

# THE DEVELOPMENT OF QUALITY OF LIFE INSTRUMENT

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## ABSTRACT

*The purpose of this research is to develop an instrument to measure the quality of life based on constructs or factors proposed within academic and non-academic institutions. Two different institutions were selected in the study which are Kolej Poly-Tech MARA Alor Setar (KPTM) and Muda Agriculture Development Authority (MADA). Literature review has been done and a conclusion on the key components (construct) of quality of life instrument are general health and functional status, socio-economic status, life satisfaction and self-esteem. Content validity is done with expert validation to improve the items that has been develop. Face validity is achieved by focus group in two different institutions to gain the feedback and opinion regarding the questionnaire. For pilot test, questionnaires were distributed to 50 respondents for each institution respectively. Then, the pilot test results were used to conduct reliability test – Cronbach's Alpha Coefficient and Exploratory Factor Analysis. The finding show that the reliability testing has achieved a satisfactory level by using EDA in depth understanding is obtained and cross checked with Cronbach's Alpha and EFA value. Concerning to the current findings in academic and non-academic area, the 4 constructs of Quality of Life would be maintained without the changing or reducing the total factors that emerge from the analysis.*

**Keywords:** *quality of life, content validity, face validity, factor analysis*

## **1.0 INTRODUCTION**

Quality of life (QoL) has a very broad and dynamic concept. The term QOL itself can be defined in a various way and yet, there is no commonly accepted definition among researchers about the exact definition of QOL. However, most of them had considered the aspect of cultural, social and environmental individuality may reflect the level of QOL (Lawton, 1991). To put simply, Quality of life ("QoL") is part of the social science concepts that related to human being on a daily basis (Kerce, 1992). Besides, QoL can be perceived as a subjective measure of happiness among individual or society. Apart from that, McCall (1975) and Abrams, (1973) had defined QoL as a degree of satisfaction or dissatisfaction experienced by people due to various causes from their life. Hence, it is important to identify the level of enjoyment while living every moment in life (Renwick et al, 1996). This definition is also found to be consistent with Barcaccia et al., (2013) where QoL is a life satisfaction ranging from physical health, family, education, employment, wealth, safety and security to freedom, religious beliefs and the environment.

The quality of life is also interrelated with the standard living of life within the members in family (Von Rueden et al, 2006). In fact, having a good quality of life is no exception to all regardless of any social class, gender, religion or age. Human cannot succeed without an appropriate quality of living standard. During an ancient time, the social structure is different from this era. A lot of things have been evolved from time to time and consequently, had extending the complexity of social structure as well. Due to the high intensity of technological advancement nowadays, there was a rising awareness pertaining to the quality of life improvement.

The assessment of quality of life is indeed complicated due to the vagueness area to tackle with. Any unjustified aspect that has been included may lead to unreliable and invalidated instrument. Currently, there exist a few established instruments about quality of life such as, World Health Organization Quality of Life instrument (World Health Organization, 2014), Health-Related Quality of Life instrument (Coons et al, 2000) and Oral-Related Quality of Life (Klassen et al., 2017) However, these instruments were concentrating more on health aspect rather than generic oriented instrument in which including social interaction, financial and self-esteem aspect. Hence, this study aims to design a generic instrument for quality of life and in the meantime this instrument

hopefully may encompass an extensive aspect as well.

## **2.0 LITERATURE REVIEW**

Nemeth, (2006) stated that health is one of the most important part of quality of life and it is usually indicated by five parts: physical function, psychological well-being, subjective symptoms, social function and cognitive function. Meanwhile, functional status is an individual's ability to perform normal daily activities (Leidy, 1994). There are two key divisions of functional ability (Guaraldi et al., 2014) namely activities of daily living (ADL) and instrumental activities of daily living (IADL). ADL is the self-care activities that a person performs daily such as eating, dressing and bathing. IADL is activities that are needed to live independently such as doing housework, preparing meals and using a telephone.

