Using Insights From Sports Psychology to Improve Recently Qualified Doctors' Self-Efficacy While Managing Acutely Unwell Patients

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Abstract

Problem

Doctors experience a range of negative reactions when managing acutely unwell patients. These may manifest as emotions or behaviors. Without appropriate coping strategies, these emotions and behaviors can impede optimal clinical performance, which directly affects patient care. Athletes use performance enhancing routines (PERs) to minimize the effect of their negative emotions and behaviors on competitive performance. The authors investigated whether PERs could similarly improve recently qualified doctors' emotional and behavioral control while managing acutely unwell patients and whether the doctors perceived any effect on clinical performance.

Approach

Twelve doctors within 2 years of graduation from medical school recruited from 2 sites in Sheffield and Chesterfield, United Kingdom, implemented PERs using the PERFORM (Performance Enhancing Routines For Optimization of Readiness using Metacognition) model over a 4-month period between April and December 2017. The doctors' perceptions of PERFORM's effect on their ability to manage patients was evaluated using self-reported mixed-methods data, including think-aloud commentaries, semistructured interviews, and self-efficacy scores.

Outcomes

Doctors reported that PERFORM improved their ability to control negative emotions or behaviors during an acutely unwell patient *in situ* simulation, showing a statistically significant improvement in self-efficacy scores ($P = .003$, effect size = 0.89). Qualitative data revealed perceived improvement in aspects of clinical performance such as enhanced knowledge recall and decision making. These performance attributes appeared to positively impact interprofessional relationships and patient care. Doctors individualized their PERs and supported the wider implementation of PERFORM in health care education.

Next Steps

This is the first study to employ individualized PERs based on sports psychology in a medical context. The PERFORM model could be introduced into existing acute patient management courses to provide emotional regulation coaching alongside clinical skills training. Further research might investigate PERFORM's effect in other environments where emotional and behavioral control is paramount, such as surgery.

Problem

Doctors of all seniority levels can feel unprepared to manage their own negative emotional and behavioral responses to challenging clinical experiences. Negative emotional responses include feelings of underconfidence, anxiety, and frustration, whereas negative behaviors may manifest as tremors, fidgeting, or even paralysis.[1,2] This is most problematic for recently qualified doctors[1] (those who graduated from medical school less than 2 years ago)—such as interns in the United States or foundation trainees in the United Kingdom—who have not had adequate opportunity to amass the wealth of clinical knowledge and experience their senior counterparts possess. This unease often occurs while managing acutely unwell patients, especially during out-of-hours shifts when the level of senior support is at its lowest because there are fewer staff members working at the hospital in the evenings and on weekends.[2] Doctors' negative emotional and behavioral experiences are associated with difficulty in accessing and applying the knowledge and skills gained during training in a complex clinical environment. Doctors lacking experience and confidence may respond to this clinical complexity by avoiding situations they deem beyond their control.[3] Unsurprisingly, newly qualified doctors frequently identify the "management of the acutely unwell patient" as a domain in which they feel least prepared in clinical practice.

Despite multiple reports on the effects of stress on doctors' management of acutely unwell patients, there remains "surprisingly little evidence concerning the strategies that doctors within their first few months of practice use to handle emotions associated with clinical experiences."[1]

The deleterious effect of negative emotional and behavioral reactions to stress on performance is well established in sports. To minimize these reactions, athletes are coached to implement performance enhancing routines (PERs) during high-stakes competitions.[4] PERs are defined as a "sequence of task relevant thoughts and actions which an athlete engages in systematically prior to his or her performance of a specific sports skill."[5] Although PERs serve many purposes—including increasing focus, alleviating stress, and/or preventing "choking" in high-stakes situations—their precise mechanism has not been established.[4]

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Sports and medicine share many similarities. Both are embedded in busy, distraction-filled environments where focus and attention are paramount for successful task completion. Consequently, surgeons have evaluated the use of mental rehearsal to optimize clinical performance in the operating room.[6] Thus far, however, mental rehearsal has generally been applied during the performance of a specific skill (e.g., suturing, knot-tying), rather than to optimize overall performance and has tended to adopt a prescribed, one-size-fits-all approach. Sports psychologists have indicated that individualized PERs, regulated through the application of metacognition, could benefit performance optimization.[4]

Metacognition has been simply described as "thinking about thinking,"[7] with individuals self-monitoring their emotions and behaviors while performing a task and making adaptive changes to their behavior to reach the desired goal of a task.[4] Coaching individuals to apply metacognition while completing tasks has improved academic performance across a range of different tasks (e.g., reading, mathematics, problem solving), ages, and cognitive abilities,[8] including medical education.[9]

The Performance Enhancing Routines For Optimization of Readiness using Metacognition (PERFORM) model was designed as a conceptual model to illustrate how PERs might be applied to medical education. The metacognitive components of the PERFORM model (metacognitive feeling, knowledge, justification, and skills) were based on descriptions by Efklides.[10] Figure 1 illustrates the PERFORM model, outlining the interplay of metacognitive monitoring and control over the use of PERs.

