



## The Beck Hopelessness Scale: Factor Structure, Validity and Reliability in a Sample of Student Nurses in South-Western Nigeria

**Olutayo Aloba<sup>1\*</sup>, Oluwaseyi Olabisi<sup>2</sup>, Olayinka Ajao<sup>3</sup> and Tolulope Aloba<sup>4</sup>**

<sup>1</sup>Department of Mental Health, Obafemi Awolowo University Teaching Hospital (OAUTHC), Osun State, Nigeria

<sup>2</sup>School of Nursing, Baptist Medical Center, Saki, Oyo State, Nigeria

<sup>3</sup>School of Nursing, Ekiti State University Teaching Hospital, Ado Ekiti, Nigeria

<sup>4</sup>Department of Nursing Sciences, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

\*Corresponding author: Olutayo Aloba, Department of Mental Health, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria, Tel: +234 8143626652, E-mail: [alobatee2002@gmail.com](mailto:alobatee2002@gmail.com)

### Abstract

**Background:** Suicide rate has been reported to be high among nurses and student nurses. Hopelessness has been globally recognized as the most significant predictor of suicide and suicidal behaviour. The Beck Hopelessness Scale (BHS) has been recognized to be very useful in the prediction of suicide but its psychometric properties have not been examined among Nigerian student nurses.

**Objective:** The purpose of this study is to explore the psychometric properties of the BHS in a sample of 438 student nurses selected from 4 tertiary health care affiliated nursing training institutions in South-western Nigerian. The student nurses completed the BHS in addition to the Rosenberg Self-Esteem Scale (RSES), the Patient Health Questionnaire-9 (PHQ-9) and the General Health Questionnaire-12 (GHQ-12).

**Results:** The BHS exhibited satisfactory reliability (Cronbach's alpha 0.89), while its convergent validity was supported via significant correlations with the GHQ-12 ( $r = 0.724, p < 0.001$ ), PHQ-9 ( $r = 0.749, p < 0.001$ ) and RSES ( $r = -0.727, p < 0.001$ ). The BHS also exhibited satisfactory discriminative concurrent criterion validity through its ability to reflect higher hopelessness scores among the student nurses with GHQ-12 and PHQ-9 scores above the cut-off points. Exploratory Factor analysis applying Principal Axis Factoring indicates that the construct of hopelessness is best explained by a 2 factor 18 item model.

**Conclusions:** The BHS is a valid and reliable measure of hopelessness among Nigerian student nurses. The findings in this study indicate that there may be need to establish interventions that will reduce the severity of hopelessness among Nigerian student nurses through the screening for depressive symptoms and psychological distress.

### Keywords

Beck Hopelessness Scale, Nigerian student nurses, Reliability, Validity, Factor analysis

### Introduction

Beck and colleagues in 1974 developed the Hopelessness Scale specifically to measure hopelessness, a construct that had been regarded as impossible to empirically evaluate [1]. The Beck's cognitive model attested that individuals who are depressed have a subjective perception of been ineffectual, appropriate self-criticism for their individual difficulties, and hold a non-productive view of their future [2]. According to Beck's cognitive model of depression, hopelessness constitutes one of the important components of the model's triad [2]. The relationship of hopelessness with depression and suicidality has been well researched and documented [3-5]. Hopelessness has been defined as the manifestation of a 'thinking style' characterized by negative futuristic attributes, anticipations and expectations [6]. Currently, the most extensively utilized instrument for the evaluation of hopelessness is the Beck Hopelessness Scale (BHS) [7]. Beck and colleagues reported a three-factor scale structure after subjecting the scale's 20 items to Exploratory Factor Analysis [1]. The original psychometric characteristic of the BHS was described based on the data obtained from 294 patients who had attempted suicide. One variable which has been permanently integrated into the measures for the evaluation of risk of suicide and suicidal behaviour is hopelessness [8]. In several observational studies, hopelessness has been repeatedly recognized as the most dependable risk factor for suicidal behaviour, either attempted or completed [9-11]. Studies have also demonstrated that the severity of hopelessness and thus the risk of suicide can be ameliorated by employing psychological therapeutic techniques [12,13]. It has been reported that student nurses in comparison to other student populations have higher levels of depression [14], which has been attributed to factors associated with their educational training [15]. Globally, among females and males aged 10 to 24 years, suicide accounted for the second and third foremost cause of mortality respectively [16]. According to the world Health Organization (WHO), more than three-quarter of the global mortality from suicide occur in the developing countries in which more than 90% of the world's young adult live [17]. It has been reported that student nurses compared to other student populations may have a higher risk of suicide and suicidal behaviour [18]. Nursing education has been described to be associated with a number of unique stressors ranging from those related to factors

