The Confirmatory Factor Analysis of The Effectiveness of Community Empowerment in The Malay and Chinese

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Abstract
Confirmatory Factor Analysis (CFA) is conducted in the measurement model and there are two ways to conduct CFA through individual confirmatory factor analysis or group confirmatory factor analysis. It depends on how many items are in the construct and if the items in the construct have more than four, the measurement model analysis is conducted separately. Whereas, pooled CFA runs all measurement models at the same time. This Unidimensionality requirement can be met through the item deletion procedure that has a low factor loading value to reach the set level of fitness indexes. Items with a factor loading value of less than 0.6 are considered unimportant to the measurement of the construct and can be discarded (Chik & Abdullah, 2018). A total of 600 randomly selected community members were involved in this research, among 300 Malay communities and 300 Chinese communities in the East Coast state, Peninsular Malaysia. Data were analyzed using the IBM-SPSS-AMOS (SEM) program version 21.0. Adjustment tests were conducted to ensure that the tested indicators truly represent the construct being measured and Confirmatory Factor Analysis was conducted in this study as a prerequisite that must be met. The findings of the study show that all the correlations between the constructs religion (based on practices, philosophy of life and morality), socio-culture (based on lifestyle, cultural customs, family culture and education), community (based on environment, information, support and challenges) and socio-economics, have a value less than 0.85 (<0.85) among dealing with drug addiction among the Malay and Chinese communities in the East Coast states, Peninsular Malaysia. The results of the combined confirmatory factor analysis of all measurement models (Pooled CFA), prove that all constructs do not have a strong relationship with each other to avoid the existence of multicollinearity problems.
Keywords: Religion, Socio-Culture, Socio-Economics, Community, Dealing with Drug Addiction.

Introduction

Drug abuse is the single most complicated social problem that is plaguing Malaysia. From the 1970s to the present, the problem of drug abuse and addiction is still lacking in encouraging changes. As a region that is said to receive a lot of change and development, the Asia Pacific region, including Malaysia, is also experiencing various social symptoms related to drug abuse. Drug abuse is closely linked to various other social diseases such as prostitution, violence, crime, AIDS and HIV. This is what threatens and harms a country whether in terms of socio-economic, socio-cultural, political or security. In 1983, the government took a new approach in combating the drug epidemic in the country. In that year the problem was declared a threat to national security. The philosophy of this policy is to create a society free from the threat of drugs. This policy was declared by Tun Dr. Mahathir bin Mohamad, former Prime Minister of Malaysia on 19 February 1983 while launching the Anti-Drug Campaign. The government has created a National Anti-Drug Committee and placed it under the National Security Council. The Government has approved the establishment of the National Drug Agency which is responsible as the Secretariat to the National Drug Council and responsible for all anti-drug actions. Since then, drugs have been considered the number one enemy of the country, not to mention the main target of drug addiction is the young generation who are the backbone and hope of the future country. Widespread drug trafficking and addiction can threaten the socio-economic, socio-cultural, spiritual well-being of the masses, weaken national resilience and threaten national security (Agensi Dadah Kebangsaan, 1997). The five (5) main laws related to drugs are, a) Dangerous Drugs Act 1952; b) Dangerous Drugs (Forfeiture of Property) Act 1988; c) Drug Addicts (Treatment and Rehabilitation) Act 1983 (Amendment 1998); d) Dangerous Drugs (Special Preventive Measures) Act, 1985 & Rules of Procedure 1987; and e) Poisons Act 1952.

Drug laws in Malaysia cover aspects of prevention to treatment and rehabilitation. In its implementation, there are legal weaknesses that are continuously identified and several amendments have been made to make them more effective. The severe punishment imposed reflects the determination of the Malaysian government to fight the drug problem. Some individuals are thought to have a higher risk for addiction due to hereditary factors. But, this only explains about 50 percent of the billing cases. Usually individuals who are at risk due to heredity have a positive family history of addiction. The identification of addiction genes allows researchers to understand this. Nowadays, it is thought that addiction is a complex genetic disease involving both genetic and environmental factors. It should be emphasized that the environment of widespread drug use will increase the risk of drug use and subsequently drug addiction. Alcohol use is also one of the examples. The use of some drugs can also cause changes in the brain at the molecular level. The effects of addiction will lead to compulsive behavior (i.e. actions that a person feels 'forced' or driven to do repeatedly). The brain is a dynamic structure that can become habituated to high levels of dopamine. Therefore, it is inadvertently available for more dopamine which leads to the concept of "hungry brain". The limbic system is also located near the memory center. Because drug use is for positive experiences or to alleviate negative experiences, drug use is often linked to those experiences which cause certain situations, experiences, or objects to act as triggers for continued drug use. This also makes it harder to stop. Those who successfully stop using drugs often report a chronic situation that reverts to addiction. Cessation is also made more difficult because of withdrawal symptoms (which is an addiction that causes withdrawal symptoms such as shaking, sweating and vomiting if the drug is not taken). Symptoms of physical

