Effects of a stress management program on third year medical students' anxiety depression and somatization

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Abstract
This article was migrated. The article was marked as recommended. Background: Transition from the medical school classroom to the clinical training years requires students to adapt in many ways. Schedules are more variable, with longer clinic hours and travel to affiliated hospitals. Students are also faced with emotional needs of patients coincident with meeting demands from attending physicians. The prevalence of anxiety, depression and overall distress increases during the four years of medical school and particularly during difficult transitions.
Methods: Forty medical students entering their first clinical year enrolled in a two session stress management program focused on mindfulness and coping strategies. Sessions were interactive, conducted by a psychologist, social worker and a counselor and comprised evidenced based components.
Results: Twenty nine students completed the program. Baseline comparisons between dropouts and eventual completers showed that dropouts were more likely to screen positive for depression, anxiety and somatic tendencies. Program completers evidenced short term increased knowledge about mindfulness and coping and demonstrated significant decreases in anxiety and somatization at the end of the program.
Conclusion: Though scheduling of any additional programs during the clinical years of medical school presents significant challenges, students who complete such a program sustain important benefits and evaluate the program positively.

Keywords
medical students, stress management, anxiety, depression
Background
The stressors related to the clinical years of medical school have been documented previously (Compton, Carrera, & Frank, 2008; Schwenk, Davis, & Wimsatt, 2010). While the first two years are classroom and laboratory based, the third year emphasizes learning in actual patient care situations. Frequent changes in the academic schedule, more responsibilities and away rotations limit time with friends. Ethical dilemmas and caring for terminally ill patients can all add to the emotional burden on students.

Symptoms of anxiety and depression often increase throughout the medical school years (Compton, Carrera, & Frank, 2008). While most students are able to cope with these challenges, some demonstrate impaired functioning and well-being (Coentre & Figueira, 2016). Within this context, programs to provide added support to medical students have been designed. A comprehensive program comprising small and large group wellness programming during each year of medical school received excellent student evaluations (Drolet & Rodgers, 2010). In an effort to improve first year medical students’ ability to cope with stress, an eight session intervention including such topics as relaxation, coping skills, mindfulness and maintaining balance was offered. Students sustained significant decreases in depression at the end of the program compared to a wait list control group (McGrady, Brennan, Lynch, & Whearty, 2012). A subgroup of first year students identified as high risk were more compliant to recommendations for relaxation practice and significantly reduced scores on anxiety inventories (Brennan, McGrady, Lynch, Schaefer, & Whearty, 2016). Herein, we describe a program of stress management for third year medical students and its effects on anxiety, depression, and somatization symptoms. Specifically, our hypothesis was that the intervention would be helpful to students in reducing anxiety, depression and somatic preoccupation.

Method
Participants: Students entering their clinical year of medical school at a medium sized medical school were potential participants. The program was offered to approximately 300 students.

Procedure: The study was approved by the IRB at the institution and all participants signed the consent form.

Recruitment: Students were required to attend a week long orientation covering a variety of topics, including Student Wellness. During one of the presentations students were presented with the opportunity to participate in a voluntary stress management program. Participants completed a demographic questionnaire, and standardized tests assessing anxiety, depressive symptoms, and tendency to somatize. Instruments: The Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2001), the Generalized Anxiety Disorder (GAD7), (Spitzer, Kroenke, Williams, & Lowe, 2006), and the Patient Health Questionnaire-15 (PHQ-15) (Kroenke, Spitzer, & Williams, 2002) were administered at baseline and after the two sessions.

Intervention: Two sessions were offered during the academic year: one on mindfulness during the Family Medicine rotation and one on coping skills during the Psychiatry rotation. Faculty members from both departments were supportive of the program. A total of about 150 minutes was spent in face to face contact between facilitator and students. Participants were encouraged to practice the techniques learned during the sessions, ideally on a daily basis.

The session held during Family Medicine educated participants on Mindfulness and centered on being fully present in the moment in a nonjudgmental manner. Emphasis was placed on improving awareness when the mind gets distracted during patient interviews or lectures. The presenter engaged participants by asking open ended questions, providing case scenarios, and using reflection on past situations. This session ended with 10 minutes of mindful practice (Krasner, Epstein, Beckman, Suchman, Chapman, Mooney, & Quill, 2009; Fortney, Luchterband, Zakletskaia, Zgierska, & Rakel, 2013). Students completed a rating scale indicating knowledge of mindfulness before and after this session.

The session held during Psychiatry focused on positive coping (Seligman, Steen, Park, & Peterson, 2005). With the use of a short questionnaire, students identified their most common coping style and the situations where that coping method was most and least likely to be successful. Empathic listening while maintaining boundaries with patients was discussed and role played. Students identified 3 things for which they were grateful on that day. They identified a few healthy pleasures, whether large or small and were recommended to enjoy what they had listed as often as appropriate. This session ended with a brief relaxation exercise, specifically slow paced breathing (Davis, Eschelman, & McKay, 2008). Students completed a rating scale indicating perceived sense of relaxation before and after the exercise.

Analysis: Data were analyzed with SPSS. Descriptive statistics were generated. ANOVA compared baseline information on participants who dropped out with those who completed the program and to compare baseline and post intervention
data for the completers. There is missing data since the numbers of students completing the questionnaires varied. Pre and post session data on knowledge of mindfulness and experience of relaxation was collapsed across all participants and all sessions. Since the direction of the differences was predicted in our hypotheses, one-tailed tests were used to determine significance.

**Results**

Sixty three students signed the consent form. Forty students (27 women and 13 men) of mean age 25 years completed the initial assessments. Most (26) were single, but 13 were either married or living with a partner. Nine students screened positive on the PHQ-15, 5 screened positive on the GAD-7 and 7 on the PHQ-9.

Twenty nine students attended both sessions (completers); eleven did not. The dropout rate for those who screened positive on the PHQ-9, or the PHQ-15 or the GAD-7 was above 50%.

Table 1 details the comparison between the PHQ-15, GAD-7, and PHQ-9 scores in completers and dropouts. Dropouts were found to have significantly higher scores on the PHQ-9 (p > 0.02) and GAD-7 (p < 0.03) (Table 1a). Completers were compared on baseline and post two sessions on GAD-7, PHQ-9 and PHQ-15. In the program completers, significant decreases in GAD-7 scores (p< 0.025) and PHQ-15 (p < 0.036) were observed (Table 1b). Furthermore, students demonstrated significant increases in knowledge of mindfulness and greater perceived relaxation following the sessions (mindfulness: paired t-test; t= -8.16 p <0.001 and relaxation: t = -7.43 p < 0.0001). Student evaluations of the program were positive, emphasizing the practical applications that were discussed and the building of relaxation and mindfulness skills.

**Discussion**

The percentage of participants in this study who screened positive on the assessment instruments (between 13% and 23%) highlights the fact that some students may need extra support services during the clinical years of medical school. A similar percentage of positive screens have reported in other groups of medical students entering their first clinical year (Brennan, McGrady, Whearty, Lynch, Rapport, & Schaefer, 2012; Roberts, 2010). Importantly, it has been reported that distress correlates with more negative patient interactions and less empathy by medical students engaged in clinical rotations (Hojat, Vergare, Maxwell, Brainard, Herrine, Isenberg, & Gonnella, 2009).

Unfortunately, students who screened positive or who had significantly higher scores on anxiety, depression and somatization were more likely to drop out of the program. It may be that the relatively high levels of anxiety and depression signaled worry about academic performance so they decided to spend the time studying. Students may also have recognized that the program was not sufficient to deal with their level of distress. Our findings support those of similar studies utilizing interventions of different intensity, length and outcome measures. For example, Phang et al (2015) found short term improvements in perceived distress and greater sense of self efficacy in medical student participants compared to a control group. Further research is needed to determine if the post program results continue long term.