**Citation:** Aloba O, Olabisi O, Ajao O, Aloba T (2016) The Beck Hopelessness Scale: Factor Structure, Validity and Reliability in a Sample of Student Nurses in South-Western Nigeria. Int Arch Nurs Health Care 2:056

**Received:** July 19, 2016; **Accepted:** August 27, 2016; **Published:** August 30, 2016

**Copyright:** © 2016 Aloba O, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

associated with the individual student, to those related to their learning environment and those that are patient related [15]. Stress among student nurses is now recognized as an international concern [19]. Suicide is one of the five topmost contributors to mortality among nursing professional, ranging from trainees to retirees [20]. Indeed, an extensive electronic search of literature revealed that no instrument has been validated as a measure of hopelessness in either the general population of Nigerian students undergoing healthcare training, or Nigerian student nurses in particular. The reduction of suicide is a complex process that requires multiple and equally complex approaches [21]. Thus, a first step in this direction will be to explore the appropriateness of the BHS as a measure of hopelessness among Nigerian student nurses by examining its validity and reliability. Students undergoing training to become professional nurses belong to the young adult population among whom suicide is recognized as a major public health issue [16]. The aim of this study is to examine the factorial structure, validity and reliability of the BHS among student nurses selected from 4 training institutions in South-western Nigerian. We hypothesized that the BHS would have statistically significant negative correlations with the Rosenberg Self-Esteem (RSE) Scale and positive correlations with the 12 item General Health Questionnaire (GHQ-12) and the 9 item Patient Health Questionnaire (PHQ-9).

## Methods

### Participants

The participants in this study were student nurses, who were selected from four school of nursing training institutions each affiliated to a tertiary health care facility (university teaching hospitals) in South-western Nigeria. After the objectives of the study were explained to the students, the questionnaires for the study were completed by the students in their hostels located within the training institution premises. The criteria for exclusion include current or previous history of a psychiatric or chronic medical disorder and the refusal to consent. The Ethical and Research Committees of each of the tertiary health care institutions granted the approval for the study. Over a 3 months' period, a total of 506 students were recruited. Sixty-eight of the questionnaires were excluded from analysis either as a result of incomplete data on the BHS or the fulfillment of one the exclusion criteria. Thus, a total of 438 questionnaires were analyzed.

### Measures

The students completed a sociodemographic questionnaire, in addition to the Beck Hopelessness Scale (BHS), the Rosenberg Self Esteem Scale (RSE), Patient Health Questionnaire-9 (PHQ-9) and the General Health Questionnaire-12 (GHQ-12).

**Sociodemographic questionnaire:** This consists of variables such sex, age and questions making enquiries about previous or current history of psychiatric or chronic medical disorders.

**Beck Hopelessness Scale (BHS):** Hopelessness was quantified among the student nurses with the originally 20 item BHS [1]. The individual completing the scale responds true or false to each item. The scale's items are phrased such that the respondents either assents to a futuristically positively worded statement or rejects a futuristically negatively worded statement to get a score of one point per question. Out of the scale's 20 items, seven (items 1, 5, 6, 8, 13, 15 and 19) are negatively scored, with the respondent awarded a point if they indicated 'No' to any of these items. A score that ranges between 4 and 8 reflects mild levels of hopelessness, while score range of 9 to 14 and 15 to 20 are indicative of moderate and severe levels of hopelessness respectively. The original version exhibited a 3 factor structure (feeling in association with the future; loss of motivation; expectations of the future) after the items were subjected to exploratory factor analysis [1]. The total score ranges from 0 to 20, with higher levels of hopelessness indicated by higher scores on the scale.

**Rosenberg Self-Esteem (RSE) Scale:** The student nurses' level of self-esteem was measured applying this 10 item scale, which assesses how worthy they perceive themselves. They student nurses completed the scale by responding to positive and negative self-evaluating statements on a 5 point Likert format. Total score ranges from 0 to

30, with higher levels of self-esteem reflected by higher scores [22]. The RSE has been utilized as a self-esteem measuring tool in diverse Nigerian populations [23]. The scale has also been described to exhibit adequate psychometric qualities among adolescents and young adults in Nigeria [24].

**Patient Health Questionnaire-9 (PHQ-9):** This 9 item questionnaire is a self-administered scale that was developed from the interviewer-based PRIME-MD [25], for screening and evaluating the severity of depressive symptoms, with the individuals completing it putting into perspective the previous 2 weeks. The items are measured on a 4-point scale (0-3) with greater severity of depressive symptoms reflected by higher total scores. The PHQ-9 has been reported to possess satisfactory reliability and validity among Nigerian adolescents and young adults [26].

