Does Physician's Training Induce Overconfidence That Hampers Disclosing Errors?

Mayer Brezis, MD, MPH, Yael Orkin-Bedolach, MD,* Daniel Fink, MD,† and Alexander Kiderman, MD‡*

Purpose: Although transparency is critical for reducing medical errors, physicians feel discomfort with disclosure. We explored whether overconfidence relates to physician's reluctance to admit that an error may have occurred.

Method: At 3 university medical centers, a survey presented a clinical vignette of a girl with urinary infection and penicillin allergy to medical students and physicians, asking them to rate their level of confidence for each step of the diagnosis and management. After anaphylaxis develops after cephalosporin administration, respondents were asked about their willingness to admit that an error might have occurred and to rate their level of discomfort in doing so. We analyzed levels of confidence, accuracy, willingness to admit mistake, and discomfort.

Results: Respondents reported high levels of confidence for their answers to the questions of diagnosis and management, even when wrong—indicating miscalibration of confidence and accuracy. Compared with students, physicians had significantly higher levels of confidence, lower accuracy, and lower willingness to admit mistake. Although most respondents agreed in principle that errors should be disclosed, in the presented case, significantly less agreed to admit that a mistake might have occurred or to say so explicitly to the family. An association was found between overconfidence and discomfort with disclosure.

Conclusions: Our study shows overconfidence associated with clinician's training and with reluctance to admit mistake, suggesting a contributing role to the difficulty in leveraging safety events into quality improvement. Training physicians to have both knowledge and adequate self-doubt is an educational challenge.

Key Words: overconfidence, medical errors, disclosure, transparency

(*J Patient Saf* 2019;15: 296–298)

Reducing medical errors remains a challenge.[1–3] Beyond the widely accepted ethical duty of disclosure, experience suggests the key value for improvement of honest communication with patients and families as an institutional policy.[4–7] Although the principle of transparency is increasingly endorsed by physicians,[8,9] gaps exist between expected and actual practice.[10–13] Many physicians feel discomfort with disclosure and are embarrassed to express regret or give an apology.[6,10] Fear of litigation contributes but may not be the overwhelming determinant[8] of physicians' difficulty deriving from shame, panic, anger, disappointment, self-doubt, and guilt.[14] We hypothesized that the psychological distress after an error could be especially trying if training promotes a sense of infallibility.[14,15] Using a clinical vignette, we explored whether overconfidence relates to physician's reluctance to admit that an unexpected error might have occurred.

From the *Hadassah-Hebrew University Medical Center; †Shaare Zedek Medical Center; and ‡Clalit Health Services, Jerusalem, Israel.

Correspondence: Mayer Brezis, MD, MPH, Center for Clinical Quality and Safety, Hadassah-Hebrew University Medical Center, Jerusalem, Israel, Ein Kerem Campus, Jerusalem, Israel (e-mail: brezis@mail.huji.ac.il).

The authors disclose no conflict of interest.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.journalpatientsafety.com).

METHODS

From February to August 2011, a survey was conducted on a convenience sample of attendees (final-year medical students, interns, residents, senior physicians) at staff meetings in medicine, surgery, pediatrics, gynecology, and primary care of 3 university medical centers in Jerusalem (response rate > 90%, n = 286). A vignette case, developed to fit a range of specialties, presented a 15-year-old girl with known allergy to amoxicillin, dysuria, leucocytes, and bacteria in the urine sediment. Sequential questions were as follows: What is your diagnosis? Would you recommend heavy fluid intake? After the urine culture grows *Escherichia coli* sensitive to cephalexin, would you prescribe it? Respondents were asked to rate their level of confidence on a 5-point Likert scale for each step of the diagnosis and management. In the vignette, the girl develops anaphylactic shock after receiving cephalexin (see Supplemental Digital Content 1, http://links.lww.com/JPS/A39). Respondents were asked about their willingness to admit that an error might have been made (by themselves or by someone else) and to rate their level of discomfort in doing so. Confidence and accuracy (percentage choosing the option predefined as appropriate) were normalized to the range 0 to 1 (as previously done[16]) and the percentage willing to admit mistake was similarly normalized. Statistical analysis used χ^2, Kruskal-Wallis, analysis of variance, and Spearman for between-group comparisons, trend analysis, and correlation (SPSS version 19; IBM Corp: Armonk, NY).

