# Medical Student Well-being Outcomes After a Novel Shared Meal and Resiliency Skills Course

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## ABSTRACT

**Introduction:** Medical student well-being is a major problem. The authors aimed to assess well-being outcomes 6-months after a novel extracurricular shared meal and resiliency course.

**Methods:** We implemented the course during 3 academic years (2018-2020). Participants received surveys assessing resilience, perspective-taking, self-compassion, and empathy at 4 timepoints. We used linear mixed effects models to assess changes from baseline to post-course assessments for the 3-year aggregate and pre-COVID and early-COVID time periods.

**Results:** One week and 6 months post-course, resilience, perspective-taking, and self-compassion scores improved ($P < 0.01$). Notably, resilience changed significantly only during early-COVID ($P < 0.01$), not pre-COVID ($P = 0.16$). For scores with evidence-based interpretation cut-offs, no clinical changes occurred.

**Discussion:** Several well-being measures statistically improved post-course but did not change clinically. Qualitative studies may better capture meaningful well-being outcome impact.


## INTRODUCTION

Emotional distress among medical students presents serious challenges. Meanwhile, resiliency skills, including perspective-taking, empathy, and self-compassion, bolster medical student well-being.[1,2] While required resiliency training has not shown improved well-being outcomes,[3] elective resiliency skills courses have offered promise.[1,2]

The Oregon Health Sciences University (OHSU) Resiliency Skills Curriculum is an innovative course that previously demonstrated encouraging immediate post-course improvements in mindfulness, perceived stress, and positive affect.[4] In the course, students and facilitators share a warm, healthy meal, then practice resiliency skills.[4] At our institution, we recognized a gap in providing resiliency training. We aimed to pilot the OHSU course over 3 years (2018-2020), assessing select well-being skill outcome measures 6 months post-course.[5-7] When the coronavirus-19 (COVID) pandemic interrupted the 3rd course-year, we also aimed to compare outcomes pre-COVID (2018, 2019) versus early-COVID (2020).

## METHODS

The University of Wisconsin Social Science/Education Institutional Review Board certified this study as program evaluation.

### Setting, Format, Approach

The 8-session extracurricular course was delivered each year during February to May. Sessions occurred in a medical school classroom or wellness lounge. The final 4 sessions in 2020 were conducted virtually. The group shared a meal, practiced resiliency skills, then debriefed. Facilitators used reflective listening, nonjudgment, and compassion. During exam weeks, the course director emailed participants, offering encouragement and resiliency skill reminders.

### Enrollment, Recruitment

Yearly enrollment was limited to 15 students. An enrollment

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lunch talk occurred 4 weeks pre-course for students to learn about the course and attendance expectations (6 of 8 sessions). Although the course schedule was tailored to first-year schedules, all medical students were eligible to participate in the course and study.

### Surveys, Measurements

Students received online surveys at 4 timepoints: T1 (1-4 weeks pre-course); T2 (1 week post-course, 1 week before final exams); T3 (6 weeks post-course); T4 (6 months post-course). We assessed 4 outcome measures: Brief Resilience Scale,[5] Interpersonal Reactivity Index Perspective-Taking and Empathic Concern scales (IRI-PT, IRI-EC),[6] and Neff Self-Compassion Scale.[7] These variables, which are commonly employed as proxy indicators and potential influencers of positive adaptation to stress,[1,8-11] were chosen because they represented related but distinct course-targeted skillsets. Students received small survey-completion gift card incentives.

### Statistical Analysis

We analyzed changes at each timepoint (T1, T2, T3, T4) for the 3-year aggregate using a linear mixed effects model with subject-specific random effects and autoregressive correlation structure, using age, race, and study period (pre-COVID, early COVID) as covariates. Students who enrolled and completed T1 but did not ultimately attend the course were considered lost to follow-up and did not receive T2-T4 survey requests. All responses were analyzed.