**Conclusion**

Relatively brief interventions can produce observable improvements in student ratings of distress and students rated the program positively. Mindfulness, stress management and coping seem to be important components (van Dijk, Lucassen, P.L., & Speckens, A.E., 2015). Noteworthy is the common difficulty in recruiting and retaining students for any extra programs, particularly students in their clinical years (Greeson, Toohy, & Pearce, 2015). Interventions must be brief, focused and ideally, integrated into specific clinical rotations. Findings from this study and others suggest that it is worthwhile to continue offering programs for students engaging in clinical rotations, despite the inherent challenges.

**Take Home Messages**

- Over 10% of medical students entering their 3rd year screen positive for anxiety and depression.
- Personal distress interferes with effective patient care.
- Brief stress management interventions reduce distress.
- Interventions must be brief, focus, and must include mindfulness and coping strategies.
Notes On Contributors
Dr. Angele McGrady received her B.S. from Chestnut Hill College, her Masters in Physiology from Michigan State University, her Ph.D. in Biology and her M. Ed in Counseling from the University of Toledo. She is a licensed counselor and a certified provider of biofeedback. Currently Dr. McGrady is a professor in the Department of Psychiatry at the University of Toledo Medical Center (UTMC), where she also maintains a practice in counseling and biofeedback. Dr. McGrady’s professional activities include: Past President of the Association for Applied Psychophysiology and Biofeedback and past Associate Editor of “Applied Psychophysiology and Biofeedback”. Dr. McGrady has experience in teaching: medical, nursing, physician assistant, graduate students and residents. She designed wellness programs for medical students, residents and more recently college level athletes. Her resume lists 85 peer reviewed articles and book chapters. Her book “Pathways to Illness, Pathways to Health” with Donald Moss, Ph.D. was released in 2013 by Springer.

Dr. Julie Brennan received her B.S. in Dietetics and Psychology from University of Dayton - and her Masters of Arts and Ph.D.in Philosophy from The Ohio State University. Currently Dr. Brennan is an Assistant Professor in Family Medicine at the University of Toledo Medical Center. Dr. Brennan’s research interests include wellness, health behavior change, eating disorders, obesity, depression and anxiety.

Dr. Denis Lynch is Professor Emeritus of Psychology in Family Medicine and Psychiatry at the University of Toledo Medical Center.

Kary Whearty is a licensed social worker who has participated in wellness programs for the past 10 years. These wellness initiatives have benefited medical students, patients, and healthcare workers.

Declarations
The author has declared that there are no conflicts of interest.

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Appendices

Table 1a. Comparison of dropouts and eventual completers at baseline

|                | PHQ-15 | PHQ-9 | GAD-7 | ANOVA   |
|----------------|--------|-------|-------|---------|
| Completers (27)| 6.4 (3.7) | 3.8 (3.8) | 4.4 (3.6) | *F(1,34) = 5.8 p=.021, **F(1,35) =4.9 p=.033 |
| Drop Outs (10) | 8.5 (4.2) | 7.4 (4.6) | 7.3 (3.3) |         |

Table 1b. Comparison of Measures of Distress at Baseline and After the Intervention

|                | #PHQ-15 (n=19) | PHQ-9 (n=17) | GAD-7 (n=19) | Paired t-test: # t= 1.91 p =.036; ## t= 2.07 p =.025 |
|----------------|---------------|--------------|-------------|-----------------------------------------------------|
| Baseline       | 6.7 (3.8)     | 4.3 (4.1)    | 4.9 (3.8)   |                                                     |
| Post Intervention | 5.3 (4.1)  | 3.6 (3.6)  | 3.3 (3.2)  |                                                     |

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Susan Van Schalkwyk
Stellenbosch University

