Interactive Digital Media to Reduce Medical Student Depression and Alcohol Use

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Overview: A simulation can provide helpful guidance to medical students as they encounter the stress of clinical care and can impact substance use and depression.

Problem: Medical students encountering clinical care training struggle with unique new expectations, care responsibilities and accountability, rapid changes in the role during clerkships, and limited support. They encounter a world with overwhelming information and competencies, novel clinical skills to learn, the psychological challenge of clinical care, high standards with little room for failure or mistakes, a series of informational and clinical tests, increasing debt estimated at $250,990, and limited consideration of alternative options. Low self-efficacy, inability to cope, and worsening despair can start in the transition to the clerkship year, and worsen as training progresses. The resulting depression, alcohol abuse, and health impact can establish an ineffective pattern of stress response placing themselves and their future patients at risk.

Goal: We created and evaluated a simulation for medical students to reduce the stress associated with novel exposure to clinical care and thereby enhance coping and decrease the use of negative coping mechanisms such as alcohol use.

Background: Stress results in key symptoms of professional despair: 1) depersonalization (distancing from others including fellow professionals and patients), 2) emotional and physical exhaustion often recognized as clinical depression (estimated at 27.2% by Rothenstein, 2016), and 3) career regret - key risk factors associated with suicidal ideation in medical students (Seo, 2021). Overall prevalence of suicidal ideation (11.7%) is disturbingly high (Rotenstein, 2016).

To cope medical students can utilize successful strategies emphasizing the value of peer and professional support and reprioritization including social and emotional support (60%), acceptance, planning, or self-distraction (40%), and activities from sports to religious attendance (25%) [Sattar, 2022]. Organizational support is lacking in terms of substance use intervention policies (Mannes, 2021).

Unfortunately, many students utilize negative strategies such as avoidance/denial (40%) and substance use (35%) [Sattar, 2022]. In one survey 32.4% met the diagnostic criteria for alcohol abuse/dependence (Jackson, 2016). Many refuse to obtain help; in one study of students who screened positive for depression, only 15.7% sought psychiatric treatment (Rotenstein, 2016).

Intervention Strategy: Most programs to address medical student distress and poor coping emphasize detection, symptom tracking, and subsequent intervention. In contrast, we sought to create a preventative approach – an intervention that prepares students for the experiences they will soon encounter. Our program delivers anticipatory and preparatory guidance about the stresses and challenges that await students in clinical care. In contrast to standard textual/descriptive or passive learning strategies (e.g., a lecture on wellness) we use an interactive simulation framework emphasizing skills development in a real-world equivalent environment.

Practicing skills in a simulation enhances the potential of that skill to be used in "real life." Our goal is that medical student users develop improved coping strategies and are thus prepared when stress and challenges arise. These strategies are then more likely to be deployed in the real world and decrease the use or perceived need for (ineffective) strategies such as substance use.

Rather than the more typical standardized patient experience deploying real-world "actors," we chose to create a computer-based simulation that is cost-effective, reproducible, and takes advantage of the familiarity with computer environments common to students now. Additionally, simulations offer repeatable and consistent learning encounters in which all students can experience the outcomes of trying different approaches and have a shared experience to discuss and draw on.

In addition to the interactive simulation, we developed a multimodal interactive digital toolkit for medical students including the interactive computer simulation, a set of self-assessment tools, and a interactive web-based education modules.

Intervention: A randomized cross-over study with 63 students used the simulation and the interactive media features during the Spring of 2022 (ClinicalTrials.gov NCT04494633). The racial and ethnic diversity of the sample of volunteer medical students reflected the current medical student population and included PGY 1-5 across 16 medical schools. At baseline, we measured Quality of Life (MSQoL), depression (PHS-2), alcohol use, (AUDIT-C, NIDA Quick Screen), and burnout (modified Maslach Burnout Index). These measures were 2 weeks after the completion of the program by the case group. Satisfaction, self-efficacy, and open-ending feedback were also collected.

Results: Despite our intent to create a preventative approach our study identified high preexisting symptomatology and poor coping strategies. Before the use of the intervention, fifty percent (50%) of the case group reported unhealthy alcohol use and over 60% of participants met PHQ2 criteria for depression - the control group was similar. We did not see evidence of career regret in our sample

Two weeks after the intervention, drug and alcohol use decreased from 50% to 40%, (p<0.05). They had similarly reduced depression symptoms from 60% to 40%. All individuals reported a decrease in both substance use and depression. Participants who used the intervention, but not the control group, reported decreased burnout symptoms and increased ability to adapt to change.

Discussion: A brief, multimodal interactive digital intervention can enhance cognitive skills to replace or decrease stress-response coping behaviors associated with substance use and decrease symptoms of depression. Additional investigation of self-directed interventions for medical students is needed. Similar tools may help other healthcare providers. Career regret may be a factor that shows up later in the career. Since debt already drives medical specialty career choice (Pisaniello, 2019), potentially students do not see a career change as an option given the high debt load and few means to pay off the debt besides medical practice.

Implication: Additional investigation of self-directed public health-oriented interventions for medical students is needed. It may be helpful to provide such interventions even earlier in the process of training to decrease the overall incidence of symptomatology. Similar tools may help other healthcare providers. A logical starting point would be tools to prepare future medical interns, nursing students, residents, and post-residency practicing physicians.

System-based change is also essential. Empowering students to work for organizational change related to components of training and clinical care can create a more supportive environment leading to decreased distress. Factors as well as hospital credentialing and state licensure disclosure requirements of mental health and substance use treatment may result in under-reporting and decreased willingness to seek treatment. They too need to be addressed.

References: The user experience can be seen at https://lift.clinicalencounters.com/
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