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**The clinical learning environment and supervision instrument (CLES):
validity and reliability of the Dutch version (CLES+NL)**

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1 **Abstract** (word count = 196)

2 **Background:** The clinical learning environment and supervision scale (CLES) is a
3 valid and reliable tool that was developed to assess the quality of nursing students'
4 clinical placements .

5 **Objectives:** To obtain a reliable and valid Dutch version of the CLES that is in line
6 with the Flemish culture and educational context.

7 **Design:** Scale validation study on data provided by a cross-sectional survey.

8 **Settings:** 190 wards in 31 institutions for healthcare in Flanders, Belgium.

9 **Participants:** 768 student nurses enrolled in the three year bachelor programme at
10 University College Ghent, Faculty of Healthcare Vesalius

11 **Methods:** Face and content validation was followed by data collection. Factor
12 analysis was performed using varimax rotation. Subsequently, internal consistency
13 reliability was tested on the total scale and its subdimensions using Cronbach's
14 alpha.

15 **Results:** We gathered 768 questionnaires. Factor analysis revealed 5
16 subdimensions with an eigenvalue greater than 1, explaining 71.281 % of the
17 variance. The overall internal consistency and the consistency of the five
18 subdimensions is high. Our data supports face, content and construct validity of the
19 CLES+NL.

20 **Conclusions:** The CLES+NL is a valid and reliable instrument that can be used to
21 evaluate the quality of nursing wards as learning environments in Flanders.

22

23 **Key Words**

24 Clinical Learning Environment and Supervision instrument (CLES); Clinical
25 placement; Education, Nursing; Learning environment; Validation study.

1 ***What is already known about the topic?***

- 2 • The Clinical Learning Environment and Supervision instrument (CLES) was
- 3 developed by Saarikoski and Leino-Kilpi (2002) and published in English.
- 4 • The CLES has been acknowledged as a valid and reliable instrument to
- 5 evaluate clinical learning environments for nursing students.
- 6

7 ***What this paper adds?***

- 8 • This paper demonstrates the development of a valid and reliable Dutch
- 9 version of the CLES (CLES+NL).
- 10 • The CLES+NL is slightly modified to match local cultural and educational
- 11 contexts.
- 12

1 INTRODUCTION

2 In 1999, the Bologna agreement laid the foundations of a European higher education
3 area, aiming at aligning higher education with society's changing needs. As a
4 consequence, nursing education in Belgium's Flemish community underwent major
5 structural changes. Adaptations of the curricula led to rethinking the traditional ways
6 in which clinical teaching was organised and to re-conceiving guidance of nursing
7 students during their hospital ward training.

8 Traditionally, nurse educators used to work together with their students on the wards
9 twice to three times a week. During these sessions, they performed patient care,
10 prepared and administered medication, completed patient files and performed ward-
11 specific care processes. Subsequently, the students' work was evaluated, and
12 related theoretical issues were discussed. The re-conception of nursing education,
13 however, has led to a tendency towards assigning a more academic role to nurse
14 educators. Consequently, their task of clinical teaching has –at least partially– been
15 conveyed to mentors and supervisors, who are part of the hospital ward's nursing
16 staff (Saarikoski et al., 2002).

17 At University College Ghent, we aim to provide high-quality clinical learning
18 environments to our students. Until recently, however, we were lacking a valid and
19 reliable instrument for proper assessment. From an extensive literature search, the
20 Clinical Learning Environment and Supervision instrument (CLES) has
21 been proven to be valid and reliable with different international samples (Saarikoski
22 et al., 2008, Saarikoski et al., 2007, Saarikoski and Leino-Kilpi, 2002, Saarikoski et
23 al., 2002). In order to use it for assessment of our local clinical learning
24 environments, a Dutch version of the instrument was needed. The aim of the current
25 study was to explore the reliability and validity of this CLES+NL. Due to format

1 restrictions, data resulting from the use of the scale, such as scores and differences
2 between subgroups, are not reported in the present paper.

