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Association of Nurse Staffing and Perceived Workload in German Hospitals

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Background

- Adequate staffing ratios determine the quality and safety of patient care.[1]
- Staffing ratios fluctuate over time and shift.
- Inadequate staffing ratios increase objective workload which potentially influences nurses' workload perception and is associated with nurses' job dissatisfaction and burnout.[2-5]
- Germanys minimum nursing staff requirements regulation (PpUGV) dictates different patient-to-nurse ratios for different service line in the hospitals.[6]

Aim

- Overall aim: To describe the association of nurse staffing and perceived time-varying workloads in German hospitals.
- Specific aims: 1) To describe workload perceptions of nurses in medical and surgical units 2) To explore the association of different ratios and perceived workload.

Methods

Design: Multi-center longitudinal observational study

Setting: 2 German hospitals with 8 units (part of TAILR.DE-Study[7])

Sample: Convenience sample of 76 nurses (direct patient care)

Data collection: Jan. – Sep. 2022; 14 shifts per nurse

Data sources: 1. Routine data to capture nurse staffing, 2. Surveys to capture perceived workload and stress levels.

Outcome NASA-Task Load Index (NASA-TLX)[8] to assess: Raw sum score of 4 domains (mental, physical, temporal, effort).

Predictors: Perceived Stress Scale (PSS-10)[9], Nurse characteristics (e.g. age, gender, part time or full-time employment), staffing thresholds (PpUGV), shift types (day, night)

Inferential analysis: Multi-level model with random effects for individual and unit level

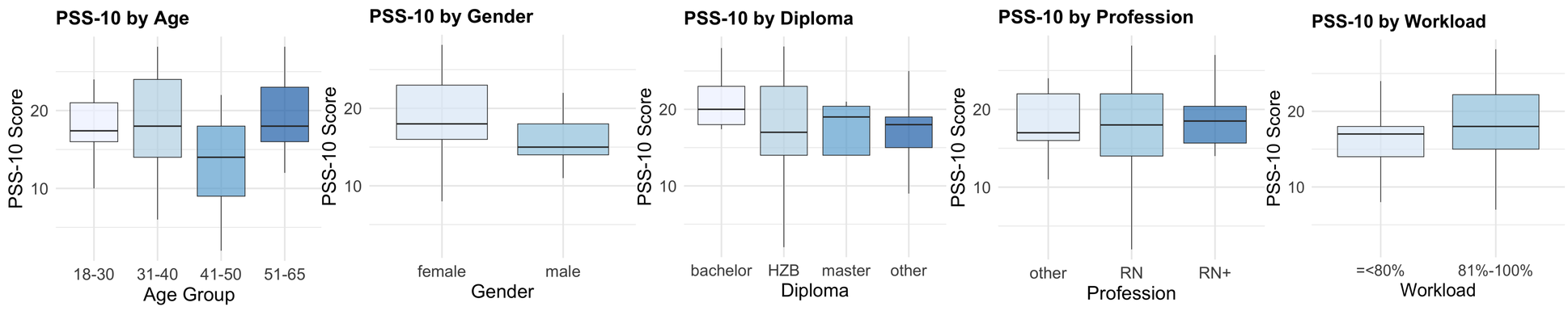
Results

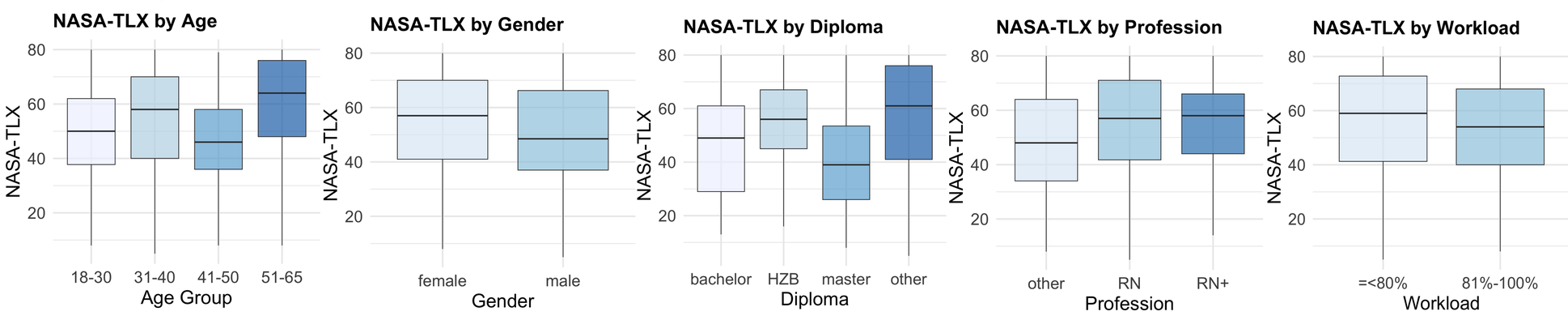
2 hospitals; 8 units; 70 nurses; Obs.: 895 (710 weekdays; 185 weekends)

Shift type: 435 morning; 307 late; 153 night

NASA-TLX mean(sd): 53.3(19.2)
PSS-10 mean(sd): 17.7(5.3)

	NASA-TLX		
Predictors	Estimates	CI	P
(Intercept)	43.04	29.32 – 56.76	**<0.001**
PSS-10	0.85	0.20 – 1.51	**0.010**
Late shift	-3.49	-5.36 – -1.62	**<0.001**
Night shift	-4.95	-7.87 – -2.02	**0.001**
Threshold 8:1 and 16:1	-4.91	-6.96 – -2.85	**<0.001**





Random Effects	
σ^2	121.38
T00 archiv	180.90
T00 unit	85.56
ICC	0.69
N unit	8
N Nurse	70
Observations	879
Marginal R^2 / Conditional R^2	0.069 / 0.708

Range NASA-TLX: 4-80, higher score = higher perceived workload
Range PSS-10: 0-40, higher score = higher stress levels

*HZB: University entrance qualification,
***RN+: RN with additional training,

** Profession other: students, nursing assisstents, others
**** Diploma other: secondary school; medium maturity; doctorate, others

Conclusion

- Older nurses and female nurses had higher NASA-TLX scores. PSS-10 scores were lowest in male nurses and nurses with a master degree.
- Patient-to-nurse ratio of 8:1 shows largest effect of reduced workload perception.
- Nurses PSS-10 is a significant predictor for perceived workload.
- No meaningful relationship can be established between the other individual factors of the nurses and the outcome due to the limited sample size.

Contact

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