KANSAS JOURNAL of MEDICINE

Virtual Adaptation of Resident I-PASS Training Session During COVID-19

Michael T. Rouse, D.O., Abebe M. Abebe, M.D., David G. Naylor, M.D., Cheryl A. Gibson, Ph.D.
University of Kansas Medical Center, Kansas City, KS
Department of Internal Medicine

Received March 21, 2022; Accepted for publication April 12, 2022; Published online June 20, 2022
https://doi.org/10.17161/kjm.vol15.17025

ABSTRACT

Introduction. Effective communication during the patient handoff process is critical for ensuring patient safety. At our academic medical center, first-year interns complete hand-off training before starting clinical rotations. The purpose of this study was to evaluate a virtual handoff training for residents as an alternative to in-person sessions due to limitations imposed by COVID-19.

Methods. Fifty residents were administered pre/post surveys to gauge the helpfulness of the training for clinical practice, familiarity and confidence in providing a hand-off, and whether they would recommend the virtual format for incoming interns. Additionally, faculty rated the virtual form of the hand-off activity, made comparisons to in-person sessions, and assessed the helpfulness of the session for residents in clinical practice.

Results. Forty-four residents (88%) and 11 faculty (85%) completed surveys. After the training session, residents who received instruction and feedback reported significant improvements in familiarity with the hand-off tool and confidence in their hand-off abilities (both $p < 0.001$). Both residents and faculty were satisfied with the virtual format of hand-off training. Most faculty felt the virtual platform was comparable to in-person sessions and would recommend ongoing use of the virtual platform when in-person sessions were not possible.

Conclusions. Teaching hospitals mandate resident training to include strategies for a uniform hand-off method to avoid medical errors. Adaptation to a virtual platform can be a successful instruction strategy, allowing for didactic and interactive sessions with direct faculty observation and feedback. ***Kans J Med 2022;15:215-217***

INTRODUCTION

Communication failures are the leading cause of patient medical errors in hospitals.[1,2] Patient hand-offs, the transfer of patient-specific clinical information from one physician to another, are especially vulnerable to miscommunications.[3] Formalized training to optimize the hand-off process can improve communication and patient safety, thus the Accreditation Council for Graduate Medical Education has identified improving hand-offs as a priority to improve patient safety, and requires residency programs to provide formal instruction and monitor the quality of handoffs.[4,5]

At the University of Kansas Medical Center, the Internal Medicine's resident hand-off training program is run by core resident faculty. First-year interns complete hand-off training before they begin clinical rotations. Using a standardized hand-off bundle, I-PASS (a mnemonic for illness severity, patient summary, action list, situational awareness with contingency planning, and synthesis by the receiver),[6] the training session is designed to familiarize incoming residents with elements of team structure, use of the electronic health record, and to provide a uniform method for patient hand-off.[7] I-PASS is a comprehensive hand-off program designed to train clinicians to exchange and synthesize patient information concisely.[8] However, as social distancing and limitations on in-person gatherings were initiated during COVID-19, adaptation of the I-PASS training session was required.

While some of the I-PASS training content could be delivered through recorded lectures, it did not permit residents to participate in an active process of delivering and receiving a hand-off with faculty feedback. Therefore, the existing in-person I-PASS session was restructured for use on the Zoom platform. This virtual platform allowed for delivery of didactic material with direct faculty observation and feedback through Zoom's breakout room feature. Formalized training is important in improving patient safety and reducing medical errors, but there are a lack of data about hand-off training using a virtual format.

The aims of this study were to characterize the adapted workshop and to assess the perspectives of residents and faculty who participated in the training session.

METHODS

Institutional Review Board exemption was obtained for educational purposes.

Setting and Participants. This study was conducted at the University of Kansas Medical Center, which is a full-service 623-bed tertiary care center and medical training facility with over 600,000 patient visits annually. For this study, 50 preliminary (Anesthesia, Dermatology, Ophthalmology, Radiology, Neurology, and Physical Medicine and Rehabilitation) and categorical (Internal Medicine or Internal Medicine/Psychiatry) residents participated in a 60-minute interactive workshop held in 2020 through the Zoom platform.

