

PSYCHOMETRIC PROPERTIES OF PSYCHOLOGICAL HARDINESS SCALE FOR BASIC EDUCATION TEACHERS

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Abstract

The primary purpose of the study is to investigate the number of items and the dimensions of psychological hardiness scale for basic education teachers. Descriptive survey research method was applied and quantitative data analysis was executed in this study. For psychological hardiness scale, two instruments were used with 44 items. A total of 997 basic education teachers were randomly selected. Basic education teachers in Bago Region and Naypyitaw were examined. And then, exploratory factor analysis (EFA) was used to investigate the number of items and the dimensions of the scale. It was also used to reduce data to a smaller set of summary variables and to postulate that there is a smaller set of unobserved (latent) variables or constructs that underlie the variables that actually were observed. Confirmatory factor analysis (CFA) is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs. CFA was conducted to determine the existing structure of the scale and to test how the variables are related to underlying constructs. For psychological hardiness scale, three subscales (commitment, control and challenge) were used with 29-items

Keywords: psychological hardiness

Introduction

In shaping the future of children by creating the foundation for their academic and social development, the basic education teachers play a crucial role. Psychological hardiness is essential for teachers because it equips them with the mental resilience to handle the daily challenges of teaching and the relationships with their colleagues in their workplace environment. Psychological hardiness is the ability to withstand stress, remain positive in difficult situations, and adapt effectively. People with strong psychological hardiness perceive challenging and difficult situations as normal experiences in life. Psychological hardiness is conceptualized as an individual capacity to positively respond to negative events and stressors in life and career (Maddi, 2004). In the educational community, psychological hardiness may be vital for retaining teachers in their workplace and maximizing retention.

Purpose of the Study

The main purpose of the study is to investigate the number of items and the dimensions of psychological hardiness scale for basic education teachers.

Definitions of Key Terms

Psychological Hardiness. The concept of psychological hardiness is conceptualized as an individual capacity to positively respond to negative events and stressors in life and career (Maddi, 2004).

Review of Related Literature

Psychological Hardiness

According to Kobasa et. al. (1982), “Hardiness is an individual trait that acts as a buffer between life stressors and an individual’s reaction to them”. It consists of three dimensions: commitment, control, and challenge. Commitment is the tendency to participate and engage in

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work and confront problems successfully. Control is an individual's capacity to anticipate challenging situations through their understanding of reality, and to create effective strategies to address these challenges and minimize their effects when they arise. Challenge is the ability to alter and cope with serious activities into opportunities for personal growth and development. Hardy persons are perceived as healthy individuals because they possess an increased sense of life and work commitment, are more open to change and challenges in life, and have a greater feeling of control over what happens to them (Bartone, Eid, Johnsen, Laberg, & Snook, 2009).

Method

Research Design

Simple random sampling method was used in this study.

Participants of Study

A total of 997 basic education teachers in Bago Region and Naypyitaw participated in this study.

Instrumentation

In order to study psychological hardiness of basic education teachers, the instrument adapted from the Arabic Scale of Psychological Hardiness developed by Nasser, (2012) and Dispositional Resilience Scale Revised (DRS-R) developed by Bartone et. al. (2007) were used. Total number of items in psychological hardiness scale is 44 items. These items are measured on 5 point Likert scales such as 1 (Strongly Disagree), 2 (Disagree), 3 (Neither Agree nor Disagree), 4 (Disagree) and 5 (Strongly Agree).

Procedure

Firstly, the related literature was studied through intensive reading from a variety of sources such as books, journals, thesis, research papers and internet sources. Next, research instruments were prepared under the guidance of the supervisor to collect data. In order to validate the prepared instruments, expert reviews were requested. According to the validation of the experts, pilot testing was carried out to assess the reliability coefficients of the respective questionnaires. After that, data collection was done and the researcher analyzed the received data.

Exploratory Factor Analysis (EFA) of Psychological Hardiness (PH)

Firstly, exploratory factor analysis was conducted with 44 items for psychological hardiness and some of the results in Extraction of Communalities were found unsatisfactory. Thus, 15 items were excluded from 44 items and 29 items were finally used to continue the subsequent procedures.

Next, Kaiser-Meyer-Olkin (KMO) and Bartlett's test were used for data analysis.

Table 1 KMO and Bartlett's Test of Psychological Hardiness (PH)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.860
Bartlett's Test of Sphericity	Approx. Chi-Square	4767.283
	Df	406
	Sig.	0.000

According to Table 1, the KMO value of 29 items was 0.860; it was greater than 0.80 that is indicating sufficient items for each factor. The Bartlett's test was found to be significant. This meant that the variables were highly correlated enough to provide a reasonable basis for factor analysis. Thus, the data from psychological hardiness were appropriate to run EFA. To calculate eigenvalue, a scree plot method was used. The result was shown in the following Figure 1.

