

Introduction to Cognitive Restructuring for Medical Students

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Abstract

Introduction: Medical students list stigma and lack of time as reasons to avoid seeking mental health care. Many patients do not receive appropriate mental health care due to a lack of knowledge regarding available treatments among their medical providers. We created this activity to enhance medical student knowledge and well-being by introducing cognitive restructuring principles and skills in a highly interactive module. **Methods:** We administered a 90-minute learning activity, which included a short videotaped lecture, clinical case vignette, small-group discussion, and application exercise. Immediately following the learning activity, students and faculty completed anonymous evaluations. **Results:** A total of 139 first-year medical students and 152 second-year medical students completed the activity. For the first-year cohort, upwards of 80% of students and 100% of faculty respondents rated the session either *good* or *excellent*. For the second-year cohort, over 80% of students and over 90% of faculty rated the session either *good* or *excellent*. Approximately 90% of first- and second-year medical students and 100% of faculty recommended offering the session to future students. Open-ended feedback from students was overwhelmingly positive. **Discussion:** The resources included in this module allow educators at any institution to implement this learning activity, as no specific content knowledge/expertise is required of faculty. As the activity was well received by students and faculty, the investment of curricular time appears to have been well spent.

Keywords

Cognitive Behavioral Therapy, Case-Based Learning, Well-Being, Mental Health

Educational Objectives

By the end of this activity, learners will be able to:

1. Describe the thought-mood-behavior connection as a model for cognitive restructuring interventions.
2. Identify three common categories of distorted thinking.
3. Demonstrate the ability to reframe negative hot thoughts (i.e., distressing dysfunctional cognitions) into alternative balanced thoughts using a thought record.

Introduction

Patients seen across all medical specialties and settings exhibit symptoms of depression and anxiety. However, many do not receive appropriate mental health care due to a lack of competence and/or mental illness stigma among their providers.¹ Medical students' promotion of mental health care can improve with education,^{2,3} suggesting the need for more resources to

increase knowledge among physicians and physicians-in-training. In addition, medical students report experiencing significant stressors themselves,⁴ with their perception of these stressors having the greatest impact on well-being.⁵ Indeed, despite the fact that matriculating medical students report better mental health than their age-matched counterparts,⁶ the majority of current medical students report psychological distress, with high rates of depression, anxiety, burnout, and suicidal ideation, as well as low mental quality of life.⁷⁻¹³

Given these statistics, all medical students should be familiar with evidence-based treatments for anxiety and depressive disorders. Cognitive behavioral therapy (CBT), which specifically targets unhealthy perceptions and behaviors, is a first-line treatment for both anxiety and depressive disorders, with a wealth of data supporting its efficacy and no negative side effects.¹⁴ Cognitive restructuring skills (i.e., identifying dysfunctional thoughts and reframing them in a more-rational way) constitute the foundation of CBT. Considering that only about one-quarter to one-third of medical students in distress seek help,^{15,16} learning these skills could improve medical student well-being. However, the only resource currently included in *MedEdPORTAL* to teach CBT skills to medical students focuses exclusively on CBT for insomnia.¹⁷

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Our interactive module introduces cognitive restructuring strategies and is appropriate for medical students at any point in their training.

Methods

Development

We developed the Introduction to Cognitive Restructuring module as part of a longitudinal medical student wellness curriculum, which occurred in the context of small-group learning communities called collaborative learning groups (CLGs). We specifically designed the activity to be facilitated by faculty with no prior expertise in cognitive restructuring for students with no prerequisite knowledge/experience.

During initial development and pilot testing in 2019, we introduced the activity to second-year medical students just before a particularly challenging block in their basic science curriculum. After implementing the module, we received significant unsolicited positive feedback from both students and faculty. However, some faculty noted that a few students were difficult to engage because they reportedly “weren’t struggling” and “didn’t need it” or “would have preferred having the time to spend studying.” Thus, we revised the learning activity to include a secondary goal of educating students about cognitive restructuring as an important intervention to assist their future patients. This effort to connect the material directly to clinical care was designed to increase the perceived relevance of the learning activity for all students.

