	1.09	1.03	.5	.41	.369	.500	.666	.281	.563	.659	Fit
S_{20}	S_{12}	.62	1.55	1.64	9.9	.17	.000	.905	.000	.001	.043	.234	Misfit
S_{21}	S_{13}	-.25	1.15	1.19	3.4	.41	.117	.131	.743	.964	.029	.384	Fit
S_{22}	S_{14}	.10	1.11	1.13	3.4	.41	.222	.861	.937	.132	.680	.267	Fit
S_{23}	S_{15}	-.24	.63	.64	-7.9	.52	.000	.992	.232	.097	.842	.565	Fit
S_{24}	S_{16}	.02	.56	.59	-9.9	.50	.054	.950	.228	.195	.978	.839	Fit
S_{35}	S_{17}	-.14	.81	.86	-2.8	.45	.000	.997	.118	.851	.182	.117	Fit
S_{36}	S_{18}	1.10	1.46	1.57	9.9	.21	.546	.000	.006	.060	.109	.964	Misfit

DIF is utilized to detect item bias in a particular group of vocational high school students. The detected items can be identified with a probability value of < 5% (.05) (Bond & Fox, 2015; Boone, Staver, & Yale, 2014; Dimitrov, 2012; Sumintono & Widhiarso, 2014; 2015; Linacre, 2019). The study revealed that 12 of the 18 new PWS-SF items were biased towards a certain

sex. There are two items that are biased toward specific ages. Three elements are biased towards specific grades. Four items are biased towards specific cities. Three items are biased towards a specific ethnicity. Furthermore, no items are biased towards certain religious affiliations.

Based on the item eligibility criteria, 14 of the 18 new PWS-SF items were obtained by vocational high school students in Indonesia were fit. However, for reasons of representation and balance of items in each dimension of the new PWS-SF, it was decided that all 18 items of the new PWS-SF versions of vocational high school students in Indonesia would still be used by revising as necessary the four misfit items.

Quality of the New PWS-SF

The unidimensionality requirement is verified using residual principal component analysis (PCA), which assesses PWS-SF's uniformity in measuring something that should be measured (Bond & Fox, 2015; Boone, Staver, & Yale, 2014; Linacre, 2019; Sumintono & Widhiarso, 2014; 2015; Herdi, Kartadinata, & Taufiq, 2019; Herdi & Yuningsih, 2023). The research revealed a raw variance of 36.7% as well as an unexplained variance of 15.0% for the new PWS-SF. This meets the unidimensionality condition of at least 20% and variances that cannot be explained by New PWS-SF of $\leq$ 15%.

The new PWS-SF rating choice verification is assessed utilizing rating scale criteria (Bond & Fox, 2015; Boone, Staver, & Yale, 2014; Linacre, 2019; Sumintono & Widhiarso, 2014; 2015; Herdi, Kartadinata, & Taufiq, 2019; Herdi & Yuningsih, 2023). Rating scale testing with Winstep v. 3.73 revealed that the average observation value ranged from logit -1.96 for choice score 1 (strongly disagree) to logit -.90 for choice score 2 (disagree), logit -.30 for choice score 3 (somewhat disagree), logit +.21 for choice score 4 (somewhat agree), logit +.89 for choice score 5 (agree), and logit +2.13 for choice score 6 (strongly agree). Andrich threshold analysis shows that values shift from NONE to negative (-.26, -.67, and -.14) and then to positive (+.45 and +.61) in stages. This suggests that the rating scale employed in the redesigned PWS-SF is appropriate for and does not confuse Indonesian vocational high school students participating in this study.

The new PWS-SF reliability analysis likewise yielded good findings, as shown in Table 2 of the statistical summary. Cronbach's alpha value, which measures test reliability, i.e., the interaction between person and item as a whole, is.74, whereas person reliability is.73 and item reliability is 1.00. The new PWS-SF tests/instruments have sufficient reliability, consistent responses from vocational high school students, and excellent item quality (Sumintono & Widhiarso, 2014; 2015). Table 2 further reveals that the person measure is +.46 logit, with an average value higher than logit.0. That is, vocational high school students tend to provide higher ratings on each new PWS-SF item.

Table 2: Statistical Summary of the New PWS-SF Version for Vocational High School Students

Output		New PWS-SF Version for VHS Students
Item	Item reliability	1.00
	Higher logit value	+1.1 logit
	Lower logit value	-.68 logit
Person	Person reliability	.73

	Higher logit value	+4.85 logit
	Lower logit value	-1.01 logit
Instrument	Cronbach's alpha	.74
	Raw variance explained by measures	36.7%
	Unexplained variance in 1st contrast	15.0%
	Unexplained variance in 2nd contrast	5.1%
	Unexplained variance in 3rd contrast	4.6%
	Unexplained variance in 4th contrast	4.3%
	Unexplained variance in 5th contrast	4.0%

Discussion

The findings revealed that the new PWS-SF has good psychometric qualities and may be utilized to assess the wellness of vocational high school students in Indonesia. Herdi and Yuningsih (2023) found that PWS for senior high school students has an empirical raw variance explained by measures of 27.6%, as well as item, person, and Cronbach's alpha reliability index values of.99,.82, and.81. Furthermore, the results demonstrate that PWS-SF for senior high school students has an empirical raw variance explained by measures of 32.8%, as well as Cronbach's alpha reliability index values of.98,.78, and.80, respectively. This implies that the PWS-FL and new PWS-SF have strong psychometric qualities and can serve as valid and effective wellness assessment instruments for senior high school students in Indonesian culture.

