

# Development of the Clinical Learning Environment and Supervision Evaluation (CLESE) Scale for Nursing Students of M.M University Mullana, Ambala

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**Abstract** A methodological study was undertaken to develop clinical learning environment and supervision evaluation (CLESE) scale for nursing students of M.M University Mullana, Ambala. Modified Delphi technique was used to develop CLESE scale with 9 experts. After 3 Delphi rounds the scale was tried out on 190 nursing students of M.M. University. The reliability of scale was assessed by Cronbach alpha which was 0.89 indicated the internal consistency of scale. Stability of CLESE scale was assessed by test retest and was .83. The tool for analysis of Content and face validity was the panel of experts. Construct validity was analyzed by factor analysis. All (53) item had correlation  $>.20$ , Bartlett's test of sphericity and KMO value of data was allowing for the factor analysis, hence all items included in factor analysis. In factor analysis 10 components were generated and all items had loading value more than .30 and accounts for 50% of variance, so all retained in the final scale. Hence, a valid and reliable CLESE scale was develop to evaluate clinical learning environment and supervision for nursing students.

**Keywords** Clinical, Learning, Supervision, Evaluation, (CLESE) Scale

## 1. Introduction

In the field of clinical practice in nursing, the evaluation of clinical learning environment and supervision has been of interest for many years. The clinical learning of the nursing students is a very sensitive process which may be affected by the learning environment and the supervision. Within nursing, there is a strong demand for high-quality, cost-effective clinical education experiences that facilitate student learning in the clinical setting. [1] The clinical learning environment and supervision (CLES) are the interactive network of forces within the clinical setting that influence the students' clinical learning outcomes. The identification of factors that characterize CLES could lead to strategies that foster the factors most predictive of desirable student learning outcomes and ameliorate those which may have a negative impact on students learning outcomes. There is scarcity of these kinds of scales in Indian setting so this study was conducted to develop clinical learning environment and supervision evaluation (CLESE) scale in Indian setting.

## 2. Objective

To develop clinical learning environment and supervision evaluation (CLESE) scale for nursing students.

## 3. Delimitations

The study was delimited to the nursing students of selected university.

## 4. Methodology

Methodological research design was adopted to carry out the study. The CLESE scale was developed under four Phases. And under each phase some steps had been taken.

### *PHASE I- PRELIMINARY PREPARATION*

This phase was completed in three steps.

#### **a) Review of literature**

During this phase the preliminary version of CLESE was developed through an ample review of literature.

#### **b) Generation of item pool**

An exhaustive list of the factors which plays an important role in learning of the students during their clinical postings was prepared from literature review, discussion with nursing faculty, as well as from the researcher's personal experience. Related items such as learning environment, supervision, role of clinical instructors etc. were selected from the content and items were pooled together.

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### c) Preparation of preliminary draft

The blue print of clinical learning environment and supervision evaluation (CLESE) scale for the nursing students has been prepared. Items were categorized under following domains and sub domains:

#### 1. Clinical learning environment

- 1.1. Pedagogical environment
- 1.2. Leadership style of ward in-charge
- 1.3. Nursing care in the ward

#### 2. Supervisory relationship

- 2.1. Occurrence of supervision
- 2.2. Content of supervisory relationship

#### 3. Role of clinical instructor

- 3.1. Integration of theory and practice
- 3.2. Cooperation between Nursing staff and clinical instructor
- 3.3. Relationship among student, staff and clinical instructor

Scoring keys were developed to use the scale and for each statement scoring keys were in the following manner: 1(Fully disagree), 2 (Disagree to some extent), 3 (Neither agree nor disagree), 4(Agree to some extent), 5 (Fully agree).

### ***PHASE II- Validation of first draft and subsequent drafts of CLESE scale***

The modified Delphi technique was used to content validation of the first draft. Panel of experts was selected. The members of panel were nursing experts from M.M college of Nursing, Mullana, Ambala, National institute of Nursing education, PGIMER, Chandigarh, National Institute of Mental Health and Neuroscience (NIMHANS), Bangalore and College of Nursing, Dayanand Medical College, Ludhiana. The first draft of the tool was circulated among 9 experts from above stated institutions for the content validation of CLESE scale. As per the expert's opinion the modifications in the scale were made. Three rounds of modified Delphi technique were completed.