3

METHODS

Scale translation and adaptation

Dutch forward and back-translation of the CLES (Saarikoski and Leino-Kilpi, 2002) was performed by two colleagues who speak English fluently. Any residual minor problems in wording were resolved by consensus between the translators and the researchers. In 2004, this version of the scale was pilot tested using the instrument among 46 nurse students. Five items were added to adapt the scale to the Flemish cultural and educational context. First, because we wished to determine whether the care patients receive meets the same high standards as targeted in our educational programme, the statement “*Overall, the patients received high quality nursing care*” was added. Further, to assess whether students felt sufficiently stimulated and experienced adequate learning opportunities, the following two items were introduced: “*I was insufficiently stimulated during supervision*” and “*The number of learning opportunities were not proportionate to the number of students on the ward*”. As nursing is teamwork, the item “*Within the team I was regarded as equal*” was added. Finally, an item evaluating *whether a student would recommend the ward to fellow students* was included.

In order to prevent acquiescence bias, five items were worded negatively. Thereby, a negative evaluation of the item yielded a higher score.

The item “*There was a mutual interaction in the supervision relationship*” was removed from the scale to avoid redundancy with “*I was insufficiently stimulated during supervision*”.

Moreover, the item “*The supervision was based on a relationship of equality and promoted my learning*” was divided into two separate statements, namely “*Supervision promoted my learning*” and “*The supervision was based on a*

1 *relationship of equality*” in order to assess both dimensions within the original
2 statement separately.

3 All items are scored on a Likert scale, ranging from “totally disagree” to “totally
4 agree”.

6 **Scale validation**

7 Although the original CLES has proven face and content validity (Saarikoski and
8 Leino-Kilpi, 2002), its translation and the addition of new items required a new
9 validation process.

10 Face validity of the CLES+NL was monitored during the pilot study. Expert validation
11 was performed by presenting the CLES+NL to our program board, consisting of 12
12 nurse educators, who were asked to evaluate the clarity and readability of all
13 statements.

14 These experts were also asked to assess the scale’s content validity by scoring the
15 relevance of the instrument’s items on a scale of 1 to 3, where 1 = not relevant, 2 =
16 relevant but not necessary, and 3 = absolutely necessary. Additionally, they were
17 asked if any other items should be added to the scale. Based upon their answers, a
18 Content Validity Index (Lynn, 1986) was calculated.

19 The scale’s construct validity was assessed statistically by means of principal
20 component factor analysis with varimax rotation. Internal consistency was tested on
21 the total scale and the subdimensions using Cronbach’s alpha calculation.

23 Tests were two-tailed and statistical significance was set at $p < .05$. The study was
24 conducted according to the ethic guidelines laid down in the Declaration of Helsinki
25 and informed consent was obtained from all subjects.

RESULTS

Participants

Participants were nursing students enrolled in the three year bachelor programme at University College Ghent, Faculty of Healthcare Vesalius. In the academic year 2007-2008, all students completed a questionnaire at the end of each clinical placement. Thus, a total of 768 questionnaires were gathered, providing data from 190 wards in 31 institutions for healthcare in Flanders. Table 1 gives an overview of the participating students' characteristics.

Table 1: Characteristics of the participants

Student's year in program	Number of participants	Gender	
		Male	Female
1st	272	78	194
2nd	241	62	179
3rd	255	62	193
TOTAL	768	202	566

Experts' face and content validation

The experts of our program board unanimously approved the CLES+NL's clarity, readability and completeness. The Content Validity Index demonstrated a general consent concerning the relevance of all items included.

Factor analysis

In order to achieve construct validity by factor analysis, we conducted some preliminary analyses. We found no items with limited discriminating characters (items scoring lower than 2.00 or higher than 4.00), nor with high positive or negative kurtosis and skewness. Therefore, all items could be included. Furthermore, the

Maiser-Meyer-Olkin measure of sampling adequacy (0.97) was considered to be good and the Bartlett's test of sphericity was significant ($p < 0.001$). All these tests indicate that performing a factor analysis was actually appropriate.