Intervention. The instructional strategy for the virtual session was guided by Bloom's mastery learning model in which specific principles were integrated into the educational session.[9] These principles included communicating learning expectations clearly at the onset of the education session, outlining specific learning objectives, giving prompt feedback during direct observations, and encouraging interaction between faculty and residents.[10] Before the virtual session, residents viewed a video presentation in which teaching faculty examined the role of hand-offs in enhancing patient safety, described elements of both satisfactory and unsatisfactory hand-offs, and discussed individual components of the I-PASS tool. At the beginning of the virtual session, faculty shared learning expectations and addressed communication skills necessary to perform effective hand-offs.

At the start of the Zoom session, all residents and participating teaching faculty joined the main room for a review of course objectives and a synopsis of the video content previewed by residents before the workshop. Next, faculty members provided I-PASS modeling in the context of a clinical case. After modeling, residents were asked to evaluate the quality of the hand-off.

For resident practice and observation, Zoom breakout rooms were utilized. Each faculty member was assigned a breakout room for a

twenty-minute interval. Residents were paired and then joined a faculty member in the breakout room. Faculty provided case scenarios and residents were asked to indicate key elements of the I-PASS hand-off. Following practice, each resident handed off patients to one another using provided case scenarios, and each was provided feedback from his/her peer and the faculty member on one another's hand-off performance. Once all residents had completed their partnered activity, they re-entered the Zoom main room where additional faculty were available for questions. At the conclusion of the session, post-workshop surveys were sent to both learners and teaching faculty to evaluate the session.

Outcomes Measured

Resident Survey. The online survey consisted of 10 items with yes/no or Likert-format responses. Items included post-graduate training status (preliminary, categorical), hand-off experience as a medical student (both written and verbal), I-PASS tool familiarity, importance of hand-offs to patient care, confidence in providing a hand-off, and helpfulness of hand-off training for clinical practice. The post survey mirrored the pre-workshop survey with the addition of an overall rating of the virtual hand-off session and level of agreement to recommend the I-PASS session for incoming interns. All survey responses were anonymous.

Faculty Survey. After the session, faculty completed a 10-item survey, which included location of residency completion, familiarity with I-PASS hand-offs, hand-off experience, Likert-scale ratings of the session, Zoom platform use and its comparison to in-person sessions, helpfulness of hand-off training in clinical practice, likelihood of recommending the virtual format for interns and preference for format type for future trainings. Respondent names or other unique identifiers were not required for survey completion.

Analysis of Outcomes. Descriptive statistics were calculated for resident characteristics and responses to survey questions (i.e., frequencies and percentages for categorical variables and means and standard deviations for continuous variables). Paired-samples t-test was performed to examine the pre-post changes in (a) helpfulness of hand-off training for clinical practice and patient care, (b) familiarity with the hand-off tool, and (c) confidence in providing a hand-off. Statistical significance was determined at the 0.05 alpha level and effect size (e.g., Cohen's d) was calculated for each comparison. REDCap®,[11] a secure, web-based application designed to support data capture for research, was used to collect and manage study data. All analyses were conducted using IBM SPSS statistical software version 24 (IBM SPSS Statistics, Armonk, NY).

RESULTS

Forty-four residents (88%) completed both pre- and post-workshop surveys. Six residents did not complete post-workshop surveys and their data were excluded from analyses. Prior to the workshop, almost two-thirds of residents (65%) indicated not receiving hand-off training for patient care during medical school. Further, most residents (59%) reported not having provided a verbal patient hand-off, although most had experience with providing a written hand-off as medical students.

To understand the level of experience with a standardized system of verbal hand-offs and written sign-outs, residents were asked to indicate how often they have used the I-PASS hand-off method. Although 98% of residents indicated hand-offs for patient care are extremely or very important and all residents strongly or somewhat agreed that hand-off training is helpful to clinical practice, most residents (82%) indicated they had never or rarely used a hand-off practice to standardize inpatient transitions in care.

