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The Effects of Feedback Fatigue and Sex Disparities in Medical Student Feedback Assessed Using a Minute Feedback System

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OBJECTIVE: Feedback is critical to the development of medical students. To enhance feedback, we created a web application, the Minute Feedback System (MFS). This app allows students to request precise, timely, written feedback from residents and staff without the burden of vague, end-of-rotation surveys. In this study, we investigate variations in response rates and feedback fatigue based on sex and rank (resident/fellow vs. faculty).

DESIGN: Data were collected from May 2015-October 2016. The MFS stores student requests for feedback along with faculty responses allowing for analysis of feedback response rate as well as sex and rank identification. Variation in response rate was analyzed using Chi-square and log-rank testing. Feedback fatigue was assessed using Cox regression modeling.

SETTING: University Affiliated, Tertiary Care Center.

PARTICIPANTS: Medical Students, Residents and Faculty.

RESULTS: About 98.6% of students (138 women, 140 men) used the MFS on their surgery clerkship. They requested feedback from 159 trainees (residents or fellows) and 114 surgical faculty. Feedback was requested more from faculty (26.3 requests per individual) compared to trainees (16.4 requests per individual).

The overall evaluator response rate was 60%. Male students were 13% less likely to receive feedback than female students. There was a higher prevalence of feedback fatigue among female faculty (11% less likely to respond) and residents (23% less likely to respond). Regression analysis showed that the overall hazard of nonresponse over time was 1.05, indicative of overall feedback fatigue among all respondents.

CONCLUSIONS: The MFS is a novel tool for feedback used by nearly all M3 students during their surgery clerkship at our institution. Evaluation of response rates demonstrated feedback fatigue, especially among women faculty and residents. Feedback fatigue was more likely to affect male students, although the reason for this is unclear. Further analysis is necessary to understand this sex-associated response disparity and its effect on student feedback in the learning environment. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: feedback, sex disparities, feedback fatigue, medical student clerkship, surgical education, formative evaluation

COMPETENCIES: Patient Care and Procedural Skills, Interpersonal and Communication Skills

INTRODUCTION

The value and necessity of feedback in medical education to improve skills and increase knowledge is universally recognized. Given the frequency of direct observations, experiential learning, and daily interactions that occur between trainees and instructors in the clinical learning environment, it seems that feedback delivery should be robust. However, the flow of effective feedback continues to be hindered by the barriers inherent in today's clinical environment. Intimidation, fear of grade ramifications, and lack of time are all frequently cited as obstacles to effective feedback.[1-3] To address some of these hurdles, we developed a novel feedback tool, the *Minute Feedback System* (MFS). Previously described by Hughes et al., this electronic, web-based

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feedback system allows students to request daily feedback from surgery residents and faculty and receive immediate feedback response. In our pilot study, students who participated in the MFS reported significantly higher quality and frequency of feedback, as well as an overall improved opinion of the clerkship in its entirety when compared to control students who did not utilize the MFS.[1,4]

Given these positive findings, we continue to use the MFS tool at our institution. Along with improving feedback at our institution, MFS has also created a robust database with feedback responses. Using this dataset, we sought to investigate the effect of the MFS on feedback practices and we developed 2 hypotheses of interest. First, we wished to investigate "feedback fatigue" defined as the decrease in response rates over time as the system loses its sense of novelty.[5] With hundreds of students rotating through surgical clerkships month after month, providing genuine feedback can become taxing and therefore response rates may decrease over time. We hypothesized that the informal nature of the online MFS request along with minimal time required for feedback delivery (less than 1 minute) would abrogate the challenge of feedback fatigue, and given its simple nature, would allow for consistent feedback over time.

Second, we investigated the effects of feedback by sex. Half of the medical students are women, but only 38% go on to a career in a surgical specialty.[6] It may be that varying experience on surgical clerkships contribute to this discrepancy. Publications in other professions suggest that women are less likely to receive constructive feedback potentially adding to sex gaps in the fields of science and business.[7] We sought to investigate whether such variation was seen in our study population, hypothesizing that the simple nature of our feedback system would allow for equitable feedback distribution to both males and females.

MATERIAL AND METHODS

The creation and implementation of the MFS have been described previously.[8] Briefly, the MFS uses the commercially available Qualtrics survey software platform to allow students to push out daily requests for feedback to residents, fellows, or faculty with whom they interacted in the clinical environment each day. The student chooses a clinical skill (physical examination, patient history, oral presentation, technical skill, or general performance) on which they would like to receive feedback and can also use free text space to ask a more specific question. When a feedback request is submitted by the student, the selected respondent (resident, fellow, or attending) immediately receives an e-mail with a link to a brief survey asking them to give the student 2-3 sentences of free text feedback on the specific skill requested. The time required for completion of feedback is intended to be less than 1 minute. Once the survey is completed, the student receives an e-mail response allowing for near-instantaneous feedback delivery.

In addition to the direct communication between student and physician, the MFS also records the information within an Institutional Review Board exempt, secure dataset. This database includes identifiable information about student request rates, resident and faculty respondent response rates, and the content of the feedback given to the student. To perform further analysis, the sexes and ranks of all requestors and respondents (resident, fellow, or attending) were coded. Additionally, feedback response rates were measured over time from the MFS introduction in May 2015 until October 2016 to assess if feedback response dampened over time which would suggest some level of feedback fatigue.

Requests for feedback were stratified by the sex of the requestor/responder, and clinical rank and was described as mean ± standard deviation. Response rates were compared by sex and clinical rank using Chi-Square tests. Initial univariate log-rank tests were used to assess the relationship of each individual factor and nonresponse over time. Finally, a Cox proportional hazards model, a survival analysis technique commonly used to analyze the effect of multiple independent variables on time to event, was used to assess the relationship between sex of respondent, sex of student, and responder rank with nonresponse over time.[5] Time in this study was defined as days since request. Results from Cox regression analyses are reported as hazard ratios (HR). Finally, to assess the effects of the MFS on the student clerkship experience, clerkship evaluations from both before and after MFS implementation were compared using Student's *t*-tests. Statistical analysis was performed using STATA (Version 13; College Station, TX) and significance was set at $p < 0.05$. An Institutional Review Board exemption was obtained for this study.

RESULTS

MFS responses were collected from May 2015-October 2016 (520 days). A total of 5195 student requests were made with 3123 resident/fellow/faculty responses, for an overall response rate of 60%. This was slightly lower than the first 3 months of trial data which yielded a response rate of 70%, but included a smaller, selected group of faculty and residents.[5] Of 282 total 3rd-year medical students who completed a surgical clerkship during this time, 278 used the MFS (98.6%). The students were nearly equally distributed between sexes (males = 140 and females = 138). Of the respondents, 114 faculty, 31 fellows, and 128 residents received student feedback requests during the course of the study; 66% of respondents were males (Table 1). The distribution of faculty had more males (76%), while residents were more evenly distributed with 53% being males. The average number of requests per student during their clerkship rotation was 18.7 (range: