

THE PSYCHOMETRIC EVALUATION OF THE SUBJECTIVE HAPPINESS SCALE-PHYSICALLY DISABLED (SHS-PD) IN MALAYSIA

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Abstract

Promoting happiness has become a key intervention goal for people with the physically disabled. This study examined the Subjective Happiness Scale-Physically Disabled (SHS-PD) construct validity, convergent validity, internal consistency reliability, and quality item. The 58-item SHS-PD comprises six subscales: Satisfaction, emotion, self, spirituality, the meaning of life, and positive thinking. This study used a sample of 290 persons with physical disabilities to demonstrate the psychometric validity of the scale. Exploratory factor analysis (EFA) used to explore the construct validity of the SHS-PD while tested the convergent validity with the Sense of Well-Being Inventory (SWBI) and Satisfaction with Life Scale (SWLS). A reliability study will carry out to explore SHS-PD, SWBI, and SWLS internal consistency. EFA conducted in this investigation showed four sub-scales for the dimensions of subjective happiness among people with physical disabilities, i.e., spirituality, emotion, self-efficacy, and satisfaction with accessibility. The result showed that SHS-PD has high internal consistency reliability, Cronbach's alpha ranged between .68 and .93, and split-half ranged between .65 and .94. Findings indicated that 18 correlations are positive and significant with the total scores of SHS-PD, three are negative and significantly correlated, and four are adverse and not significantly correlated. This study will discuss the theoretical and practical implications of these findings.

Keywords: Subjective Happiness, People with Physical Disabilities, Construct Validity, Internal Consistency Reliability

INTRODUCTION

Positive Psychology is the science of positive experience, positive individual traits, and positive institutions that enhance the quality of life and prevent pathologies from occurring [32]. However, studies of happiness were established long ago (e.g., [1, 8, 10]) found out that happiness is a complex thing as it is hard to judge whether certain situations make people happier than others. In their studies, they discovered that lottery winners are not as delighted as neutral participants, and the happiness of lottery winners does not differ significantly with accident victims. [8] investigated the relationship between personality and happiness, review subjective well-being [10], demographic factors of happiness [11]. Wilson [35] conducted studies on avowed happiness and concluded that a happy person is characterized by young, healthy, well-educated, well-paid extroverted, optimistic, worry-free, religious, and married with high self-esteem. The concept of happiness has originated long ago by Aristotle, who forwarded the ideas of eudaimonia and hedonism.

Fredrickson [15] has developed the broad-and-build model, emphasizing how positive emotions serve as an essential tool in proper human functioning in terms of thoughts and actions. According to [15] positive emotions provide resources in decision-making and coping with future challenges. The model evolved into a theory (i.e., broad-and-build theory) in the year 2001 [17]. The strength of positive emotions is indeed a powerful tool. Positive emotions facilitate human flourishing as an individual but also helpful in strengthening and stabilizing organizations [16].

Likewise, a good ratio of positive emotions is 3:1, which indicates that an individual requires at least three positive emotions and one negative emotion [18, 19]. Too much positivity will not be good because if the frequencies of positive emotions are too high, like 11:1, for instance, the overloading of positive emotions might reduce the effect of positivity [19]. The same goes for negative emotions: individuals need a little bit of negativity to serve as a driving force to complete specific tasks. Although the idea of a positivity ratio [19] is challenging, [18] stated that while negative emotion dominates through intensity, positive emotions strive through frequencies.

Despite the numerous amounts of studies on happiness established, there are still insufficient studies exploring persons with physical disabilities, especially in the context of subjective happiness in Malaysia. Several studies regarding people with disabilities have been carried out previously (e.g., [22, 24, 25, 26, 27, 28]) but these studies have only focused on people with intellectual disabilities in medical perspectives. In addition, the location of the studies stated above has been carried out in Taiwan only. Undeniably, there are also studies regarding the person with physical disabilities as well as their happiness. According to [7], nursing models that have been practicing do not help identify the self-concepts of people with spinal cord injuries. In another study has been investigated effective coping with disabilities.