As in the original scale, factor analysis revealed 5 underlying dimensions with an eigenvalue greater than 1, explaining 71.281% of the variance. The first dimension, "*Ward atmosphere*", consisted of 13 items. With an eigenvalue of 17.024, this dimension explains 22.755% of the total variance. Two new items (25 and 32) were included in this dimension. The Cronbach's alpha of this subdimension was 0.956. For the second dimension, "*Supervisory relationship*", an explained variance of 14.514% was found. The Cronbach's alpha for this subdimension was 0.940. The subdimension "*Premises of nursing care on the ward*" explained 11.715% of the variance, with a Cronbach's alpha of 0.859. The latter two subdimensions, "*The ward as a learning environment*" and "*Leadership style of the ward manager*" explained 11.688% and 10.609% of the variance, respectively, with Cronbach's alpha of 0.894 and 0.801, respectively. Table 2 shows the results of the factor analysis.

Table 2: Subdimensions, factor loadings, explained variance and reliability of the CLES+NL

	Factor Loadings	Explained variance %	Cronbach's Alpha	Item to scale correlation (range)
CLES+NL		71.281	0.970	0.457 - 0.857
Ward atmosphere (Sfeer op de afdeling)		22.755	0.956	0.674 - 0.856
1. The staff was not easy to approach (<i>De leden van het team waren niet toegankelijk</i>)*	0.781			
5. There was a positive atmosphere on the ward (<i>Er was een positieve atmosfeer op de afdeling</i>)	0.767			

4. I felt comfortable going to the ward at the start of my shift (<i>Bij aanvang van mijn dienst ging ik met een goed gevoel naar de afdeling</i>)	0.697			
25. Within the team I was regarded as equal (<i>Binnen het team werd ik als gelijke beschouwd</i>)+	0.694			
2. There was a good spirit of solidarity among the nursing staff on the ward (<i>Er was een gevoel van solidariteit tussen de verschillende verpleegkundigen</i>)	0.687			
17. The staff learned to know the student by their personal names (<i>De equipe kende iedere student bij zijn/haar naam</i>)	0.656			
3. During staff meetings I felt comfortable taking part in the discussions (<i>Tijdens overdrachten voelde ik me comfortabel genoeg om eigen inbreng te doen</i>)	0.639			
28. Mutual respect and approval prevailed in the supervision relationship (<i>Er was sprake van wederzijds respect en stimulatie tijdens de begeleiding</i>)	0.628			
16. The staff was generally interested in student supervision (<i>De equipe was geïnteresseerd in begeleiding van studenten</i>)	0.627			
29. The supervisory relationship was characterised by a sense of trust (<i>Er was sprake van vertrouwen tijdens de begeleiding</i>)	0.618			
27. The supervision was based on a relationship of equality (<i>Er was sprake van wederzijdse interactie tijdens de begeleiding</i>)	0.598			
32. I would recommend this ward to other students (<i>Deze stageplaats zou ik aanbevelen aan mijn medestudenten</i>) +	0.554			
Supervisory relationship (Supervisie)		14.514	0.940	0.782 - 0.886
23. I continuously received feedback from my mentor	0.749			

(Ik kreeg voldoende feedback van mijn mentor/begeleider)

22. I felt that I received individual supervision (Ik had het gevoel dat ik individuele begeleiding kreeg) **0.723**

21. The mentor showed a positive attitude towards supervision (De mentor had een positieve houding naar begeleiding toe) **0.680**

24. Overall, I am satisfied with the supervision I received (Over het algemeen ben ik tevreden over de begeleiding die ik kreeg) **0.627**

30. I was insufficiently stimulated during supervision. (Tijdens de begeleiding werd ik onvoldoende gestimuleerd)+ **0.537**

26. The supervision promoted my learning (De begeleiding bevorderde mijn leerervaring) **0.531**

Premises of nursing care on the ward 11.715 0.859 0.612 - 0.756

(Verpleegkundige zorg op de afdeling)

14. Documentation of nursing (e.g. nursing plans, daily recording of nursing procedures etc.) was clear (De verpleegplannen (dossiers, etc) waren duidelijk) **0.761**

