

## Development of Nursing Students Stressor Questionnaire

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### Abstract

**Background:** Stress has become a chronic and pervasive condition in the world today. Any stimulus which evokes a stress response is called a stressor. The objective of the study was to develop a questionnaire to measure stressors among first year B.Sc nursing students in Kerala.

**Methods:** Descriptive cross sectional design integrating both qualitative and quantitative methods were used for the study. Data was analyzed by qualitative content analysis, descriptive and inferential statistics.

**Results:** A 22 item screening instrument named as Nursing Students Stressor Questionnaire (NSSQ) was developed. Test retest reliability was found to be 0.923 with 95% CI 0.878 – 0.957. The internal consistency Cronbach's alpha of the tool was 0.866. Construct validity was established by exploratory factor analysis which yielded seven factors with Eigen Values more than one. The factors explained 60% of total variance.

**Conclusion:** NSSQ is a simple, easy to administer, self-reported screening instrument with acceptable reliability and validity.

**Key words:** Questionnaire, Stressor, Reliability, Construct validity, Factor Analysis.

### Background

Stress has become a chronic and pervasive condition in the world today<sup>1</sup>. Hans Selye defined stress as "the state manifested by a specific syndrome which consists of all the non-specifically induced changes within a biologic system"<sup>2</sup>. Stress has been measured in three aspects: stressors, stress responses and individual characteristics<sup>3</sup>.

Due to various internal and external expectations placed upon student's stress has become part of student's life<sup>4</sup>. Nursing students are likely to experience more stress than their friends and colleagues enrolled in other programs<sup>5</sup>. Systematic

review on sources of stress among nursing students reported that academic, clinical, personal and social stressors are mainly present among students<sup>6</sup>. Studies from India and United Kingdom have reported increasing levels of stress among nursing students<sup>7</sup>.

Stress has a negative effect on health, memory, problem-solving, ability to cope and all of which can lead to decreased academic performance<sup>8</sup>. The American Freshmen National Norms Study revealed that students joining college have increased levels of stress compared with other undergraduate students<sup>9</sup>. The stress levels of nursing students should be monitored in order to facilitate their ability to cope with stressful situations during their training<sup>10</sup>. This

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work originated from the concern about the non-availability of a valid and reliable instrument for assessment of stressors among first year baccalaureate nursing students in Kerala, India. The objective of the study was to develop a questionnaire to measure stressors among first year baccalaureate nursing students of Kerala.

## Methodology

### Research Approach

Mixed methods approach.

### Study Design

Descriptive cross-sectional design.

### Study Setting

Ten nursing colleges in Kerala.

### Study Period

August 2016 – December 2016

### Study Population

First year BSc Nursing students in Kerala.

### Exclusion Criteria

- Those who did not give consent
- Those who were absent on the day of data collection

### Source Population

First year BSc Nursing students of the academic year 2015-2016 from selected nursing colleges in Kerala.

### Sample size and sampling

In-depth interviews and FGDs were the data collection methods adopted in qualitative phase. Sample size for these methods were decided based on redundancy of data. Purposive sampling method was adopted for focus group discussions (FGD) and in-depth interviews and samples were selected from Government, Government Self Financing and Private Nursing Colleges in Kerala. Six focus group discussion with students were done. Each FGD was conducted with 10 students. 27 in-depth interviews were done with stakeholders (i.e., with eleven students, ten faculty and six parents). Pilot

study was done in a sample of forty from a private nursing college and this cluster was excluded from quantitative phase of the study.

The sample size needed for the quantitative phase of the study for a 36 item questionnaire was 360 based on the formula ( $10 \times$  total item of the tool). In order to get a cross sectional population of students one Government nursing college (75 students), two Government self-financing nursing colleges (100 students) and six Private nursing colleges (290 students) were selected for the quantitative phase of the study. Purposive sampling technique was adopted in the selection of colleges and from each college all eligible students were included in the study. The total students from these nine nursing colleges were 465. Among these 465 students 60 students who participated in FGD were excluded. So, from the remaining 405 students 372 students who met the criteria for the study were selected.

### Data collection tools and techniques

The tools for data collection are:

- Focus group discussion guide for students
- In-depth interview guide for students, parents, and faculty
- The Stressor Questionnaire

Face to face interview and self-reporting was the technique used for data collection.

### Steps in the development of stressor questionnaire

The questionnaire was designed to have the following properties.