OBJECTIVE

Campen and Iedem [5] stated that people with disabilities presented with a low level of subjective well-being when participating in the societal activity. [29] argued that people with disabilities in Croatia possessed a lower level of happiness than people who do not. In Malaysia, several writers have carried out studies of happiness [33, 34]. Despite that, research regarding people's happiness with physical disabilities in Malaysia has only established by Dunn et al. [14], but the study did not provide empirical evidence to support their findings. Myer and Diener [30] argued that subjective well-being could define as the presence of positive affect, the absence of negative affect, as well as life satisfaction. However, how far the definition of subjective well-being presented by Myers and Diener represents people with physical disabilities in Malaysia is unclear. Based on the qualitative findings from Bullare@ Bahari [2], this study sought to test the validity and reliability of the Subjective Happiness Scale for persons with physical disabilities in Malaysia.

METHODOLOGY

a) Research Design

A descriptive survey study design for validation of the SHS-PD in Malaysia was conducted to people with physical disability and examine its psychometric characteristics. Specifically, construct validity, internal consistency reliability, and convergent validity of this scale was evaluated.

b) Participants

Study participants were individual with physically disabled. A total of 290 physically disabled participants involving 203 males and 87 females were selected to be the subject of this study. The age of the samples chosen ranged from 13 to 84 years old. The average age of respondents is 36.6 years old (S.D = 17.4).

Gender	Participants
Female	203
Male	87
Total	290

The sample size involved is sufficient to conduct a factor analysis, as Hair et al. [21] stated. Subjects were selected using purposive sampling based on physical disability. Most respondents are unemployed (86.2%), and 5.9% of respondents are self-employed. Only 3.8% are working in a non-government organization, 2.8% are working in a government organization, and 1.4% are retired government servants.

In terms of religion, most of the respondents are Moslem (71.0%). Other than that, respondents are Christian (23.1%), Buddhist (5.5%), and Hindu (0.3%). It is also showed that most respondents fell into the category of Bumiputera (79.7%), followed by the Chinese (10.3%), Malay (8.3%), and finally Indian (1.4%). As far as marital status is concerned, 70.0% are not married, 21.7% are married, 6.2% of their partners had passed away, and 2.1% were divorced. In terms of the location of residence, more than half of respondents (65.2%) were from the east coast of Sabah, Malaysia, followed by southwest coast Sabah, Malaysia (20.3%), northwest coast of Sabah Malaysia (9.7%), and finally inland of Sabah Malaysia (4.8%).

Another demographic factor is the educational level. Almost half of the respondents (47.2%) did not receive formal education. Half of the participants have received formal education until secondary school (51.7%), and only 1.0% succeeded in obtaining a bachelor's degree. Mean years of formal schooling received are very short, which is 4.8 years (S.D = 4.88). The intervals of the educational period for participants are between 0 to 16 years. The mean monthly income of families is below the poverty line (RM391.50; S.D = 637.6).

There are 80.7% of the subjects categorized into acquired physical disability, while the rest classified as having a congenital physical disability. Specifically, 25.2% suffered from spinal cord injury, lost part of their body [i.e., Legs (18.6%), hand (7.2%)], cerebral palsy (13.8%), congenital limb defect (8.6%), acquired weak body parts [body, legs, hand (6.9%)], acquired limb defect (6.6%), congenital weak body parts [i.e., body, legs, hand (5.5%)], polio (4.1%), dwarfism (1.4%), spina bifida (1.0%), multiple physical disabilities (0.7%) and 0.3% suffered from brain injury. Almost half of the respondents (46.2%) became physically disabled due to sickness, followed by accidents (31.0%), since birth (19.3%), and since childhood (3.4%).

In addition, data analysis also showed that 49.7% of the participants are not using any supporting equipment, 37.2% are using a wheelchair, followed by 6.2% are using crutches, 3.4% are using various assistive devices (e.g., Artificial hands and legs). The average age of respondents becoming physically disabled is 28.2 years old, and the average duration of becoming physically disabled is 14.6 years.

c) Instruments

This study is using a set of questionnaires known as the Instrument of Subjective Happiness for Physically Disabled (ISHPD), which contains the Subjective Happiness Scale-Physically Disabled (SHS-PD), Sense of Well-Being Inventory (SWBI) by Chapin et al. [6], and Satisfaction with Life Scale (SWLS) by Diener et al. [12].

• *Socio-demographic Characteristic*

An investigator-developed form was used to collect data on the socio-demographic characteristics (age, gender, ethnicity or race, marital status, religion, education level, job, and monthly income), the category of physical disability, reason of disability, period of disability, an assistive device used, quantity of support received, medical histories, and treatment histories of respondents.