hoarseness and psychological hoarseness are different, depending on the class of drug used. Symptoms of hoarseness are shorter, for example in a few years for some cases, psychological hoarseness, also known as will, can last for years. A craving is a high desire that occurs suddenly at any time. The lesson that can be learned is that prevention is better than cure. Experimentation can lead to abuse which may involve the risk of addiction.

The purpose of this study is to identify the Confirmatory Factor Analysis (CFA) of each independent and dependent variable used in this study, based on real data obtained from Malay and Chinese community samples. Among the factors used in this study are the religious factor (based on practices, philosophy of life and morality), the social-cultural factor (based on lifestyle, cultural customs, family culture and education), the community factor (based on environment, information, support and challenges), socio-economic factors and factors dealing with drug addiction in Malay and Chinese community areas in the East Coast state, Peninsular Malaysia. The main purpose of CFA is to make an assessment on the factors that are needed so that they are significant on the latent factors that will be used. This evaluation is carried out to measure the strength of the variable regression path by looking at the value on the factor loading value instead of the value obtained through the relationship between the factors (Byrne, 2013). Any factor loading value that has a value less than 0.6 (< 0.6) during the CFA analysis process, those items need to be dropped from the built model. According to Chik and Abdullah (2018), whichever factor (independent or dependent variable) is used, the CFA analysis must be performed first before the Structural Equation Modeling (SEM) analysis is performed next.

Research Methodology
The research method used is quantitative and uses research instruments that have been adapted according to the suitability of factors based on religion (practices, philosophy of life and morality), socio-culture (lifestyle, cultural customs, family culture and education), community (environment, information, support and challenges) and socio-economics on the dealing with drug addiction among the Malay and Chinese communities in the East Coast states, Peninsular Malaysia. Data were analyzed using Structural Equation Modeling (SEM) with the help of the IBM-SPSS-AMOS version 21.0 program. SEM is formed with two (2) main models namely Measurement Model and Structural Model. Before the SEM test is performed, an adaptation test should be conducted to ensure that the indicators tested truly represent the construct being measured. Confirmatory Factor Analysis (CFA) is a measurement model test to ensure that each construct meets procedures such as validity and reliability for each construct tested (Kline, 2016; Hair, Black, Babin, Anderson & Tatham, 2006; Schumucker & Lomax, 2004). The fit of the measurement model is very important to ensure that each latent construct in this study has fit with the data studied before SEM can continue (Kline, 2016; Schumucker & Lomax, 2004).

Using the CFA method can assess the extent to which the observed factors are significant to the latent construct used. This evaluation is done by examining the value of the strength of the regression structure path from the factor to the observed variable (ie Factor Loading value) instead of the relationship between the factors (Byrne, 2013). Through the use of CFA, any item that does not fit the measurement model is dropped from the model. This discrepancy is due to the low value of the load factor. Researchers need to perform the CFA process on all the constructs involved in the model, either separately or in a pooled CFA model

(Alias & Hartini, 2017). The suitability of the tested hypothesis model was verified by using Fitness Indexes to see the value of Root Mean Square Error of Approximation (RMSEA<0.08), Comparative Fit Index (CFI>0.90) and Chi Square/Degrees of Freedom (chisq/df<5.0). According to Hair et al. (2006) if the χ2 value is less than 2.00 but significant, then it is necessary to state whether the sample size is large or vice versa. A sample size that exceeds 200 can cause the χ2 value to be significant. Because of that, Hair and his colleagues suggested two other indices namely CFI and RMSEA to ensure that the CFA analysis forms the unidimensionality of the study model. If the CFI value exceeds 0.90 and the RMSEA is less than 0.08, it is said that there is unidimensionality for the formation of each construct.

