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Examining the Relationship Between Markers of Emergency Department Crowding and Physician Wellbeing

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BACKGROUND

Most literature on emergency department (ED) crowding and boarding has focused on adverse patient outcomes (increased patient mortality).

Few studies have explored relationships between ED crowding, boarding and emergency physician (EP) wellbeing (burnout, professional satisfaction).

EPs are consistently among those with the highest rates of burnout:

- **65%** in 2012 to **44%** in 2020

OBJECTIVES

- Explore changes to EP wellbeing over time.
- Evaluate the relationships between markers of ED crowding and boarding and EP wellbeing.

METHODOLOGY

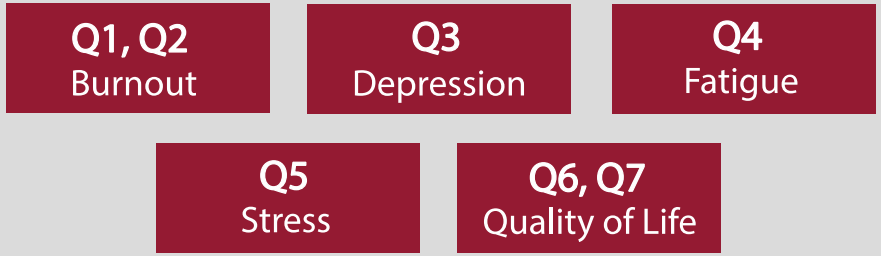
Data was collected from resident and attending EPs at our Level-I, tertiary care center.

Participants completed the **7-item Physician Well-Being Index (PWBI)** twice weekly following clinical shifts over 3 months.

The PWBI assesses distress across several dimensions using a score from 0 (high well-being) to 7 (low well-being).

PWBI scores >/= 4 indicates physician distress.

Figure 1: Domains of the 7-item Physician Well-Being Index



For the same period, we collected markers of ED crowding and boarding:

- **Number of ED arrivals (24 hours, by shift)**
- **Average patient census by shift**
- **Average boarding census by shift**

Linear and logistic regressions using GEE were performed to examine:

- Time trends in PWBI score.
- Relationships between ED crowding and boarding markers and PWBI scores.
- Associations between high levels of ED arrivals, census, and boarding (>90th percentile) and the responses for each PWBI question.

Regression models were constructed to control for the potentially confounding effects of:

- The day of the week
- Shift type
- EP role (resident/attending)

RESULTS

- **42 EPs** (43% resident, 57% attending) provided **273 PWBI assessments**.
- **Overall mean PWBI score was 2.3** (SD 1.53, 95% CI: 2.1 to 2.5), and no significant differences between the means of resident and attendings were found (2.0, ±1.50, 95% CI: 1.5 to 2.6 vs. 2.5, ±1.52, 95% CI: 1.9 to 3.0, respectively).
- **Frequencies of responses to PWBI items:** Q1 (burnout: EE), Q6 (mental QOL), and Q2 (burnout: depersonalization) had the highest numbers of yes responses at ***67%***, ***54%***, and ***51%***, respectively (Figure 2).
- **Associations between ED crowding and boarding & PWBI score:** No statistically significant relationships were observed between time, measures of ED volume, and PWBI scores (Table 1).
- **Associations between high levels of ED crowding and boarding & PWBI responses:** No statistically significant relationships were observed between high levels of arrivals in 24 hours, patient arrivals by shift, average census by shift, average boarding census by shift, and the PWBI items for burnout, depression, stress, and mental quality of life.

Figure 2: Responses to each PWBI item

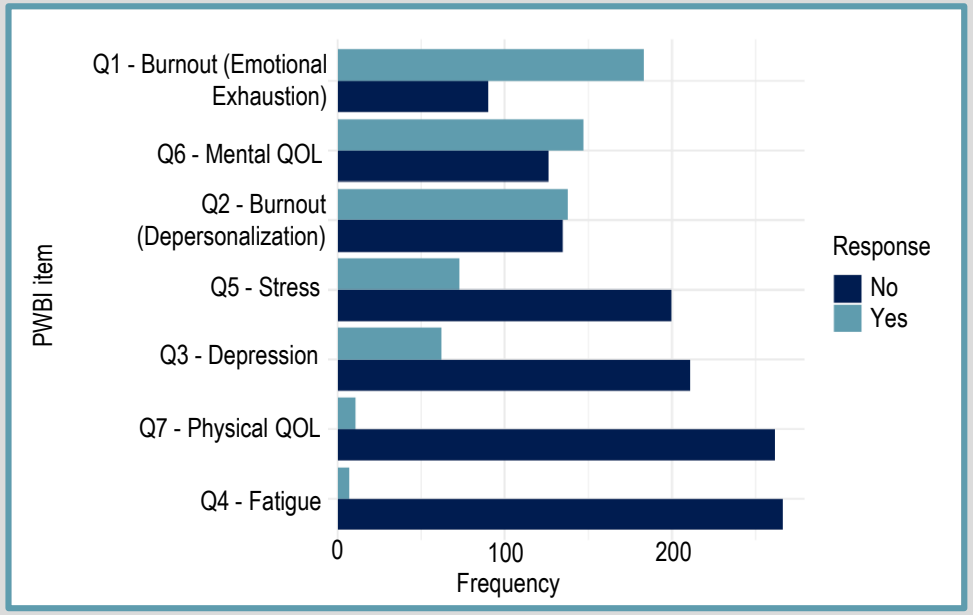


Table 1: Parameters from GEE analysis (linear regression)

Predictor	Beta Estimate (b)	Std Error (SE)	95% CI	Sig.
Week	-0.047	0.027	(-0.099, 0.006)	0.082
Arrivals (24 hours)	-0.089	0.059	(-0.206, 0.027)	0.133
Arrivals (shift)	-0.006	0.013	(-0.031, 0.020)	0.667
Avg Census (shift)	0.004	0.019	(0.041, 0.047)	0.829
Avg Boarding Census (shift)	-0.161	0.105	(-0.367, 0.045)	0.127

CONCLUSION

This study found ED crowding and boarding measures were not significantly related to EP well-being, as measured by the PWBI.

Further, this study found no significant change during this time period in PWBI.

Our study found similar rates of burnout as compared to recently published national data.

No relationships were found between the endorsement of the burnout items and working shifts with high measures of ED volume.

Additional research may be needed to validate the PWBI as a tool to distinguish significant changes in "real-time" EM physician burnout based on shift-to-shift variability.

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