In action, the PERFORM model is initiated by a metacognitive feeling, an affective, nonanalytical "gut" feeling that can be positive or negative. Positive feelings are associated with confidence, familiarity, or a "feeling of knowing," indicating that the individual feels on track to complete a specific task and a PER is not required. Negative feelings or behaviors, such as physiological responses to stress (e.g., shaking hands, sweaty palms) or nervous physical routines (e.g., fidgeting), are associated with difficulty.[10] Negative feelings or behaviors should induce a metacognitive judgment to explain why they are present, such as anxiety due to a lack of familiarity with a situation or a loss of focus due to distraction. Once identified, a PER, including the techniques listed in the metacognitive knowledge box in Figure 1, is selected from the metacognitive knowledge bank, informed by self-, task-, and experience-specific knowledge. Once implemented, the PER is evaluated using metacognitive skills.

If implementing the PER does not resolve the negative emotion or behavior, 2 pathways are activated. First, this information is fed back into the metacognitive knowledge bank to inform the future selection of PERs within specific contexts. Then, an alternative PER is selected and implemented. This select–implement–evaluate cycle continues until a positive outcome—alleviation of the negative emotion or behavior—is reached. At this point, the positive PER experience is fed back into the metacognitive knowledge bank for future reference and the individual returns to the entry point (top) of the model, where he or she continues to monitor any metacognitive feelings throughout the remainder of the task. In this way, metacognitive experiences refine the metacognitive knowledge bank by adding, deleting, or revising the PERs and their associations with certain situations.[7]

In this Innovation Report, the authors aim to understand how the application of PERs using the PERFORM model could improve recently qualified doctors' emotional and behavioral control during their management of acutely unwell patients in both *in situ* simulations and clinical practice.

Approach

A multiple case study design was adopted to gain an in-depth understanding of participants' experiences. The unit of analysis was an individual doctor, bound within a single, 4-month clinical placement within the study period of April 2017 to December 2017.

Mixed methods were used in the study to manage the complexity and messiness of social research and aided validity because they allowed the authors to triangulate the research findings.

Recruitment and study sites

Doctors within 2 years of graduation from medical school were recruited from 2 study sites in Sheffield and Chesterfield, United Kingdom, a large central academic teaching hospital (CTH) and a smaller peripheral district general hospital (DGH), respectively, to allow for potential differences in levels of supervision and training. Participants were recruited via emails and face-to-face contact. Convenience sampling maximized the number of cases, given doctors' limited availability because of busy work schedules. The study content and timelines were identical over both sites and ran sequentially over two 4-month periods.

Study overview

The study was organized into 3 stages. During stage 1, participants were coached to use the PERFORM model (see Figure 1) in simulation, mirroring the strategies used in sports to build a PER in a practice environment. Each participant selected a routine from a list of PERs taken directly from the sports psychology literature (shown in the metacognitive knowledge box in Figure 1) and applied it during a simulation of treating an acutely unwell patient.

In stage 2, this initial coaching was transferred to the real clinical environment. Participants self-directed opportunities to apply the PERFORM model during a patient encounter and completed a reflective log, which encouraged personal evaluation and modification of the model, after each encounter was over.

In stage 3, both the processes and outcomes of the study were evaluated. First, each participant attended an acute upper gastrointestinal hemorrhage *in situ* simulation involving a high-fidelity mannequin and multidisciplinary staff (including nursing and health care assistants) in a ward with no patients. The simulation was recorded on video and participants conducted think-aloud commentaries narrating over the video recordings of their simulations. These commentaries were transcribed verbatim and analyzed using framework analysis based on the metacognitive facets of the PERFORM model.

