

## Grit: Does It Protect Against Burnout?

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### Background & Motivation

Burnout is a serious issue plaguing the medical profession. Burnout syndrome is characterized by emotional exhaustion, professional inefficacy and cynicism (Figure 1). The effects of burnout include lack of empathy, depression, intention to leave the profession and suicidal ideation—any one of which could negatively impact patient care. **Burnout is not restricted to practitioners, as symptoms are also observed in medical students.**

### Research Questions

In this study we seek to:

1. **Assess the associations between 4 different job resources** measured at the beginning of the first year of medical school with burnout symptoms occurring later in the year at 4 time-points.
2. **Determine the prognostic value of these jobs resources in predicting burnout.**



Figure 1. The three components of burnout.



Figure 2. Job Demands-Resources conceptual framework

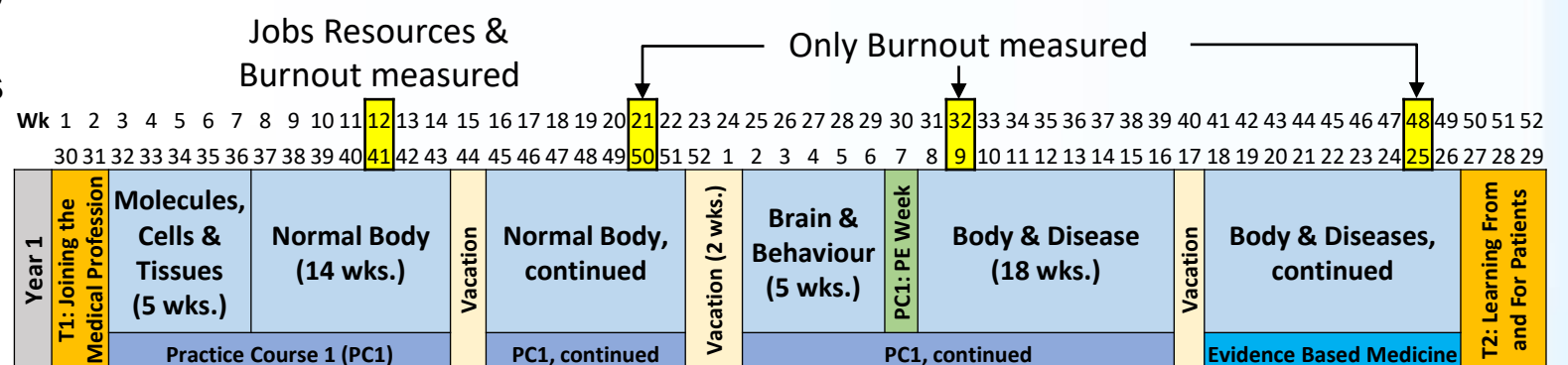


Figure 3. Curriculum of Year 1 for class of 2021, with sampling dates highlighted in yellow

### Methods

The conceptual framework of the study is based on the Job Demands-Resources model that states a person may experience symptoms of burnout when job demands exceed perceived job resources (Figure 2). Job resources are physical, psychological and organizational aspects of the job that are functional to achieve work goals, reduce job demands and/or stimulate growth and development. **Specific job resources of grit, tolerance for ambiguity, social support, and religiosity were measured in Duke-NUS Medical School students at the start of Year 1.** Students were surveyed for burnout symptoms at approximately quarterly intervals during the first academic year (Figure 3). **Students reporting high ratings in cynicism and exhaustion were defined as experiencing burnout.** We investigated associations of student job resources with burnout using multivariable logistic regression analysis.

Table 1. Odds Ratios and p-values for predicted outcome of NO BURNOUT

Variable	Odds Ratio	95% CL	p-value
Female Gender	1.56	0.44 5.52	0.49
Tolerance for Ambiguity	1.02	0.90 1.15	0.81
<b>Grit</b>	<b>1.19</b>	<b>1.04 1.36</b>	<b>&lt;0.01</b>
Social Support	1.03	0.96 1.10	0.38
Religiosity	0.95	0.81 1.13	0.58

Table 2. ROC Curve Cut-points with Positive and Negative Predictive Values (PPV and NPV) for predicted outcome of NO BURNOUT

Grit Score	NPV	PPV	Youden J
39.0	0.67	0.74	0.24
40.0	0.70	0.76	0.29
41.0	0.57	0.76	0.27
42.0	0.58	0.80	0.38
43.0	0.52	0.82	0.38
<b>44.0</b>	<b>0.52</b>	<b>0.92</b>	<b>0.49</b>
45.0	0.46	0.91	0.39
47.0	0.40	0.88	0.24
48.0	0.38	0.86	0.19
50.0	0.36	0.83	0.14