In September 2020, we implemented this learning activity with second-year medical students. After obtaining feedback regarding their desire to learn the material earlier in their academic career, we implemented the learning activity with first-year medical students in late October 2020. Before introducing the session to the first-year medical student cohort, we also revised the faculty guide (Appendix A), student guide (Appendix B), and faculty preparation session in response to second-year medical student cohort feedback.

Facilitator Training

As was customary before each CLG session, our team met with the faculty facilitators for approximately 30 minutes to review the learning activity for the day. During this meeting, we reviewed the faculty guide (Appendix A) and corresponding student guide (Appendix B) with faculty facilitators, briefly describing each activity and answering questions. As time permitted, we also engaged faculty in a discussion regarding common first-year medical student concerns and struggles, as well as the importance of faculty modeling (appropriate) vulnerability by

disclosing some of their own difficulties during the small-group session with students. This latter part was emphasized for the faculty training for the first-year cohort following feedback from the second-year medical student cohort.

Implementation

The 90-minute session began with a brief didactic component followed by both individual and group-based active learning components intended to encourage higher-level learning. The CLG students and faculty watched the 30-minute introductory lecture together as a small group. During the pilot year, we offered the lecture live in a large lecture hall (Appendix C). However, due to COVID-19 restrictions, in 2020 the groups watched a prerecorded lecture (Appendix D) during their small-group session. The lecture described the basics of CBT (e.g., the thought-mood-behavior connection) as the foundation for cognitive restructuring interventions, reviewed categories of distorted thinking commonly experienced by medical students, and provided instruction regarding the completion of a simple thought record. For the remainder of the learning activities, students stayed in their CLG small-group classrooms.

Following the didactic, students independently read a case vignette found in their student guide (Appendix B), making note of the cognitive distortions they identified and labeling the corresponding categories. We developed the vignette (which described medical students experiencing common cognitive distortions) to offer students an opportunity to begin applying knowledge from the lecture in a way that would be personally relatable but less threatening than immediately discussing personal experiences. Based on feedback, we included the list of cognitive distortions and their definitions in the faculty and student guides. As a group, the students then reviewed the cognitive distortions highlighted within the vignette. We instructed the faculty facilitators to focus mainly on identifying the distorted thoughts rather than engaging students in a debate regarding the actual category of the distortion(s), but we did provide an answer key in the faculty guide with the correct category of each distortion (Appendix A). This activity took approximately 20 minutes.

Next, faculty facilitators led their group in a 20-minute self-reflection/application exercise. Students and faculty spent 5 minutes writing five examples of their own recent distorted thoughts and attempted to label the cognitive distortion categories to examine patterns. However, because only a select sample of cognitive distortion categories were introduced in the lecture, accurate labeling was not the focus of this activity. Based on faculty and student feedback, we modified the faculty

instructions in the final guide to include an announcement that students should be prepared to share at least one of their distorted thoughts with the rest of the group. This warning provided students with the opportunity to identify an example they would be comfortable discussing with the group. For the remaining 10 minutes of the activity, the faculty member facilitated a discussion among the group regarding common themes related to their *hot thoughts* (i.e., distressing dysfunctional cognitions) as well as common patterns in the categories of distorted thinking. We emphasized that listening empathically as group members shared their thoughts and experiences provided important practice using these skills that could enhance future patient care.

Following the discussion, the group members chose one of the identified hot thoughts (perhaps the most commonly expressed thought in the group) to use for group practice in completing a thought record. Together, the group members worked through the steps of cognitive restructuring for the next 20 minutes. As explained during the lecture, the group selected a hot thought for restructuring, attempted to identify the category of distortion, listed evidence supporting and refuting the hot thought, and then developed an alternative balanced thought. At the end of the session, the faculty facilitators instructed students to practice cognitive restructuring each night and to fill out the mini thought record in the student guide (Appendix B) as homework. Faculty were instructed to review this homework with the students during their CLG session the following week during their check-in.