**General Health Questionnaire-12 (GHQ-12):** This scale was utilized to evaluate the level of psychological distress among the student nurses. It is a short non-specific instrument employed for the assessment of the mental health wellbeing and a screening tool for common mental health disorders [27]. Satisfactory psychometric properties in terms of reliability, validity and its factorial structure has been documented among the Nigerian population [28]. The binary scoring system (0-0-1-1) was adopted. The total score range from 0 to 12, with higher levels of psychological distress reflected with higher cumulative scores on the scale.

### Data Analysis

The data analysis was done with the 21<sup>st</sup> version of the IBM SPSS (Statistical Product and Service Solutions) software. Mean (standard deviation) and frequency were used to depict the socio-demographic characteristics and scores on the study measures completed by the respondents. The overall internal consistency of the items of the BHS was evaluated with Cronbach's alpha. Exploratory Factor Analysis (EFA) with Principal Axis Factoring (PFA) and Oblimin rotation was employed to identify the numbers of latent factors within the scale. We retained the factors with Eigen values greater than 1 applying Kaiser's criteria [29]. Suitability of our data for EFA was examined with the Kaiser-Meyer-Olkins (KMO) measurement of sampling adequacy [30]. The independent variables in this study were the GHQ-12, the PHQ-9 and the self-esteem scores. Correlational analyses with self-esteem, psychological distress and depression scores were used to examine the construct (convergent) validity of the BHS. Linear regressions with 95% Confidence Interval was used to identify those variables that significantly influence the hopelessness scores among the student nurses. Level of statistical significance was set at p value less than 0.05 and all statistical tests were 2 tailed.

## Results

Sociodemographic and study measure details of the student nurses: As shown in table 1, a total number 506 students were recruited but 68 of them were excluded from the analysis. Of the 68 students who were excluded, 4 are currently on treatment for psychiatric disorders, 12 were on treatment for chronic medical disorders (asthma and sickle cell disease), 15 refused to participate claiming that that they were too busy while 37 had incomplete data

**Table 1:** Sociodemographic characteristics of the nursing students (n = 438).

Total number of student nurses recruited	506
Total number excluded	68
<b>Variable</b>	<b>Frequency (%)</b>
<b>Sex</b>	
Male	55 (12.6%)
Female	383 (87.4%)
<b>Variable</b>	<b>Mean (SD) [Range]</b>
Age (years)	20.29 (2.41) [17-40]
BHS-18	4.02 (4.30) [0-16]
RSE	20.80 (4.40) [10-30]
PHQ-9	5.17 (4.09) [0-19]
GHQ-12	2.67 (2.64) [0-12]

**Table 2:** Psychometric characteristics and factor structure (principal axis factoring with oblimin rotation) of the Beck Hopelessness Scale among the student nurses ( $n = 438$ ).

Item	Mean (SD)	Item-total correlations	Factor 1	Factor 2
17. It is very unlikely that I will get any real satisfaction in the future.	0.15 (0.36)	0.560	0.745	-
11. All I can see ahead of me is unpleasantness rather than pleasantness	0.13 (0.34)	0.572	0.679	-
12. I don't expect to get what I really want.	0.18 (0.39)	0.533	0.651	-
9. I just can't get the breaks, and there is no reason I will in the future.	0.28 (0.45)	0.430	0.603	-
13. When I look ahead to the future, I expect that I will be happier than now.	0.06 (0.25)	0.717	0.587	-
14. Things don't just work out the way I want them to.	0.41 (0.49)	0.465	0.552	-
20. There is no use in really trying to get anything I want because I probably won't get it.	0.14 (0.35)	0.536	0.541	-
16. I never get what I want, so it is foolish to want anything.	0.15 (0.35)	0.537	0.533	-
2. I might as well give up because there is nothing I can do about making things better for myself.	0.13 (0.33)	0.460	0.492	-
7. My future seems dark to me.	0.26 (0.44)	0.467	0.483	-
8. I happen to be particularly lucky, and I expect to get more of the good things in life than the average person.	0.07 (0.25)	0.681	-	0.711
6. In the future, I expect to succeed in what concerns me the most.	0.04 (0.19)	0.398	-	0.678
1. I look forward to the future with hope and enthusiasm.	0.35 (0.19)	0.424	-	0.666
3. When things are going badly, I am helped by knowing they cannot stay that way forever.	0.06 (0.23)	0.366	-	0.605
5. I have enough time to accomplish the things I want to do	0.08 (0.27)	0.448	-	0.600
15. I have great faith in the future	0.11 (0.32)	0.607	-	0.569
10. My past experiences have prepared me well for the future.	0.65 (0.25)	0.467	-	0.447
19. I can look forward to more good times than bad times.	0.09 (0.29)	0.505	-	0.428
Eigen value			6.23	1.50
% of total variance explained			34.6%	8.1%
Cronbach's alpha			0.82	0.80
Kaiser-Meyer-Olkins measure of sampling adequacy		0.89		
Overall Cronbach's alpha = 0.89				

**Table 3:** Construct validity of the Beck Hopelessness Scale among the student nurses ( $n = 438$ ).

Variable	1	2	3	4
1. BHS	1			
2. GHQ-12	0.721 **	1		
3. PHQ-9	0.746 **	0.730 **	1	
4. Self-esteem	-0.731 **	-0.740 **	-0.721 **	1

\*\*  $p < 0.001$

**Table 4:** Discriminative concurrent criterion validity of the Beck Hopelessness Scale among the student nurses ( $n = 438$ ).

