The roles of basic psychological needs, self-compassion, and self-efficacy in the development of mastery goals among medical students

Abstract

Aim: Competency-based medical education aims to foster mastery goals in learners. We examined medical students' mastery approach (beneficial) and mastery avoidance (maladaptive) goals and their associations with students' basic psychological needs, self-compassion, and self-efficacy.

Methods: This was a cross-sectional study employing an online questionnaire. Two hundred medical students in all four years of the medical program completed the questionnaire, containing measures of mastery goals, basic psychological needs (autonomy, competence, relatedness), self-compassion, and self-efficacy. Regression analyses were performed.

Results: Of the three basic psychological needs, the need for competence was significant in explaining both types of mastery goals. Self-efficacy and self-compassion were significant in explaining mastery approach and mastery avoidance goals, respectively.

Conclusion: Creating learning environments that are supportive of students' need for competence, raising students' awareness of the value of learning from mistakes in competency acquisition, and providing opportunities for students to experience self-efficacy may foster beneficial mastery approach goals in medical students.

Introduction

Competency-based medical education (CBME) is seeing uptake in medical programs worldwide (Frank et al. 2017). One of its key features is an emphasis on engaging learners in taking an active role in competency acquisition. From this perspective, CBME aims to foster in learners a specific type of motivation, namely pursuit of mastery goals, and a mindset of lifelong learning. In contrast to performance goals which are characterized by motivation to demonstrate one's competence to others, mastery goals are characterized by motivation to engage in the deep process of learning to develop competence. Mastery goals are further divided into approach and avoidance goals, depending on whether the goal is directed at desirable events or at avoiding undesirable events (i.e., approaching success or avoiding failure). As such, mastery approach is motivation to improve or gain competence; mastery avoidance is motivation to avoid being incompetent or not doing worse than one has done in the past (see Elliot & Hulleman 2017).

Not all mastery goals, however, are adaptive or beneficial. While mastery approach goals have been shown to relate to deep processing, error tolerance, perseverance, and enjoyment of learning (Fryer & Elliot 2008; Elliot & Hulleman 2017), mastery avoidance goals are associated with disorganized learning, psychological ill-being, and avoidance of help-seeking (Poortvliet et al. 2015; Elliot & Hulleman 2017). In the CBME context, mastery approach goals are clearly the desired type of goals.

Personal characteristics of the learner and features of the learning environment have been shown to give rise to distinct goals (Fryer & Elliot 2007). Medical training is challenging; it requires self-efficacy, a belief that one has capability to succeed and overcome difficulties based on one's own past experience (Bandura 1994), and self-compassion, an ability to manage stressful events with compassion and understanding when one has failed or made a mistake (i.e.,

developing tolerance for imperfection in self and approaching mistakes as learning opportunities) (Neff et al. 2005; Neff 2009).

With respect to learning environments, CBME holds further challenges for learners used to traditional curricula (Gruppen et al. 2017) and can negatively affect leaner self-efficacy "if the challenge level presented through criterion-based learning and performance expectations is inappropriately high" (Swing et al. 2010, p.667). Furthermore, it is yet to be determined how CBME is supportive of three basic psychological needs – autonomy, competence, and relatedness – which are critical for optimal development, learning, and well-being (Ryan & Deci 2017; Ryan & Moller 2017). Autonomy refers to individuals' desire for making their own choices and initiating actions; competence refers to individuals' desire to experience mastery and achievement of their goals; and relatedness refers to individuals' desire to have positive and beneficial relationships and feel connected to others. When basic needs are supported by the environment, individuals are more likely to be oriented toward mastery and learning. In contrast, when these needs are thwarted by the environment, individuals are more likely to engage in maladaptive (i.e., avoidance) behaviours (Ryan & Deci 2017; Ryan & Moller 2017). The three needs are considered interconnected and equally important, and "lacking autonomy, competence, or relatedness in any activity or domain of activity has detectable costs for both quality of motivation and well-being" (Ryan & Moller 2017, pp. 217-218). The focus of studies conducted with medical students to date has been largely around autonomy support (Kusurkar et al. 2015; Feri et al. 2016).

As medical schools worldwide are adopting CBME, it is important to study learners' motivation, including the goals learners endorse and pursue in CBME curricula and factors contributing to goals adoption. In this study, we examined medical students' mastery approach

and avoidance goals and their associations with students' basic psychological needs, self-compassion, and self-efficacy.