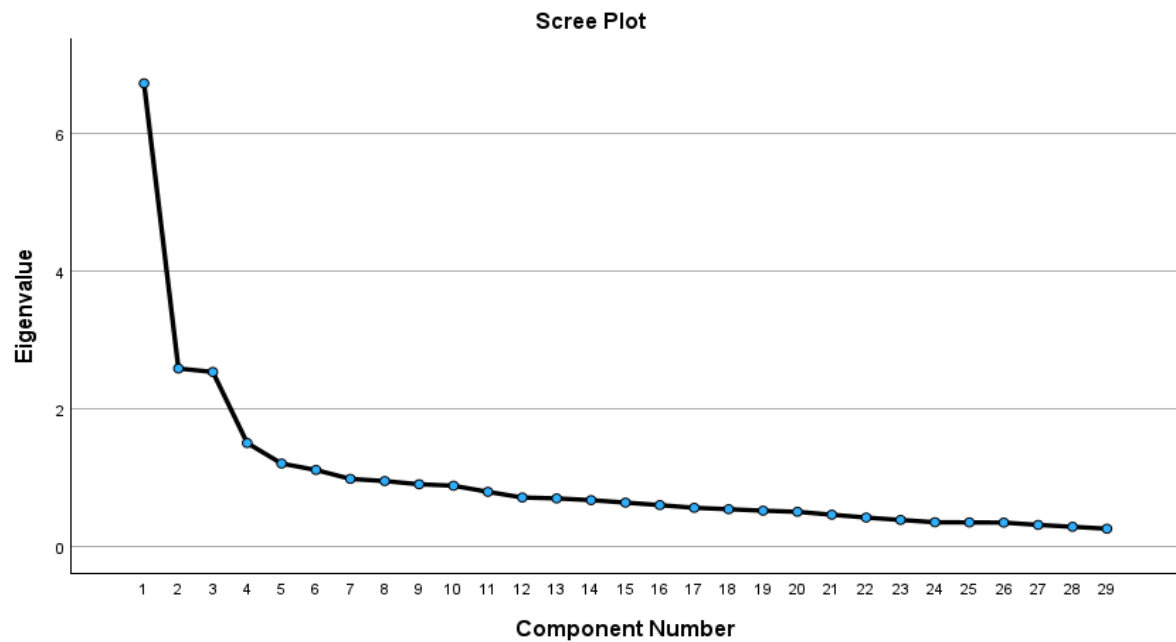


Figure 1 Scree Plot of Psychological Hardiness Scale

One of the reasons for running a factor analysis in this study is to reduce the large number of variables that describe a complex concept such as psychological hardiness to a few interpretable latent variables (factor). Based on Figure 1, eigenvalues of three factors were found to be greater than one.

Table 2 Factor Loadings for Psychological Hardiness (PH)

Factors			
Item	1	2	3
1	.732		
3	.725		
4	.464		
6	.698		
7	.700		
8	.643		
9	.709		
10	.556		
11	.466		
12	.620		
19	.732		
20		.405	
22		.457	

Factors			
Item	1	2	3
24		.493	
25		.394	
35		.634	
36		.618	
37		.618	
38		.639	
39		.730	
40		.734	
41		.601	
21			.460
27			.417
30			.541
34			.459
42			.743
43			.792
44			.728

After factor rotation, the number of items for each factor was determined. The first factor, commitment (C1) included eleven items with factor loadings ranging from 0.464 to 0.732, the second factor, control (C2) included eleven items with factor loadings ranging from 0.405 to 0.734, and the third factor, challenge (C3) included seven items with factor loadings ranging from .417 to 0.792. With these factor loading values of the items, the psychological hardiness scale indicated a good result because according to Hair et al. (2014), if the factor loading value of the item greater than 0.4, it is an indicator of a good result.

Confirmatory Factor Analysis (CFA) of Psychological Hardiness (PH)

Confirmatory factor analysis (CFA) is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs.

Table 3 Model Fit Indices of Psychological Hardiness Factors

Chi-square	p-value	Df	CMIN/Df	CFI	TLI	RMSEA	SRMR
1288.351	< .001	361	2.611	.867	.851	0.057	0.064

If the CFI is higher than **0.80** (Nayir, 2013), the model fit is acceptable. Carlback and Wong recommended that SRMR value below ≤ 0.08 indicates good fit and $TLI \geq 0.85$ indicates good fit. If RMSEA value is $\leq .08$, it could be considered acceptable (Carlback & Wong, 2018), and the data fit to the model. If the CMIN/DF value is ≤ 3 it indicates an acceptable fit (Kline, 2016). If the CMIN/DF value is ≤ 5 it indicates a reasonable fit (Marsh & Hocevar, 1985) and similarly, CMIN/Df (Chi-square/Df) was not exceeded 3, the data fit to the model (as cited in Al-Mamary, Shamsuddin, 2015). Therefore, the model fit psychological flexibility with 29-items for the measurement psychological hardiness of basic education teachers. The confirmatory factor analysis of psychological hardiness was expressed in Figure 2.