### ***Modifications after three modified Delphi rounds***

#### **Structure of the scale**

- Instruction Note added

Note- This (CLESE) scale will help to obtain your evaluation of clinical learning environment and supervision during clinical postings. You are requested to give responses regarding last clinical posting you have undergone. Your information will be kept confidential and anonymity will be maintained. Your participation is greatly valued and appreciated.

- Scoring keys modified

In the third draft the scoring keys were: 1 (Fully disagree), 2 (Disagree to some extent), 3 (Neither agree nor disagree), 4 (Agree to some extent), 5 (fully agree) but now in the fourth draft the scoring keys modified as: Always (3), Sometimes (2), Never (1) (Experts suggested that it will be easy to understand for the students.)

#### **1. THE LEARNING ENVIRONMENT**

#### **1.1. Pedagogical environment**

##### *Items modified*

- Item number 5<sup>th</sup>, There were lab manuals & procedure books available and accessible in the ward now modified as “Lab manuals & procedure books were available and accessible in the ward/unit”

#### **1.2. Leadership style of Subject In-charge (SI) or head of the department (HOD)**

##### *Items modified*

- Item number 3<sup>rd</sup>, The SI or HOD was having good leadership & managerial qualities now modified as “The SI or HOD possessed good leadership & managerial qualities”

**Scoring:** The scoring keys were generated and given in the fourth draft of the scale. Evaluation criterion for each sub domain was categorized into three categories which were: Needs to improve, average and good and the range of score were also given according to these categories.

### **PHASE III- PILOT STUDY**

The objectives of the Pilot study were to assess the feasibility of scale and to pre-test the scale for language and sequence of items. The CLESE scale was administered to 10 students of B.sc nursing second year from M.M College of nursing who were posted in orthopaedics ward. The result of pilot study indicated that the language of items was clear and understandable. The average time taken in evaluating the clinical learning environment and supervision was 15-18 minutes. All the items were same after pilot study, no modifications were done.

### **PHASE IV-FINAL TRYOUT**

Draft prepared after the third Delphi round was tried out on large sample.

Starting from students of B.sc nursing second year, third year and fourth year of M.M College of nursing then students of B.sc nursing second year and fourth year of M.M Institute of nursing, the data was collected from 190 students in the month of January – February 2013. The average time taken by the students to fill the scale was 15-18 minutes.

### **RELIABILITY OF CLESE SCALE**

Data was analyzed by SPSS (version 16.0). There were total 53 items in the CLESE scale and overall Cronbach's alpha of CLESE scale was 0.89 which indicates internal consistency. Corrected item to total correlation was applied on 53 items of scale, 49 items in the scale had item score to total score correlation between 0.2-.07 Whereas 4 items in the scale had item score to total score correlation less than 0.2 showing there incompatibility with the overall scale.

To check the individual contribution of items, each item was deleted one by one to see the changes in the value of Cronbach alpha. But none item had shown increase in the value of Cronbach alpha rather the value of Cronbach alpha remained same or it decreased which indicates all the items are contributing in the scale. This indicates that all the 53 items were contributing for the reliability of the scale.

#### **Test re-test reliability of CLESE scale**

**(Stability of CLESE scale)**

The test-retest group (n=52) was formed from B.sc nursing third year student of M.M College of nursing, who had just ended their clinical placement and were asked to evaluate the learning environment and supervision of their last clinical placement. The questionnaires were coded with order numbers from BSN1 to BSN52. The students were asked to note the code number of the questionnaire in their personal diaries. This enabled analysis of the data so that every assessment could be compared with the correct assessment. After one week (only theory block was going on) the students were asked to use the same code number and to evaluate exactly the same clinical placement they had evaluated one week previously.

The total instrument test-retest reliability was 0.83 which shows that the CLESE scale has the good stability

**VALIDITY OF CLESE SCALE Pearson's Correlation:**

To analyze inter-items correlation among items of CLESE scale Pearson's Correlation was applied. All (53) item had correlation  $>.20$ . (The optimal lower value for item to total correlation should be at least 0.2 -0

**Construct Validity**

To assess the adequacy as well as eligibility of scale items for undergoing factor analysis the KMO value and p-value were calculated. The KMO value of data in this study was 0.770 which was calculated by SPSS (version 16) (The KMO

value of data should be 0.50 for proceeding for factor analysis.) whereas p value of Bartlett's test of sphericity was 0.000. Which was significant (Value of Bartlett's test of sphericity must be  $<0.05$ ). It means that the data was suitable for factor analysis.

