Critical Care Nurses' Workload
Association between Nurse Perceived and Objectively Measured Workload: An Observational Longitudinal Study

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Background

- Workload of critical care nurses (CCN) is high and assessment is mainly focused on objective measures.
- Perceived workload of CCN increasingly in focus.
- Perceived workload = Perception of job demands, resources and workload depends on the individual CCN' characteristics, coping strategies and resources.
- Objectively workload = From the patients' illness time- and task-based load.
- Not clear if and how perceived and objectively measured workload are associated.

Aims

1) To describe CCNs' perceived and objectively measured workload per shift
2) To explore the association between perceived and objectively measured workload

Method

- **Design**: Observational longitudinal
- **Setting**: University-affiliated interdisciplinary adult intensive care unit
- **Sample**: Non-probability convenience
- **Collection timeframe**: After every shift over four weeks perceived and objectively workload were measured
- **Data variables**:
  - Perceived measures with the Questionnaire on the Experience and Evaluation of Work (QEEW2.0)
  - Objectively measures with Therapeutic Intervention Scoring System (TISS-28), Nine Equivalents of Nursing Manpower Use Score (NEMS), Swiss Society for Intensive Care Medicine (SGI)-category and number patients of the CCN
- **Descriptive analyses (Aim 1)**
- **20 Multilevel models (Aim 2)**:
  - Dependent variables = Five daily perceived workload measures
  - Independent variables = Four daily objective workload measures

Conclusions

- Objective instruments can measure direct patient workload but not all daily perceived workload domains such as *emotional-moral load* or *performance* which corresponds to important work demanding of CCN.
- Perceived workload and strategies to reduce should be given a high priority in nurse management.
- Perceived workload should be included into daily shift management and into case-based payment.

Results

- 60 CCN included
- 765 shifts included

Aim 1: (Table 1)
- CCN perceive high *mental load*, moderate *pace and amount of work* and *physical load*, low *emotional-moral load,* and good *performance.*
- Higher basic than daily perceived workload.
- Higher perceived workload in direct patient care.

- Higher workload using the *SGI-category* and *number patients of the CCN* than using the *TISS-28* and *NEMS*.

Aim 2: (Table 2)
- Statistically significant associations between *TISS-28*, *NEMS*, *SGI-category* and *number patients of the CCN* with daily perceived *pace and amount of work*, *physical* and *mental load*, but not with *emotional-moral load* and *performance*.

Predictor Variables	Basic mean load (SD) (N = 60)	Daily mean load (SD) [mean direct / indirect patient care] (N = 813 [765 / 48])
Pace and amount of work	41 (± 9.7)	30 (± 24.5) [32 / 13]
Physical load	47 (± 17.5)	33 (± 25.1) [34 / 20]
Mental load	89 (± 11.6)	66 (± 26.4) [67 / 54]
Emotional-moral load	49 (± 10.7)	26 (± 21.6) [27 / 14]
Performance	29 (± 11.1)	27 (± 16.2) [27 / 27]
Job satisfaction	24 (± 11.8)	
Motivation	18 (± 11.1)	
Work Life Balance	32 (± 14.2)	
Interruptions	54 (± 10.6)	
Staffing adequacy	53 (± 13.3)	
Support from team	23 (± 10.7)	
Support from management	20 (± 15.4)	
Shift load in TISS-28 [points]		43 (± 15.5) ~ 456 min
Shift load in NEMS [points]		36 (± 14.0) ~ 382 min
Shift load in SGI-category [nurses-per-patient needed]		1.1 (± 0.5) ~ 663 min
Number patients of the CCN [N]		1.2 (± 0.4)
Nurse-patients-ratio of whole shift [N]		1.2 (± 0.2)

Table 1: Description of basic, daily perceived and objectively measured workload, perceived load lowest 0 = never loaded / very strongly agree, highest 100 = always loaded / absolutely disagree, SD = standard deviation, one shift = 8.2 h = 491 min

Daily perceived workload / Objectively measured workload	TISS28 Estimate (CI) p-value Cond. R2	NEMS Estimate (CI) p-value Cond. R2	SGI-category Estimate (CI) p-value Cond. R2	Number patients of the CCN Estimate (CI) p-value Cond. R2
Pace and amount of work	0.52 (0.43 – 0.62) **<0.001*** 0.355	0.57 (0.46 – 0.67) **<0.001*** 0.352	13.54 (10.50 – 16.59) **<0.001*** 0.324	11.74 (8.20 – 15.28) **<0.001*** 0.293
Physical load	0.22 (0.13 – 0.32) **<0.001*** **0.417***	0.23 (0.12 – 0.33) **<0.001*** **0.413***	5.89 (2.95 – 8.83) **<0.001*** **0.410***	6.24 (2.88 – 9.59) **<0.001*** **0.408***
Mental load	0.32 (0.23 – 0.41) **<0.001*** **0.525***	0.37 (0.28 – 0.47) **<0.001*** **0.533***	7.61 (4.91 – 10.32) **<0.001*** **0.512***	2.28 (-0.87 – 5.43) 0.156 **0.491***
Emotional-moral load	0.02 (-0.06 – 0.10) 0.645 0.381	0.02 (-0.08 – 0.11) 0.744 0.381	0.47 (-2.11 – 3.05) 0.723 0.381	1.05 (-1.90 – 3.99) 0.485 0.381
Performance	-0.04 (-0.11 – 0.03) 0.300 0.260	-0.04 (-0.11 – 0.04) 0.325 0.261	-0.67 (-2.81 – 1.47) 0.537 0.260	-0.28 (-2.72 – 2.16) 0.824 0.261

Table 2: Multilevel models: CI = 95% Confidence Interval, p = probability (in **bold*** <0.05), Cond. R2 = Conditional Goodness of model fit (in **bold*** >0.40)

28.06.2023