After training, self-perceived confidence for providing a hand-off significantly increased ($p < 0.001$, $d = 1.10$ [large]), with 70% of residents indicating their confidence level was good to excellent. Additionally, residents' familiarity with the I-PASS hand-off tool significantly increased ($p < 0.0001$, $d = 1.15$ [large]). When asked if they would recommend the virtual workshop for incoming interns, most residents (95%) indicated they would do so. All residents completed the training activity without need for remediation.

Eleven of 13 teaching faculty completed a post-workshop survey. Of those, 8 (73%) completed their residency at the academic medical center where this study took place. Faculty were asked to indicate their familiarity with I-PASS for hand-offs before the session. All faculty were familiar with I-PASS hand-offs before the workshop took place, with most (82%) indicating they were very to extremely familiar with the process. Ten of 11 faculty indicated they had participated in hand-off training previously. Overall, all faculty rated the virtual training as satisfactory to excellent and believed it would be helpful for residents in clinical practice. Most faculty felt the virtual platform was comparable to in-person sessions with about one-fourth (27%) indicating the Zoom platform was somewhat or significantly better for the conduct of direct observation and feedback. Technical challenges were minimal. All faculty recommended ongoing use of the virtual platform when in-person sessions were not feasible.

DISCUSSION

Patient hand-off training often includes both interactive and observational components that are challenging to perform due to in-person restrictions during COVID-19. Direct observation of hand-off skills is essential to assess trainees and to provide them with supportive feedback.[12] Importantly, the virtual platform used in this study permitted faculty to provide direct observation and feedback for residents using the breakout room feature. Following training, residents were significantly more familiar with the hand-off tool and expressed increased confidence in their abilities to provide a hand-off. Several research studies also have shown that feedback following direct observation leads to improvements in trainee comfort and their ability to perform essential clinical skills.[13-16]

Transitions in patient care and hand-offs between health care providers are a potential source of preventable errors. Providing formal patient hand-off instruction is necessary to help residents develop the necessary communication skills to avoid clinical errors. Researchers have reported that trainees who received instruction and feedback had significantly higher confidence in their hand-off abilities,[17-19] leading to a decrease in medical errors and preventable adverse events.[7,20]

Study limitations include a relatively small sample size representing a single institution that may limit generalizability. Ongoing use of I-PASS was not assessed, which would have enhanced the study by addressing sustainability of hand-off elements learned during the virtual training session and identifying any needs for corrective action. Although interventions to improve communication between healthcare providers have been associated with improved patient safety,[21,22] it was beyond the scope of this study to track change in rate of medical errors.

Virtual hand-off training and its effects on the communication process and patient safety warrants further study.

CONCLUSIONS

Teaching hospitals mandate resident training to include strategies for a uniform hand-off method to avoid communication failures and preventable medical errors.[23] Residents are expected to conduct effective hand-offs, but without feedback and instruction, they do not always possess the necessary hand-off communication skills.[24] To meet this requirement during the COVID-19 pandemic, a virtual format for hand-off training can be used as one successful instructional strategy to standardize patient hand-off methods, allowing for didactic and interactive sessions with direct faculty observation and feedback.