According to Mugenda et al., (1990), he identified that satisfaction with quality of life is also predicted by income and satisfaction with financial status. For incomes, individual who had higher incomes had significantly higher quality of life (Ferrans & Powers, 1992). Then, based on Lau & May (1998), growth of asset or sales and return of investment will affect the improvement of quality of life and property (house) also influence the quality of life (Roback, 1982). Apart from that, Ghiselli et al, (2001) indicated a strong connection between job satisfaction and quality of life and also quality of life influenced by their jobs satisfaction (Rice et al., 1992). Next, a study done by Von Rueden et al., (2006) identified that family wealth plays a part for children's physical wellbeing, parent relations and home life and perceived financial resources. According to the Max-Neef (1995), he found that for every society there seemed to be a period in which economic growth led to the improvement in quality of life. Based on Giddings et al., (2002), equity including social justice regardless of class, gender, race or where they live and participation. This means that people have the same access to decision making. In addition, satisfaction with life was related to depression, limiting pain, self-reported health, financial situation and social support (López-Ortega et al., 2016). Besides that, self-esteem consists of two related parts; the first is the sense of self-assurance in handling the challenges of life and trusting one's ability and second part including believing in success, happiness and self-respect (Hemati & Kiani, 2016).

### **3.0 METHODOLOGY**

#### **3.1 Sampling Frame**

The target respondents were selected using stratified sampling method. The entire respondents are randomly selected with no preference in age or gender. In this study, the target population focused on two different institutions. Kolej Poly-Tech Mara Alor Setar (KPTM Alor Setar) represents academic institution and Muda Agriculture Development Authority (MADA Alor Setar) represents non-academic institution. The purposes of selecting these two institutions are because this study aims to develop a generic instrument. Thus, academic and non-academic institution was selected as a sampling frame in this study.

#### **3.2 Development of Quality of Life (QoL) instrument**

The development of Quality of Life (QoL) instrument involved three main phases. The first phase is the construct identification. Second phase is item selection for each construct. The final phase is the content validity, reliability testing and data analysis (Che Ahmad et al., 2015).

i. **First Phase: Construct Identification**

In this phase, the construct of QoL will be identified through any relevant literature. All possible literature will be reviewed in order to identify the construct that optimally represent the QoL measurement.

ii. **Second Phase: Item Selection**

Once the construct have been identified, the item for each construct will be selected. The items were also selected through reviewing past literature pertaining to QoL. All these selected items will be validated through two validation process; content validity and face validity. This validation process is important in order to ensure the selected items can reflect the sense of QoL And besides, the selected items could maximize the level of honesty and accuracy from the respondent as well (Connell et al., 2018).

a. **Content Validity**

The content was validated by an expert who is a senior lecturer and researcher in knowledge sharing behavior in human development at School of Quantitative Sciences, Universiti Utara Malaysia. She

is also a member of Qualitative Research Association Malaysia (QRAM). From the expert reviewing process, all the comments was taken into consideration and further improvement to the items was done such as wording and sentences used. Meanwhile, no addition or reduction of the number of items selected in this study since the content was considered appropriate and compatible by the expert.

b. Face Validity

c.

Face validity is the validation process that involve with a potential respondent. Since the targeted respondent for the pilot study is among Kolej Poly-Tech Mara Alor Setar (KPTM) and Muda Agriculture Development Authority (MADA) employees, then 8 respondents from KPTM and 4 respondents from MADA were selected as a focus group for face validity purposes. The instrument was distributed to this focus group and any comment and criticism about the instrument was taken into account. This process can provide a better overview about the understanding of each items and whether the items and measurement scale were correctly constructed.

iii. Third Phase: Field Testing and Data Analysis

Once the instrument was validated, a pilot study is conducted to the selected respondents from KPTM and MADA staffs. 100 respondents were selected through stratified random sampling comprising 50 respondents from KPTM and 50 respondents from MADA. The result obtained from the pilot study will be used for reliability testing. Reliability testing was done to examine the consistency of the items. And it is done through exploratory data analysis, factor analysis and Cronbach's alpha value. Cronbach's alpha of 0.6-0.7 indicates acceptable reliability, and 0.8 or higher indicates good reliability. High reliabilities (0.95 or higher) are not necessarily desirable, as this indicates that the items might be redundant.

### 3.3 Measurement Scale

The numerical scales (interval scales) was used to measure the quality of life. It is the suitable scale that can be used in this study as it is more sensitive considering that the numerical scales have numbers as response options to identify categories or response position rated by the respondents. The items can be scored on either a numerical range of 1 (Extremely Disagreed) to 7 (Extremely Agreed). Then, the result score was categorized into four equal interval that represent the level of agreement that showed in the Table 1 below.