• *Subjective Happiness Scale-Physically Disabled (SHS-PDs)*

The researcher himself developed the SHS-PD. The development of the instrument is based on the findings by Bullare@ Bahari [2]. The processes of developing SHS-PD are carried out based on the guideline provided by Creswell et al. [9] and Rosenbaum [31]. The scale consists of six sub-scales and representing by 58 items. After the data has analysed using factor analysis with the method of Principal Component Analysis (PCA) with oblique rotation (Promax), this scale shrunk into four

sub-scales and represented by 25 items. Table 1 shows the sub-scale and number of items of SHS-PD before and after factor analysis.

Table 1:
Sub-Scale and Number of Items in SHS-PD Before and After Factor Analysis

Before Factor Analysis		After Factor Analysis	
<i>Sub-scale</i>	<i>No. of Items</i>	<i>Sub-Scale</i>	<i>No. of Items</i>
1. Satisfaction	14	1. Spirituality	8
2. Emotion	11	2. Emotion	7
3. Self	11	3. Self-efficacy	7
4. Spirituality	8	4. Satisfaction towards accessibility	3
5. Meaning of Life	8		
6. Positive Thinking	6		
Total	58	Total	25
Range of Scores	58 – 290	Range of Scores	25 – 125

* Factor analysis using method *PCA* with oblique rotation (Promax); weighting factor 0.50

The SHS-PD consists of five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). The maximum scores of participants for the original scale are 290, and the minimum score is 58. Likewise, on the modified scale (25 items), the maximum score of respondents is 125, and the minimum score is 25. Higher scores indicate that the respondent possesses a high level of subjective happiness. The SHS-PD also contains seven reverses (negative) items that fall into the dimension in the sub-scale of emotion. The following are examples of items in SHS-PD:

Item:	Sub-scale:
• I leave everything to God for what has happened to me.	Spirituality
• I accept the decree of God to me.	Spirituality
• I feel bored. *	Emotion
• I am stressed. *	Emotion
• I can satisfy others.	Self-efficacy
• I feel satisfied when I can live freely without being controlled.	Self-efficacy
• I am satisfied with assistive devices or supporting equipment that I am using now.	Satisfaction with accessibility
• I am satisfied with the ease of access provided for a disabled person.	Satisfaction with accessibility

* Reversed item

Besides SHS-PD, the researcher also used two other scales that measure happiness: The Sense of Well-Being Inventory (SWBI) by Chapin et al. [6], and the Satisfaction with Life Scale (SWLS) by Diener et al. [12]. Both scales use to identify the convergence validity of SHS-PD.

• ***Psychological Well-being in SWBI.***

There is a sub-scale that measures the psychological well-being (PWB) of a physically disabled person. It consists of seven items: five negative items and two positive items. SWBI is introduced by Chapin et al. [6]. SWBI consists of a four-point Likert scale ranging from 1 = strongly disagree to 4 = strongly agree. The Malay version of SWBI is translated from the original version using back-translation. Then, SWBI is explicitly modified to measure the psychological well-being of a

physically disabled person and individuals who live with a physically disabled person who suffered from spinal cord injury. The PWB has a solid internal consistency for physically disabled samples (0.79). The following are seven items in PWB:

Item:	
• I always feel sad.	Reversed item
• I am satisfied with myself.	Not Reversed item
• I am always worried.	Reversed item
• I am disappointed with my disability.	Reversed item
• People judge me differently because of my disability.	Reversed item
• I feel lonely.	Reversed item
• I am satisfied with my physical appearance.	Not Reversed item

- ***Life Satisfaction.***

SWLS is introduced by Diener et al. [12], which contains five items and the total of scores measure life satisfaction globally (i.e., higher scores, high life satisfaction). The Malay version has translated from the original version by Bullare@ Bahari et al. [4]. Previous studies showed that SWLS has a high internal consistency ranging from 0.66 and 0.81. Kortte et al. [23] have used SWLS to measure the life satisfaction of Physically Disabled persons who suffered from spinal cord injury and found that the internal consistency of SWLS was 0.79. The following are items in SWLS:

Item:
• In most ways my life is close to my ideal.
• The conditions of my life are excellent.
• I am satisfied with my life.
• So far, I have gotten the important things I want in life.
• If I could live my life over, I would change almost nothing.

d) Data Collection

The data collected in the quantitative phase involved three methods. There are:

- Administration of ISHPD directly: face-to-face with respondents,
- Online survey and,
- E-mail survey.