REFERENCES

[1] Arora V, Johnson J, Lovinger D, Humphrey HJ, Meltzer DO. Communication failures in patient sign-out and suggestions for improvement: A critical incident analysis. Qual Saf Health Care 2005; 14(6):401-407. PMID: 16326783.
[2] Sutcliffe KM, Lewton E, Rosenthal MM. Communication failures: An insidious contributor to medical mishaps. Acad Med 2004; 79(2):186-194. PMID: 14744724.
[3] Keyes C. Coordination of care provision: The role of the 'handoff'. Int J Qual Health Care 2000; 12(6):519. PMID: 11202606.
[4] Nasca TJ, Day SH, Amis ES Jr, ACGME Duty Hour Task Force. The new recommendations on duty hours from the ACGME Task Force. New Engl J Med 2010; 363(2):e3. PMID: 20573917.
[5] Accreditation Council for Graduate Medical Education. Common Program Requirements. 2011. https://www.acgme.org/what-we-do/accreditation/common-program-requirements/.
[6] Starmer AJ, Spector ND, Srivastava R, et al. I-PASS, a mnemonic to standardize verbal handoffs. Pediatrics 2012; 129(2):201-204. PMID: 22232313.
[7] Starmer AJ, Spector ND, Srivastava R, et al. Changes in medical errors after implementation of a handoff program. New Engl J Med 2014; 371(19):1803-1812. PMID: 25372088.
[8] Starmer AJ, O'Toole JK, Rosenbluth G, et al. Development, implementation, and dissemination of the I-PASS handoff curriculum: A multisite educational intervention to improve patient handoffs. Acad Med 2014; 89(6):876-884. PMID: 24871238.
[9] Akpan B. Mastery learning--Benjamin Bloom. In: B Akpan, TJ Kennedy. [Eds]. Science Education in Theory and Practice. Cham, Switzerland: Springer, 2020, pp. 149-162. ISBN: 9783030436193.
[10] Barsness KA. Achieving expert performance through simulation-based education and application of mastery learning principles. Semin Pediatr Surg 2020; 29(2):150904. PMID: 32423593.
[11] Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)--a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform 2009; 42(2):377-381. PMID: 18929686.
[12] Iobst WF, Sherbino J, Cate OT, et al. Competency-based medical education in postgraduate medical education. Med Teach 2010; 32(8):651-656. PMID: 20662576.
[13] Links PS, Colton T, Norman GR. Evaluating a direct observation exercise in a psychiatric clerkship. Med Educ 1984; 18(1):46-51. PMID: 6690897.
[14] Ali L, Ali S, Orakzai N, Ali N. Effectiveness of Direct Observation of Procedural Skills (DOPS) in postgraduate training in urology at Institute of Kidney Diseases, Peshawar. J Coll Physicians Surg Pak 2019; 29(6):516-519. PMID: 31133147.
[15] Graddy R, Reynolds SS, Wright SM. Coaching residents in the ambulatory setting: Faculty direct observation and resident reflection. J Grad Med Educ 2018; 10(4):449-454. PMID: 30154978.
[16] Hasnain M, Connell KJ, Downing SM, Olthoff A, Yudkowsky R. Toward meaningful evaluation of clinical competence: The role of direct observation in clerkship ratings. Acad Med 2004; 79(10 Suppl):S21-24. PMID: 15383380.
[17] Gordon M, Hill E, Stojan JN, Daniel M. Educational interventions to improve handover in health care: An updated systematic review. Acad Med 2018; 93(8):1234-1244. PMID: 29620675.
[18] Stojan JN, Schiller JH, Mullan P, et al. Medical school handoff education improves postgraduate trainee performance and confidence. Med Teach 2015; 37(3):281-288. PMID: 25155969.
[19] Didwania A, Kriss M, Cohen ER, McGaghie WC, Wayne DB. Internal medicine postgraduate training and assessment of patient handoff skills. J Grad Med Educ 2013; 5(3):394-398. PMID: 24404301.
[20] Singh N, Yun C, Likhtshteyn M, et al. Systematic handoffs to improve patient outcomes and resident satisfaction: A single-center observational study. J Gen Intern Med 2019; 34(7):1092-1093. PMID: 30734191.
[21] Baggs JG, Schmitt MH, Mushlin AI, et al. Association between nurse-physician collaboration and patient outcomes in three intensive care units. Crit Care Med 1999; 27(9):1991-1998. PMID: 10507630.
[22] Khan A, Spector ND, Baird JD, et al. Patient safety after implementation of a coproduced family centered communication programme: Multicenter before and after intervention study. BMJ 2018; 363:k4764. PMID: 30518517.
[23] [No authors] Sentinel Event Statistics Released for 2015. Jt Comm Perspect 2016; 36(4):10. PMID: 29714846.
[24] Hauff SR, Hopson LR, Losman E, et al. Programmatic assessment of level 1 milestones in incoming interns. Acad Emerg Med 2014; 21(6):694-698. PMID: 25039555.

Keywords: internship and residency, patient hand-off, COVID-19, online education