Table 1: Level of agreement by respondents

No.	Level of Agreement for Quality of Life	Interval range
1.	Extremely Disagreed	1 – 2.49
2.	Disagreed	2.5 – 3.99
3.	Agreed	4.0 – 5.49
4.	Extremely Agreed	5.5 – 7.0

### 3.4 Measurement Index

Indexes scores are designed, which involves determining their score ranges and weights for the items. Finally, indexes should be validated, which involves testing whether they can predict indicators related to the measured variable not used in their construction.

Figure 1 below shows the measurement index for Quality of life scores using norm which yields an estimate of the position of the tested individual in a predefined population, with respect to the trait being measured. The estimate is derived from the analysis of test scores and possibly other relevant data from a sample drawn from the population. Norm referencing gives meaning to scores by comparing them to values for a specific norm group. The percentages of 0-30 consider as poor, while 30-70, moderate and 70-100 percent are good.

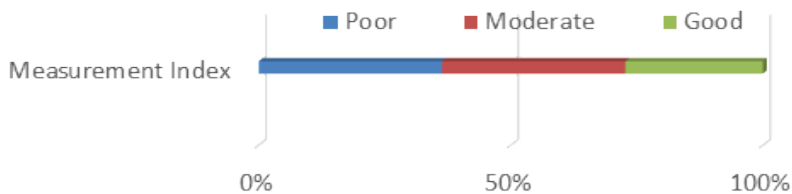


Figure 1: Measurement Index

## 4.0 RESULT

This section explains the justification of each item selected in QoL instrument and its validity and reliability were determined.

i. First Phase: Construct Identification

After going through an extensive review of the literature, four constructs were identified in which literally can represent the QoL as stated by George & Bearon, (1980). The constructs are Socio-Economic status, General Health and Functional status, and Self-esteem and Life satisfaction.

ii. Second Phase: Item Selection

Based from these 4 constructs, 25 items were selected to be inserted in the instrument. After going through the validation process, these 25 items is retained as well. The selection of this items was summarize as shown in table 2.

Table 2: Item selection

Constructs of Quality of Life	No. of Items	Items Description
1. B: General health & functional status	7	Physical, psychological, subjective symptoms, social and cognitive function (Leidy, 1994). Activities and instrument of daily living (Guaraldi et al., 2014)
2. C: Socio-economic status	6	Financial Strength (Ferrans & Powers, 1992; Mugenda et al., 1990). Own of Asset (Roback, 1982). Job Satisfaction (Ghiselli et al., 2001; Rice et al., 1992) Family Well-Being (Von Rueden et al., 2006). Local Economic Status (Max-Neef, 1995). Environment and Society (Giddings et al., 2002)
3. D: Life satisfaction	6	Health, Standard of living, personal relationship, Feels Secured, vision and mission (López-Ortega et al., 2016)
4. E: Self-esteem	6	Confidence Level, Dream Goal, Positive Minded, Handle Criticism, Societal Interaction and Handling Stress (Hemati & Kiani, 2016)

After validation from the expert, the draft instrument was distributed to the respondents in the focus group for face validity. It found that a respondent from KPTM Alor setar completed the instrument within 10 minutes. Meanwhile, each respondent in MADA completed the instrument within 10 to 20 minutes. Besides, most of the respondents understood the items and only two respondents from the supporting staff category from both institutions preferred to answer the instrument in Bahasa Malaysia version. Thus, the instrument was produced in English and Bahasa Malaysia versions according to the level of respondents' understanding before the pilot study done. Table 3 shows the items that have been revised after consultation with the expert.

Table 3: Revised item

Item	Revised Item
19: I have a bright future	I have a clear vision for my life
25: I can handle problems well	I can handle problems very well

iii. Third Phase: Field Testing and Data Analysis

Once the instrument was validated, a pilot study is conducted to the selected respondents from KPTM and MADA.

a. Reliability testing

The reliability testing has been done using pilot study from both institutions and were analyzed separately. Analysis of the findings showed that the values of Cronbach's Alpha reliability of the four constructs of the quality of life were in the range of 0.736116 to 0.898714 for KPTM Alor Setar while 0.790587 to 0.885413 for MADA as shown in Table 4.