The researcher has carried out direct administration of ISHPD and supported by enumerators hired by the researcher. Before the questionnaire administering, enumerators had been briefed about the questionnaire's content to confirm that enumerators understand each item clearly. The researcher also discussed the method of administration of the questionnaire, ethics while administering questionnaires, and their responsibilities as an enumerator. Eight enumerators assisted the researcher in the data collection, and all enumerators had parents with physical disabilities, which provide an advantage due to some knowledge about the conditions and circumstances of a physically disabled person. As a token of appreciation, each enumerator does reward for each questionnaire administered. Each respondent is also given consolation for their participation.

Two alternatives use to obtain answers in the immediate survey process. First, the respondents themselves answer the questionnaire (self-administered), or second, respondents are assisting by enumerators by reading each item in ISHPD and mark the answer for them. There are no problems

for respondents who have received an education in answering the questionnaire themselves, but enumerators and the researcher monitor the process to clarify confusion for each item could be explained. For respondents who could not read, they are assisting by enumerators. In the actual study, $n = 255$ (88.0%) answered the questionnaire themselves.

The second method is an online survey. The researcher himself developed an online questionnaire for people with physical disabilities. The online survey makes it easier for people with physical disabilities to participate. However, they would need a computer or hand-phone with internet services to do so. Only 30 participants (10.3%) have used this method and the average time of questionnaire completion ranged from 15-20 minutes. The final method used in data collection is an e-mail survey. Through this method, the researcher himself e-mailed a copy of ISHPD to a specific respondent. Respondents self-administered then download the questionnaire. After completion, respondents resend the completed questionnaire to the researcher. Only five participants (1.7%) have used this method.

e) Data Analysis

The data collected are analysed using descriptive statistics (e.g., Frequency, average, range, and standard deviation). First, descriptive statistics use to explore profiles and characteristics of respondents' physical disabilities. Second, construct validity, dimensions, and sources of happiness of people with physical disabilities tested with factor analysis using Principal Component Analysis (PCA) with oblique rotation (Promax). Factor analysis is a method to identify whether each item possessed a high weighting value for each section or construct represented. It is also a statistical method to test the relationship of scores produced by each construct [3]. According to Hair et al. [21], the researcher considers the factor analysis' criteria and assumptions. It's shown in Table 2.

Table 2:
Criteria of factor analysis based on Hair et al. (2012)

No.	Matter	Criteria by Hair et al. (2012)
1.	Kaiser-Meyer-Olkin measure of sampling adequacy (KMO)	Range = 0.5 – 0.7
2.	Bartlett's test of sphericity	< .05
3.	Anti-image correlation matrix of items	0.50 and above
4.	Communalities of the variables	0.50 and above
5.	Factor loadings	0.30 and above
6.	Factors with eigenvalues greater than 1	> 1
7.	Percentage of variance usually explained 60% or higher.	60% and above

Third, convergent validity test by using Pearson correlation coefficient. The convergent validity chooses because it can explore the relationship between scores of four dimensions of subjective happiness. Furthermore, convergent validity can also explore the relationship between four dimensions of subjective happiness and eight sources of subjective happiness with standard scales (i.e., PWB and SWLS).

Obtained convergent validity by exploring the correlation between four sub-scales of subjective happiness (i.e., Spirituality, emotion, self-efficacy, and satisfaction with accessibility).

Besides the correlation between four sub-scales, also obtained convergent validity by investigating the correlation between four sub-scales with standard happiness scales that measured the same concept (i.e., PWB and SWLS). Convergent validity is acquired when the value of the correlation is high [20].

The internal consistency for SHS-PD, PWB, and SWLS are analysed using Cronbach Alpha coefficient methods. Next, the quality of items in SHS-PD is also analysed using the Pearson correlation coefficient. The researcher has studied the correlation between items with total scores for dimensions of subjective happiness of a person with physical disabilities—the data analysis carrying out by using IBM SPSS Statistics version 27.0.

RESULTS

a) *Construct validity of SHS-PD*

In this study, the researcher used the exploratory factor analysis (EFA) to explore and identify total factors produced by Dimensions of Subjective Happiness Scale-Physically Disabled (SHS-PD). A total of 290 people with physical disabilities have answered 58 items of the SHS-PD. After factoring analysis has been conducted using Principal Component Analysis (PCA) with oblique rotation Promax and the weighting value of 0.50, the SHS-PD shrunk into 25 items; thus, it produced four factors. The findings of factor analysis base on the criteria and assumptions proposed by Hair et al. [21] shown in Table 3.