Participants reported their perceived ability (self-efficacy) to gain control over

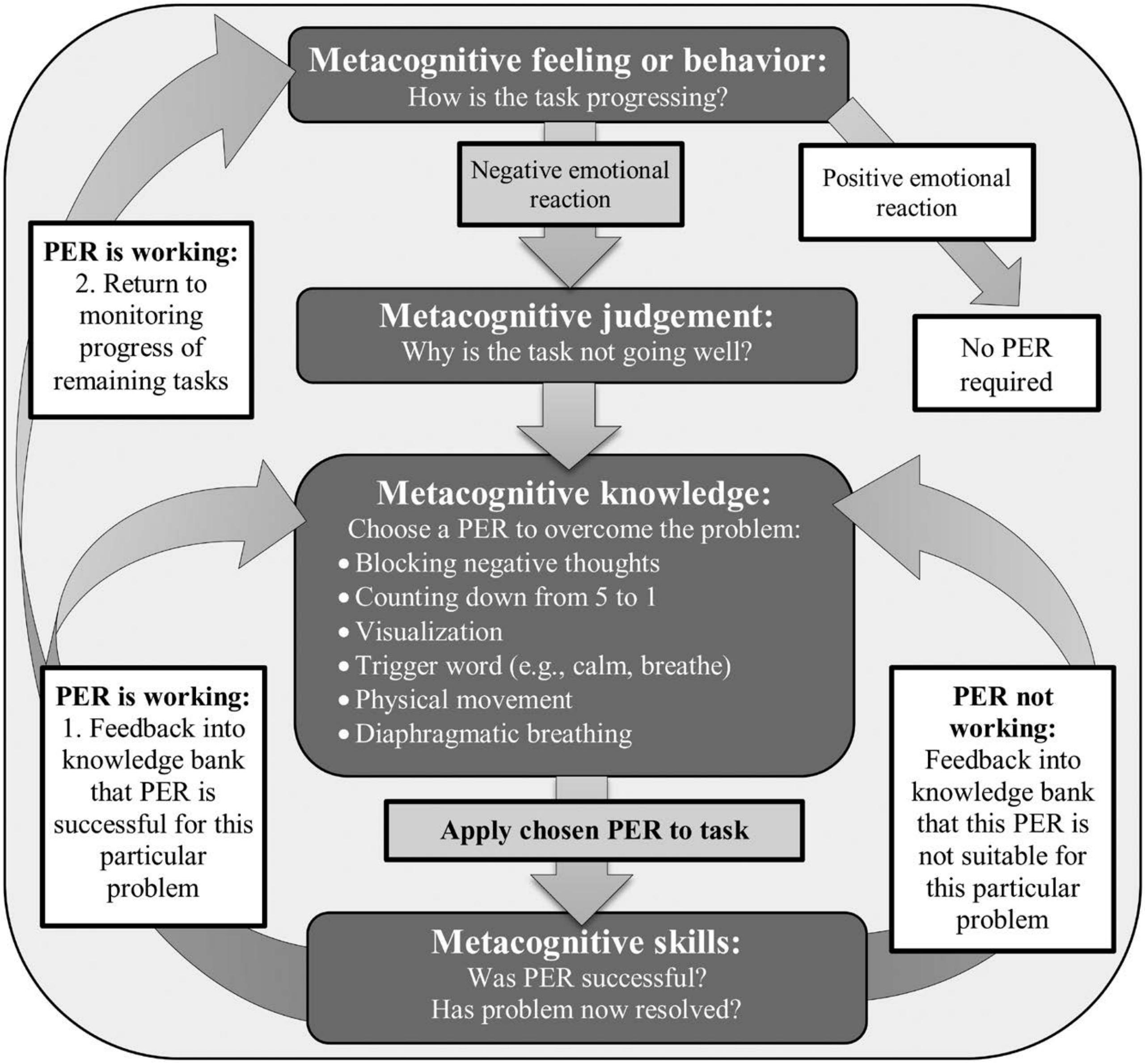

Figure 1 Conceptual PERFORM model, adapted from Church et al.[9] Participants were coached to apply the PERFORM model during a clinical scenario by starting at the top central box (metacognitive feeling) and following either the positive or negative arrow, depending on their current emotional reaction. If positive, no further action was needed. Following the central negative pathway, participants engaged metacognitive judgment to ascertain the reason for the underlying negative effect and to choose a PER from their metacognitive knowledge bank. Once applied, the PER was evaluated for effectiveness at relieving the negative effect through use of metacognitive skills; if the negative effect was not relieved (right-hand curved arrow), a different PER was chosen. This was repeated until the negative effect was relieved. Then, participants followed the left-hand curved arrows to (1) feed back this information to the metacognitive knowledge bank for future reference and (2) return to the top of the model to continue monitoring their emotions throughout the remainder of the task. On initiation of a future negative emotion, the participant would move through the central model pathway again. Abbreviations: PERFORM, Performance Enhancing Routines For Optimization of Readiness using Metacognition; PER, performance enhancing routine.

a negative emotional and/or behavioral reaction during the *in situ* simulation, where 0 = no control and 100 = full control over emotions and behaviors immediately before, and after, the use of a PER. Wilcoxon signed-rank tests and ANCOVA were used to analyze changes in pre-/post-PER self-efficacy and influence of variables (SPSS 25 for Mac, IBM Corporation, Armonk, New York). As the data were nonparametric, effect size was calculated using the formula $r = z/\sqrt{N}$. Post-hoc tests were carried out where indicated.