Table 4: The Cronbach's alpha value

Constructs of Quality of Life	KPTM Alor Setar	MADA
	Conbach's Alpha	Conbach's Alpha
1. B: General health & functional status	0.840827	0.790587
2. C: Socio-economic status	0.736116	0.830305
3. D: Life satisfaction	0.898714	0.885413
4. E: Self-esteem	0.877668	0.859988



Based on the Cronbach’s Alpha value for both institutional, the instruments are highly reliable and proves that this instrument have good internal consistency.

- b. Reliability testing using EDA (via box plot), EFA factor loading, Cronbach’s Alpha value and Cronbach’s Alpha if item deleted

Table 5: Reliability testing on construct general health and functional status

General health & functional status				
Items	EDA (Boxplot)	EFA Factor Loading	Cronbach Alpha if item deleted	
B1	<p>The values of the columns being stacked.</p> <p>The name of the column...hich the value came.</p>	0.67896	0.826373	
B2		B1: I am able to do any regular physical activities	0.75000	0.798310
		B2: I am happy with my life	0.36611	0.855239
B3		B3: I still remember my childhood moments	0.61771	0.806501
		B4: I can handle my stress	0.34404	0.845666
B4		B5: I always visit relatives or friends	0.70977	0.784396
		B6: I always visit relatives or friends	0.72575	0.809546
B5	B7: I always visit relatives or friends		<b>Overall:</b> 0.840827	
B6				
B7				

The box plot in Table 5 shows most of the respondent answers were between 4 to 6. Overall Cronbach’s Alpha for 7 items is 0.8408. Two items have the lowest EFA factor loading that are Item B3 (I still remember my childhood moments) and item B5 (I always visit relatives or friends). Item B3 factor loading is equal to 0.36611 while item B5 factor loading is 0.344. If item B3 deleted, Cronbach’s Alpha will increase to 0.855. No significant different if the item deleted.

However, the study decides to retain the items since all the Cronbach Alpha values were in level of good reliability and box plot show the consistency as well. Childhood moment might be correlated with private relationship with relatives and friends. The moment might be affected if the respondent having bad memories with relative or friends in the past. The positive history of childhood moment would increase the social acceptance among friends and eventually rising up the tendency to socialize such as through visiting a friends and relatives (Shiner et al., 2003).

Table 6: Reliability testing on construct socio-economic status

Socio-economic status				
Items	EDA (Boxplot)		EFA Factor Loading	Cronbach Alpha if item deleted
C1	<p>The values of the columns being stacked. The name of the colum...which the value came.</p>		0.61533	0.670264
C2			0.46543	0.716238
C3			0.65374	0.720953
C4			0.36828	0.767042
C5			0.53240	0.672957
C6			0.71446	<b>Overall:</b> 0.736116

The box plot in Table 6 displays most of the respondent answers were between 4 to 6. The respondents' answers are consistent. Overall Cronbach Alpha for 6 items is 0.736116. Items have the lowest EFA factor loading; C2 (I am satisfied with my asset and property) and item C4 (I want to raise my kids in the way I've been raised). Item C1 and C4 having low factor loading but deleting the item would not change much on the Cronbach Alpha value. We strongly believe the item belong to this construct. The justification is the respondent might come from the low income earners family in which had affected the respondent to earn insufficient income too. As consequences, he/she tend to have some discontentment of how he/she being raised by his/her parent. According to Moskvicheva et al., (2016) parents-children relationship can influence the future profession of the child. Hence, the way of the child being raised, consequently would affect their future as well.

Table 7: Reliability testing on construct life satisfaction

Life satisfaction				
Items	EDA (Boxplot)		EFA Factor Loading	Cronbach Alpha if item deleted
D1	<p>The values of the columns being stacked.</p> <p>The name of the column...which the value came.</p>		0.65686	0.891623
D2			0.76582	0.877593
D3			0.79815	0.864649
D4			0.64765	0.897123
D5			0.68536	0.883216
D6			0.84051	0.868503
			<b>Overall:</b> 0.898714	

The box plot in Table 7 displays most respondent answers are consistent between 4 to 6. The overall Cronbach Alpha for six items is 0.8987, which is good reliability. The value of EFA factor loading for all 6 items are greater than 0.648. Therefore, all six items in this construct of life satisfaction are reliable.

