Introduction:
Emergency residents are particularly vulnerable to sleep deprivation due to persistent conflicts between work schedule and the biological clock. Recent approaches to address fatigue-related risk mainly focused on reducing work hours and ensuring sufficient recuperation time. Such approach has demonstrated its limits due to growing emergency rooms visits and emergency residents’ shortage. Dawson & McCulloch (2005) introduced the notion of proofing as a complementary approach to manage fatigue-related risk. Fatigue proofing strategies (FPS) aim to reduce the likelihood a fatigued operator will make an error, in contrast of reduction strategies (FRS) aiming to reduce the likelihood a fatigued operator is working. Most formal risk control systems do not encompass the notion of proofing and FPS typically develop as informal practices. In this study, we aim to 1) identify informal reduction and proofing strategies used by residents and 2) to investigate how they relate to fatigue-related risk indicators.

Methods:
First, we organized 4 focus-group with a total of 25 residents in order to identify informal strategies used to manage fatigue-related risk. Second, we designed a questionnaire assessing the frequency of use of each reported strategy. Third, we administered the questionnaire together with the Malash Burnout Inventory to a larger sample and conducted a prospective observational study. 32 residents participated in the study for a total of 181 shifts analyzed. We gathered sleep diaries, subjective sleepiness, reaction time, medical errors and performance ratings at different time points during day and night shifts.

Results:
We conducted linear mixed-effect models to investigate the relationships between FRS, FPS, fatigue, performance and burnout.

Conclusion:
Our results suggest that FRS and FPS allow residents to maintain acceptable occupational performance at the expense of individual factors.

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