Table 3:
Criteria and results of factor analysis (Promax) for the SHS-PD

No.	Matter	Criteria by Hair et al. (2012)	Findings
1.	Kaiser-Meyer-Olkin measure of sampling adequacy (KMO)	Range = 0.5 – 0.7	0.94
2.	Bartlett's test of sphericity	< .05	0.000
3.	Anti-image correlation matrix of items	0.50 and above	Range = 0.87 – 0.97
4.	Communalities of the variables	0.50 and above	Range = 0.5 – 0.74
5.	Factor loadings	0.30 and above	Range = 0.52 – 0.89
6.	Factors with eigenvalues greater than 1	> 1	Range = 1.3 – 10.7
7.	Percentage of variance usually explained 60% or higher.	60% and above	63.9%

According to the analysis completed, there are four dimensions of happiness of a person with physical disabilities (i.e., 1. Spirituality, 2. Emotion, 3. Self-efficacy, 4. Satisfaction with accessibility). These components are like components of Promax rotation. The communality value for each factor showed the proportion of variance for each factor developed. The cumulative percentage of variance contributed is 63.9%. Table 4 shows the development of four components of dimensions of subjective happiness of a physically disabled person using Promax rotation with a weighting value of 0.50.

Table 4:
Factor analysis (Promax) for the dimensions of SHS-PD

Factors and items of the dimensions of subjective happiness of physically disabled person	Components				Communality
	1	2	3	4	
Factor 1: Spirituality					
1.1 I leave everything to God of what has happened to me	.89				.74
1.2 I accept the decree of God	.85				.74
1.3 I always believed in God	.80				.74
1.4 I am satisfied with my level of spirituality	.79				.71
1.5 My expectation towards God is high	.77				.71
1.6 I accept what has happened in my life	.75				.68
1.7 I appreciate what I have got now	.63				.67
1.8 My faith to God is very high	.60				.61
Factor 2: Emotion					
2.1 I feel bored		.83			.73
2.2 I am stressed		.82			.73
2.3 I feel lonely		.81			.71
2.4 I feel sad		.77			.61
2.5 I am worried		.75			.67
2.6 I am always angry		.69			.50
2.7 I always blame myself		.66			.50
Factor 3: Self-efficacy					
3.1 I can satisfy others			.88		.72
3.2 I am satisfied being able to live freely without being controlled			.77		.57
3.3 I am delightful			.70		.63
3.4 I am confident with myself			.69		.65
3.5 I can calm my mind, even in a challenging situation			.66		.52
3.6 I can make others happy			.65		.64
3.7 I am always critical with my thinking (e.g., Criticizing myself for improvement)			.52		.50
Factor 4: Satisfaction with accessibility					
4.1 I am satisfied with the equipment I am using now				.81	.68
4.2 I am satisfied with ease of Access for disabled person				.77	.66
4.3 I am satisfied with equalities between disabled and non-disabled person in various aspects				.55	.50
The percentage of variance contributed (%)	42.8	10.6	5.5	5.0	
Total of percentage of variance contributed (%)	63.9				

Extraction Method: Principal Component Analysis (PCA), Rotation Method: Promax with Kaiser Normalization.

The correlation matrix value for components of the dimensions of subjective happiness of a physically disabled person also showed that four elements are correlated, ranging from .360 to .65. The value of the correlation matrix justifies that the Promax rotation method is suitable to explore and develop components that are related. Table 5 shows the correlation matrix for the four elements of the dimensions of subjective happiness for a physically disabled person using Promax rotation with a weighting value of 0.50.

Table 5:
Correlation matrix between four components of SHS-PD

Dimensions of subjective happiness	Components			
	1	2	3	4
1. Spirituality	1.00			
2. Emotion	-.44	1.00		
3. Self-efficacy	.65	.47	1.00	
4. Satisfaction with accessibility	.36	-.27	.31	1.00

b) Convergent Validity Between Sub-Scales of SHS-PD

This section explained the convergent validity for a physically disabled person's subjective happiness. Furthermore, it also carried out between sub-scales of dimensions of happiness with a standardized happiness scale (i.e., SWLS and PWB). Table 6 displays the interrelation between four sub-scales of dimensions of subjective happiness of a physically disabled person.