Variable	No (%)	Mean (SD)	P value	t value	Cohen's d
GHQ-12 $\leq 2$	247 (56.4%)	1.58 (1.68)	< 0.001	-17.698	1.62
GHQ-12 $\geq 3$	191 (43.6%)	7.18 (4.59)			
PHQ-9 $\leq 4$	263 (60.0%)	1.48 (1.38)	< 0.001	-22.084	1.97
PHQ-9 $\geq 5$	175 (40.0%)	7.85 (4.36)			

on either the BHS or the study measures. Female students constituted 87.4% of total sample (438). Mean age was 20.29 (SD 2.41). The mean score on the BHS was 4.02 (SD 4.30). The mean score on the RSE was 20.80 (SD 4.40) while the mean scores on the GHQ-12 and PHQ-9 were 2.67 (SD 2.64) and 5.17 (SD 4.09) respectively.

Psychometric characteristics and factor structure of the BHS among the student nurses ( $n = 438$ ). Table 2 shows that the overall internal consistency (Cronbach's alpha 0.89) of the 18 item BHS was satisfactory. We had to eliminate item 4, "I can't imagine what my life would be like in 10 years", and 18, "The future seems vague and uncertain to me", due to item total correlations values less than 0.30 which indicates that among our respondents, the items do not correlate very well with the overall scale [30]. The corrected item-to-scale correlations of the 18 items ranged from 0.366 to 0.717. Exploratory Factor Analysis applying Principal Axis Factoring with Varimax rotation yielded 2 factors (Factor 1: Negative anticipation regarding the future; Factor 2: Positive anticipation regarding the future) which accounted cumulatively for a variance of approximately 43%. The items that composed Factor 1 (10 items/Eigen value 6.23) and 2 (8 items/Eigen value 1.50) had satisfactory Cronbach's alpha of 0.82 and 0.80 respectively.

Construct validity of the 18 item BHS among the student nurses ( $n = 438$ ). The construct validity of the BHS based on the correlations

with the Rosenberg Self Esteem scale, GHQ-12 and PHQ-9 is shown in table 3. Among the student nurses, hopelessness exhibited significant positive correlations with scores on the GHQ-12 ( $r = 0.721, p < 0.01$ ) and PHQ-9 ( $r = 0.746, p < 0.01$ ) and significant negative correlations with self-esteem ( $r = -0.731, p < 0.01$ ).

Discriminative concurrent criterion validity of the BHS-18 among the student nurses ( $n = 438$ ).

Applying independent sample t test analysis, the BHS as shown in table 4 was able to reflect statistically significant higher hopelessness scores among the respondents with GHQ-12 scores of 3 or greater ( $p < 0.001$ ) and those with PHQ-9 scores of 5 or higher ( $p < 0.001$ ). These cut-off scores reflect potential psychiatric morbidity and possible depressive disorder according to the GHQ-12 [28] and the PHQ-9 [31] respectively. The table also reflects the effect size regarding the group differences.

### Linear regression model

Table 5 shows that the score on the 18 item BHS was significantly determined by the Rosenberg Self-Esteem, PHQ-9 and GHQ-12 scores. The first model of the stepwise regression method, included the PHQ-9 ( $R^2 = 0.557$ , Adjusted  $R^2 = 0.556$ ), the second model included the PHQ-9 and Self-Esteem ( $R^2 = 0.635$ , Adjusted  $R^2 = 0.633$ ) while the third and final model included the PHQ-9, Self-Esteem and the GHQ-12 ( $R^2 = 0.656$ , Adjusted  $R^2 = 0.654$ ). The standardized coefficients indicate that aggregatively, these 3 variables explained 66% of the variance in the 18 item BHS among the student nurses. It can also be noted that that the largest variance was contributed by the PHQ-9 score (approximately 56.0%). Thus, the linear regression model predicting the BHS-18 score among the student nurses is  $0.375 * PHQ-9 + (-0.289) * RSE + 0.394 * GHQ-12 + 7.047$  (Constant).

