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**THE CLINICAL LEARNING ENVIRONMENT, SUPERVISION AND NURSE TEACHER SCALE  
(CLES+T): PSYCHOMETRIC TESTING OF THE CATALAN VERSION**

**ABSTRACT**

**Background:** The clinical learning environment is the space in which nursing students develop their professional skills. The Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) scale makes it possible to assess its quality.

**Purpose:** To validate the CLES+T Scale in the Catalan context.

**Methods:** The translation process was carried out according to the principles of good practice of the International Society for Pharmacoeconomics and Outcomes Research Working Group. The students completed the Catalan version of the CLES+T and 15 days later they took part in the temporal stability test.

**Results:** The internal consistency was 0.934, the interclass correlation coefficient of the re-test was 0.865. The exploratory factor analysis showed 5 dimensions.

**Conclusion:** The Catalan version of the CLES+T scale is a valid and reliable tool to assess the quality of clinical learning environments in Catalonia.

**Keywords:** Nursing Students, Surveys and Questionnaires, Validation Study, Cross-Sectional Studies.

## **1. INTRODUCTION**

The European directive establishes that clinical practice in the nursing degree represent a total of 2,300 hours, during which the student will find a wide range of learning possibilities (European Parliament and the Council of the European Union, 2013).

The clinical learning environment (CLE) is defined as "a multidimensional unit" (Chan, 2002), the place where the student puts into practice everything they have learned at the university. In this context, they develop the competences of the profession (Palomino Moral et al., 2005).

During the clinical practice, the nurses guide and accompany the students at all times.

The nurse (clinical tutor) together with the multidisciplinary team must support the student, make them feel integrated and create learning opportunities (Hooven, 2015).

The experience of the clinical tutors is what makes them able to combine their care work with teaching (Young et al., 2019).

In turn, the academic tutors (AT) supervise the clinical practices, offer support to the nurses so that the teaching in the hospital units is of high quality (Chan et al., 2018).

Together, the clinical and academic tutors evaluate the learning process in the CLE and must give feedback to the student so that they are aware of their progress (Engström et al., 2017).

During the past 20 years, several authors have been interested in finding out how the student perceives these environments and evaluating whether the elements that interact in them are suitable for high quality learning (Chan, 2002; Dunn & Burnett,

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3 1995; Hooven, 2014; Saarikoski & Leino-kilpi, 2002). Thanks to them, we know that a  
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5 good CLE must be a unit that offers learning opportunities, where staff are valued,  
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7 motivated, and provide high quality care (Seshan et al., 2011).  
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## 10 11 12 13 **2. BACKGROUND** 14

15 In 2017, Nicotera et al. conducted a comparative study of six scales that assessed the  
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17 quality of clinical learning environments. They concluded that the most complete was  
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19 the CLES+T (Nicotera et al., 2017). The first version of the scale was the Clinical  
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21 Learning Environment, Supervision Scale (CLES), which in 2002 was designed to assess  
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23 nursing students' satisfaction with the CLEs (Saarikoski & Leino-kilpi, 2002). In 2008, it  
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25 was expanded with a subscale that included the evaluation of the role of the academic  
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27 tutor in the CLE, resulting in the CLES +T scale (Saarikoski et al., 2008). This latest  
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29 version has been adapted for and validated in more than 30 languages. The CLES+T  
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31 makes it possible to measure the dimensions of the CLEs. It consists of 34 items  
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33 classified into 5 factors or sub-dimensions: "pedagogical atmosphere" (9 items),  
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35 "supervisory relationship" (8 items), "leadership style of the ward manager" (4 items),  
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37 "premises of nursing on the ward" (4 items) and the "role of nurse teacher" (9 items).  
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39 All of them are evaluated using a 5-point Likert type score (Strongly disagree = 1,  
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41 Disagree = 2, Partially agree/Partially disagree = 3, Agree = 4, Totally agree = 5). The  
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43 internal validity determined using Cronbach's  $\alpha$  index for the original scale ranges from  
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45 0.77 to 0.96 (Saarikoski et al., 2008).  
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## 57 **3. METHODS** 58

### 59 **3.1. Aim** 60

To develop the cross-cultural adaptation of the CLES+T Scale in Catalonia.

### **3.2. Design**

Prospective cross-sectional study.

### **3.3. Participants**

Students from the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> years of the Nursing Degree from public and private universities, who carried out their clinical practice in hospitals in the Barcelona metropolitan area, participated. Students from the Erasmus programme, who were doing their internships in Catalonia at that time, and those who did not know Catalan were excluded.