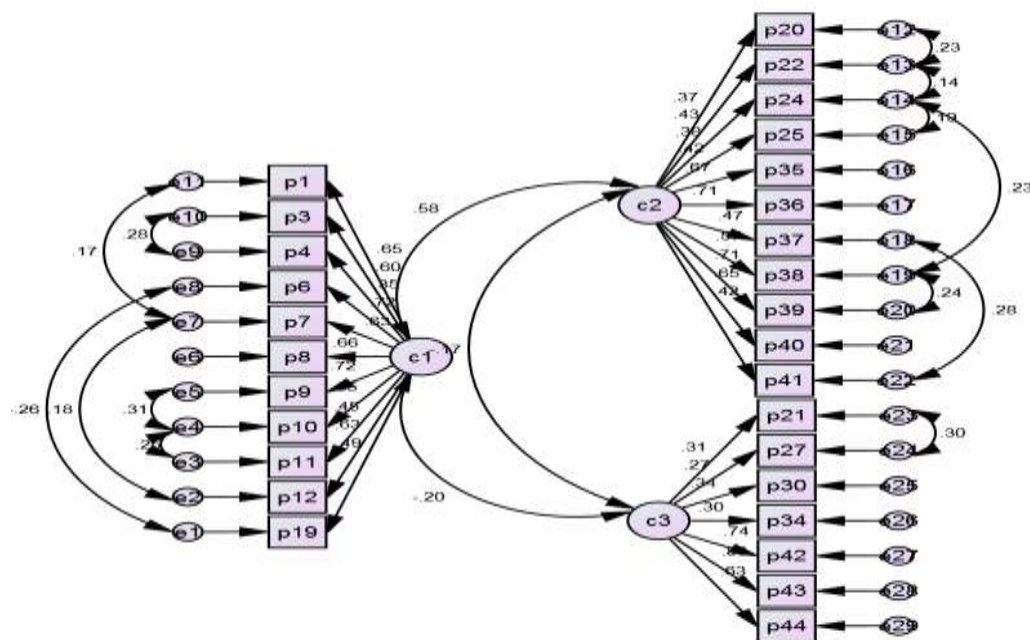


Figure 2 The Confirmatory Factor Analysis of Psychological Hardiness Factors

And then, the evaluated fit indices were also calculated. These indices involved the unstandardized estimates (b), standard errors (S.E), critical ratio (C.R) and standardized estimates (β). At the significant level of 0.05, the magnitude of C.R is higher than 1.96, it could be considered as significant (as cited in Arbuckle, 2012). The significant level (p values) and R^2 values were also calculated.

Convergent Validity of Psychological Hardiness (PH)

Convergent validity is also an evidence to test construct validity. To establish convergent validity, factor loadings of the indicator variables, composite reliability (CR) and average variance extracted (AVE) were used.

Table 4 Composite Reliability (CR) and Average Variance Extracted (AVE) of Psychological Hardiness Scale

Factors	No. of items	(CR)	(AVE)
Commitment	11	0.89	0.42
Control	11	0.85	0.45
Challenge	7	0.80	0.40
Total	29		

The AVE values range from 0.40 to 0.45. The CR values range from 0.80 to 0.89. According to Hunang et al., (2013), AVE should be above 0.5 and CR should be 0.7 and above. If AVE values were below the acceptable minimum cutoff point of 0.5, convergent validity may be adequate because all latent factors had CR values above 0.7 (as cited in Hamid, Samiz &

Sidek, 2017). So, psychological hardiness scale was assumed that it was a valid instrument to measure the psychological hardiness of basic education teachers.

Discriminant Validity of Psychological Hardiness (PH)

Discriminant validity was used to show that the construct is actually differing from one another empirically. Discriminant validity was evaluated with square root of AVE with correlations of latent constructs.

Table 5 Square Root of AVE with Correlations of Latent Factors of Psychological Hardiness (PH)

Factors	Commitment	Control	Challenge
Commitment	.648		
Control	.453	.670	
Challenge	-.183	-.169	.632

The diagonal numbers *in italic* are the square root of AVE values

According to Table 5, all the square root of AVE values was greater than 0.5 and these values were greater than all the inter-latent factor correlations for all factors in the relevant rows and columns. Thus, the results of the discriminant validity of psychological hardiness were congruent with Hair et al., (2011). Overall, discriminant validity can be accepted for the measurement model and the discriminant validity between the constructs.

Reliability Coefficients of Psychological Hardiness (PH)

Table 6 Number of Items and Reliability Coefficients in Each Subscale of Psychological Hardiness (PH)

Factors	No. of items	Cronbach's alpha
Commitment	11	0.850
Control	11	0.815
Challenge	7	0.706
Total	29	0.781

Based on Table 6, reliability coefficient of each subscale ranged from 0.706 to 0.850. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. However, there is actually no lower limit to the coefficient. Thus, psychological hardiness scale was reliable to measure the psychological hardiness of basic education teachers.

Conclusion and Suggestions

This study tried to investigate the psychometric properties of psychological hardiness scale with 44 items for basic education teachers. These items are analyzed and reduced by calculating exploratory factor analysis and confirmatory factor analysis. After running these, 29 items were finally left in psychological hardiness scale. The instrument for psychological hardiness is valid to measure. And then, this study adapted the instrument which is reliable to find out the psychological hardiness of basic education teachers in Myanmar societies. So, this instrument should be used in the future researches of educational psychology fields.

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