RESULTS

Most respondents diagnosed urinary tract infection, recommended high fluid intake (despite a lack of evidence[17]), and initiation of cephalexin (despite penicillin allergy) with high levels of confidence (Fig. 1). Figure 2 shows the levels of confidence, accuracy, and willingness to admit the mistake according to training stage. Compared with students, physicians had significantly higher levels of confidence, lower accuracy, and lower willingness to admit mistake. Although most admitted unease with disclosure, students and women had significantly higher levels of discomfort and readiness to admit mistake. Although 91% of the respondents agreed in principle that errors should be disclosed as advised by Israel Medical Association's position paper,[18] in the presented case, 81% agreed to admit to the girl's mother that a mistake may have occurred, and 70% agreed to say so explicitly or after the mother threatens to sue ($P < 0.005$ between rates). A weak association was found between overconfidence and discomfort with disclosure (Spearman $\rho = 0.172$, $P = 0.004$). No differences were found between specialties or between hospitals.

DISCUSSION

Diverse factors impede physician's willingness to admit and disclose a mistake[19,20]: fears (of liability, discipline, family's anger, loss of reputation), uncertainty (how to disclose), helplessness (about system's response), and attitudinal barriers (perfectionism, arrogance). In the current work, we wished to examine whether overconfidence before an error might prime

physician's disinclination to disclose it after its occurrence because of the discomfort induced by a sudden large decline in self-image.

Our study extends observations on clinician overconfidence and diagnostic errors[16] to decision making.[21] As shown for difficult diagnoses,[16] physician confidence remained high despite large reductions in appropriateness of choice (Fig. 1), whereas student confidence seemed better calibrated to accuracy, as observed in previous work.[22] Training may promote overconfidence as previously suggested[23] and reduce willingness to admit errors[15] as shown in the present study (Fig. 2). Despite agreeing with the principle of disclosure, physicians were often reluctant to admit that an error had occurred, even in a virtual vignette, as previously reported.[24]

Overconfidence was associated with discomfort, suggesting a contributing role to the difficulty in leveraging safety events into quality improvement. Physicians have limited ability to self-assess accurately,[25] and overconfidence impedes acceptance of feedback on performance. The painful realization of a discordance between subjective and objective evaluation elicits psychological defense mechanisms of denial, rationalization, excuse making, or blaming, and only if handled supportively, the discomfort provides motivation to improve performance.[26]

The validity of our observations is limited by the fact that the vignette was a virtual exercise for an unusual case and that actual behavior is far more complex in real life. In addition, because the population sampled clinicians in 1 city, our results may not be generalizable. Our observations suggest that overconfidence deserves more research on its role as a barrier to safety and quality improvement.

Overconfidence is pervasive in human behavior. Most people believe that they are better drivers, more intelligent, competent, attractive, virtuous, compassionate, and less prone to errors than others ("better than average" effect,[27,28] see Supplemental Digital Content 2, http://links.lww.com/JPS/A40). Laypersons and professionals (in health care, research, education, law, or public policy) overestimate the accuracy of their judgments.[29] Students overestimate their academic performance when it is low and underestimate it when high.[30–32] Overconfidence, a metacognitive bias fueled by emotions and self-enhancement motivation, underlies intuitive decisions that may have conferred an adaptive advantage despite leading to mistakes in domains with high levels of uncertainty[33]—such as health care where physician's certainty poorly correlates with accuracy.[16,21,22,34] Studies conflict as to whether calibration accuracy improves with training, experience, reflection, or feedback.[35–37] A subjective sense of power—which typically follows the transition from studentship and internship into higher positions in the clinical team[15]—seems to exacerbate overconfidence.[38–40] Feedback threatening self-esteem has lower effectiveness in improving performance.[41] Trust, support, and mutual respect with access, visibility, and commitment of senior managers characterize a safety culture in high-performing hospitals,[42] perhaps mitigating the effect of overconfidence on disclosure.