Findings
Confirmatory Factor Analysis (CFA)
        There are two models that need to be analyzed in carrying out Structural Equation Modeling (SEM), namely the Measurement Model and the Structural Model. Chik and Abdullah (2018) suggest two steps that need to be carried out in a Structured Equation Modeling (SEM) namely: a) Confirming the Measurement Model of all the constructs involved through the Confirmatory Factor Analysis (CFA) method, and b) Modeling all the constructs into Structural Model as well as doing SEM procedures (Chik & Abdullah, 2018; Hoque, Awang, Jusoff, Salleh & Muda, 2017; Kashif, Samsi, Awang & Mohamad, 2016). The fit of the Measurement Model with the study data is important to validate a SEM. If the Measurement Model does not match the data from the field, then the constructed SEM is invalid. Therefore, the first step in SEM analysis is to determine the appropriateness of the Measurement Model to the data from the field. Analysis of the fit of the Measurement Model with field data is done by using Confirmatory Factor Analysis (CFA) to confirm the proposed Measurement Model of the construct.

        Testing the Validity and Reliability of the Measurement Model**:** Before evaluating the appropriateness of a constructed model, the evaluation of Unidimensionality, Validity and Reliability of the Measurement Model of the construct of this study needs to be carried out first. Unidimensionality: This requirement can be met through the items deletion procedure that has a low Factor Loading value until it reaches the set Fitness Indexes level. Items with a Factor Loading value of less than 0.6 are considered unimportant to the measurement of the construct and should be discarded. Validity: The three types of validity that must be achieved by a construct measurement model are Construct Validity, Convergent Validity and Discriminant Validity. Construct Validity: Refers to the accuracy of a measurement instrument used to measure the intended construct in the study. Construct Validity describes the extent to which a statement in the item used can measure the construct that the researcher wants to measure. Construct Validity is achieved when all Fitness Indexes for the construct in question meet the specified level (Chik & Abdullah, 2018). Table 1 below shows the three categories of fit index that need to be achieved by a construct measurement model, namely Absolute Fit, Incremental Fit and Passionate Fit.

Table 1
Three (3) Categories of Matching Indexes and Recognized Index Types

Name of Category	Name of Index	Level of Acceptance
Absolute Fit Index	RMSEA	RMSEA < 0.08
	GFI	GFI > 0.90
Incremental Fit Index	AGFI	AGFI > 0.90
	CFI	CFI > 0.90
	IFI	IFI > 0.90
	TLI	TLI > 0.90
	NFI	NFI > 0.90
Parsimonious Fit Index	Chisq/df	Chi-Square/ df < 3.0

Source: Chik & Abdullah (2018)

Convergent Validity: Refers to the relationship of a measurement model with other measurement models in theory. Convergent validity of a construct will be achieved if all Average Variance Extracted (AVE) values reach a minimum value of 0.50. Discriminant Validity: Explains the extent to which a construct does not have too strong a relationship with another construct in the same model so that it can be said that a construct is a shadow or repetition (redundant) of another construct. Discriminant Validity is assessed through the discriminant validity index summary. According to Chik & Abdullah (2018) and Hoque et al. (2017), discriminant validity for a construct can be achieved if all diagonal matrix values are greater than other values in row cells and also in column cells. The diagonal value of the matrix is the square root of the AVE, while the values in the matrix are the correlations between the constructs in the model. Average Variance Extracted (AVE): The AVE value is calculated from the factor loading value for each item in a certain construct and needs to reach a minimum limit of 0.50 (AVE > 0.5) to prove the reliability of the Measurement Model of a latent construct in this study, which can be achieved (Chik & Abdullah, 2018; Hoque et al., 2017). Reliability: SEM uses the Composite Reliability (CR) value to verify the reliability of the Measurement Model according to the factor loading value of each item. Each construct that has a value of CR>0.6, has achieved Composite Reliability (Chik & Abdullah, 2018; Hoque et al., 2017).

CFA Analysis for the Measurement Model of Religion (Practices, Philosophy of Life and Morality) Construct

The analysis of Fitness Indexes in Table 2 below shows that the Religion (Practices, Philosophy of Life and Morality) Construct Measurement Model has reached the level of the Fitness Index level as stated in Table 1 above. This means that Construct Validity has been achieved (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 2
Analysis To Determine Validity for Religion (Practices, Philosophy of Life and Morality) Construct

Category Name	Index Name	Index Value	Findings
1. Absolute fit	RMSEA	0.069	Reach the set level
2. Incremental fit	CFI	0.947	Reach the set level
3. Parsimonious fit	ChiSq/df	2.407	Reach the set level

The Measurement Model for the Religion (Practices, Philosophy of Life and Morality) construct has reached the value of the Conformity Index level. This means that Construct Validity for this construct, has been achieved (Chik & Abdullah, 2018; Kashif et al., 2016).
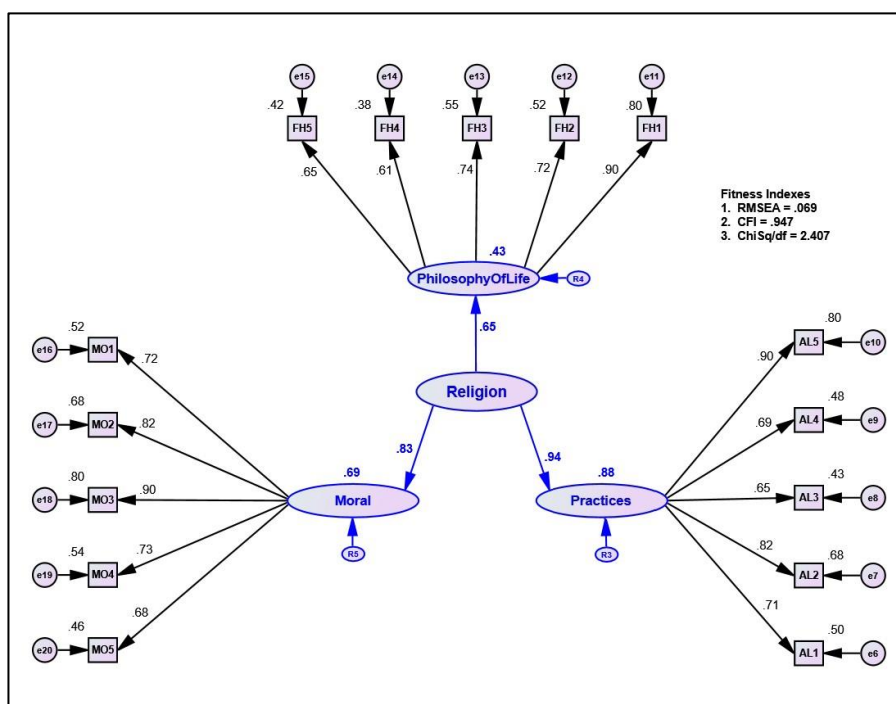

Figure 1. The Measurement Model of Religion (Practices, Philosophy of Life and Morality) Construct

CFA Analysis for the Measurement Model of Socio-Culture (Lifestyle, Cultural Customs, Family Culture and Education) Construct

The analysis of Fitness Indexes in Table 3 below shows that the Socio-Culture (Lifestyle, Cultural Customs, Family Culture and Education) Construct Measurement Model has reached the level of the Fitness Index level as stated in Table 1 above. This means that Construct Validity has been achieved (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 3
Analysis To Determine Validity for Socio-Culture (Lifestyle, Cultural Customs, Family Culture and Education) Construct

Category Name	Index Name	Index Value	Findings
1. Absolute fit	RMSEA	0.056	Reach the set level
2. Incremental fit	CFI	0.947	Reach the set level
3. Parsimonious fit	ChiSq/df	1.941	Reach the set level

The Measurement Model for the Socio-Culture (Lifestyle, Cultural Customs, Family Culture and Education) construct has reached the value of the Conformity Index level. This means that Construct Validity for this construct, has been achieved (Chik & Abdullah, 2018; Kashif et al., 2016).
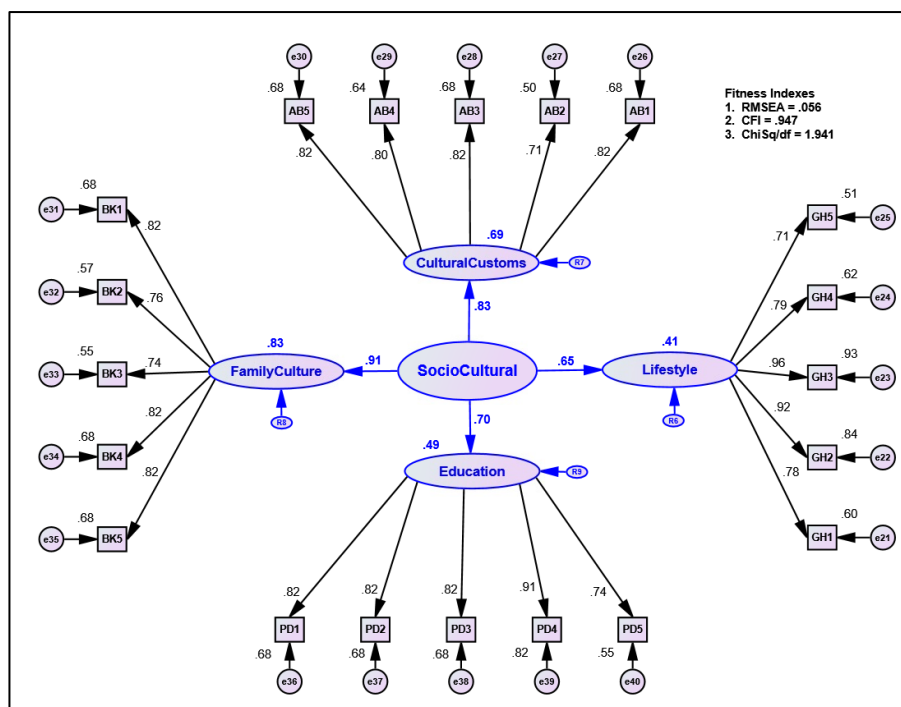
Figure 2. The Measurement Model of Socio-Culture (Lifestyle, Cultural Customs, Family Culture and Education) Construct