**Extraction communality of items of CLESE scale**

To find out the extraction communality value of each item of CLESE scale, Principal Component analysis extraction method was applied. Initial communality is assumed as 1(100%) for each item. Extraction communality of items was in range of 0.51-0.91. Average communality extraction was 0.66(Average communality extraction should be  $>0.6$ ). It means data is suitable to carry out factor analysis.

**Rotated component matrix by using Principal component analysis**

By applying rotated component matrix by using principal component analysis scale had generated 10 components listed as 1, 2, 3.....10 as depicted in table-1.

All the items had loaded ( $>.30$ ) on factor 1 to 10 so all items were retained in the final scale.

**Principal component analysis** technique with varimax rotation had yielded a total of 10 factors having eigen value of above 1. The eigen values of 10 components was in the range of 1.424-9.529. The 10 factors so generated accounted for 50% variance.

**Table 1.** factor analysis of CLESE scale using principal component analysis through varimax rotation

Items	Rotated Component Matrix									
	Components									
	1	2	3	4	5	6	7	8	9	10
Clinical instructor gave feedback after every procedure	.737									
During the procedure, the clinical instructor gave guidance and support	.691									
Clinical instructor gave demonstration before actual performance of the procedure	.672									
Clinical instructor gave feedback after evaluating assignments	.564									
There were routine clinical teachings by clinical instructors	.555		.341							
Clinical instructor showed interest in patient care in the ward/unit	.542	.321								
Clinical assignments were related to the objectives of clinical posting	.518					.325				
In my opinion, the clinical instructor was capable to integrate theoretical knowledge and everyday clinical nursing practice	.412								.401	
The clinical instructor was able to operationalise the learning goals of clinical placement	.371									
The clinical instructor and the nursing team worked together in supporting my learning		.706								
The clinical instructor was capable of giving his or her theoretical expertise to the nursing team		.651								
All over focus of discussion was on my learning needs.		.611								
The common discussions between nursing staff, clinical instructor and myself were comfortable experiences		.556		.322						
The clinical instructor was a member of the nursing team		.541								
In our common discussion I felt that we are colleagues.		.528								
I was oriented to ward/unit settings by clinical instructor		.412					.390			-.315
The clinical instructor helped me to reduce the theory-practice gap	.369	.403								
How often did you have separate unscheduled supervision by the subject in-charge or HOD without the clinical instructor?										
There were routine ward/unit tests to evaluate the				.771						

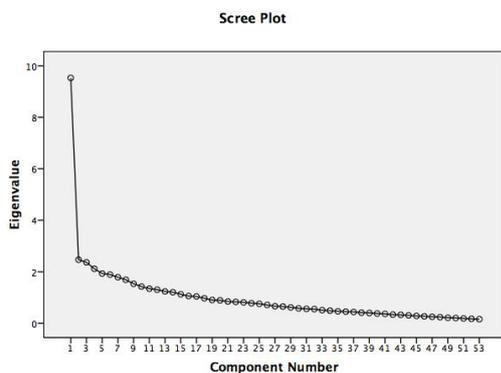
Items	Rotated Component Matrix									
	Components									
	1	2	3	4	5	6	7	8	9	10
performance.										
The clinical instructors gave feedback in calm manner			.636							
Overall I was satisfied with the supervision I received.			.632							
I felt that I received individual supervision.			.531							
I continuously received feedback and suggestions of improvement from my clinical instructor	.399		.412		.345					
There were frequent bed side rounds			.389			.376				
The SI or HOD possessed good leadership & managerial qualities				.662						
The SI or HOD regarded the students in her/his ward/unit as a key resource				.655					.351	
The SI or HOD was leader of nursing team				.649						
Feedback from the SI or HOD could easily be considered as a learning situation				.608						
The efforts of individual student were appreciated by SI or HOD				.542						
There was a mutual interaction in the supervisory relationship					.667					
Mutual respect and approval prevailed in the supervisory relationship					.654					
The supervisory relationship was characterized by a sense of trust					.615					
The supervision was based on a relationship of equality and promoted my learning					.496					
There was a defined channel of communication in the ward/unit						.594				
Nursing staff followed proper biomedical waste management.						.547				
Patients received individual nursing care						.525				
Documentation of nursing care (e.g. nursing plans, daily recording of Nursing procedures, charting etc.) was maintained						.492				
There was a safe practice environment in terms of using personal protective measures like gloves, mask, soap etc.						.488	-.378			
Nursing staff followed proper infection control measures						.472		-.373		
Students were actively involved in giving nursing care to the patients						.443	.353			
The clinical instructor was present every time in the ward/unit during posting hours and supervised the group well.							.605			
Clinical instructor took return demonstration from every student	.443				.310		.459			
The clinical instructor varied according to shift or place of work							.422	.393		-.309
The learning situations were meaningful & multi-dimensional in terms of content like procedures & recording-reporting in the ward/unit							.359			
I felt comfortable going to the ward/unit at the start of my clinical postings								.574		
I had a clinical instructor							.414	.535		
The clinical instructors knew the student by their personal names								.464	.327	
The clinical instructors were interested in student supervision			.308					.384	.382	
Lab manuals & procedure books were available and accessible in the ward/unit									.688	
There were sufficient articles in inventory of the ward/unit.									.469	
Same clinical instructor had 10-15 students and was a group supervisor rather than an individual supervisor								.329	.437	
The clinical instructors were easy to approach										.645
There were no problems in the information flow related to patient care										.583