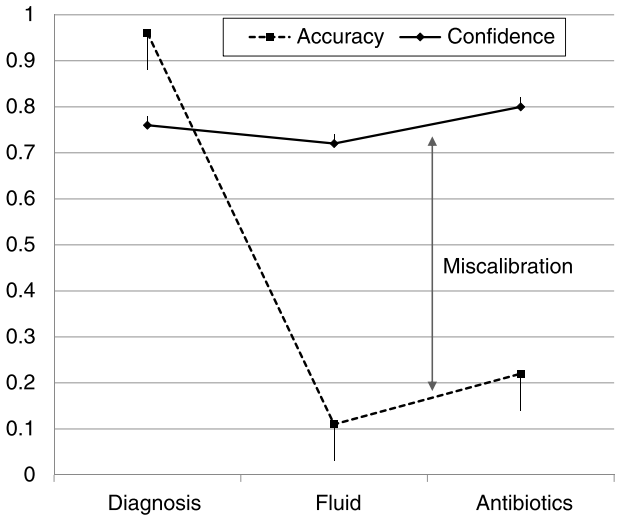

FIGURE 1. Mean (and 95% confidence interval) levels of accuracy and confidence in diagnostic and therapeutic options. The gap between accuracy and confidence represents miscalibration as described previously.[16]

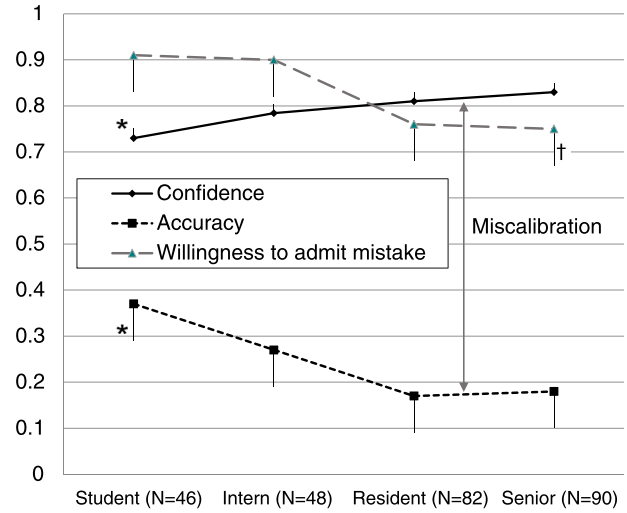

FIGURE 2. Mean (and 95% confidence interval) levels of accuracy and confidence (for choice of therapy) and willingness to admit a mistake by stage of training. Comparison and trend analysis used analysis of variance. *$P < 0.05$ students versus physicians, $P < 0.001$ for linear trend. †$P < 0.05$ physicians versus nonphysicians (students and interns), $P < 0.01$ for linear trend.

By etymology, an MD is an expert: in Latin, "doctor" means teacher; in Arabic, Hakīm (حكيم) means wise man. Training physicians to have both knowledge and capacity to doubt is an educational challenge in self-assessment.[43] In addition, the real or perceived power associated with MD graduation or specialty completion seems to exacerbate the tendency for people to overweight their own judgment[38–40] and may challenge role modeling for residents to uncertainty and fallibility.[15] Combining expertise with humility and an ability to listen to external voices, such as peers, other caregivers, patients, and families, may necessitate a paradigm shift in medical education—merging appropriate training,[44] self-reflection,[43] and role modeling[45] with organizational culture[20] and leadership[46] to improve physician's willingness to admit and disclose errors.