CFA Analysis for the Measurement Model of Community (Environment, Information, Support and Challenges) Construct

The analysis of Fitness Indexes in Table 4 below shows that the Community (Environment, Information, Support and Challenges) Construct Measurement Model has reached the level of the Fitness Index level as stated in Table 1 above. This means that Construct Validity has been achieved (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 4
Analysis To Determine Validity for Community (Environment, Information, Support and Challenges) Construct

Category Name	Index Name	Index Value	Findings
1. Absolute fit	RMSEA	0.068	Reach the set level
2. Incremental fit	CFI	0.935	Reach the set level
3. Parsimonious fit	ChiSq/df	2.374	Reach the set level

The Measurement Model for the Community (Environment, Information, Support and Challenges) construct has reached the value of the Conformity Index level. This means that Construct Validity for this construct, has been achieved (Chik & Abdullah, 2018; Kashif et al., 2016).
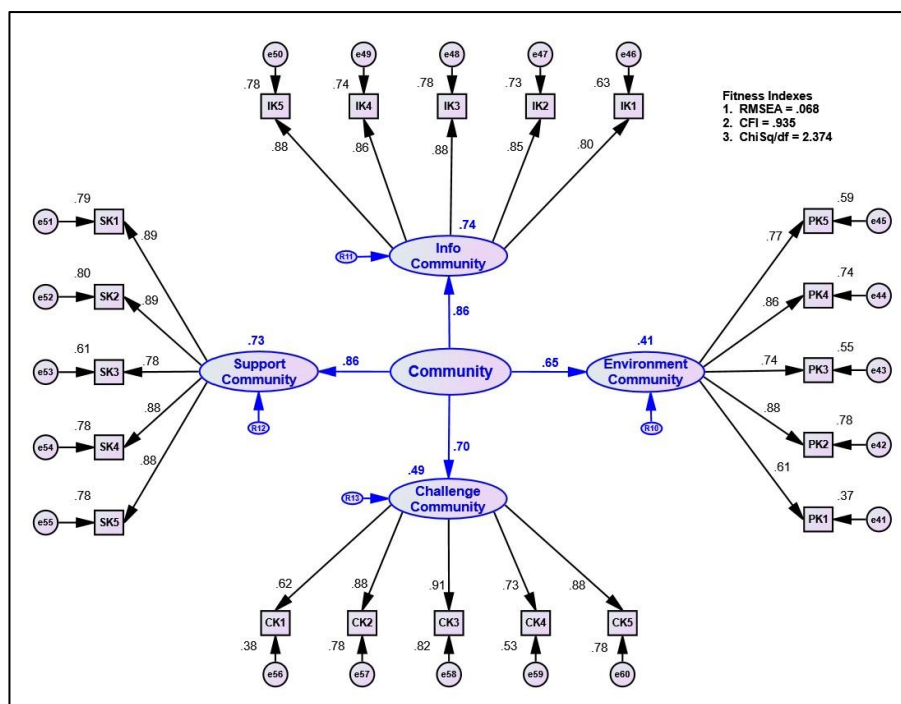
Figure 3. The Measurement Model of Community (Environment, Information, Support and Challenges) Construct

CFA Analysis for the Measurement Model of Socio-Economics Construct

The analysis of Fitness Indexes in Table 5 below shows that the Socio-Economics Construct Measurement Model has reached the level of the Fitness Index level as stated in Table 1 above. This means that Construct Validity has been achieved (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 5

Analysis To Determine Validity for Socio-Economics Construct

Category Name	Index Name	Index Value	Findings
1. Absolute fit	RMSEA	0.013	Reach the set level
2. Incremental fit	CFI	0.949	Reach the set level
3. Parsimonious fit	ChiSq/df	1.080	Reach the set level