Table 6:
Interrelation between four sub-scales of SHS-PD

Dimensions of subjective happiness	Components			
	1	2	3	4
1. Spirituality	1.00			
2. Emotion	.47**	1.00		
3. Self-efficacy	.74**	.51**	1.00	
4. Satisfaction with accessibility	.53**	.36**	.52**	1.00

** $p < .01$

According to Table 6, results indicate that there are significant positive relationships between sub-scales of spirituality, positive emotion, self-efficacy, and satisfaction with accessibility.

c) Convergent Validity Between Sub-Scales of SHS-PD with SWLS and PWB

This section discussed the convergent validity between sub-scales in dimensions and sources of subjective happiness with two standardized scales (i.e., SWLS and PWB). Convergent validity tested using the Pearson correlation coefficient. Table 7 illustrates the interrelation analysis between four sub-scales of dimensions of subjective happiness of a physically disabled person with SWLS and PWB.

Table 7
Interrelation between sub-scales of SHS-PD with SWLS and PWB

Dimensions of subjective happiness	Components	
	PWB	SWLS
1. Spirituality	.43**	.50**
2. Emotion	-.70**	-.52**
3. Self-efficacy	.53**	.60**
4. Satisfaction with accessibility	.45**	.56**

** $p < .01$

Based on Table 7, significant positive relationships between sub-scales of spirituality, self-efficacy, and satisfaction with accessibility with SWLS and PWB affirmed.

d) Internal Consistency of Sub-Scales of SHS-PD, SWLS and PWB

This study will explain the internal consistency of dimensions of subjective happiness of a physically disabled person and standardized happiness scales (SWLS and PWB). Cronbach Alpha coefficient and Split-Half use to test the consistency or reliability. Table 8 shows the results of internal consistency using Cronbach Alpha coefficient and Split-Half.

Table 8:
Cronbach Alpha coefficient and Split-Half of SHS-PD, SWLS and PWB

Scales	No. of items	Cronbach Alpha	Split-Half
SHS-PD*			
1. Spirituality	8	.93	.94
2. Emotion	7	.89	.87
3. Self-efficacy	7	.88	.86
4. Satisfaction with accessibility	3	.68	.65
SWLS**	5	.86	.81
PWB*** (Before recoding of reversed items)	7	.46	.63
PWB*** (After recode of reversed items)	7	.80	.81

* = Subjective Happiness Scale-Physically Disabled; ** = Satisfaction with Life Scale; *** = Psychological Well-Being.

According to Table 8, the Cronbach Alpha coefficient values of the sub-scales of dimensions of subjective happiness of a physically disabled person are moderate-very high (i.e., Ranging from 0.592 and 0.947). The split-half coefficient has displayed almost similar results of reliability, ranging between 0.538 and 0.941. Sub-scales of spirituality recorded the highest value of the coefficient for both methods. Also, the SWLS and PWB obtained a high value of the coefficient for Cronbach Alpha and Split-half.

e) Quality of items for SHS-PD

Significant items are items that can differentiate responses by individuals. In addition, it will include only significant items in the finalized instrument or inventory. In this study, the researcher has used the Pearson correlation coefficient to correlate items in SHS-PD with the total scores of SHS-PD. Findings indicate that 18 correlations are positive and significant with the total scores of SHS-PD, three are negative and significantly correlated, and four are negative and not significantly correlated. The highest correlation coefficient between items and total scores of SHS-PD is the 48th item, “God is always remembered in my heart,” and the 51st item, “I appreciate what I have got now.” Both items recorded the coefficient value of $r = 0.71$, $p < .05$ and the lowest coefficient value recorded is $r = -0.10$, $p > .05$ (i.e., 42nd item “I am bored”). Table 9 summarizes the values of the Pearson correlation coefficient between 25 items.