### **3.4. The translation process**

A process of forward-backward translation and evaluation of the comprehensibility and clarity of the questionnaire obtained was developed. For this, the translation process was based on the principles of good practice of the International Society for Pharmacoeconomics and Outcomes Research Working Group (ISPOR). With permission from the author of the original scale, two Catalan translators fluent in the original language (English) and with experience tutoring students in clinical practice at the Faculty of Medicine and Health Sciences, independently, carried out a first translation. The two Catalan versions were unified by the research team. This second version was translated back into the original language independently by two native English translators. The backward translated into English versions were reviewed with the original version by the research team to finally harmonise all the translations and thus

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3 guarantee conceptual equivalence.  
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### 8 **3.5. Ethical considerations**

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10 The study was approved by the research ethics committees of both the hospital and  
11 the university (XXXXXX/XXXXXX). Informed consent was requested from all  
12 participants.  
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### 20 **3.6. Data Collection**

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22 The recruitment period was from October 2019 to June 2021. 290 students out of a  
23 potential 800 participated, a response rate of 36.25%.  
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27 The participants filled out the questionnaires during the last week of practice, taking  
28 into account their last CLE. They answered a first section covering the  
29 sociodemographic variables and then the Catalan version of the CLES+T scale.  
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34 To study temporal stability, a re-test was sent to all participants by email 15 days after  
35 their first response. A total of 72 re-tests were received, equivalent to 24.8% of those  
36 surveyed.  
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### 45 **3.7 Data Analysis**

46 Sociodemographic data were analysed using descriptive statistics.  
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48 To analyse reliability, the internal consistency and temporal stability of the scale were  
49 tested. Internal consistency was calculated using the Cronbach's alpha statistical  
50 method to assess relationships between items on the scale. A Cronbach's alpha score >  
51 0.7 indicates reliable results (Campo-Arias & Oviedo, 2008; García de Yébenes Prous et  
52 al., 2009). Temporal stability was studied using the interclass correlation coefficient  
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3 (ICC) using test-retest. Taking into account a 95% confidence interval, ICC values < 0.5  
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5 were considered to have poor reliability, between 0.5 and 0.75 moderate reliability,  
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7 good reliability for values between 0.75 and 0.9 , and excellent reliability for values >  
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9 0.9 (Koo & Li, 2016).  
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12 The construct validity was evaluated through exploratory factor analysis, grouping the  
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14 answers according to dimensions. The Varimax method for matrix rotation was chosen  
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16 and the number of factors was determined considering 5 domains, as in the original by  
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18 Saarikoski (2008). Beforehand, a principal component analysis was performed to  
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20 determine the relevance of the factor analysis. A Kaiser-Meyer-Olking (KMO) value  $\geq$   
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22 0.5 was considered acceptable after performing the KMO sample adequacy measure  
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24 index, as well as a significant result (p value < 0.005) in the Bartlett sphericity test. The  
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26 analysis was carried out with the IBM SPSS Statistics version 21 for Windows program.  
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## 35 **4. RESULTS**

### 36 **4.1 Demographic information**

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38 290 students from 8 Catalan universities participated, of whom 84.5% were women  
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40 (245). The mean age of all participants was  $23.9 \pm 5.52$  years. The representation by  
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42 course year was 96 students from the second year, 102 from the third and 92 from the  
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44 fourth. A total of 20 practice units were evaluated (wards for various specialities, and  
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46 special units: ICU, Emergencies, Operating Theatre, Resuscitation, Oncology, Nurse  
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48 Managers, Semi-Critical Unit, and Haematology). The percentages of participants per  
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50 shift were 49% on the morning shift, 37.2% on the afternoon shift, and 13.8% on the  
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52 night shift.  
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59 92.8% carried out their practice in a university hospital.  
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#### **4.2 Reliability analysis**

Cronbach's alpha analysis was performed to assess the internal consistency of the scale, resulting in a value of 0.934 for the total scale. The corrected inter-item correlations ranged between 0.386 and 0.750, indicating satisfactory correlations.

Cronbach's alpha if any of the items were eliminated was in all cases less than 0.934 and, therefore, none of the questions could be omitted.

The interclass correlation coefficient of the re-test was 0.865, indicating the temporal stability of the scale to be good.

#### **4.3 Construct validity**

The KMO value was 0.919 and the Bartlett sphericity test resulted in  $p < 0.001$  ( $\chi^2 = 6796$  and  $df = 561$ ) which indicate a good correlation between the items.

The structure was analysed in 5 factors, as in the original scale, and 63.32% of the variability of the variance was obtained. Here factor 1 (supervisory relationship) explained 35.46% of the variance, factor 2 (pedagogical atmosphere) 11.86%, factor 3 (role of nurse teacher) 6.78%, factor 4 (leadership style of the ward manager) 5.02% and, finally, factor 5 (premises of nursing on the ward) 4.19%.

Question 14 could only explain 37.4% of its variability but, on the other hand, for question 8, 84.1% of its variability is explained by the model.

Table 1 shows the results of the exploratory factor analysis.

(See supplementary material table 1)

## 5. DISCUSSION

The results of the study show the construct validity of the Catalan version of the CLES+T. Defining a 5-factor model, the same as other versions of the scale, such as the original Saarikoski (Saarikoski et al., 2008), the German (Bergjan & Hertel, 2013), the Norwegian (Henriksen et al., 2012), the Greek (Papastavrou et al., 2016), the Arabic (Guejdad et al., 2022), and the Spanish (Vizcaya-Moreno et al., 2015).