The Measurement Model for the Socio-Economics construct has reached the value of the Conformity Index level. This means that Construct Validity for this construct, has been achieved (Chik & Abdullah, 2018; Kashif et al., 2016).
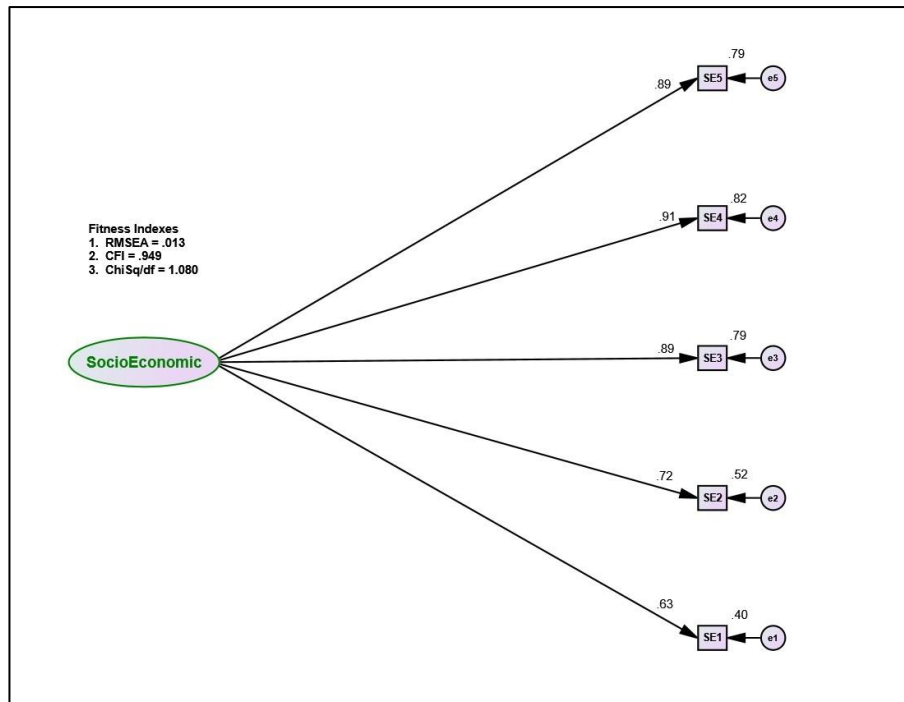
Figure 4. The Measurement Model of Socio-Economics Construct

CFA Analysis for the Measurement Model of Dealing with Drug Addiction Construct

The analysis of Fitness Indexes in Table 6 below shows that the Dealing with Drug Addiction Construct Measurement Model has reached the level of the Fitness Index level as stated in Table 1 above. This means that Construct Validity has been achieved (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 6

Analysis To Determine Validity for Dealing with Drug Addiction Construct

Category Name	Index Name	Index Value	Findings
1. Absolute fit	RMSEA	0.048	Reach the set level
2. Incremental fit	CFI	0.978	Reach the set level
3. Parsimonious fit	ChiSq/df	1.326	Reach the set level

The Measurement Model for the Dealing with Drug Addiction construct has reached the value of the Conformity Index level. This means that Construct Validity for this construct, has been achieved (Chik & Abdullah, 2018; Kashif et al., 2016).
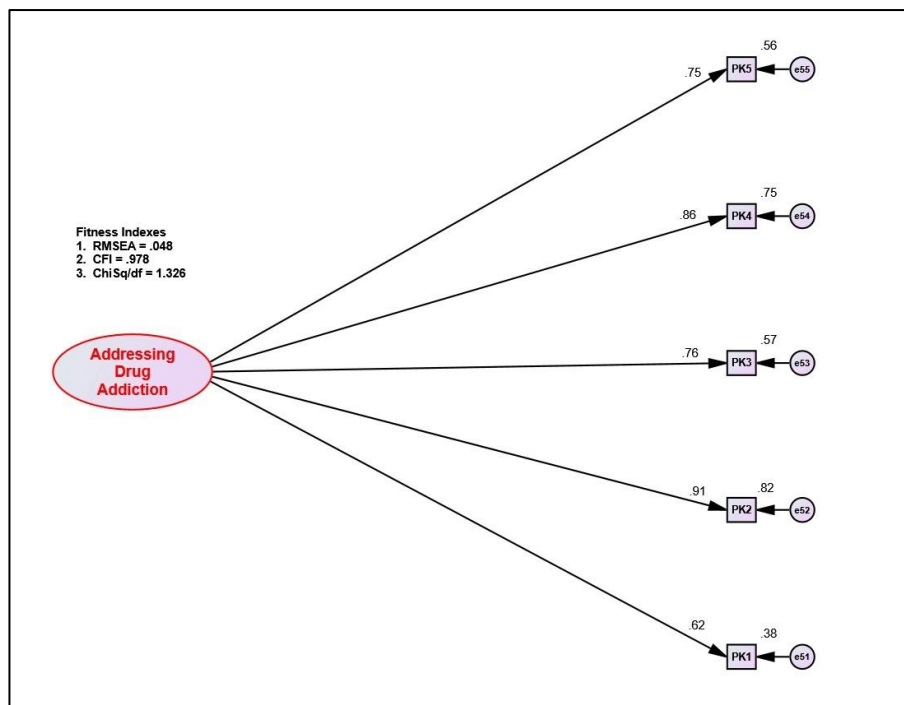
Figure 5. The Measurement Model of Dealing with Drug Addiction Construct