Table 9:
The coefficient values of Pearson correlation between 25 items of SHS-PD

Items	Correlation coefficient	Items	Correlation coefficient	Items	Correlation coefficient
2	.64**	33	.65**	48	.71**
6	.63**	39	-.11	49	.67**
9	.51**	40	-.14*	50	.67**
11	.58**	41	-.16**	51	.71**
23	.63**	42	-.10	52	.70**
25	-.07	43	-.12*	56	.57**
26	.59**	44	-.03	57	.54**
29	.65**	46	.59**		
30	.63**	47	.64**		

** = $p < .01$, * $p < .05$

f) Assessment of SHS-PD using Factor Scores and Summated Scale

This section explains the assessment of the dimensions of the subjective happiness scale for the physically disabled. It involved factor scores and summated scales representing all items. It is also decreasing items representing selective components or factors. In this study, factor scores refer to the highest weighting value of elements in dimensions of subjective happiness. In the first factor, the highest weighting value lies on item 50: “I leave everything to God of what has happened to me”, factor two (item 42: “I feel bored”), factor 3 (item 30: “I can satisfy others”), and factor four (item 9: “I am satisfied with the equipment I am using now”).

Likewise, the summated scales use to summarize complex concepts into a single measure to reduce errors in measurement and facilitate replication for other studies. In this study, the summated scales refer to the mean score for each dimension representing subjective happiness (i.e., spirituality, emotion, self-efficacy, and satisfaction with accessibility). The researcher has tested two independent variables (i.e., gender: male or female, and categories of physical disabilities: congenital or acquired). Table 10 shows the assessment of independent variables for gender, and Table 11 displays the review for categories of physical disability.

Table 10:

Assessment of new variable from original variable using factor scores and summated scales based on gender

Measurement	Mean scores		Independent Samples t-tests	
	Male (n = 203)	Female (n = 87)	t value	Significant
Summated scale*				
Scale 1: Spirituality	3.82	3.95	-1.19	.237
Scale 2: Emotion	2.69	2.62	.58	.564
Scale 3: Self-efficacy	3.39	3.43	-.37	.711
Scale 4: Satisfaction with accessibility	3.07	3.11	-.38	.708
Factor scores**				
Factor 1: Spirituality	3.97	4.02	-.415	.679
Factor 2: Emotion	2.82	2.76	.374	.709
Factor 3: Self-efficacy	3.42	3.39	.252	.801
Factor 4: Satisfaction with accessibility	3.01	3.07	-.368	.713

* Summated scales; ** Weightier factor 1 (item 50), Factor 2 (item 42). Factor 3 (item 30), Factor 4 (item 9); ***Scale measurement: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

According to Table 10, there are two assessments for the dimensions of subjective happiness for a person with physical disabilities (i.e., Summated scale and factor scores) compared with gender. Hence, independent samples t-tests measure four dimensions of subjective happiness of a physically disabled person according to their gender. The result shows no significant differences between males and females in the four dimensions of subjective happiness using factor scores and summated scale.

Table 11:

Assessment of new variable from the original variable using factor scores and summated scales based on categories of physical disabilities

Measurement	Mean scores		Independent t-test	
	Congenital (n = 56)	Acquired (n = 234)	t value	Significant
Summated scale*				
Scale 1: Spirituality	4.40	3.72	5.54	.000
Scale 2: Emotion	2.26	2.77	-3.93	.000
Scale 3: Self-efficacy	3.92	3.28	5.52	.000
Scale 4: Satisfaction with accessibility	3.32	3.03	2.31	.022
Factor scores**				
Factor 1: Spirituality	4.45	3.88	3.98	.000
Factor 2: Spirituality	2.27	2.93	-3.68	.000
Factor 3: Self-efficacy	4.00	3.27	5.00	.000
Factor 4: Satisfaction with accessibility	3.32	2.96	2.12	.035

* Summated scales; ** Weightier factor 1 (a50), Factor 2 (a42). Factor 3 (a30), Factor 4 (a9); ***Scale measurement: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree; N = 290.

Based on Table 11, SHS-PD assessing by two methods (i.e., Summated scales and factor scores) and compared with categories of physical disabilities (i.e., Congenital and acquired). The researcher conducted independent samples t-tests to measure four dimensions of subjective happiness between congenital and acquired physically disabled persons. The result shows significant differences in the four dimensions of subjective happiness between categories of physical disabilities using two methods of assessment. Mean scores for the dimensions of spirituality, self-efficacy, and satisfaction with accessibility for congenital physical disabilities are higher than acquired physical disabilities.

In addition, mean scores of dimensions of emotion are higher for the sample of acquired physical disabilities than congenital physical disabilities. Findings indicate that use both methods (i.e., Factor scores and summated scales) to explore differences between the four dimensions of subjective happiness based on gender and categories of physical disabilities in future studies. Besides testing differences between dimensions based on gender and types of physical disabilities, researchers can also compare dimensions of subjective happiness based on educational level, income, age, et cetera.