Comparing them among themselves, the main factor of the Catalan version is similar to the other versions, thus, in our version, factor 1 has 35.46% of the variance, which is 40% in the original, and 48% in the German, and in the Spanish, 20%. The similarity could be explained by a European model, where the clinical tutor offers individualised follow-up with a nurse-student ratio of 1:1. There was also a match in the factor with the least weight "premises of nursing on the ward", which on the Saarikoski scale had 3% of the variance, the German one 6%, the Spanish 5.5% and the Catalan 4.2%, and it is in this factor that more differences were found between the items it consists of.

If we analyse the items that make up each factor between the Catalan versions and the original one by Saarikoski, we can see that there are only discrepancies in 4 of the items, which in the original scale are part of the "pedagogical environment" factor and in the Catalan one are found in the factor "premises of nursing on the ward".

Table 2 shows the item differences between the factors.

(See supplementary material table 2)

Differences in the factor "premises of nursing on the ward" have been described in other validations, such as the Chinese, Arabic and Spanish versions (Guejdad et al.,

2022; Vizcaya-Moreno et al., 2015; Zhao et al., 2021). Its authors believe that the explanation is found in the theoretical model of the dimensions. The fact is that it could be the close relationship that exists between the premises of nursing on the ward and the good teaching environment of the unit that would lead to a difficult separation between factors, which, depending on the cultural context, could lead to detecting differences between these dimensions, and, therefore, it is interesting to continue investigating the theoretical model of the scale.

## **6. LIMITATIONS**

The study was interrupted by the Sars-Cov2 pandemic. The first sample was collected during the course that was halted by the pandemic and the second after the practice was restarted, when the academic year was back to normal. No differences were observed between the groups, and they were included as the same participating sample.

## **7. CONCLUSION**

Based on the results obtained, the implementation of the CLES+T scale in the Catalan context is feasible. Its use can help to assess the quality of the CLE according to each of the dimensions it consists of, and encourages further research into the theoretical model of the dimensions of the scale.

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**9. TABLES****Table 1.** Exploratory factor analysis

Items on factor	Supervisory Relationship (factor 1)	Pedagogical atmosphere on the ward (factor 2)	Role of nurse teacher (factor 3)	Leadership style of the ward manager (factor 4)	Premises of nursing on the ward (factor 5)
My supervisor showed a positive attitude towards supervision	0.847				
I felt that I received individual supervision	0.770				
I continuously received feedback from my supervisor	0.813				
Overall I am satisfied with the supervision I received	0.848				
The supervision was based on a relationship of equality and promoted my learning	0.814				
There was a mutual interaction in the supervisory relationship	0.774				
Mutual respect and approval prevailed in the supervisory relationship	0.807				
The supervisory relationship was characterised by a sense of trust	0.817				
The staffs were easy to approach		0.739			
I felt comfortable going to the ward at the start of my shift		0.636			
During staff meetings (e.g. before shifts) I felt comfortable taking part in the discussions		0.631			
There was a positive atmosphere on the ward		0.750			
The staffs were generally interested in student supervision		0.671			
In my opinion, the NT was capable of integrating theoretical knowledge and everyday practice of nursing			0.715		
The NT was capable of operationalising the learning goals of this placement			0.685		
The NT helped me to reduce the theory-practice gap			0.783		
The NT was like a member of the nursing team			0.717		

The NT was able to give his or her expertise to the clinical team			0.823		
The NT and the clinical team worked in supporting my learning			0.798		
The common meetings between myself, mentor and NT were comfortable experience			0.611		
In our common meetings I felt that we are colleagues			0.609		
Focus on the meetings was in my learning needs			0.715		
The WM regarded the staff on her/his ward as a key resource				0.856	
The WM was a team member				0.870	
Feedback from the WM could easily be considered a learning situation				0.825	
The effort of individual employees was appreciated				0.426	
The ward can be regarded as a good learning environment					0.540
The staff learned to know the students by their personal names					0.322
The wards nursing philosophy was clearly defined					0.723
Patients received individual nursing care					0.623
There were no problems in the information flow related to patients' care					0.440
Documentation of nursing (e.g. nursing plans, daily recording of nursing procedures, etc.) was clear					0.528
There were sufficient meaningful learning situations on the ward					0.751
The learning situations were multi-dimensional in terms of content					0.675

The items of CLES+T scale "reprinted from International Journal of Nursing Studies, Vol 45, Issue 8, Mikko Saarikoski, Hannu Isoaho, Tony Warne, Helena Leino-Kilpi, The nurse teacher in clinical practice: Developing the new sub-dimension to the clinical learning environment and supervision (CLES) scale, pp.1235–1237, Copyright (2023), with permission from Elsevier."

**Table 2.** Item differences between the factors

Factor	Saarikoski	Martí-Ejarque
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For Review Only