Table 8: Reliability testing on construct self-esteem

Self-esteem				
Items	EDA (Boxplot)	EFA Factor Loading	Cronbach Alpha if item deleted	
E1	<p>The values of the columns being stacked. The name of the col...hich the value came.</p>	E1: I have a lot of things to be proud of	0.65084	0.874635
E2		E2: I believe that I can achieve my dream	0.71635	0.875219
E3		E3: I am positive-minded person	0.69663	0.856541
E4		E4: I am comfortable meeting with a new person	0.68560	0.848460
E5		E5: I can handle criticism	0.71700	0.843257
E6		E6: I can handle problems very well	0.78621	0.836949
				Overall: 0.877668

The box plot in Table 8 shows most respondent answers were between 4 to 6. A very consistent pattern of the box-plot. Overall Cronbach Alpha for all 7 items is 0.8777, having good reliability. The value of EFA factor loading for all

6 items are greater than 0.686. Therefore, all items in construct of self-esteem are reliable.

### c. Construct Validity

Construct validity was investigated, as described below, employing the principal component factor analysis with Varimax rotation and Kaiser Normalization. In this study, only those items with a factor loading of at least 0.40 on their own scale were kept in the refined instrument. The Kaiser-Meyer-Olkin Test (KMO) value of the study data were 0.8045 and 0.776 for both Kolej Poly-Tech MAra and MADA which sufficient for conducted the factor analysis. The Principal Component Analysis (PCA) procedure was carried out using orthogonal rotation (varimax) in determining the factors and items contained therein. According to Field (2000), values of KMO between 0.8 and 0.9 are very good and suitable for factor analysis.

As per Table 9 below, the factor analysis suggested six constructs should be retained. This also consistent with the result of eigenvalues of the covariance matrix and the scree plot. From the eigenvalues, six constructs should be retained since the eigenvalues greater than 1.1150 (average of eigenvalues) are significant. From the scree plot below, it can be seen that the curve begins to flatten between factors 6 and 7. Note also that construct 7 onwards have an eigenvalue of less than 1.1150, so only 6 constructs have been retained. This can be seen that the result of EFA is contradict with the original instrument are developed based on the literature review.

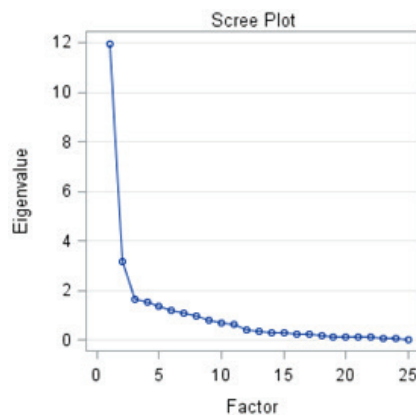


Figure 1: Scree plot

Then the factor analysis proceed to rotation and the result is as shown in Table 3.10. After the rotation, factor loading closer to 1 or -1 will be more likely to affect the variable while a factor loading of zero would indicate no effect.

Table 9: Rotated factor pattern

Rotated Factor Pattern						
	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
D5	0.81216	0.32551	-0.14457	-0.20536	0.03592	0.05250
D3	0.81097	0.20842	0.10396	0.17013	0.05274	0.23789
D2	0.77500	0.18073	0.11848	0.21909	0.00502	0.26328
D6	0.72171	0.31060	0.31497	0.11064	0.15089	0.07558
E2	0.67925	0.20041	0.23532	0.01808	0.05799	0.21081
E1	0.67596	0.09963	0.16718	0.27678	0.03296	0.09560
D4	0.66394	0.25261	0.21005	-0.03621	0.01857	-0.12676
D1	0.66216	0.02646	0.43469	-0.04706	0.16014	0.07467
C6	0.57896	0.11113	0.46002	0.26983	0.34437	-0.05889
B4	0.12243	0.78362	0.13797	-0.07677	0.22376	0.11783
B7	0.26099	0.77014	0.25783	0.19584	-0.09204	0.09542
B5	-0.09260	0.68110	-0.09764	0.27069	0.06848	0.03655
E3	0.40913	0.65116	-0.02456	0.28658	-0.04569	0.10884
B6	0.17461	0.64771	0.23051	0.11406	0.20491	0.51655
E6	0.47991	0.64359	0.15408	0.31453	0.01794	-0.05671
B2	0.39504	0.62782	0.18358	-0.16744	0.19855	0.29212
E4	0.47667	0.62599	-0.04787	0.05165	0.34900	-0.29079
C3	0.38033	0.61312	0.20403	-0.21118	-0.10863	0.18778
E5	0.38145	0.57482	0.11451	0.38576	0.37750	-0.21128
C1	0.15539	0.41977	0.78886	0.01280	-0.01796	0.09097
C2	0.47491	-0.22783	0.67015	-0.19068	0.37087	0.00202
C5	0.25476	0.13748	0.58390	0.31366	-0.06573	0.26632
C4	0.12065	0.18833	0.05903	0.87093	0.03890	0.07663
B3	0.06868	0.17663	0.05587	0.03446	0.85892	0.18093
B1	0.43019	0.22190	0.17722	0.09341	0.22259	0.75434

