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should be added to this list and acts as a further barrier to the promulgation of EBM in clinical practice.

Practice points

<ul style="list-style-type: none"> • Medical students without A-level mathematics may express anxieties over quantitative calculations, as required in teaching evidence-based medicine.
<ul style="list-style-type: none"> • Empirically, there is no difference in exam performance between students with or without A-level mathematics.
<ul style="list-style-type: none"> • Such concerns appear attitudinal rather than reflecting any lack of competence.
<ul style="list-style-type: none"> • Negative attitudes to quantification may act as a barrier to the practice and use of evidence-based medicine.

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A comparison of medical students' written expressions of emotion and coping and standardized patients' ratings of student professionalism and communication skills

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SUMMARY Little is known about the relationship between medical students' expression of emotion when confronted with a traumatic medical event and their perceived communication skills and professionalism. **Method.** Eighty-nine second year medical students participated in an objective structured clinical examination (OSCE) that included a writing exercise. Standardized patients assessed student performance on communication and professionalism. Student writing samples were analysed for emotional language and coping strategies. **Results.** Two kinds of written language, high positive and distancing, were related to "active" and "detached" coping methods. Standardized patients rated students who used highly positive emotional language as having poorer professionalism and communication skills. Students who endorsed "accepting" coping were perceived as more professional. **Discussion.** Future research should investigate whether certain emotional expressions in medical

students' writings are related to less patient-centered coping, poorer communication skills, and less professionalism.

Introduction

Although there is increasing interest in how writing that reflects on clinical experience might enhance both medical students' communication skills and professionalism, little empirical research exists documenting the value of this approach. Some evidence suggests that exposure to such writing can increase medical students' self-perceived

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empathy and professionalism (Rucker & Shapiro, 2003; Hatem & Ferrara, 2001; Henderson, 2002), but a recent study investigating the effects of writing a critical incident report concluded that this intervention performed significantly less well than a simple faculty interview in terms of successfully identifying professional issues (Baernstein & Fryer-Edwards, 2003). Other research suggests that writing about traumatic events is related to improved physical and psychological well-being (Smyth *et al.*, 1999).

One unanswered question is whether the emotional content of medical student writing (i.e., words expressing either positive or negative emotion) might be related to either student or patient outcomes. We examined medical students' writing about a hypothesized traumatic physician-patient encounter in relation to 1) students' assessment of how they would deal with any negative feelings about the situation described (coping) and 2) standardized patients' (SPs) assessment of student communication skills and professionalism in a diagnostically-related objective structured clinical examination (OSCE) station. Because this was an exploratory study, we did not formulate specific hypotheses about relationships among the variables under investigation. This project was reviewed and approved by our institution's human subjects review board.

Method

Subjects

Subjects were second year medical students enrolled in a required course to teach interviewing skills, physical examination, and clinical reasoning.

Procedures

As part of their final course evaluation, 89 students participated in a clinical skills appraisal consisting of three cases in an OSCE format. SPs assessed student performance on interviewing, physical examination, and professionalism.

After completing an OSCE station of a middle-aged man with cardiac risk factors presenting with chest pain, students read a prose-poem "The Hands" (Stone, 1985), describing an emergency room encounter with a man who succumbs to a heart attack. Students had 15 minutes to type and electronically submit a narrative describing their emotions in response to the events portrayed, and how they would deal with any stress associated with the situation. Usable writing samples were obtained from 85 of 89 students (four samples were electronically lost). This interstation exercise was not given weighting in students' final OSCE scores.

Measures

The first author developed a coding schema using existing theoretical work (Pennebaker & Seagal, 1999) analysing emotional language. 1) High positive emotion (awe, exhilaration, excitement); 2) Low positive emotion (acceptance, composure); 3) High negative emotion (desperation, shock, deeply troubled); 4) Low negative emotion (helplessness, depression); 5) Positive emotional distancing, (curiosity,

absorption); 6) Negative emotional distancing, (indifference, detachment).

The coding schema also categorized students' hypothetical ways of responding to perceived stressful aspects of the situation in the reading, resulting in these coping categories: 1) Active (learning what one can for the next patient; moving on). 2) Accepting (accepting professional limitations). 3) Communicative (talking to others). 4) Self-focused (taking time off, caring for oneself). 5) Detached (not thinking about the situation; not getting too close to patients; focusing on technical aspects).