We also analyzed percentage changes at each timepoint for the 3-year aggregate and within study periods using a linear mixed effects model with subject-specific random effects to account for repeated assessments. We used an autoregressive correlation structure of order one to account for correlations between repeated assessments, using age and race as covariates.

We examined normal probability and residual plots to verify model assumptions. We reported adjusted changes with corresponding 2-sided 95% confidence intervals and 2-sided *P* values. Statistical significance was defined as P<0.05. For all statistical analyses, SAS software (SAS Institute, Cary NC, version 9.4) was used.

## RESULTS

### Demographic Characteristics

Over 3 course-years, 40 students enrolled; 32 ultimately participated in the course. Participating students attended 6.82 (SD 1.31) sessions. All 40 enrollees completed T1; all 32 course participants completed all T1-T4 surveys.

Thirteen (40.6%) course participants indicated Asian or Asian American, Hispanic or Latino, and multiracial identities. Compared to our medical school student body representation (19.8%), these students were overrepresented. Cisgender women and gender-diverse students were also overrepresented (n = 26, 81.3%; n = 1, 2.5%; respectively) compared to student body representation (48.7%, <1%, respectively). See Table 1.

**Table 1.** Student Demographic Characteristics

| Demographic Characteristics | Total Course Registrants, n=40 n (%) | Total Course Participants, n=32 n (%) |
|---|---|---|
| Age | | |
| 20-24 years | 31 (77.5) | 26 (81.2) |
| 25-29 years | 9 (22.5) | 6 (18.8) |
| Training year | | |
| First year | 37 (92.5) | 30 (93.7) |
| Fourth year | 1 (2.5) | 0 (0.0) |
| Other[a] | 2 (5) | 2 (6.3) |
| Residency status | | |
| In-state | 28 (70) | 24 (75) |
| Out-of-state | 12 (30) | 8 (25) |
| Primary language[b] | | |
| English | 37 (92.5) | 30 (93.8) |
| Vietnamese | 1 (2.5) | 1 (3.1) |
| Korean | 1 (2.5) | 1 (3.1) |
| Bengali | 1 (2.5) | 0 (0.0) |
| Race/ethnicity[c] | | |
| Asian | 11 (27.5) | 8 (25) |
| Hispanic or Latino | 4 (10) | 2 (6.3) |
| White or Caucasian | 21 (52.5) | 19 (59.4) |
| Multiracial | 4 (10) | 3 (9.3) |
| Gender identity[d] | | |
| Cisgender woman | 33 (82.5) | 26 (81.3) |
| Cisgender man | 6 (15) | 5 (15.6) |
| Nonbinary | 1 (2.5) | 1 (3.1) |
| Sexual orientation[e] | | |
| Heterosexual | 37 (92.5) | 29 (90.6) |
| Bisexual | 1 (2.5) | 1 (3.1) |
| Queer | 2 (5) | 2 (6.3) |

[a]Possibilities for "other" included gap year, MD-PhD student.

[b]No student identified Spanish, Chinese, Japanese, French, German, Portuguese, Russian, Arabic, Hindi as primary languages.

[c]No students selected Black or African American, Native Hawaiian, other Pacific Islander, American Indian, Alaska Native, or "self-describe" options.

[d]No student selected transgender or "self-describe" options.

[e]No student selected Gay, Lesbian, Questioning, "self-describe," or "choose not to disclose."

### 3-Year Aggregate

From the T1 to T2 assessments, resilience (0.4; CI, 0.2-0.5; $P < 0.01$), perspective-taking (0.3; CI, 0.2-0.4; $P < 0.01$), and self-compassion (0.5; CI, 0.4-0.6; $P < 0.01$) significantly improved; empathy did not change significantly ($P = 0.21$). From the T2 to T3 assessments, perspective-taking significantly worsened (-0.1; CI, -0.2 to 0.0, $P = 0.03$); no other outcomes changed statistically. From the T3 to T4 assessments, no outcomes changed significantly. Adjusted mean scores at all timepoints indicated moderate resilience and moderate self-compassion, based on published cut-off scores.[7,8] To our knowledge, no established perspective-taking or empathic concern (IRI-PT/EC) cutoffs exist.