The findings of this study support previous research that PWS has satisfactory psychometric properties. According to Adams, Bezner, and Steinhardt's (1997) research on young adults, PWS has good internal consistency (α =.88-.93), high correlation with all dimensions at p < or =.05, and good discriminant, face, and factorial validity, indicating unidimensional wellness. However, the analysis on each dimension needs to be reviewed. PWS can be suspended in all dimensions. Each PWS factor has an aggregate score ranging from 3 to 29, with higher scores indicating a higher/healthier level of wellness.

Adams, Bezner, Garner, and Woodruff (1998) reported that PWS had sufficient temporal stability (r = .73) in university students, r = .81 company employees, as well as having satisfactory construct and discriminant validity. Adams, Bezner, and Steinhardt's (1997) discovered internal consistency in PWS, including overall (α =.91), physical (α =.81), spiritual (α =.77), emotional (α =.74), psychological (α =.71), intellectual (α =.64), and social (α =.64).

Harari, Waehler, and Rogers (2005) used a sample of young adults to assess the overall validity, each dimension, and criteria of PWS. The PWS had high international consistency (α =.91) and adequate criterion validity when compared to other mental health measures, such as the Beck Depression Inventory-II (R2 =.29), the Beck Anxiety Inventory (R2 =.11), and the Hopkins Symptom Checklist-21 (R2 =.18). However, the factor analysis failed on all six PWS subscales. The test results also indicated adequate internal reliability of PWS (α =.93).

Research by Rothman and Ekkerd (2007) shows that the PWS population version in South Africa has an acceptable Cronbach Alpha coefficient, both overall and in each dimension, with values ranging from.74 to.81. However, the correlation between the two dimensions was not significant (r =.06).

Foster and Levitov (2012) determined that PWS has acceptable psychometric qualities. Taylor, Gungor, Blount, and Mullen (2018) concluded that some researchers believe PWS should be

measured in a unidimensional model (Adams, Bezner, & Steinhardt, 1997; Harari, Waehler, & Rogers, 2005), while some others believe it should be measured in a multidimensional model (Kaveh, Ostovarfar, Keshavarzi, & Ghahramani, 2016). This conclusion is confirmed by a factor analysis that indicated that only one component is sufficient to explain PWS in the female population aged 31-40 years in the United Arab Emirates (Al Awar, et al., 2022).

According to the theory of perceived wellness, being healthy is holistic and multidimensional, encompassing psychological, emotional, social, physical, spiritual, and intellectual health (Adams, Bezner, & Steinhardt, 1997; Adams T. B., Bezner, Drabbs, Zambarano, & Steinhardt, 2000). Hettler's Hexagonal Model of Wellness proposes six dimensions of wellness: occupational, physical, social, intellectual, spiritual, and emotional (Blount, Tyalor, & Lambie, 2020; Granello, 2015). According to modern wellness theory, achieving optimal health necessitates balancing and maintaining integrated spiritual, social, physical, emotional, intellectual, occupational, and environmental elements (Anspaugh, Hamrick, & Rosato, 2011). The wellness system model highlights the following principles: (1) healthy is multidimensional; (2) healthy is a dynamic variable; (3) healthy is self-regulating in all dimensions of life; and (4) healthy is self-regulating between dimensions of life (Bart, et al., 2018).

Sheerazi et al. (2022) found that the PWS version of undergraduate and postgraduate students working as physical therapists aged 24 and above in Pakistan can be used as an assessment tool to assess the six dimensions of wellness, including physical, psychological, emotional, spiritual, social, intellectual, and emotional health, with internal consistency α =.88 to.93. Similarly, Kaveh, Ostovarfar, Keshavarzi, & Ghahramani (2016) investigated the psychometric features of PWS versions of Iranian employees using confirmatory component analysis and Cronbach's alpha coefficient. The findings revealed that the Persian version of PWS has a fit, acceptable index, and may be utilized as a useful wellness assessment tool. This is supported by Cronbach's alpha coefficients of.87 for PWS and.83,.73,.68,.73,.85, and.82 for each emotional, mental, social, physical, spiritual, and intellectual dimension. Factor analysis is adequate with KMO value =.844 (significant at $p < .0001$), coefficient $X2/df = 1.88$, GFI =.71, CFI =.93, TLI/NNFI =.93, and RMSEA =.070.

Memnun (Karagozoglu, 2013) discovered that Cronbach's test-retest and Alpha reliability coefficients ranged between.81 and.83 while adapting PWS to Turkish for the population aged 22-36 years. Bhattacharya, Deka, Barman, and Jamil's (2023) research of elderly people aged > 65 years in India found that the variability of test-retest observations of each dimension of PWS was $\geq$.8, indicating strong reliability, unless the physical dimension had poor reliability. Pearson's tests also revealed that psychological, emotional, and physical dimensions exhibited very strong positive relationships (.734,.703, and.722) with PWS composite scores. Meanwhile, spiritual, intellectual, and social dimensions had a positive and significant association with PWS composite scores.

4. Conclusion

This pilot study created new PWS-SF 18 items with good psychometric qualities for Indonesian vocational high school students. This is demonstrated by the test results of numerous item fit

criteria (item measure, item fit order, and differential item functioning), instrument quality analysis (unidimensionality and rating scale), and reliability. As a result, the new PWS-SF can be employed as an effective and helpful wellness assessment tool for Indonesian vocational high school students. Further studies are needed to evaluate the new PWS-SF on more representative vocational high school students in Indonesia, taking into account ethno-socio-demographic characteristics.

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