- It should be a discriminative instrument to distinguish subjects who may have different levels of experience of stressors.
- It must capture the major stressors experienced by first year BSc nursing students
- The summary scores should be amenable to statistical analysis
- It should have acceptable levels of reliability and validity
- It should be relatively short, simple, and self-administered

Steps in the development of questionnaire are the following

## Conceptualization

Literature reviews threw light on conceptualization of stressors which were mainly academic, clinical, personal and psycho-social in nature

## Item generation

Items were generated from sources like research findings from literature, expert opinions, existing instruments and qualitative methods. These methods generated 137 items altogether.

## Identification of items

66 items were identified from the pool of 137 items based on the prioritization by the researcher deleting all the repetitive item or those having the same meaning and the items were grouped under different domains.

## Item selection

The list of 66 items were administered to 8 experts and I-CVI was calculated. The items were then reduced from 66 to 45. The content validity of the tool was also ensured through this process.

## Item wording and item sequencing

The items were worded considering the reading level of respondent avoiding ambiguity, jargons etc. and were sequenced from general to specific

## Response formatting and selection of type of scale

A 5 point likertscale with options ranging from very frequently to never was selected. The response very frequently was given a score of four and never a score of Zero. It was a self-rated questionnaire and higher the score higher the stressors experienced. All items were given equal weightage

## Pretesting

Pretesting was done among 10 experts, 15 peers and 20 students and items were reduced from 45 to 36. These procedures established the face validity and content validity of the tool

## Pilot study and cognitive interviewing

The instrument was administered under optimal conditions to a sample of forty students as a dress rehearsal of the main study. Cognitive interviewing

was done with 15 students. Test-retest reliability was also done along with pilot study.

## Final administration of tool

The refined 36 item tool was administered in a cross-sectional population of students based on the formula (10\* total item of tool) and analyzed its psychometric properties

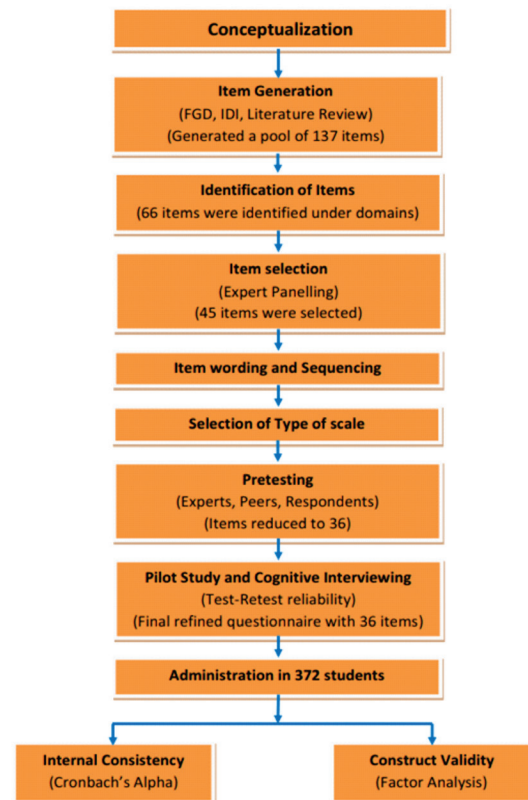


Figure 1: Steps in the development of stressor questionnaire

## Item analysis

Item analysis involves various analysis done on each item to assess descriptive statistics, correlation matrices, internal consistency Cronbach's alpha and factor analysis for item reduction.

## Descriptive statistics of the tool

Frequency, mean, standard deviation and graphical presentation of each item were done. Since none of the items showed 'floor and ceiling effect' no items were deleted during this phase.

## Correlation matrix

Inter item correlation and Item total correlation was calculated and items were reduced from 36 to 27.

## Reliability Assessments

Test retest reliability and internal consistency reliability were checked in the study. Test retest reliability was done in a sample of forty students by administering the questionnaire twice over a period of two weeks. The Intra - Class Correlation Coefficient calculated was 0.923 with 95% CI 0.878 - 0.957. Internal consistency reliability was estimated after a single administration of the questionnaire using Cronbach's Alpha. It was done to know whether all items in the tool are closely related to the construct under study. Cronbach's Alpha of 27 item tool was 0.885 and the final 22 item tool was 0.886.

## Validity Assessments

The validity of the tool was measured in terms of face validity, content validity and construct validity. Face validity and Content validity was established during different stages of tool development. Construct validity was established by exploratory factor analysis. This produced seven factors with eigen values greater than one. Factor analysis of 27 item tool finally yielded one with 22 items.

## Steps of Factor Analysis

### *Appropriateness of factor analysis*

Significant value of Bartlett's test and KMO value of 0.866 indicated that the data was factorizable.