Evaluation

At the conclusion of the activity, students and faculty spent 5 minutes completing an anonymous evaluation of the activity (Appendix E), which was administered online via Qualtrics. Four items assessed satisfaction with the learning activity and were evaluated on a 5-point Likert scale (1 = *terrible*, 5 = *excellent*). The fifth item assessed whether participants would recommend that we continue to offer this session for future medical students. We also invited respondents to provide qualitative comments or suggestions. Responses to the survey were voluntary and anonymous and did not affect the evaluation of student performance.

Results

Second-Year Medical Student Cohort

In September 2020, we implemented this learning activity with 152 second-year medical students.

We received evaluations from 90 students (59%) and 13 faculty facilitators (72%). As seen in Table 1, evaluations were

overwhelmingly positive, with over 80% of second-year medical students and over 90% of faculty facilitators rating the overall session, as well as each element of the session, either *good* or *excellent*. Furthermore, 90% of students and 100% of faculty recommended offering the session to future students.

First-Year Medical Student Cohort

In October 2020, we implemented the learning activity with 139 first-year medical students and received feedback from 83 students (60%) and two faculty facilitators (11%). Table 2 lists the results of these evaluations. Similar to the second-year students, the vast majority of responses were very positive. Indeed, upwards of 80% of first-year medical students rated the overall session, as well as each element of the session, either *good* or *excellent*, and 88% of students recommended offering the session to future first-year medical students. Both faculty respondents rated the session as *excellent* and recommended offering it in the future. In addition, several other faculty provided informal positive feedback to the CLG course director either in person or via email. Of note, the faculty facilitators for the first-year medical students were separate from the cohort of facilitators for the second-year medical students.

Qualitative Results (First- and Second-Year Cohorts)

Responses to the open-ended question reflected significant engagement and interest in the learning activity for second-year medical students ($n = 40$), first-year medical students ($n = 32$), and faculty ($n = 6$). As seen in Table 3, student and faculty respondents described the session as helpful and worthwhile. They appreciated the content and structure of the activities as well as the group discussion. Some suggestions were offered to improve student comfort with the material.

Discussion

This activity was created to enhance medical students' knowledge of cognitive restructuring techniques and improve their well-being. The literature consistently shows the inherent challenges of creating a wellness curriculum, with no one-size-fits-all solution. Our student feedback from prior wellness activities yielded similar results, with some students requesting more well-being content and others describing it as a "waste of time." Incorporating feedback from prior wellness sessions, we developed this module with the following in mind: (1) We used a mix of learning strategies (lecture, case, personal reflection, skill practice, and discussion) in an attempt to engage every student; (2) we emphasized the clinical relevance of the material for future patient care, particularly to engage those students who reported they "aren't stressed" currently; and (3) we incorporated

Table 1. Student and Faculty Ratings of the Learning Activity in the MS 2 Curriculum

Raters	Activity	M	SD	Range	% Endorsing Top Two Response Options ^a
MS 2s	Overall rating of activity (n = 90) ^b	4.3	0.8	1-5	87
	Effectiveness/helpfulness in achieving learning objectives ^b				
	Lecture (n = 86)	4.4	0.8	1-5	90
	Case vignette group exercise (n = 90)	4.1	0.9	1-5	81
	Personal reflection regarding hot thoughts (n = 90)	4.3	0.8	2-5	84
	Group sharing regarding hot thoughts (n = 90)	4.3	0.9	1-5	87
	Thought record practice in group (n = 89)	4.2	0.9	1-5	89
MS 2 faculty facilitators	Likelihood of recommending session to future students (n = 89) ^c	4.4	1.0	1-5	90
	Overall rating of activity (n = 13) ^b	4.7	0.5	4-5	100
	Effectiveness/helpfulness in achieving learning objectives ^b				
	Lecture (n = 13)	4.7	0.5	4-5	100
	Case vignette group exercise (n = 13)	4.6	0.6	3-5	92
	Personal reflection regarding hot thoughts (n = 13)	4.8	0.6	3-5	92
	Group sharing regarding hot thoughts (n = 13)	4.8	0.4	4-5	100
Thought record practice in group (n = 13)	4.6	0.6	3-5	92	
Likelihood of recommending session to future students (n = 13) ^c	4.9	0.4	4-5	100	

Abbreviation: MS 2, second-year medical student.

