EXTERNAL VALIDATION OF NINE EQUIVALENTS OF NURSING MANPOWER SCORE (NEMS) IN COMPARISON WITH THE SIMPLIFIED THERAPEUTIC INTERVENTION SCORING SYSTEM (TISS-28) IN A PEDIATRIC ICU IN BRAZIL

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Introduction

• **Background:**
  – The Nine Equivalents of Nursing Manpower Score (NEMS) and the simplified Therapeutic Intervention Scoring System-28 (TISS-28) is an instrument that has been used to measure severity of illness and nursing workload in adults intensive care units (ICUs).

• **Objectives:**
  – To evaluate the validly of NEMS and compare it with the TISS-28 in children.
Methods

- Prospective observational study from 01/10/2006 to 30/09/2008.
- Data from all patients admitted to the paediatric intensive care unit (PICU) were included in the study.
- Variables for NEMS and TISS-28 were recorded daily for each child admitted to the PICU.
- Demographic data were also recorded and patients followed until PICU discharge or death.
Results

- 816 children were included, yielding a total of 7,702 observations.

From 01/10/2006 to 30/09/2008
830 admissions in PICU

Not included 13 admissions all newborns with less than 28 days.

Elegible
817 admissions

Lost of 1 patient data (0.12%).

Sample of study: 816 admissions from 661 childrens

7,702 daily measures of scores
Results

NEMS over-predicted nursing workload compared to TISS-28

- The mean NEMS was 25±10.2. NEMS at admission was 24.7±8.2 and the maximum NEMS was 26.6±9.2.
- TISS-28 score was lower than NEMS at all instances (19.4±13.7 for all observations; 19.2±7.6 at admission; and 21.3±8.2 for maximum TISS; p< 0.05 in all analyses).
Results
There was good correlation between NEMS and TISS-28

- There was good correlation ($r^2=0.69$) for all observations, $r^2=0.70$ at admission, and $r^2=0.74$ for maximum score; ($p>0.01$ for all).

**Regression analysis of NEMS versus TISS-28 in all observations**

The relationship between the two systems was

$$NEMS = 4.25 + 1.04 \times TISS-28$$
Results

NEMS and TISS-28 showed good agreement

Bland–Altman plots for limits of agreement between NEMS and TISS-28

Limits of agreement for 2SD was -3.9 and +13.9.

The mean difference between NEMS and TISS-28 was 5.0 ± 4.4

Analysis of the measurement outside 2SD (>8.9 SD) = 6.2%.
Results

The NEMS and TISS-28 showed a good discrimination for mortality

- Performed at admission - ROC curve
  - NEMS=0.71(0.63-0.78)
  - TISS-28=0.68(0.60-0.75)

- Performed at maximum score - ROC curve
  - NEMS=0.80(0.74-0.85)
  - TISS-28=0.76(0.70-0.82)
• NEMS over-predicted nursing workload compared to TISS-28.

• However, we found a good correlation between TISS-28 and NEMS in a paediatric population.

• NEMS and TISS-28 showed good agreement

• NEMS and TISS-28 also showed good mortality discrimination capacity.