REFERENCES

1. Card AJ. Patient safety: this is public health. *J Healthc Risk Manag*. 2014; 34:6–12.
2. James JT. A new, evidence-based estimate of patient harms associated with hospital care. *J Patient Saf*. 2013;9:122–128.
3. Kuehn BM. Patient safety still lagging: advocates call for national patient safety monitoring board. *JAMA*. 2014;312:879–880.
4. Gallagher TH, Studdert D, Levinson W. Disclosing harmful medical errors to patients. *N Engl J Med*. 2007;356:2713–2719.

5. Kachalia A, Kaufman SR, Boothman R, et al. Liability claims and costs before and after implementation of a medical error disclosure program. *Ann Intern Med*. 2010;153:213–221.
6. Bell SK, Smulowitz PB, Woodward AC, et al. Disclosure, apology, and offer programs: stakeholders' views of barriers to and strategies for broad implementation. *Milbank Q*. 2012;90:682–705.
7. Kachalia A, Little A, Isavoran M, et al. Greatest impact of safe harbor rule may be to improve patient safety, not reduce liability claims paid by physicians. *Health Aff (Millwood)*. 2014;33:59–66.
8. Gallagher TH, Waterman AD, Garbutt JM, et al. US and Canadian physicians' attitudes and experiences regarding disclosing errors to patients. *Arch Intern Med*. 2006;166:1605–1611.
9. O'Connor E, Coates H, Yardley I, et al. Disclosure of patient safety incidents: a comprehensive review. *International J Qual Health Care*. 2010;22:371–379.
10. Kaldjian L, Jones E, Wu B, et al. Disclosing medical errors to patients: attitudes and practices of physicians and trainees. *J Gen Intern Med*. 2007;22:988–996.
11. Iedema R, Allen S, Britton K, et al. Patients' and family members' views on how clinicians enact and how they should enact incident disclosure: the "100 patient stories" qualitative study. *BMJ*. 2011;343:d4423.
12. Iezzoni LI, Rao SR, DesRoches CM, et al. Survey shows that at least some physicians are not always open or honest with patients. *Health Aff*. 2012;31:383–391.
13. Etchegaray JM, Gallagher TH, Bell SK, et al. Error disclosure: a new domain for safety culture assessment. *BMJ Qual Saf*. 2012;21:594–599.
14. Sirriyeh R, Lawton R, Gardner P, et al. Coping with medical error: a systematic review of papers to assess the effects of involvement in medical errors on healthcare professionals' psychological well-being. *Qual Saf Health Care*. 2010;19:1–8.
15. Mizrahi T. Managing medical mistakes: ideology, insularity and accountability among internists-in-training. *Soc Sci Med*. 1984;19:135–146.
16. Meyer AD, Payne VL, Meeks DW, et al. Physicians' diagnostic accuracy, confidence, and resource requests: a vignette study. *JAMA Intern Med*. 2013;173:1952–1958.
17. Gray M, Krissovich M. Does fluid intake influence the risk for urinary incontinence, urinary tract infection, and bladder cancer? *J Wound Ostomy Continence Nurs*. 2003;30:126.
18. Say the Truth and Say it Quickly. Available at: http://www.ima.org.il/ENG/ViewCategory.aspx?CategoryId=4498. Accessed on December 29, 2015.
19. Kaldjian LC, Jones EW, Rosenthal GE, et al. An empirically derived taxonomy of factors affecting physicians' willingness to disclose medical errors. *J Gen Intern Med*. 2006;21:942–948.
20. Braithwaite J, Westbrook MT, Travaglia JF, et al. Cultural and associated enablers of, and barriers to, adverse incident reporting. *Qual Saf Health Care*. 2010;19:229–233.
21. Croskerry P, Norman G. Overconfidence in clinical decision making. *Am J Med*. 2008;121:S24–S29.
22. Friedman CP, Gatti GG, Franz TM, et al. Do physicians know when their diagnoses are correct? *J Gen Intern Med*. 2005;20:334–339.