### Discussion

We examined the psychometric characteristics of the Beck Hopelessness Scale (BHS) in terms of its factor structure, validity and reliability in a cross-sectional sample of student nurses selected from four training institution in South-western Nigeria. Among the Nigerian student nurses, the items of the BHS exhibited satisfactory internal consistency with a correlation coefficient Cronbach's alpha of 0.89. Internal consistency (Cronbach's alpha) value above 0.70 is generally regarded as acceptable regarding the reliability of a scale's items [32]. The examination of the reliability of the BHS across seven

**Table 5:** Linear regression analysis (stepwise method) showing the factors that predicted the Beck Hopelessness Scale among the student nurses ( $n = 438$ ).

Model	Unstandardized Coefficient	Standardized Coefficient	p value	95% Confidence Interval
	<b>B Std. Er</b>	<b>Beta t</b>		
1.(Constant)	0.031 0.221	-0.16	0.873	-0.868
PHQ-9	0.783 0.033	0.746 23.398	< 0.001	0.718 – 0.849
$R^2 = 0.557$	<i>Adjusted R<sup>2</sup> = 0.556 Variance = 56%</i>			
2.(Constant)	9.756 1.035	-9.428	< 0.001	7.722 – 11.789
PHQ-9	0.478 0.044	0.456 10.896	< 0.001	0.392 – 0.565
Self-esteem	-0.395 0.041	-10.044	< 0.001	-0.495 – (-0.314)
$R^2 = 0.635$	<i>Adjusted R<sup>2</sup> = 0.633 Variance = 64%</i>			
3.(Constant)	7.047 1.130	-6.238	< 0.001	4.827 – 9.267
PHQ-9	0.375 0.047	0.357 7.968	< 0.001	0.282 – 0.467
Self-esteem	-0.289 0.045	-6.792	< 0.001	-0.379 – (-0.202)
GHQ-12	0.394 0.075	0.242 5.244	< 0.001	0.247 – 0.542
$R^2 = 0.656$	<i>Adjusted R<sup>2</sup> = 0.654 Variance = 66%</i>			

different cross-sectional groups by Aiken in 2002, revealed consistently satisfactory Cronbach's alpha values ranging from 0.82 to 0.93 [33]. The Cronbach's alpha value among the Nigerian student nurses is relatively similar to what was reported by the original developers of the scale (0.93) [1], despite the differences in the sociodemographic profiles of their sample which consisted mainly of psychiatric patients. In addition, the Cronbach's alpha of the BHS among the Nigerian student nurses is also similar to what has been reported among other non-clinical samples such as Chinese adolescents (Cronbach's alpha 0.85) [34], undergraduate students in United States (Cronbach's alpha 0.88) [35], and in community samples in South Africa (Cronbach's alpha 0.89) [36], Hungary (Cronbach's alpha 0.91) [21], and in Japan (Cronbach's alpha 0.86) [37]. We can therefore infer that the BHS is a reliable tool for the evaluation of hopelessness among our sample of Nigerian student nurses. Despite the elimination of 2 of the scale's items (4 and 18) due to their low item-total correlations (< 0.30), the BHS still demonstrated a satisfactory level of validity. The construct (convergent) validity of the 18 item BHS among the Nigerian student nurses was supported through its statistically significant positive correlations with the Patient Health Questionnaire-9 (PHQ-9), the General Health Questionnaire-12 (GHQ-12) and negative correlations with the Rosenberg Self-Esteem Scales (RSE). Previous studies have consistently demonstrated statistically significant positive correlations between BHS and scales for the assessment of depressive symptoms when evaluating individuals with depressive disorders [38,39]. The significant positive correlation between the BHS and the GHQ-12 among our study participants further confirms our hypothesis regarding these two variables. Hopelessness was associated with a higher level of psychological distress among the student nurses. The strength and the direction of the correlation between the BHS and the Self-Esteem Scale also provides additional support for the convergent validity of the BHS among the Nigerian student nurses. The negative correlation observed between hopelessness and self-esteem was also reported in an exploratory study of adolescents and young adults in Turkey that examined the relationship among self-esteem, hopelessness and other psychosocial variables [40]. We also attempted to see if the BHS will express the ability to identify those student nurses with scores on the GHQ-12 and PHQ-9 above the cut-off scores of 3 [28] and 5 [31] respectively. The BHS demonstrated satisfactory discriminant concurrent criterion validity in relation to the GHQ-12 and the PHQ-9 scores among the Nigerian student nurses. The Nigerian student nurses whose scores on the GHQ-12 (3 and above) were indicative of the possibility of psychiatric morbidity and those whose scores on the PHQ-9 indicates possible depressive disorder (5 and above) had significantly higher levels of hopelessness. Another finding that further supports the construct (convergence) validity of the BHS among the student nurses was that the results of the multiple linear regression analyses revealed that approximately 66% ( $R^2 = 0.656$ ) of the variance in the total BHS score among the student nurses was contributed by the combination of the scores on the PHQ-9, GHQ-12 and the RSE scales. Based on these significant correlations, we can conclude to a reasonable degree, that the BHS among Nigerian student nurses is a valid measure of hopelessness.