Methods

Brief program description

The MD program at our university has begun the transition toward CBME. Examples in the current program include an assessment that is pass/fail, with a required proof of competence through make-up assessments for absences and for sub-sections of courses/rotations that were not passed even in the setting of an overall passing grade. There is also a longitudinal course across all four years of the program, with a system of curriculum and assessment for clinical skills, professionalism, and integrative cases that span across system blocks/rotations. In clerkship, there is a system of workplace-based assessment that includes regular documentation of observed clinical encounters in an electronic portfolio.

Study design and procedures

This was a cross-sectional study. Quantitative data were collected from medical students using an online questionnaire. Of 640 medical students in the program in 2016-2017, 267 students agreed to participate in the study. Institutional ethics approval was obtained prior to data collection.

Study participants

Two hundred medical students completed the questionnaire and their survey responses were subsequently used in the analyses. Nine students chose not to disclose their gender and/or age. Of those respondents, who provided their demographic information, 60% were female and 93% were under 30 years of age. Overall, 23% of the respondents were in year 1, 30% in year 2, 21% in year 3, and 26 % in year 4.

Measures

Mastery goals

Two subscales from the validated Achievement Goals Instrument (Baranik et al. 2007) were used to assess mastery approach and avoidance goals, respectively; minor changes were made in item wording (e.g., 'coworkers', 'projects', and 'job' were replaced with 'others in my program', 'tasks', and 'program', respectively). Using a Likert-type scale (1–not at all true of me; 7–yes, very true of me), students were asked to indicate the extent to which each statement was true of them in relation to their medical program. In total, 11 statements were used to measure mastery approach (e.g., "I enjoy difficult tasks in my program where I will learn new skills"; 4 items; α=0.72) and mastery avoidance (e.g., "In my program, I focus on not doing worse than I have done in the past"; 7 items; α=0.68) goals. Higher scores on each goal measure indicated greater endorsement of the respective mastery goals.

Basic psychological needs

The 12-item validated Basic Psychological Needs Scale (Brien et al. 2012) was used to assess levels of satisfaction of each need (autonomy, competence, relatedness; 4 items each); minor changes were made in item wording (same as above). Using a Likert-type scale (1–strongly disagree; 6–strongly agree), students were asked to indicate how they typically felt in relation to their medical program. Sample items are: "In my program, I can take on responsibilities" (autonomy; α=0.75); "In my program, I feel competent" (competence; α=0.79); and "When I am with the people from my program, I feel I am a friend to them" (relatedness; α=0.89). Higher scores on each need measure were indicative of greater satisfaction of the respective needs.

Self-compassion

The 12-item validated Self-Compassion Scale (Raes et al. 2011) was used to measure the degree of compassion individuals exhibit toward themselves in instances of failure or during challenging time. Using a Likert-type scale (1–almost never; 5–almost always), students were asked to indicate how often they behaved in a certain way. Sample items are: "I try to see my failings as part of the human condition" and "When I fail at something important to me, I become consumed by feelings of inadequacy" (reverse-coded). Higher scale scores were indicative of greater self-compassion (α=0.86).

Self-efficacy

A single-item measure was used to assess students' self-efficacy at the global level. Using a Likert-type scale (1–strongly disagree; 6–strongly agree), students were asked to indicate the level of agreement with the statement "I can get through difficult times because I have experienced difficulty before".

Analyses

Descriptive (means, standard deviations, correlations) and inferential (regressions) analyses were performed in SPSS 24.0. The year in the medical program, three basic psychological needs, self-compassion, and self-efficacy were entered as predictors in the regression analyses of mastery approach and mastery avoidance goals.

Results

Overall, students indicated greater endorsement of mastery approach than mastery avoidance goals (Table 1). The correlation between these goals was negative and of moderate size. Students reported, on average, comparable levels of three basic psychological needs, self-compassion, and self-efficacy, which were all above midpoints of their respective scales. The results of regression analyses revealed that of the three psychological needs, the need for competence was significant

in explaining both mastery approach and avoidance goals (positive and negative relationships, respectively). The contributions of the other two needs (autonomy and relatedness) in explaining mastery approach and avoidance goals were largely negligible. Self-efficacy was positively and significantly associated with mastery approach goals. Self-compassion was negatively and significantly associated with mastery avoidance goals (Table 1).