SPs in each OSCE station rated students on five communication skills (active listening; understanding patient perspective; concern for patient feelings; interest in patient as person; establishing shared agenda) and gave them an overall communication score ("student's ability to communicate with me"). SPs also rated students on three professionalism behaviors ("student appeared to know what he/she is doing"; "I trust this student"; "student placed my interest first"), as well as an overall professionalism item ("student appeared professionally competent").

Data analysis

All data derived from language and coping codes were dichotomized according to either presence or absence of the variable. SP data were expressed as continuous variables. All SP evaluations were scored on a 1–5 rating scale, 1 = not at all, 5 = a great deal. Cumulative scores for both communication and professionalism were achieved by summing the individual items. Analyses used SP ratings from the OSCE chest pain station only.

Data comparing dichotomized variables were analysed using Pearson chi-square; analysis employing a combination of dichotomized and continuous variables used analysis of variance (SPSS, 1996). In all analyses, alpha was set at $p < 0.05$. Because of the exploratory nature of this study, we did not adjust the criterion for statistical inference for multiple comparisons.

Results

Large numbers of students used high positive emotion (77.6%), high negative emotion (60.0%), and low negative emotion (86.5%) words in their writing samples. A smaller number (41.2%) used low positive emotion words. Almost 30 percent (29.9%) used positive emotionally distancing language, while a small number (10.6%) used negative emotionally distancing words. Large numbers of students endorsed active (52.9%), accepting (61.2%), and communicative (84.0%) coping. Self-focused coping appeared in less than one-third of the sample (27.1%) and detached coping, even less frequently (14.1%).

Students who recorded active and detached coping strategies were more likely to use negative emotionally distancing words ($p = 0.02$; $p = 0.01$) and high positive emotion words ($p = 0.03$; $p = 0.02$). Students who recorded self-focused coping also were more likely to use negative emotionally distancing words ($p = 0.04$).

Students judged by SPs to have both better specific ($p = 0.03$) and overall communication skills ($p = 0.01$) as well as specific professionalism skills ($p = 0.03$) tended not to use high positive emotion words. Students judged by SPs to have higher overall professionalism were more likely to endorse accepting coping strategies ($p = 0.04$).

Discussion

The majority of medical students in this study were able to identify in writing a wide range of emotions and coping in their responses to a hypothetical traumatic doctor–patient encounter. In general, emotional language was not related to either self-perceived coping styles or SP ratings of communication skills and professionalism. However, students who expressed heightened positive affect and/or evidence of emotional withdrawal and disengagement when confronted with a hypothetical clinically somber situation were also more likely to adopt “moving on”, self-protective, and detached coping styles. Further, SPs rated such students as less professional and having poorer communication skills. On the other hand, students who expressed accepting coping in their writing (i.e., who were able to allow for the possibility of limitation and failure) received higher SP professionalism ratings.

Practical implications

The exploratory nature of this study requires caution in making any clinical inferences. However, we speculate that the use of highly positive emotional language by students may represent a kind of failure of empathy. Students who used this kind of language appeared to be expressing their excitement, enthusiasm, and exhilaration at being (imaginatively) present during a cardiac resuscitation. These students were focused on their own positive responses, while paying less empathic attention to the fact that a man had died and a doctor had struggled unsuccessfully to save his life. The positive relationship between such written language and self-focused, detached coping strategies suggests that it may spring from a desire to protect and distance oneself as a way of dealing with painful situations. Conversely, patients seemed to prefer student physicians who are able to accept the limitations of their profession. We conclude that, in clinical settings, medical students should guard against tendencies to be overly optimistic, cheerful, or ebullient, and rather should project a demeanor of acceptance and humility.

This study was subject to several limitations, including the fact that it was conducted with only one class of students at one medical school. Because our sample consisted of pre-clinical students, it is possible that more experienced students would be less likely to focus on their own excitement at being in a medically dramatic clinical situation. Because of curricular requirements, the study had no control group, so that all analyses were conducted within a single group. Finally, the number of statistical tests performed and the failure of many of our results to achieve a $p < 0.01$ level

of significance mean that these findings are suggestive rather than definitive.

Nevertheless, future research should continue to probe the relationship between students’ expressions of emotion and coping, whether written or verbal, and patients’ perception of student communication skills and professionalism. In particular, more comprehensive studies should consider the possibility that medical students have a tendency to defend against the emotional stressors of clinical practice by reacting with inappropriately positive emotions (Stein, 2003), or emotional distancing, which may be related to less patient-centered coping and patient perceptions of poor communication skills and overall lack of professionalism. Future studies should also examine whether these findings can be replicated and persist as training progresses, particularly during the clinical years.

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