The subjection of the 18 items of the BHS to Exploratory Factor Analysis applying Principal Axis Factoring with Oblimin rotation since we assumed that the extracted factors will correlate with each other, yielded a 2 factor structure among the student nurses. Factors 1 and 2 consisted of 10 and 8 items respectively. The items that constituted the factors had adequate internal consistencies (Factor 1: Cronbach's alpha 0.82; Factor 2: Cronbach's alpha 0.80). After critically scrutinizing the phrasing of each of the items in the 2 factors, Factor 1 was labelled, "Negative anticipation regarding the future", while Factor 2 was labeled, "Positive anticipation regarding the future". Previous studies involving non-clinical samples have also reported a 2 factor BHS structure. Similar to what we observed regarding the factorial structure of the BHS among the Nigerian student nurses, Steed (2001) reported a 2 factor 16 item model of the scale in a cross-sectional sample of 544 undergraduate students in the United States following Principal Axis Factoring method of Exploratory Factor Analysis [35]. Steed (2001), initially extracted a four factor model that could not be meaningfully interpreted, but subsequently extracted a clarified 2 factor model following the elimination of four of the scale's items [35]. Pompili and Tatarelli (2007) in a study that involved 340 Italian university students, also reported a 2 factor model of the BHS, after applying a similar factor analytic method, although, compared to our factor model, their model consisted of only 11 items [41]. The factor structure of the BHS among the Nigerian student nurses was also similar to what Tanaka and colleagues (1998) described regarding the scale's structure in a non-clinical sample of 154 adults in Japan, the authors applying Principal Component Analysis with Oblique rotation reported a 2 factor model composed of 18 items [42]. Our BHS model shares an interesting similarity with the Japanese model regarding the number of items that constituted each factors (factor 1 and 2 contained 10 and 8 items respectively). One feature that has been consistent with all the previous studies regarding the factor structure of the BHS is that none of them had been able to replicate the structure described by Beck and colleagues (1974) who originally developed the scale. Other authors have reported a 1 model factorial structure [43-45], while others have reported a 3 factor model [46,47]. The ambiguity regarding the structure of the BHS despite its reliability and validity as a measure of hopelessness in diverse samples has been previously documented [44].

A total score of 9 and above has been demonstrated to be associated with an increased likelihood (11 times) of engaging in suicidal behaviour compared to those with lower scores [48]. An additional analysis of the data in this study revealed that 84 (19.2%) of the student nurses had a total score of 9 and above. Although the total possible score on the BHS in this study after the elimination of 2 items was 18. Significantly increased risk of suicidality in terms of suicidal attempts and ideations has been reported in individuals with scores of 9 and above [48]. In terms of normative data, the mean BHS score among the Nigerian student nurses was 4.02 (SD 4.30). This value is relatively comparable to what was reported by Lawoko and Soares (2002), who examined hopelessness among the parents of patients with congenital heart disease (mean BHS 4.80) and parents

of healthy children (mean BHS 3.80) in Sweden [49]. The mean BHS we observed in this study was relatively higher to what was reported among 108 undergraduate and graduate college students (mean BHS 2.8) in the USA [50], but lower (mean BHS 8.6) to what was reported by Tanaka, et al. (1996) among community residential individuals in Japan [37].

Our study is not without some limitations which are related to the methodology we adopted. One limitation is that we focused only on student nurses in South-western Nigeria, which is one of the country's six geo-political regions, thus the generalization of our findings to the young adult population in the other regions is limited. In addition, our methodology which is cross-sectional in nature puts a limitation on the causal clarification of the relationships between the study variables. An additional limitation of our study was that the gender distribution among our study participants was rather skewed towards the female gender, but we observed that there were no statistically significant differences in the mean BHS between the male (3.47 / SD 3.69) and the female (4.09 / SD 4.38) student nurses ( $t = -1.148$ ,  $p = 0.254$ ). Notwithstanding these limitations, our current observation regarding the psychometric characteristics of the BHS has provided preliminary evidence that it is a valid and reliable measure of hopelessness among Nigerian student nurses. The strength of our study is that this is the first study in Nigeria to examine the feasibility of the BHS as an instrument for the evaluation of hopelessness in a representative non-clinical young adult sample of Nigerian student nurses. Our findings are in accordance with the results in published literature, that reported that individuals with higher levels of hopelessness are more likely to experience greater severity of depressive symptoms, psychological distress and reduced self-worth.

In conclusion, there may be the need to put into place screening procedures to identify the Nigerian student nurses with high levels of hopelessness in order to ameliorate the severity of depressive symptoms and psychological distress, and thus reduce the overall risk of suicide in this population. Additional studies are still needed to examine the reliability and validity of the BHS, in addition to the exploration of the interaction between hopelessness and other psychosocial factors such as quality of life and functioning among the Nigerian young adult population.