13. There were problems in the information flow related to patients care (Er waren problemen met de infodoorstroming betreffende patiënten)* **0.749**

12. Overall, the patients received high quality nursing care (Globaal genomen was de zorg naar patiënten toe kwalitatief hoogstaand)+ **0.661**

11. Patients received individual nursing care (Patiënten kregen geïndividualiseerde verzorging) **0.644**

10. The wards nursing philosophy was clearly defined (De manier van verplegen op de afdeling was duidelijk gedefinieerd) **0.637**

The ward as a learning environment (De afdeling als leeromgeving) 11.688 0.894 0.681 - 0.822

18. There were sufficient meaningful learning situations on the ward (<i>Er waren voldoende betekenisvolle leermomenten op de afdeling</i>)	0.832
19. The learning situations were multi-dimensional in terms of content (<i>De leermomenten waren multidimensioneel (zorg, omgang, technisch, ...)</i>)	0.808
20. The ward can be regarded as a good learning environment (<i>Deze afdeling kan als een goede leeromgeving beschouwd worden</i>)	0.698
31. <i>The number of learning opportunities were not proportionate to the number of students on the ward (Er waren onvoldoende leermomenten tov het aantal studenten op de afdeling)+</i>	0.641

Leadership style of the ward manager	10.609	0.801	0.431 - 0.694
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(Leiderschapsstijl van de hoofdverpleegkundige)

7. The ward manager was a team member (<i>De hoofdverpleegkundige maakte deel uit van het team</i>)	0.784
9. The efforts of individual employees were appreciated (<i>De inspanningen van individuele verpleegkundigen werden geapprecieerd door de hoofdverpleegkundige</i>)	0.777
8. Feedback from the ward manager could easily be considered as a learning experience (<i>De feedback van de hoofdverpleegkundige kon als leerervaring aanzien worden</i>)	0.723
6. The ward manager regarded the staff on her/his ward as a key resource (<i>De hoofdverpleegkundige beschouwde zijn/haar team als belangrijk</i>)	0.692
15. Basic familiarisation was not well organized (<i>Het eerste contact was niet goed georganiseerd</i>)*	0.461

1 * Items that were negatively worded in Dutch; + new items in the Dutch scale; (Dutch
2 translation between brackets)

3

DISCUSSION

Our results demonstrated the overall internal consistency and the consistency of the five subdimensions of the CLES+NL to be high, thus supporting validity and reliability of the instrument.

Using the CLES+NL, we identified ward atmosphere and supervisory relationship as the two most important factors constituting a 'good' clinical learning environment.

This is in line with the findings by Saarikoski and Leino-Kilpi (2002), who identified the supervisory relationship as the most important factor in the students' clinical learning, and who found that ward managers can create the conditions of a positive ward culture and a positive attitude towards students and their learning needs.

(Saarikoski and Leino-Kilpi, 2002).

The major strengths of our study are the large sample size upon which our validation results are based, the CLES+NL's high item-scale correlations and its high inter-item correlations.

There are, however, some limitations to this study. First, the data were collected in one single educational institution, so caution is warranted in generalising our results to other institutions. This potential bias is nevertheless limited by the fact that the wards, which are the actual subject of this study, were located in various healthcare institutions in Flanders. Second, the data were collected in a one year period, so a follow-up study is needed to consolidate the scale and its subdimensions. Third, although face, content and construct validity were assessed in the current study, the lack of a valid 'gold standard' makes it impossible to test criterion validity. Our statistical analyses nevertheless suggest that the CLES+NL measures the same theoretical concept as the CLES. Thereby, criterion agreement between both scales can be assumed. Finally, during our validation study, the CLES+T was published,

1 which added to the CLES an additional sub-scale for measuring the quality of nurse
2 teacher's co-operation with the crucial actors in the clinical practice of student nurses
3 (Saarikoski et al., 2008). Due to the timing of this publication, it was impossible to
4 take it into account while developing the CLES+NL. Notwithstanding these
5 limitations, results support our claim that the CLES+NL can contribute to the process
6 of assessing the educational development of nursing students in Flanders.

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