^aTop two response options were *excellent/good* or *definitely yes/probably yes*.

^bRated on a 5-point Likert scale (1 = *terrible*, 2 = *poor*, 3 = *average*, 4 = *good*, 5 = *excellent*).

^cRated on a 5-point Likert scale (1 = *definitely no*, 2 = *probably no*, 3 = *neutral/unsure*, 4 = *probably yes*, 5 = *definitely yes*).

the results of pilot testing and informal student/faculty feedback to maximize student and faculty comfort discussing potentially sensitive topics.

As a result, the session was very well received by both students and faculty, and there were no consistent weaknesses identified in the activity. Some discrepancies in student feedback regarding preferences for more- or less-structured activities (vs. open discussion) may reflect the composition and cohesion of the small groups and/or the students' own comfort engaging in discussion more than they do the quality of the learning activities. Indeed,

the flow of the session worked very well and has been applied to other wellness activities at our institution. Specifically, having an expert deliver basic foundational knowledge in a brief lecture to both faculty and students provided consistent information across groups. The interactive, small-group activities purposefully allowed students to apply their new knowledge initially to a safer external case example, and subsequent activities guided students and faculty to apply their new knowledge on a personal level. This learning module was designed to be delivered in a small-group setting to groups that meet longitudinally and therefore have an established level of cohesion and

Table 2. Student and Faculty Ratings of the Learning Activity in the MS 1 Curriculum

Raters	Activity	M	SD	Range	% Endorsing Top Two Response Options ^a
MS 1s	Overall rating of activity (n = 80) ^b	4.3	0.8	2-5	82
	Effectiveness/helpfulness in achieving learning objectives ^b				
	Lecture (n = 73)	4.3	0.9	2-5	84
	Case vignette group exercise (n = 81)	4.3	0.8	2-5	83
	Personal reflection regarding hot thoughts (n = 83)	4.4	0.8	2-5	83
	Group sharing regarding hot thoughts (n = 83)	4.4	0.9	1-5	84
	Thought record practice in group (n = 83)	4.3	0.8	2-5	80
MS 1 faculty facilitators	Likelihood of recommending session to future students (n = 83) ^c	4.4	0.9	1-5	88
	Overall rating of activity (n = 2) ^b	5.0	0.0	5-5	100
	Effectiveness/helpfulness in achieving learning objectives ^b				
	Lecture (n = 2)	5.0	0.0	5-5	100
	Case vignette group exercise (n = 2)	4.5	0.5	4-5	100
	Personal reflection regarding hot thoughts (n = 2)	4.5	0.5	4-5	100
	Group sharing regarding hot thoughts (n = 2)	4.5	0.5	4-5	100
Thought record practice in group (n = 2)	4.5	0.5	4-5	100	
Likelihood of recommending session to future students (n = 2) ^c	5.0	0.0	5-5	100	

Abbreviation: MS 1, first-year medical student.

^aTop two response options *excellent/good* or *definitely yes/probably yes*.

^bRated on a 5-point Likert scale (1 = *terrible*, 2 = *poor*, 3 = *average*, 4 = *good*, 5 = *excellent*).

^cRated on a 5-point Likert scale (1 = *definitely no*, 2 = *probably no*, 3 = *neutral/unsure*, 4 = *probably yes*, 5 = *definitely yes*).