## Summary Points

- Exploratory factor analysis revealed that the construct of hopelessness among Nigerian student nurses is best explained by a 2 factor structure applying the BHS
- The BHS demonstrated satisfactory validity and reliability among the Nigerian student nurses

## Conflicts of Interest

We the authors declare that we have no conflict of interest regarding this study.

## References

1. Beck AT, Weissman A, Lester D, Trexler L (1974) The measurement of pessimism: The Hopelessness Scale. *J Consult Clin Psychol* 42: 861-865.
2. Beck AT (1967) *Depression Clinical experimental and theoretical aspects*. Harper and Row: New York.
3. Meites TM, Deveney CM, Steele KT, Holmes AJ, Pizzagalli DA (2008) Implicit depression and hopelessness in remitted depressed individuals. *Behav Res Ther* 46: 1078-1084.
4. Beevers CG, Miller IW (2004) Perfectionism, cognitive bias, and hopelessness as prospective predictors of suicidal ideation. *Suicide Life Threat Behav* 34: 126-137.
5. Smith JM, Alloy LB, Abramson LY (2006) Cognitive vulnerability to depression, rumination, hopelessness, and suicidal ideation: multiple pathways to self-injurious thinking. *Suicide Life Threat Behav* 36: 443-454.
6. Abramson LY, Metalsky GI, Alloy LB (1989) Hopelessness depression: A theory-based subtype of depression. *Psychol Rev* 96: 358-372.
7. Velting DM (1999) Personality and negative expectations. Trait structure of the Beck Hopelessness Scale. *Pers Indiv Differ* 26: 913-921.
8. Bryan CJ, Rudd MD (2006) Advances in the assessment of suicide risk. *J Clin Psychol* 62: 185-200.
9. Cochrane-Brink KA, Lofchy JS, Sakinofsky I (2000) Clinical rating scales in suicide risk assessment. *Gen Hosp Psychiatry* 22: 445-451.
10. MacLeod AK, Tata P, Tyrer P, Schmidt U, Davidson K, Thompson S (2005) Hopelessness and positive and negative future thinking in parasuicide. *Br J Clin Psychol* 44: 495-504.
11. McMillan D, Gilbody S, Beresford E, Neilly L (2007) Can we predict suicide and non-fatal self-harm with the Beck Hopelessness Scale? A meta-analysis. *Psychol Med* 37: 769-778.
12. Kuyken W (2004) Cognitive therapy outcome: the effects of hopelessness in a naturalistic outcome study. *Behav Res Ther* 42: 631-646.
13. Williams JM, Crane C, Barnhofer T, Duggan D (2005) Psychology and suicidal behaviour. In K.Hawton (Ed). *Prevention and treatment of suicidal behaviour: from science to practice* Oxford University Press 71-90.
14. Bramness JG, Fixdal TC, Vaglum P (1991) Effect of medical school stress on the mental health of medical students in early and late clinical curriculum. *Acta Psychiatr Scand* 84: 340-345.
15. Higginson R (2006) Fears, worries and experiences of first-year pre-registration nursing students: a qualitative study. *Nurse Res* 13: 32-49.
16. Patton GC, Coffey C, Sawyer SM, Viner RM, Haller DM, et al. (2009) Global patterns of mortality in young people: a systematic analysis of population health data. *Lancet* 374: 881-892.
17. *Preventing global suicide: a global imperative*. Geneva: World Health Organization; 2014.
18. Goetz CS (1998) Are you prepared to S.A.V.E. your nursing student from suicide? *J Nurs Educ* 37: 92-95.
19. Burnard P, Edward D, Bennet K, Thaibah H, Tothova V, et al. (2008) A comparative longitudinal study of stress in student nurses in five countries: Albania, Brunnei, the Czech Republic, Malta and Wales. *Nurse Educ Today* 28: 134-145.
20. Peipins LA, Burnett C, Alterman T, Lalich N (1997) Mortality patterns among female nurses: a 27-state study, 1984 through 1990. *Am J Public Health* 87: 1539-1543.
21. Perczel FD, Sallai J, Rozsa S (2010) Adaptation of the Beck Hopelessness Scale in Hungary. *Psychol Topics* 19: 307-321.
22. Rosenberg M (1965) *Society and the adolescent self-image*. Princeton University Press, Princeton, NJ.
23. Loto OM, Adewuya AO, Ajenifuja OK, Orji EO, Ayandiran EO, et al. (2010) Cesarean section in relation to self-esteem and parenting among new mothers in southwestern Nigeria. *Acta Obstet Gynecol Scand* 89: 35-38.
24. Okoie OE, Nwoga AN, Onah AT (2015) Moderating Effect of Cyber Bullying on the Psychological Well-Being of In-School Adolescents in Benin, Edo State, Nigeria. *Eur J Sustainable Develop* 14: 109-118.
25. Spitzer RL, Williams JB, Kroenke K, Linzer M, deGruy FV, et al. (1994) Utility of a new procedure for diagnosing mental disorders in primary care. The PRIME-MD 1000 study. *JAMA* 272: 1749-1756.
26. Adewuya AO, Ola BA, Afolabi OO (2006) Validity of the patient health questionnaire (PHQ-9) as a screening tool for depression amongst Nigerian university students. *J Affect Disord* 96: 89-93.
27. Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, et al. (1997) The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychol Med* 27: 191-197.
28. Gureje O (1991) Reliability and the factor structure of the Yoruba version of the 12-item General Health Questionnaire. *Acta Psychiatr Scand* 84: 125-129.
29. Cattell RB (1966) *The Scree Test For The Number Of Factors*. *Multivariate Behav Res* 1: 245-276.
30. Field A (2009) *Discovering statistics using SPSS*. 3 rev ed. London: SAGE 856.
31. Kroenke K, Spitzer RL (2002) The PHQ-9: a new depression diagnostic and severity measure. *Psychiatr Ann* 32: 509-521.
32. Gliner JA, Morgan GA (2000) *Research Methods in Applied Settings: An Integrated Approach to Design and Analysis*. Mahwah, NJ: Lawrence Erlbaum Associates.
33. Aiken LR (2002) *Psychological testing and assessment*. Allyn & Bacon, New York.
34. Shek DTL (1993) Measurement of pessimism in Chinese adolescents: The Chinese Hopelessness Scale. *Soc Behav Pers* 21: 107-112.
35. Steed L (2001) Further validity and reliability evidence for Beck Hopelessness Scale scores in a nonclinical sample. *Educ Psychol Measur* 61: 303-316.
36. Edward DJA, Steele GI (2008) Development and validation of the Xhosa Translation of the Beck Inventories: 3. Concurrent and Convergent Validity. *J Psychol Afr* 18: 227-236.