23. Dawson N, Connors A Jr, Speroff T, et al. Hemodynamic assessment in managing the critically ill: is physician confidence warranted? *Med Decis Making*. 1993;13:258.
24. Chan DK, Gallagher TH, Reznick R, et al. How surgeons disclose medical errors to patients: a study using standardized patients. *Surgery*. 2005;138:851–858.
25. Davis DA, Mazmanian PE, Fordis M, et al. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA*. 2006;296:1094–1102.
26. Duffy F, Holmboe ES. Self-assessment in lifelong learning and improving performance in practice: physician know thyself. *JAMA*. 2006;296:1137–1139.
27. Alicke MD, Govorun O. The better-than-average effect. In: Alicke MD, Dunning D, Krueger J, eds. *The Self in Social Judgment*. New York, NY: Psychology Press; 2005:85–106.
28. Brown JD. Understanding the better than average effect motives (still) matter. *Pers Soc Psychol Bull*. 2012;38:209–219.
29. Dunning D, Heath C, Suls JM. Flawed self-assessment implications for health, education, and the workplace. *Psychol Sci Public Interest*. 2004;5:69–106.
30. Kennedy EJ, Lawton L, Plumlee EL. Blissful ignorance: the problem of unrecognized incompetence and academic performance. *Journal of Marketing Education*. 2002;24:243–252.
31. Karnilowicz W. A comparison of self-assessment and tutor assessment of undergraduate psychology students. *Social Behavior and Personality*. 2012;40:591–604.
32. Edwards RK, Kellner KR, Sistrom CL, et al. Medical student self-assessment of performance on an obstetrics and gynecology clerkship. *Am J Obstet Gynecol*. 2003;188:1078–1082.
33. Johnson DDP, Fowler JH. The evolution of overconfidence. *Nature*. 2011;477:317–320.
34. Cavalcanti RB, Sibbald M. Am I right when I am sure? Data consistency influences the relationship between diagnostic accuracy and certainty. *Acad Med*. 2014;89:107–113.
35. Miller DJ, Spengler ES, Spengler PM. A meta-analysis of confidence and judgment accuracy in clinical decision making. *J Couns Psychol*. 2015;62:553–567.
36. Hacker DJ, Bol L, Keener MC. Metacognition in education: a focus on calibration. In: Dunlosky J, Bjork RA, eds. *Handbook of Metamemory and Memory*. New York, NY: Psychology Press; 2013;429–455.
37. Eva KW, Armson H, Holmboe E, et al. Factors influencing responsiveness to feedback: on the interplay between fear, confidence, and reasoning processes. *Adv Health Sci Educ Theory Pract*. 2012;17:15–26.
38. Tost LP, Gino F, Larrick RP. Power, competitiveness, and advice taking: why the powerful don't listen. *Organ Behav Hum Decis Process*. 2012;117:53–65.
39. See KE, Morrison EW, Rothman NB, et al. The detrimental effects of power on confidence, advice taking, and accuracy. *Organ Behav Hum Decis Process*. 2011;116:272–285.
40. Fast NJ, Sivanathan N, Mayer ND, et al. Power and overconfident decision-making. *Organ Behav Hum Decis Process*. 2012;117:249–260.
41. Kluger AN, DeNisi A. The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychol Bull*. 1996;119:254–284.
42. Taylor N, Clay-Williams R, Hogden E, et al. High performing hospitals: a qualitative systematic review of associated factors and practical strategies for improvement. *BMC Health Serv Res*. 2015;15:244.
43. Eva KW, Regehr G. Self-assessment in the health professions: a reformulation and research agenda. *Acad Med*. 2005;80:S46–S54.
44. Stroud L, McIlroy J, Levinson W. Skills of internal medicine residents in disclosing medical errors: a study using standardized patients. *Acad Med*. 2009;84:1803–1808.
45. Kahn JS. A piece of my mind. I'm sorry. *JAMA*. 2015;313:2427–2428.
46. Oliver D. The hardest word: managers and leaders should say sorry too. *BMJ*. 2015;351:h3644.