Discussion

We found that the need for competence (desire to experience mastery and achievement of one's goals) was positively associated with mastery approach and negatively associated with mastery avoidance goals. That is, when students feel competent and able to execute tasks and to solve problems, they are more likely to adopt mastery approach goals in the program. On the other hand, when students' need for competence is not supported by the learning environment, students are more likely to pursue mastery avoidance goals, and potentially develop a mindset of achieving minimal competence as a coping strategy to avoid feeling incompetent in the program. Empirical research indicates that setting an optimal level of challenge and providing constructive, criterion-referenced, and frequent feedback on student performance help support students' need for competence (ten Cate et al. 2011; Cook & Artino 2016). Next steps in our MD program, for example, include the implementation of enhanced progress tracking in the electronic portfolio for learners and a new system for coaching over time, where each student has an academic advisor who regularly reviews the student's learning trajectory to guide and promote growth.

Next, those students who were less self-compassionate reported a greater endorsement of mastery avoidance goals, which, in published literature, are shown to be a maladaptive type of motivation (Elliot & Hulleman 2017). On the other hand, students who were more self-

compassionate (i.e., approach mistakes and failure experiences as learning opportunities) tended to endorse mastery avoidance goals to a lesser extent. These findings have important implications for practice. Explicitly teaching students how to approach learning mistakes in competency acquisition, helping students recognize and use their mistakes as valuable learning opportunities and manage failure constructively are likely to encourage the pursuit of more adaptive goals by students (see Neff et al. 2005; Leighton et al. 2017 for details).

Finally, students who reported a higher degree of self-efficacy were more likely to endorse mastery approach goals. Learners with high self-efficacy set challenging goals, are willing to step out of their comfort zone, persevere in the face of difficulty, and engage deeply in learning (Swing et al. 2010). High self-efficacy is traced to prior accomplishments and successes (Pardes 2008). As such, educators need to design learning experiences in the program and implement them in ways that allow students to experience success at the optimal level of challenge. An example of this in our pre-clerkship curriculum involves the use of an online team-based learning platform that allows teachers to provide challenging case-based problem solving exercises to simultaneous small groups of students while monitoring the groups' responses in real time. This system allows teachers to push the students to more difficult case scenarios while the contemporaneous monitoring gives them the ability to pause the activity for large group discussion and feedback if small group responses show that students are misunderstanding key concepts or experiencing difficulty with the cases. This and similar efforts will be further optimized by the involvement and collaboration of specialists in cognition and motivation and academic advisors guiding students through their individual learning trajectories.

Due to the cross-sectional nature of the data, causality cannot be inferred from the observed relationships. Nevertheless, it is important that we strive to understand the

underpinnings of mastery goals endorsement by medical students in CBME environments to inform the implementation of CBME curricula and assessment practices.

Conclusion

Our findings suggest that: creating learning environments that are supportive of students' need for competence; raising students' awareness of the role of self-compassion and the value of learning from mistakes; and providing opportunities for students to experience self-efficacy will likely lead to the development of beneficial mastery (approach) goals among medical students.

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Declaration of interest

The authors report no conflict of interest.

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Table 1. Means, SDs, correlation and standardized regression coefficients (n=200)

				Correlation Coefficients[a]							Standardized Regression Coefficients	
	Variables	**Mean**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**MAP goals** R^2adj=.12	**MAV goals** R^2adj=.21
1	**Year in program**	-	-								.13	.01
2	**Autonomy**	4.35	0.73	.17*							-.05	.09
3	**Competence**	4.61	0.62	.10	.46**						.26**	-.42**
4	**Relatedness**	4.65	0.87	.05	.33**	.26**					.07	-.02
5	**Self-compassion**	3.15	0.64	.08	.24**	.24**	.30**				.01	-.22**
6	**Self-efficacy**	4.66	0.80	-.04	.29**	.42**	.12	.29**			.18*	-.01
7	**MAP goals**	5.50	0.75	.14*	.15*	.32**	.14	.13	.27**			
8	**MAV goals**	4.23	0.85	-.04	-.16*	-.43**	-.17*	-.31**	-.24**	-.35**		

**$p\leq0.01$; *$p\leq0.05$; SD – standard deviation; MAP – mastery approach; MAV – mastery avoidance.

[a] Numbers from 1 to 7 in the row below represent the order of the study variables as shown in the first column.