Based on the result of factor rotation, 6 constructs were organized by highest absolute loading. In construct 1, it consists of 9 items that ranging from 0.57896 to 0.81216 with D5 is a highest loaded item. For construct 2, it has 10 items that ranging from 0.574820 to 0.78362 with B4 is a highest loaded item. Furthermore, construct 3 encompasses 3 items that ranging from 0.58390 to 0.78886 with C1 is a highest loaded item. Then, every construct 4, 5 and 6

contain one item only. It can be seen that the result was different with the initial design of instrument. The new construct based on the factor rotation are described in Table 10 below. However, we decided to maintain with the four constructs of Quality of Life that we had proposed before without the changing or reducing the total factors that emerge from the analysis as stated at each construct above.

Table 10: New construct of quality of life using EFA

Item No.	Construct 1
D5	I feel secured with my surrounding.
D3	I am satisfied with my achievement in life.
D2	I am satisfied with my health.
D6	I have a clear vision.
E2	I believe that I can achieve my dream
E1	I have a lot of things to be proud of
D4	My personal relationship is going well.
D1	I am satisfied with my standard of living.
C6	I participate and living comfortably in the society
	Construct 2
B4	I can handle my stress
B7	I enjoyed doing household chores
B5	I always visit relatives or friends
E3	I am positive-minded person
B6	I can handle daily routines well
E6	I can handle problems very well
B2	I am happy with my life
E4	I am comfortable meeting with a new person
C3	I love my current job
E5	I can handle criticism
	Construct 3
C1	My monthly expenses do not exceed my income
C2	I am satisfied of my asset and property (house)
C5	I can survive in this current economic state.
	Construct 4
C4	I want to raise my kids in the way I've been raised.
	Construct 5
B3	I still remember my childhood moments
	Construct 6
B1	I am able to do any regular physical activities

#### **4.1 Discussion**

The purpose of the study was to develop a valid and reliable instrument that has the capability to assess

Quality of Life for different participants from various institutions. As a result, QoL instrument contains 4 construct with a total of 25 items, General health & functional status (7 items), Socio-economic status (6 items), Life satisfaction (6 items) and Self-esteem (6 items).

The study found that, the QoL instrument have good content and construct validity as well as high reliability. The number of items was appropriate for respondents to answer. Besides that, it is user-friendly; the grammar and words used in QoL instrument are simple and easy to understand. It is also very economical to use in terms of time and cost efficiency. Besides that, this instrument can be used for various respondents. Although this instrument does not consider other elements that can be included in the construct, so therefore, any improvement must take into account other elements.

#### **5.0 CONCLUSION**

The paper reports the development and validation of an instrument which is designed to measure the quality of life. The development of the QoL is addition to existing QoL instruments. The findings confirm the validity and reliability of the QoL instrument and can be used for academic or non-academic institution. However, extensive research is needed to further refine the instrument by including different characteristics of the respondents to create more valid and reliable measures of the quality of life.

Concerning to the current findings in academic and non-academic area, the four constructs of Quality of Life would be maintained without the changing or reducing the total factors that emerge from the analysis. The same questionnaire will be used for future main study and the same analysis procedure will be performed with the large sample size determination.



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