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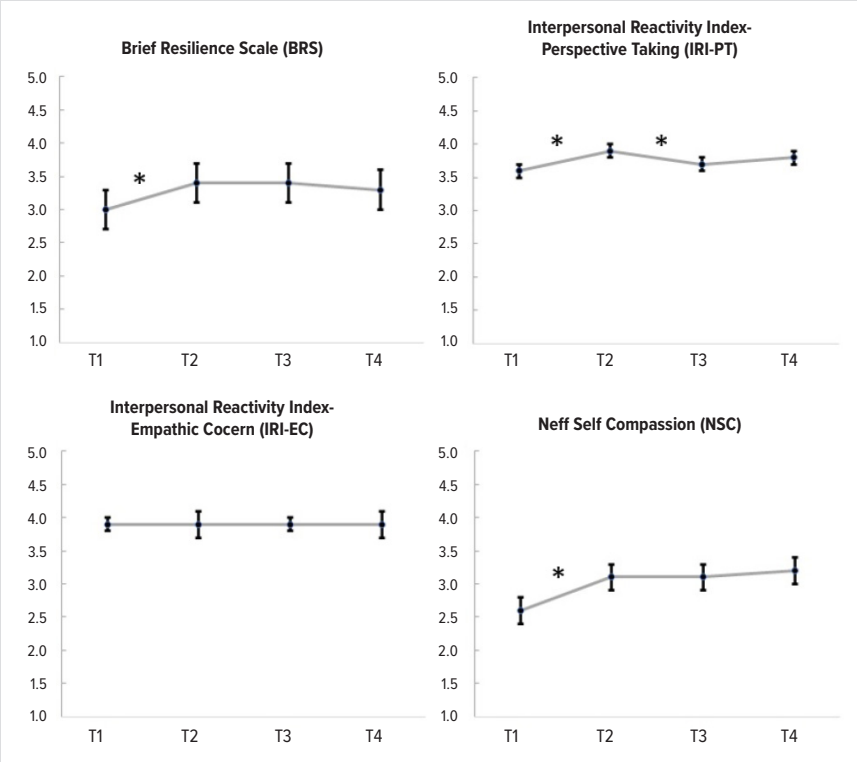
**Table 2.** Evaluation of Overall Percentage Changes in Wellness Measures From Pre-course Baseline (T1) to 6 Months Post-Course Completion (T4)

| Wellness Outcome | Period | Adjusted Means[a] (95% CI) | *P* Value | Percentage Change Interpretation | Adjusted Means for Change, Pre-COVID to Early COVID (95% CI) | *P* Value |
|---|---|---|---|---|---|---|
| **Brief Resiliency Scale (BRS)**[5] | Combined | 8.8% (1.9-15.6%) | **0.014**[a] | **Improved** | | |
| Scale range 1-5, higher score suggests | Pre-COVID | 5.1% (-2.1 to 12.2%) | 0.16 | No change | **13.5% (1.9 to 25.0%)** | **0.024**[a] |
| greater resilience | Early-COVID | 18.5% (8.0-29.1%) | **0.0012**[a] | **Improved** | | |
| **Interpersonal Reactivity Index-** | Combined | 5.5% (1.6-9.4%) | **0.0079**[a] | **Improved** | | |
| **Perspective Taking (IRI-PT)**[6] | Pre-COVID | 6.6% (2.2-11.0%) | **0.0046**[a] | **Improved** | -4.0% (-11.1 to 3.1%) | 0.26 |
| Scale range 1-5, higher score suggests | Early-COVID | 2.6% (-3.9-9.1%) | 0.42 | No change | | |
| better perspective-taking | | | | | | |
| **Interpersonal Reactivity Index-** | Combined | 2.2% (-1.7-6.0%) | 0.26 | No change | | |
| **Empathic Concern (IRI-EC)**[6] | Pre-COVID | 3.1% (-1.3-7.4%) | 0.16 | No change | -3.2% (-10.2 to 3.8%) | 0.35 |
| Scale range 1-5, higher score suggests | Early-COVID | -0.2% (-6.6-6.2%) | 0.95 | No change | | |
| greater empathy | | | | | | |
| **Neff Self Compassion (NSC)**[7] | Combined | 16.7% (7.1-26.3%) | **0.0013**[a] | **Improved** | | |
| Scale range 1-5, higher score suggests | Pre-COVID | 17.7% (6.8-28.6%) | **0.0025**[a] | **Improved** | -3.7% (-21.3 to 13.9%) | 0.67 |
| greater self-compassion | Early-COVID | 14.0% (-2.0 to 30.1%) | 0.084 | No change | | |