Table 12:
Correlation between summated scales

Summated scales	Scale 1	Scale 2	Scale 3	Scale 4
Scale 1	1.00			
Scale 2	-.47**	1.00		
Scale 3	.74**	-.51**	1.00	
Scale 4	.53**	-.36**	.52**	1.00

** $p < .01$; $N = 290$.

Pearson correlation coefficient uses to measure the correlation between summated scales. Results indicate that three scales (i.e., Scale 1, 3, and 4) are positively correlated, and scale 2 is significant and negatively correlated with three other scales.

Table 13
Correlation between summated scales with factor scores (N = 290)

	1	2	3	4	5	6	7	8
1. Scale 1	1							
2. Scale 2	-.47**	1						
3. Scale 3	.74**	-.51**	1					
4. Scale 4	.53**	-.36**	.52**	1				
5. Factor scores 1	.84**	-.36**	.57**	.44**	1			
6. Factor scores 2	-.38**	.85**	-.46**	-.28**	-.24**	1		
7. Factor scores 3	.57**	-.38**	.82**	.41**	.41**	-.37**	1	
8. Factor scores 4	.37**	-.34**	.35**	.77**	.34**	-.26**	.25**	1

** $p < .01$

The researcher has used the Pearson correlation coefficient to investigate the relationship between summated scales with factor scores of dimensions of subjective happiness of a physically disabled person. Respectively, the study found that all scales positively and significant correlate

with factors except for scale two and factor two, which is negatively associated with three other scales and factors.

DISCUSSION AND CONCLUSION

The purpose of this study sought to test the validity and reliability of the Subjective Happiness Scale for persons with physical disabilities in Malaysia. The Malaysian Persons with Disability Act 2008 acknowledged the rights of a disabled person and has transformed the welfare-based program into a rights-based program [13]. Hence, this study is relevant in facilitating disabled persons' rights to obtain happiness. Fredrickson [15, 17] proposed that the broad-and-build theory emphasizes positive emotions in proper human flourishing. Thus, this study provides the first step in helping disabled persons achieve good flourishing.

This study has taken the initiative to explore subjective happiness among physically disabled persons in Malaysia. It is unfair that people with physical disabilities have been sidelined in various studies, especially in terms of happiness, because the Malaysian Persons with Disabilities Act 2008 has acknowledged the rights of disabled people. According to [5], people with disabilities presented a low level of subjective well-being when participating in societal activities. This study finding that could facilitate persons with disabilities can reduce if certain dimensions of happiness are accomplishing (i.e., spirituality, emotion, self-efficacy, satisfaction with accessibility).

Myers and Diener [30] suggested that subjective well-being defines by three dimensions (i.e., Presence of positive affect, absence of negative affect, life satisfaction). These dimensions are not sufficient and clear enough in explaining the subjective happiness of disabled persons. In contrast, this study has constructed an alternative model in defining the subjective happiness of disabled persons (Happiness of Disabled Persons Model), which suggested that subjective happiness of physically disabled persons can achieve by four dimensions (i.e., spirituality, emotion, self-efficacy, satisfaction with accessibility).

The limitation of this study is that it has carried out in Sabah, Malaysia only. Thus, the happiness of physically disabled persons in peninsular Malaysia is still vague. This study suggests that future studies should explore the subjective happiness of physically disabled persons throughout Malaysia and foreign countries. In addition, other forms of disabilities should consider by future studies, such as visual disabilities, intellectual disabilities, et cetera. Despite the limitations, this study is the first step in exploring the subjective happiness of disabled persons and it also provides strong empirical evidence to support its findings. To conclude, this study has found four dimensions of subjective happiness of physically disabled persons (spirituality, emotion, self-efficacy, and satisfaction with accessibility). Hence, we suggest that the proper flourishing of physically disabled persons should focus on these four dimensions.

COMPLIANCE WITH ETHICAL STANDARDS

a) Ethical Approval

All procedures performed in studies involving human participants followed the ethical standards of the institutional, national research committee, the 1964 Helsinki declaration, and its later amendments or comparable ethical standards.

b) Informed Consent

This study obtained informed consent from all individual participants.

c) Conflict of Interest

The authors declare that they have no conflict of interest to disclose.

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