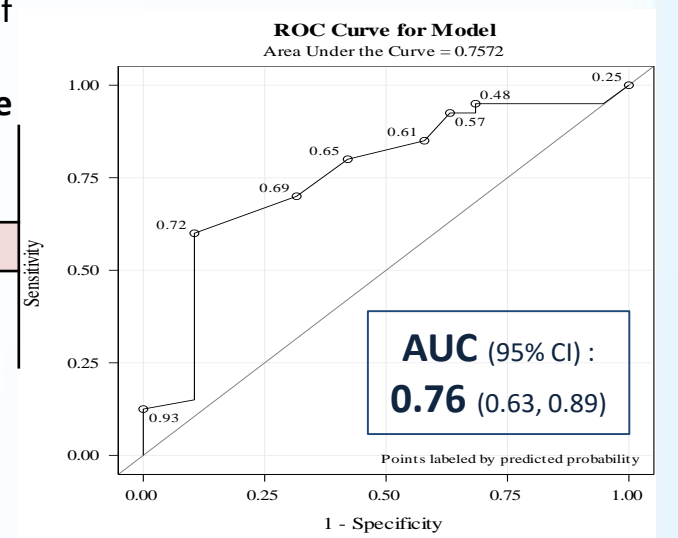


Figure 4. Receiver Operating Characteristic (ROC) Curve for grit score as a predictor of NO BURNOUT in a first year medical student. The area under the curve (AUC) is 0.76, indicating that grit score is a good predictor of NO BURNOUT in a first year medical student.

### Results

Of 59 students in the study, 19 (32.2%) experienced burnout (study definition) at some point during the first year of medical school (Figure 4). Stepwise multivariable logistic regression analysis identified grit as a significant protective factor against burnout, i.e., **grit increases the odds of NO BURNOUT** (Table 1). Using grit as a single predictor of NO BURNOUT, area under the ROC curve (95% CI) was 0.76 (0.63, 0.89) (Figure 4). A grit score of 44 was a statistically optimal cutpoint, with grit  $\geq 44$  indicating 'high' resilience to burnout (Table 2 & Figure 5).

### Conclusions

Among the 4 variables considered, grit was identified as a key protective factor against burnout (study definition) in first year medical students, suggesting that **students with high grit scores have less risk of burnout.** Efforts to create and enhance organizational grit in medical school might benefit students who are at risk of burnout.

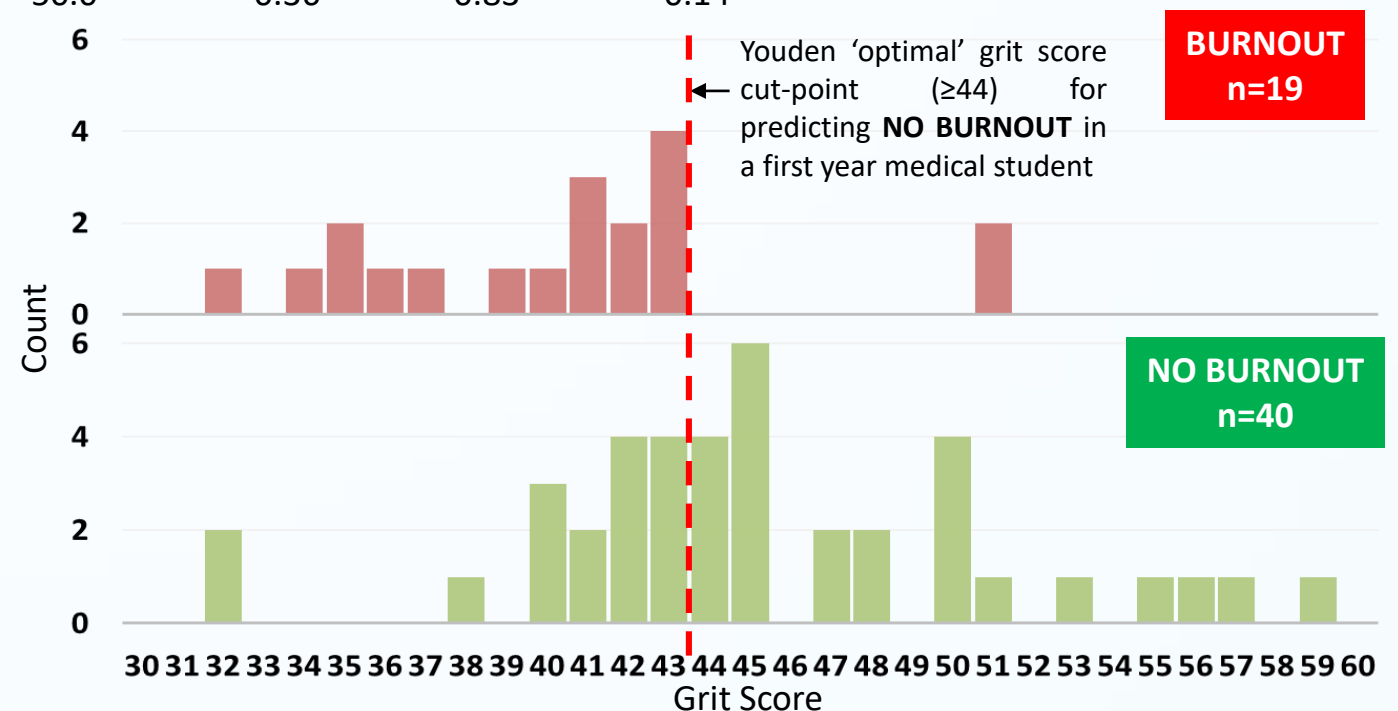


Figure 5. Distribution of students according to their grit score (x-axis). Y axis represents the number of students. The upper panel corresponds to students who experienced burnout at least once in the year. Lower panel represents students who experienced NO BURNOUT.