[a]Adjusted by age and race (non-White race and White race).

Assessing overall percentage changes between the T1 and T4 timepoints, resilience (8.8%; CI, 1.9%-15.6%; $P<0.01$), perspective-taking (5.5%; CI, 1.6%-9.4%; $P<0.01$), and self-compassion (16.7%; CI, 7.1%-26.3%; $P<0.01$) improved significantly; empathy did not change significantly ($P=0.26$). See Table 2.

**Figure.** Model Adjusted Means and 95% Confidence Intervals for Wellness Outcomes at Each Time Point for the Combined Cohort




Indicates significant change between consecutive timepoints, $P<0.05$

## Pre-COVID

Pre-COVID changes largely mirrored the aggregate. From T1 to T2, resilience (0.4; CI, 0.2-0.5; $P<0.01$), perspective-taking (0.3; CI, 0.2-0.5; $P<0.01$), and self-compassion (0.5; CI, 0.4-0.6; $P<0.01$) improved significantly; empathy did not change significantly ($P=0.07$). From T2 to T3, perspective-taking worsened significantly (-0.1; CI -0.3 to 0.0; $P=0.04$); no other outcomes changed statistically. From T3 to T4, no outcomes changed significantly. See Figure.

Assessing overall percentage changes from T1 to T4, perspective-taking (6.6%; CI, 2.2%-11.0%; $P<0.01$) and self-compassion (17.7%; CI, 6.8%-28.6%; $P<0.01$) improved significantly. Resilience and empathy did not change significantly ($P=0.16$, $P=0.16$, respectively). See Table 2.

## Early-COVID

From T1 to T2, resilience (0.4; CI, 0.1-0.7; $P=0.01$), perspective-taking (0.2; CI, 0-0.3; $P=0.04$), and self-compassion (0.4; CI, 0.1-0.7; $P=0.01$) improved significantly; empathy did not change significantly. From T2 to T3 and T3 to T4, no outcomes changed significantly. See Figure.

Assessing overall percentage changes from T1 to T4, only resilience improved significantly (18.5%; CI, 8.0%-29.1%; $P<0.01$). Perspective-taking, self-compassion, and empathy did not change significantly ($P=0.42$; 0.08, 0.95, respectively). The resilience



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change pre-COVID versus early-COVID was significant (18.5% vs 5.1%; CI, 1.9%-25.0%; $P = 0.02$). See Table 2.

## DISCUSSION

This study demonstrated that following this novel medical student shared meal and resiliency skills course, several statistically significant well-being improvements were observed up to 6 months post-course. This included perspective-taking and self-compassion (pre-COVID) and resilience (early-COVID) but not empathy. This study also found that despite statistically significant improvements in self-compassion and resilience, clinical interpretations for these outcomes (eg, low, moderate, high) did not improve.