## Factor extraction

Factor extraction was done using Principal Component Analysis (PCA). PCA yields communalities, Eigen Values, Percentage Variance and Factor loadings. If the communality of a particular variable is low then the variable will struggle to load significantly in any factor. All items in the newly developed tool had a communality of above 0.4. PCA yielded 7 factors with Eigen value >1. Scree test also yielded seven factors. The cumulative percentage variance explained by retained items were 60%. Factor loading indicate the degree of correlation between the variable and the factor. Only items with factor loading more than 0.35 were selected in the study.

## Factor Rotation

After factor extraction varimax rotation was done. In case of those items with a factor loading >0.35 on more than one factor at the same time, the items to which it maximally loaded was selected. In case of cross loading and loading on a wrong factor the item was deleted. There should be a loading of minimum two items to consider as a factor. Finally, a 22 item seven factor structure tool with a variance of 60% was derived.

## Labelling of factors

Factor 1 and 6 loaded psychosocial stressors, 2 and 3 clinical stressors, 4 personal stressors, 5 and 7 academic stressors.

Factors	Eigen Value	Percentage Variance	Cumulative Percentage Variance
1	5.939	12.693	12.693
2	1.577	10.406	23.099
3	1.315	8.250	31.349
4	1.191	7.697	39.047
5	1.112	7.442	46.489
6	1.027	7.293	53.782
7	1.010	6.087	59.869

Table 1: Eigen value and percentage of variance

## Scoring pattern of new questionnaire

The newly developed Stressor Questionnaire was named as Nursing Students Stressor Questionnaire

(NSSQ). The average time for completion of NSSQ is 5 minutes. Since all the stressors were related to first year BSc nursing curriculum the tool is presented without any subscales. The score ranges between 0 and 88. Higher the score higher is the stressor experience.

## Discussion

The item generation of the tool was based on literature reviews and qualitative methods. Cultural appropriateness and content relevance were ensured by the qualitative methods. The multiple sources of data collection offered an opportunity for data triangulation. Item generation including stake holders, item selection by expert paneling and series of pretesting established face validity and content validity of the tool.

The internal consistency of the questionnaire as estimated by Cronbach's Alpha is 0.866. Various authors have made different recommendations regarding the minimum level of reliability. Streiner & Norman reports ideally it should exceed 0.8<sup>11</sup>. Xie & De Vellis recommends an alpha coefficient of 0.70 – 0.80 as respectable and 0.80 – 0.90 as very good<sup>12</sup>. An alpha of 0.70 is rated as an acceptable standard by Nunnally also<sup>13</sup>. The test retest reliability estimated by Intra Class Correlation Coefficient was 0.923 with 95% CI 0.878 – 0.957. Indrayan reports any value not less than 0.75 is enough for good agreement<sup>14</sup>.

The exploratory factor analysis yielded 7 factors by Principal Component Analysis. Among various extraction methods PCA is recommended as the best extraction technique<sup>15</sup>. The eigen value of the components ranged between 5.939 and 1.010 and percentage of variance between 12.693 and 6.087. Using the eigen value for establishing a cut off is more reliable when the number of variables is between 20 and 50. All the items had factor loading above 0.35 which is ideal minimum prescribed by psychometricians. In most cases items loaded on to their appropriate factors. A total variance of 60% of the stressor questionnaire explained by the factors is also a desired property of the instrument. Streiner and Norman suggests a cumulative variance of at least 60% for the retained factors<sup>11</sup>. Some others go for 50 – 60 % in subjects like humanities<sup>16</sup>.

Convergent and discriminant validity of the Stressor Questionnaire was assessed in the second phase of the study. Criterion validity was not checked due to the absence of gold standard measure. Thus, the validity assessments by factor analysis and testing of convergence were good enough to establish construct validity of the instrument.

The present study revealed that stressors are related to academic, clinical, personal and psychosocial factors. The finding supports the views of Pulido-Martos et al<sup>6</sup>. Jarone & Benjamin reported high stress in nursing students are related to clinical and interpersonal factors<sup>5</sup>. Academic load and interpersonal interactions came out as important stressors of student nurses in a study conducted by Shukla et al<sup>17</sup>. Abasimi et al reported student nurses mainly experience personal stressors followed by academic stressors and social stressors<sup>18</sup>. Many studies revealed that stressors of nursing students are mainly related to clinical practice<sup>9,19,20</sup>.

Qualitative data strongly pointed out the fact that some of the traditional nursing procedures are outdated to be followed in the clinical setting. So, brain storming should be done and some of the traditional nursing procedures should be improvised to meet the demands of the real clinical practice.

## Conclusion

The newly developed Nursing Students Stressor Questionnaire is a simple, easy to administer, self-reported screening instrument with acceptable reliability and validity.

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