A final semistructured interview (SSI) (for which the protocol can be found in Supplemental Digital Appendix 1 at http://links.lww.com/ACADMED/B37) explored participants' perceptions of using the PERFORM model and their suggestions for its future applications. Interviews were transcribed verbatim before inductive thematic analysis using NVIVO 12 for Mac (QSR International, Melbourne, Australia).

Outcomes

Of the 12 participants who enrolled in the study (4 females and 8 males), 4 participants were in their first year post-graduation and 8 were in their second year. Seven worked in the DGH, and 5 worked in the CTH. The clinical specialties in which they worked were acute medicine (n = 4), general medicine (n = 5), surgery (n = 2), and academic with mixed clinical shifts (n = 1).

Quantitative outcomes

Eleven of the 12 participants implemented a PER during the stage 3 *in situ* simulation. Self-efficacy scores relating to the participants' control of negative emotions or behaviors were reported immediately before and following the implementation of their PERs during the *in situ* simulations (see Table 1).

There was a statistically significant improvement in individual self-efficacy scores during an acutely unwell patient *in situ* simulation (median change = 25.00, interquartile range 15.00–35.00, z = −2.94, *P* = .003, effect size = 0.89). Multiple regression analysis revealed that no other variables were statistically significant (see Table 1). However, with a small number of participants, a null finding may be due to low power inherent in the statistical test. Participants working in the larger CTH demonstrated a greater improvement in self-efficacy scores compared with those working in the smaller DGH. In contrast, there were almost no differences between participants with differing lengths of post-medical school graduation experience (1 year versus 2 years post-graduation).

Qualitative outcomes

The underlying mechanisms by which PERs improved doctors' self-efficacy when caring for acutely unwell patients were described through themes of personal, interprofessional relationships and clinical performance. The application of the PERFORM model was unpacked through themes of individualization, limitations, and recommendations. Doctors endorsed the wider implementation of PERFORM in health care education, particularly during the transition from student to qualified physician. Participants considered this to be the best time to introduce the model because it would allow newly qualified doctors to control their emotional and behavioral reactions to new clinical situations, enabling them to more confidently apply the skills and knowledge they gained during training. In this way, the model was perceived as a tool that could support experiential learning journeys during postgraduate training. Quotes from the think-aloud commentaries and SSIs demonstrate these themes (see Table 2), with alphanumerical codes denoting the hospital and enrollment number of each participant.

Table 1

Statistical Results of Self-Efficacy Scores[a] of Recently Qualified Doctors' Control Over Negative Emotions and Behaviors, Following Their Use of Performance Enhancing Routines (PERs) in Simulation, 2017

Change in self-efficacy pre–post-implementation of PER	Median	Interquartile range	z statistic	*P* value
Entire cohort	25.00	15.00–35.00	−2.94	.003[b]
By place of work				
Central teaching hospital	30.00	27.50–52.50		
District general hospital	16.25	14.38–31.25		
By training grade				
Doctor within 1 year of graduation from medical school	23.75	15.63–56.25		
Doctor within 2 years of graduation from medical school	25.00	25.00–35.00		
Multiple regression analysis covariate	**Coefficient (B)**	**Confidence interval (95%)**		***P* value**
Constant	84.69	−21.30 to 190.69		.08
Baseline self-efficacy score	−1.00	−3.17 to 1.16		.24
Place of work	−14.55	−50.99 to 21.89		.29
Trainee level	−9.54	−53.17 to 34.09		.54
Job[c]				
Emergency department	53.04	−23.64 to 129.72		.12
General medicine	34.31	−29.46 to 98.07		.19
General surgery	92.40	−17.63 to 202.43		.08
Gender	20.46	−25.58 to 66.50		.25

[a]On a scale of 0–100.
[b]Statistically significant (*P* < .05).
[c]Compared with critical care rotation.