*Extraction Method: Principal Component Analysis.*

*Rotation Method: Varimax with Kaiser Normalization.*

## 5. Scree Plot

The Scree plot is a graph of the eigen values against all the factors. The graph is useful for determining how many factors to be retained in the scale. The point of interest is where the curve starts to flatten. In this study from Scree plot, it was clear that first four factors had major contribution to the total variance (point of first inflection) and around six factors appear relevant in explaining data variance overall (point of second inflection). The first factor had eigen value 9.529, second factor mirror the value 2.470, factor 3 had eigen value 1.60, factor 4 had eigen value 2.117, factor 5 had eigen value 1.932, factor 6 had eigen value 1.892, factor 7 had eigen value 1.788, factor 8 had eigen value 1.689, factor 9 had eigen value 1.534 and factor 10 had eigen value 1.424. Subsequent to first ten factors, the Scree plot curve is almost smoother without any more inflection. So ten factors and all the 53 items were retained on the basis of Scree plot test.



## 6. Results

A clinical learning environment and supervision evaluation scale was developed to evaluate clinical learning environment and supervision for nursing students of M.M University Mullana, Ambala. The study was conducted in four phases. Reliability and validity of CLESE scale was analyzed. To find out internal consistency reliability of present CLESE scale, the Cronbach's alpha was used. There were total 53 items in the CLESE scale and overall Cronbach's alpha of present scale was 0.89 which indicates internal consistency of the scale. For the analysis of inter-items correlation among items of CLESE scale Pearson's Correlation was applied. All (53) item had correlation  $>.20$ , the total scale test-retest reliability was 0.83. Content validity and face validity was done by the expert's opinion, for the content validity the content validity index calculated which was .92 signifying that tool was having a good content validity. For construct validity of the scale principle component factor analysis was applied which generated 10 components according to the factors so generated through factor analysis. Thus all the items were having loading values  $>.30$  on factor which shows the CLESE was having good construct validity. The scoring was

done sub-domain wise under 3 categories and range of scores was also given for each sub-domain like: if the score is  $<70\%$  then it was categories as needs to improve, 70-90% was categories as average and  $>90\%$  was categories as good.

## 7. Discussion

There are mainly two problems in evaluating the clinical learning environment and supervision; complex nature of clinical learning environment and lack of appropriate tool. [2] It was felt by the researcher in his day to day experience that clinical learning environment and supervision should be evaluated by the nursing student so that the deficiencies can be figured out and further planning can be done to improve the clinical learning environment and supervision. For evaluating the clinical learning environment and supervision there was no such scale available in Indian setting. Although in recent years, few tools were developed for assessment of the quality of clinical learning environment in the foreign setting. One of them is clinical learning environment, supervision and nurse teacher (CLESE+T) evaluation scale which is developed in Finland by Mikko Saarikoski. [3] The domain of this scale was not appropriate for the Indian setting. Hence the need was felt to prepare a scale according to Indian setting to evaluate the clinical learning environment and supervision. The present study was aimed at developing the clinical learning environment and supervision evaluation (CLESE) scale and testing the psychometric properties of the newly formed scale. The CLESE scale will help the nurse educators to assess the clinical learning environment and supervision.

## 8. Conclusions

The conclusion is drawn from the findings of the study that CLESE scale has high validity and reliability and can be used effectively to evaluate clinical learning environment and supervision for nursing students.

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