This review has been migrated. The reviewer awarded 3 stars out of 5

This article describes an aspect of medical education that remains a particular challenge and one that requires our attention. The effects of anxiety and depression among the student population is cause for concern, particularly in countries where as graduates they will be required to work in under-resourced contexts. The nature of the intervention, therefore, appears to be one that has merit as it seeks to support students in dealing with some of the challenges resulting from the stress of moving from classroom based teaching and learning to the clinical context. The article is quite short and therefore the reader is expected to fill in the gaps which is not always useful. Reference is made to several different instruments and it is not always clear what was used when. Also, it would have been interesting to have had some rationale for the instruments that were selected – why these and not others? I also believe that the article would have been strengthened by considering some of the findings more critically. The students who participated in the programme were self-selected. Given that this appears to have been a relatively small sub-set of the full group (40/300??), it could have been interesting to reflect on why these students elected to follow this option. Why did 63 initially sign up and only 40 participate? A comment about academic challenges was noted as a possible reason for only 29 of the 40 completing, but this seems to be pure conjecture as there is no evidence for this. Similarly, the conclusion about the nature of such interventions (brief, focused, integrated) all ring true, but cannot be offered as conclusions from the study. Perhaps some qualitative work as a next step could be of value?

Compelling Interests: No conflicts of interest were disclosed.

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Trevor Gibbs
AMEE

This review has been migrated. The reviewer awarded 3 stars out of 5

An interesting paper about a very difficult but all too common a problem amongst, I would imagine, all tertiary students. The results were deemed positive to the extent that the authors supported the inclusion of similarly structured courses within other curricula. Whilst not wishing to disagree with the authors as to the value of this intervention, I do wonder if such an activity brings in a false sense of security. I think that the attrition rate of students wishing to take part in such an activity needs exploration, particularly since the authors found that anxiety / depression / somatisation scores were higher in this group. Certainly I would agree with my co-reviewers that a longer term follow up of all participants and non-participants is indicated. With this in mind I am not sure that I can agree with the take home messages of the authors.

Competing Interests: No conflicts of interest were disclosed.

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Manish Khazane
SRM UNIVERSITY, RAMAPURAM, CHENNAI.

This review has been migrated. The reviewer awarded 3 stars out of 5

Angele McGrady et al, 2017 aimed to assess the anxiety, depression and somatic preoccupation of the medical students entering into the clinical rotation phase of their medical schools. Authors emphasized on topics such as coping skills, mindfulness and maintaining balance during this phase. Two sessions included, mindfulness during the family medicine rotation and one on coping skills during the Psychiatry rotation. Post intervention sessions, it was found that students demonstrated significant increase in the knowledge of mindfulness and relaxation. Although the study finds the level of improvement due to the concerned intervention, study aptly excludes students with higher anxiety/distress levels who should be the main targets to be worked upon. Although there is a definite agreement as stated by the author that interventions should be brief, focused and integrated into specific clinical rotations. Further focus should
be laid upon finding and treating those students who are battling with anxiety, depression and sufficient support should be enabled for them.

**Competing Interests:** No conflicts of interest were disclosed.

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**Julie Hunt**

Lincoln Memorial University

This review has been migrated. The reviewer awarded 4 stars out of 5

The mental health of medical students and medical providers is a critical area where medicine stands to improve. This article describes a two-session intervention for medical students and evaluates its impact on mental health. This intervention is concise and incorporated into an existing clinical rotation, both of which make it more appealing to students and educators. I agree with the authors that a follow-up study evaluating lasting impact would be helpful in justifying the value of the intervention and perhaps suggesting how often during a student's education this intervention should be offered. Disturbingly, the drop-outs were more in need of mental health intervention than the completers. The authors suggest a few reasons for this. Interviewing or surveying those who dropped out about their reasons could have elucidated that and provided valuable information to the authors and readers about how to avoid this disturbing trend. Overall, this is a good initial evaluation of an intervention that appears reasonable in the time and effort required to deliver it.

**Competing Interests:** No conflicts of interest were disclosed.