Next Steps

This study is the first to use individualized PERs based on sports psychology in a medical context. It has contributed to an under-researched area[1] and successfully demonstrated a perceived sense of enhanced control by doctors managing complex clinical situations in both simulation and genuine patient encounters. The study provided doctors with an opportunity to discuss emotional and behavioral reactions to starting work and may complement other, more clinically focused acute patient management training programs for medical students, recently qualified doctors, or other health care professionals who also practice within complex clinical environments, such as nurses. The participating doctors reported that the PERFORM model improved their ability to control their negative emotional and behavioral responses during complex clinical scenarios, facilitating enhanced recall and application of clinical knowledge. In the same way, PERs also facilitated the doctors' management of nonacute scenarios (e.g., difficult discussions with patients and their relatives), thereby decreasing their avoidance of challenging situations.[1] Working within the complex clinical environment, doctors must be able to manage the emotional challenges of heavy workloads, uncertainty, and change by developing appropriate coping strategies. Currently, doctors receive little support or guidance in developing such strategies. The PERFORM model fills this need.

This study included a small cohort of self-selecting participants. Although this limits generalizability of the outcomes, case study research such as this aims instead for transferable outcomes by

Table 2

Topic, Themes, and Subthemes With Illustrative Quotations Identified During Thematic Analysis of Semistructured Interviews and Think-Aloud Commentaries with Recently Qualified Doctors Following Their Use of Performance Enhancing Routines During a Simulation[a]

Topic/Theme	Subtheme	Illustrative quotation
Mechanisms		
Personal	Discussing emotions	It was good just talking about it [be]cause firstly just as an issue I think it is fairly common among junior doctors? … and it's not something that's necessarily openly acknowledged by, any like other seniors I suppose, or like in the teaching programs. (C01)
	Finding solutions	I've always kinda been aware that I've been nervous but I've never actively, made a path to try and solve that. (C06)
	Professional identity	That's probably one of the most important things you can be as a clinician is being self-aware? … because you're not ever gonna do everything perfect all the time. (C02)
Interprofessional relationships	Trust	Maybe I came across a bit more professional … because I was calmer. (C06)
	Influence	If you LOOK panicked, then they [nurses] feel panicked … so if you can manage not to look panicked, even if you are … then that panic doesn't spread. (C04)
Clinical performance	Autonomy	I just kind of panic and be like, "Ah I need someone here now"…. It [PERFORM model] probably gets me a little bit further [with patient management]. (C01)
	Accessing knowledge	[It] allows me to draw on the knowledge that I know I've got. (S03)
	Efficiency	That's what prompted me to think, "Right, so I've done this, so I need to call someone"…. Which may've, probably would've still come, but might've been a little bit later. (S01)
Application of the model		
Individualization	Initiating the model	[I was] preempting that I was going to feel anxious, but it was kind of like recognizing that's a situation where I probably would feel, panicked normally … if I let myself get really worried about it, it would kind of be a bit too late to bring it round. (S02)
	Novel PERs	I go through that thought process of, "Oh I'm cleaning my glasses so let's think about what's goin' on and stop." (S01)
	Applying to nonacute/ nonclinical situations	When you have to go and speak to a patient's family, and they're gonna ask difficult questions and … I've like done the breathing BEFORE … so that when I go to them I've got a clear idea in my head of what the plan is and what's happening and I feel calm. And I can handle the situation. (C04)
Limitations	Conspicuous	I suppose sometimes [I] feel—would feel a bit self-conscious about, so things like sort of doing deep breathing and things I think are obvious to myself … y'know even though that might not be true. (S04)
Recommendations	Timing of intervention	[PERFORM should be coached] … maybe like final year … and maybe even just F1 maybe … in the first few weeks…. (C06)

Abbreviations: PERFORM, Performance Enhancing Routines For Optimization of Readiness using Metacognition; PERs, performance enhancing routines.

[a]The code in parentheses following each quotation denotes the individual study participant.

exploring multiple variables in a small number of settings so that findings can be applied to, but are not necessarily replicated in, other contexts.

Simulation may not replicate stress in the same way as a genuine clinical environment, but its purpose in this context was to provide an opportunity for participants to apply the PERFORM model without compromising patient safety or confidentiality. Self-assessment data can be problematic, but its use was appropriate here given that the aims of this study were to explore emotional and behavioral control and not direct clinical performance. Observed clinical performance data were not collected because any change observed over the 4-month study period would have been the result of multiple factors, including clinical experiences and other educational activities. Therefore, direct causative links between the participants' improved clinical performance and involvement in the study could not have been drawn without a control group.

Despite these limitations, this proof of concept merits further investigation, which might address whether PERFORM improves objectively assessed clinical performance using a case–control design. Alternatively, further research could investigate the application of PERFORM to other high-pressure clinical environments, such as surgery.

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