The first critical question is whether the statistically significant well-being improvements demonstrate meaningful psychological improvement. Finding no changes in resilience and self-compassion clinical interpretations, one possibility is that statistical outcome improvements do not reflect meaningful improvement in lived experiences. If this is true, then costs required to implement extracurricular resiliency courses (eg, monetary, time, effort) may exceed their expected benefits. Medical schools should carefully weigh decisions about well-being improvement resource allocation, accounting for this possibility. Many have conjectured that without interventions modifying stressors within the educational environment, resiliency courses will likely prove insufficient to address student well-being needs.[3]

Simultaneously, we understand that using standardized well-being questionnaires to capture changes in students' lived well-being experiences may be challenging and that qualitative work exploring course impact may help better elucidate the long-term effect of participating in resiliency courses. Dunn et al propose conceptualizing student well-being as mediated by a "coping reserve tank" that is fluid, depleting and replenishing depending on the student's perceived balance of emotional challenges and relational support.[12] Meal-sharing resiliency courses that offer both emotional and relational support may help bolster a sense of well-being that is not easily quantified.

In this course, students adhered well to course attendance expectations despite no academic repercussions for deciding to discontinue or reduce course participation. We cautiously conjecture that the significant improvements in select well-being outcomes alongside excellent course attendance potentially signal meaningful perceived well-being benefits. Additionally, despite our small sample, we found statistically significant changes in certain measures, indicating that these findings would potentially hold in larger samples. Future studies should investigate the relationship between resiliency courses and empathy to understand why certain measures, but not empathy, statistically improved.

Our study also provides potential COVID-related insights. Our most notable COVID-related finding was that resilience improved significantly more during early-COVID than pre-COVID. Studies describing medical student resilience during the pandemic remain sparse, but literature describing community trauma responses following natural disasters is more robust.[13] Studies show that the "disaster environment provides an active and ongoing opportunity to reframe, reorganize, and construct new meaning in a compressed timeline," and communities commonly experience a sense of collective heroism.[13] Students who actively practiced resiliency skills or felt cared for in a resiliency-based community during the early-COVID period might have been particularly positioned to feel more resilient during post-course assessment, despite experiencing difficult pandemic-related emotions.[14] Meanwhile, the change to virtual sessions, which may have limited participants' abilities to portray body language, connect emotionally, or stay attentive, may have influenced other early-COVID outcomes.

Finally, we discovered that certain demographic characteristics aligned with course participation. Specifically, participants disproportionately identified as cisgender women, Asian descent, Hispanic/Latino descent, or multiracial; no participants identified as Black, African American, Native Hawaiian, Pacific Islander, American Indian, or Alaska Native. Studies have suggested that burnout is highest for cisgender women,[15] so overrepresentation of this group is not surprising. Additionally, structural inequities faced by students of color and students underrepresented in medicine (UIM) potentially may have augmented participants' needs to seek supportive connection and community via a resiliency course.[16] At the same time, some UIM students may have felt deterred from participating in the resiliency course, which was facilitated primarily by non-UIM physicians.

### Limitations and Future Directions

The most important limitation is selection bias. Participants self-selected into the course, so this study offers insights about students seeking well-being support at a single institution. Additionally, the small pilot study sample limited our ability to develop and validate a comprehensive model capturing both the relational dependencies among outcomes and longitudinal changes within outcomes. Some studies have indicated that self-compassion may represent a key predictor of various well-being outcomes, including burnout and resilience; however, this must be explored further.[9,11] Additional large-scale studies would be valuable for exploring whether results vary by year in medical training and for examining medical student resilience during natural disasters (eg, pandemics/epidemics, hurricanes) to clarify COVID-related findings.

Finally, qualitative research may be important for elucidating perceptions of how resiliency courses influence well-being that quantitative studies may not effectively ascertain, as it may be difficult to interpret the impact of small but significant changes on surveys. Qualitative research also may support resiliency skills program development in generating best practices for responding


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to the well-being needs of UIM students and other students who experience structural inequities in medicine.

## CONCLUSIONS

Whether shared meal resiliency courses meaningfully enhance well-being remains unclear. Multiple statistically improved well-being outcomes combined with excellent course attendance may suggest that the course offers benefits for self-selecting participants. Future studies should explore perspectives on resiliency course utility.

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