Combined Confirmatory Factor Analysis of All Measurement Models (*Pooled* CFA)

This Pooled CFA analysis is necessary to evaluate the correlation value between the constructs in the Discriminant Validity procedure. If the correlation value between two constructs exceeds 0.85, then there is redundancy between the two constructs (Chik & Abdullah, 2018; Hoque et al., 2017). A model involving a second order construct is a construct that has dimensions or sub-constructs where each dimension or sub-construct has a certain number of items. Researchers will have difficulty combining all the second-level constructs in one model to conduct Pooled Confirmatory Factor Analysis (Pooled CFA). The solution, all second order constructs need to be summarized into a first order construct model by taking the mean item of each sub-construct or dimension (Chik & Abdullah, 2018; Hoque et al., 2017). The results of the Pooled CFA procedure are shown in Figure 6 below. The single headed arrow value is the factor loading values of each item and the double headed arrow value is the correlation between constructs. Through the Pooled CFA method, only one model fit index that represents all the constructs is released. Table 7 below shows that all three categories of model fit index for the construct measurement model have been achieved.

Table 7

Analysis To Determine Validity for All Constructs and Sub-Constructs

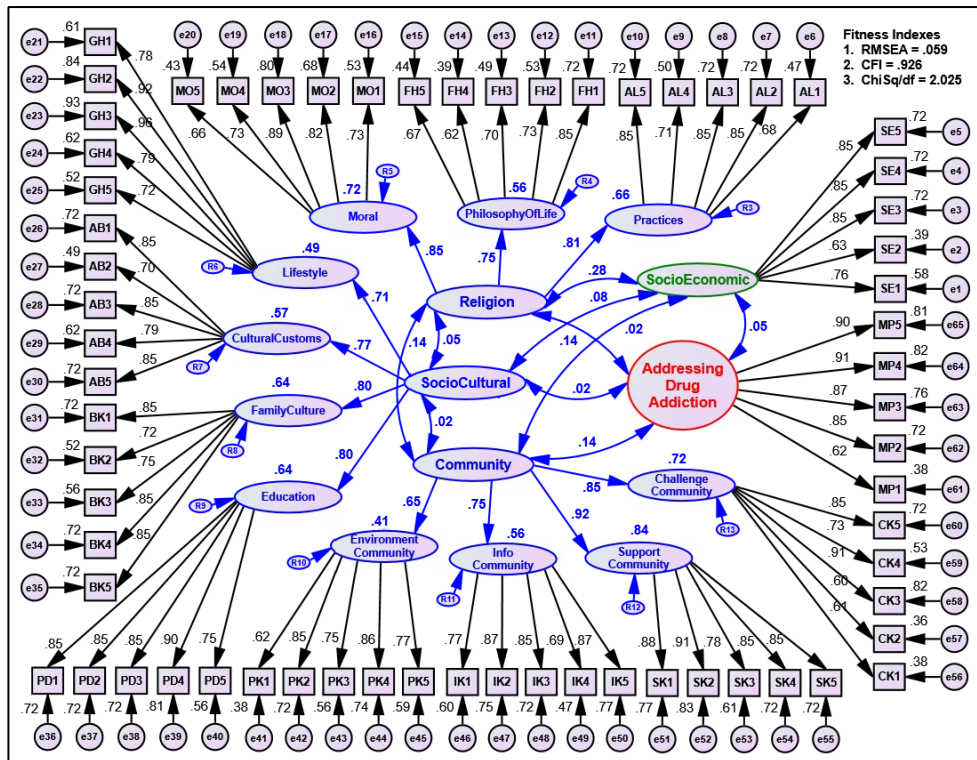| Category Name	Index Name	Index Value	Findings
1. Absolute fit	RMSEA	0.059	Reach the set level
2. Incremental fit	CFI	0.926	Reach the set level
3. Parsimonious fit	ChiSq/df	2.025	Reach the set level