37. Tanaka E, Sakamoto S, Ono Y, Fujihara S, Kitamura T (1996) Hopelessness in a community population in Japan. *J Clin Psychol* 52: 609-615.
38. Nissim R, Flora DB, Cribbie RA, Zimmermann C, Gagliese L, et al. (2010) Factor structure of the Beck Hopelessness Scale in individuals with advanced cancer. *Psychooncology* 19: 255-263.
39. Steer RA, Iguchi MY, Platt JJ (1994) Hopelessness in i.v. drug users not in treatment and seeking HIV testing and counselling. *Drug Alcohol Depend* 34: 99-103.
40. Karatas Z, Firdevs Savi Cakar (2011) Self-Esteem and Hopelessness, and Resiliency: An Exploratory Study of Adolescents in Turkey. *Intern Edu Studies* 4: 84-91.
41. Pompili M, Tatarelli R, Rogers JR, Lester D (2007) The Hopelessness Scale: a factor analysis. *Psychol Rep* 100: 375-378.
42. Tanaka E, Sakamoto S, Ono Y, Fujihara S, Kitamura T (1998) Hopelessness in a community population: factorial structure and psychosocial correlates. *J Soc Psychol* 138: 581-590.
43. Mystakidou K, Parpa E, Tsilika E, Pathiaki M, Hatzipli I, et al. (2008) The experience of hopelessness in a population of Greek cancer patients receiving palliative care. *Int J Soc Psychiatry* 54: 262-271.
44. Aish AM, Wasserman D, Renberg ES (2001) Does Beck's Hopelessness Scale really measure several components? *Psychol Med* 31: 367-372.
45. Chang EC, D'Zurilla TJ, Maydeu-Olivares A (1994) Assessing the dimensionality of optimism and pessimism using a multimeasure approach. *Cognit Ther Res* 18: 143-160.
46. Rosenfeld B, Gibson C, Kramer M, Breitbart W (2004) Hopelessness and terminal illness: the construct of hopelessness in patients with advanced AIDS. *Palliat Support Care* 2: 43-53.
47. Dyce JA (1996) Factor structure of the Beck Hopelessness Scale. *J Clin Psychol* 52: 555-558.
48. Beck AT, Brown G, Berchick RJ, Stewart BL, Steer RA (1990) Relationship between hopelessness and ultimate suicide: a replication with psychiatric outpatients. *Am J Psychiatry* 147: 190-195.
49. Lawoko S, Soares JJF (2002) Distress and hopelessness among parents of children with congenital heart disease, parents of children with other diseases, and parents of healthy children. *J Psychosom Res* 52: 193-208.
50. Brackney BE, Westman AS (1992) Relationships among hope, psychosocial development, and locus of control. *Psychol Rep* 70: 864-866.