Table 3. Qualitative Feedback From Students and Faculty^a

Theme	Quotes
Value of activity	<p>“Every single person in my CLG found this relatable, and I believe we all made significant strides towards healthier thinking thanks to this session.” (MS 2-4)</p> <p>“The most helpful of all the mental health activities in CLG. It has action items and immediate effect on wellbeing. It is an activity that can be done during high stress and panicked situations.” (MS 1-7)</p> <p>“A+++.” (F-MS 2-5)</p>
Content/structure of learning activity	<p>“For those who engage, I think there’s a bounty here far beyond what a single session on radiographs or ethics can offer.” (MS 2-40)</p> <p>“A session that just allowed group discussion more than lectures and activities and homework would by far have benefitted my CLG more. People were willing to open up for the first time in a year together, and we were limited by time and activities.” (MS 2-17)</p> <p>“This is a good life skill to have in general, and it was taught excellent[ly].” (MS 1-5)</p> <p>“The self-application exercises are better and more useful than the lecture or the case report exercise, but I think the lecture and case report are necessary to help get across the point of the exercise, so the second part is more valuable to the students and faculty.” (F-MS 2-3)</p> <p>“I think this was a great activity and I learned a lot not only for myself and the students, but also for patients as well.” (F-MS 1-1)</p>
Timing of learning activity	<p>“We should do this earlier for the first-year students when they are just starting school.” (MS 2-12)</p> <p>“This session is well-timed and immediately applicable to us—especially looking at neuro approaching.” (MS 2-39)</p> <p>“I really appreciate the timing of this activity, before the three big exams. I needed that. I think we all needed that to feel better, manage the stress, and do our best. Thank you so much.” (MS 1-13)</p>
Lecture feedback	<p>“[The lecture] really helped us to structure the conversation.” (MS 2-16)</p> <p>“[I liked] that we watched the lecture in class so that we didn’t need to prepare beforehand.” (MS 2-31)</p> <p>“Maybe make the video shorter or with breaks in between to talk instead of having the video play all the way through.” (MS 1-21)</p> <p>“I think [the lecture] would be enhanced by in-person discussion [rather than prerecorded]. However, the lecture recording was short and I think that helped keep the students engaged.” (F-MS 2-2)</p>
Feedback on group discussion	<p>“Appreciated doing it as a group rather than individual.” (MS 2-7)</p> <p>“I think that it caught us all a little off guard to have to share our personal hot thoughts. Some warning would have been nice, but all in all the exercise was very nice and prompted good discussion.” (MS 2-9)</p> <p>“It was great to talk to the rest of our class about our hot thoughts and see that people are experiencing the same thing.” (MS 1-24)</p> <p>“I like how it makes them think deep that they actually do this. Their first response was to tell me they don’t have thoughts like these, and then as soon as I started to give my own examples in both professional and personal life, they opened up realizing such behaviors are quite common.” (F-MS 2-1)</p>

Abbreviations: CLG, collaborative learning group; F, faculty; MS 1, first-year medical student; MS 2, second-year medical student.

^aEach student quote was identified by a unique number (e.g., MS 1-1) that reflected the student’s cohort and participant ID. Faculty quotes were identified by a unique number preceded by an F that reflected the faculty member’s cohort and participant ID (e.g., F-MS 2-1).

trust. Although not required for the activities, we believe that the creation of a safe/trusting environment is an important element to promote engagement and enhance the learning experience.

Limitations

Our assessment of the session was limited to student and faculty satisfaction with the learning activities and did not directly assess the learning objectives. Future research should examine whether students achieve a significant gain in knowledge/skills and whether that gain is sustained over time. Additionally, the evaluation measures were exclusively self-reported, which could reflect social desirability or other forms of bias. Finally, though response rates were generally over 50%, results may not be generalizable to the population as a whole.

Conclusions

The included resources will allow educators at any institution to implement this learning module, as no specific content knowledge/expertise is required of the faculty facilitators. Students and faculty have recommended offering this module to medical students and, interestingly, to faculty as well. The 90-minute investment of curricular time appears to have been

time well spent. Many students have asked us to create a follow-up activity. In the future, we may consider adding an additional cognitive restructuring module or a new cognitive flexibility session.

Appendices

- A. Faculty Guide.docx
- B. Student Guide.docx
- C. Lecture Slide Deck.pptx
- D. Video Lecture.mp4
- E. Session Evaluation.docx

All appendices are peer reviewed as integral parts of the Original Publication.

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Ethical Approval

The University of Florida Institutional Review Board deemed further review of this project not necessary.

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