Figure 6. Pooled CFA Analysis Findings

Discriminant Validity is necessary to prove that all the constructs in the model do not have a strong relationship with each other leading to the problem of multicollinearity (Chik & Abdullah, 2018; Hoque et al., 2017; Kashif et al., 2016). Table 8 below shows the Discriminant Validity Index Summary between all the constructs in the model.

Table 8
Discriminant Validity Index Summary

Construct	(a)	(b)	(c)	(d)	(e)
Religion (a)	**0.80**				
Socio-Culture (b)	0.05	**0.77**			
Community (c)	0.14	0.02	**0.80**		
Socio-Economics (d)	0.28	0.08	0.02	**0.79**	
Dealing with Drug Addiction (e)	0.14	0.02	0.02	0.05	**0.84**

Table 9 above presents the square root value of AVE for each construct on the diagonal matrix. The other values in the table are correlations between the two constructs. According to Chik and Abdullah (2018), Discriminant Validity will be achieved if all the values of the square root of AVE (Diagonal) are greater than other values whether the values are in rows or columns. Findings from Table 9 show that Discriminant Validity for all constructs in the model has been achieved.

Conclusion

Overall, the CFA analysis was carried out on the measurement model for Religious Factors (based on Practice, Philosophy of Life and Morality), Socio-Cultural factors (based on Lifestyle, Cultural Customs, Family Culture and Education), Community factors (based on

Environment, Information, Support and Challenges), Socio-Economic factors and Dealing with Drug Addiction factors among the Malay and Chinese communities in the East Coast states, Peninsular Malaysia, have reached the fitness index level. The combined results of factor analysis of all measurement models (Pooled CFA), prove that all the factors do not have a strong relationship with each other, so there is no redundancy and multicollinearity.

References
Kebangsaan, A. D. (1997). *Laporan Tahunan ADK dan Pasukan Petugas Anti Dadah, Dadah Apa Anda Perlu Tahu*, 1997.

Alias, H., & Husain, H. (2017). *Structural Equation Modelling (SEM) dan manual AMOS graphic (edisi Bahasa Melayu) Modul 1 dan 2.* Kelantan: Universiti Teknologi MARA.

Byrne, B. M. (2013). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd edition). New York: Routledge.

Chik, Z., & Abdullah, A. H. (2018). Developing and validating instruments for measurement of motivation, learning styles and learning disciplines for academic achievement. *International Journal of Academic Research in Business and Social Sciences, 8* (4), 594 - 605.

Chik, Z., & Abdullah, A. H. (2018). Effect of motivation, learning style and discipline learn about academic achievement Additional Mathematics. *International Journal of Academic Research in Business and Social Sciences*, 8(4), 772–787.

Duntemen, G. H. (1989). *Principles components analysis: Quantitative applications in the social sciences*. California: Sage Publications, Inc.

Field, A. (2006). *Discovering statistics using SPSS*. London: Sage Publications Ltd.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivatiate data analysis* (6th ed.). New Jersey: Pearson Education International.

Hoque, A. S. M. M. and Awang, Z., (2016). "The exploratory factor analysis (efa) of entrepreneurial marketing scale-development and validation." In *Tourism Conference 20-22 APRIL 2016* p. 22.

Hoque, A. S. M. M., Awang, Z., Jusoff, K., Salleh, F., and Muda, H (2017). Social Business Efficiency: Instrument Development and Validation Procedure using Structural Equation Modelling. *International Business Management, 11*(1), 222-231.

Kashif, M., Samsi, S. Z. M., Awang, Z., & Mohamad, M. (2016). EXQ: measurement of healthcare experience quality in Malaysian settings: A contextualize perspective. *International Journal of Pharmaceutical and Healthcare Marketing, 10* (1), 27 - 47.

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). New York: The Guilford Press.

Lewis-Beck M. S. (1994). *Factor analysis and related techniques*. London: Sage Publication, Ltd.

Schumucker, R. E. & Lomax, R. (2004). *A beginner's guide to structural equation modeling* (2nd ed.). Mahwah, New Jersey: Lawrence Erlbaun Associates Publishers.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics (6th ed.).* Boston, MA: Pearson.