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Brief Communication

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Optimizing the electronic health record: An inpatient sprint addresses provider burnout and improves electronic health record satisfaction

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ABSTRACT

Objective: We sought reduce electronic health record (EHR) burden on inpatient clinicians with a 2-week EHR optimization sprint.
Materials and Methods: A team led by physician informaticists worked with 19 advanced practice providers (APPs) in 1 specialty unit. Over 2 weeks, the team delivered 21 EHR changes, and provided 39 one-on-one training sessions to APPs, with an average of 2.8 hours per provider. We measured Net Promoter Score, thriving metrics, and time spent in the EHR based on user log data.
Results: Of the 19 APPs, 18 completed 2 or more sessions. The EHR Net Promoter Score increased from 6 to 60 postsprint (1.0; 95% confidence interval, 0.3-1.8; $P = .01$). The NPS for the Sprint itself was 93, a very high rating. The 3-axis emotional thriving, emotional recovery, and emotional exhaustion metrics did not show a significant change. By user log data, time spent in the EHR did not show a significant decrease; however, 40% of the APPs responded that they spent less time in the EHR.
Conclusions: This inpatient sprint improved satisfaction with the EHR.

Key words: burnout, professional/prevention & control, efficiency, organizational, electronic health records/organization & administration, program evaluation, quality improvement

INTRODUCTION

Clinician burnout continues to plague the healthcare workforce, with some specialties reporting overall burnout rates as high as 54%.[1,2] One potentially modifiable risk factor for burnout that continues to emerge from a multitude of evaluations is physician dissatisfaction with the electronic health record (EHR).[1,3,4]

Previous studies have described tailored EHR training interventions to improve provider efficiency and satisfaction with the EHR when delivering inpatient and ambulatory care.[5,6] Understanding best practices, EHR functionality, and aligning with the organizational needs have been described as key components to interventions.[6] To achieve optimization, it is necessary to understand the workflow of providers in order to refine them, followed by training

on the best practices of the use of the EHR.[8] Our study describes a novel approach to combating clinician burnout from the EHR in the inpatient context with training, personalization, and configuration of the EHR content.

MATERIALS AND METHODS

Site and participants

The intervention, which we called an inpatient sprint, was conducted on a medical-surgical acute care unit at the University of Colorado Hospital, which is a 650-bed academic tertiary referral hospital using a fully integrated EHR (Epic Systems, Verona, WI.) The team of clinicians who participated in the study were a group of advanced practice providers (APPs), which include nurse practitioners and physician assistants who specialize in the treatment of patients admitted to the hospital with hematologic malignancies. This study was deemed a quality improvement project and exempt by the Colorado Multiple Institutional Review Board.

Evaluation metrics and preintervention planning

An initial needs analysis was performed by one-on-one sessions with the lead APPs and attending provider from the team to delineate their EHR system configuration requests. The hospital information technology help desk ticket system was queried for any requests that had been submitted by team members in the last year. Baseline provider efficiency in the EHR was based on total time spent in the EHR, time spent in order entry, and time spent in documentation was established using user logs, a standard reporting tool provided by the EHR vendor and has been utilized previously.[9] The number of shifts per APP was captured. The report was performed twice. The first time period evaluated was 6 weeks of data, ending 2 weeks before the intervention period. The second report began 9 days postintervention, again capturing the subsequent 6 weeks of data.

Baseline burnout was evaluated using an email survey using questions from the Emotional Exhaustion Scale, Emotional Recovery Scale, and Emotional Thriving Scale, a modified subset of the Maslach Burnout Inventory.[10,11] Percentage scores were calculated by aggregating those who agreed slightly or agreed strongly to the statements. Preintervention satisfaction with EHR was evaluated using the Net Promoter Score (NPS).[5,12] Additional questions were surveyed, including perception of time in the EHR postsprint. The provider efficiency report, burnout questions, and NPS were reevaluated 2 weeks after completion of the 2-week sprint. Inferential statistics were calculated with a longitudinal regression model using SAS 9.4 (SAS Institute, Cary, NC). Calculations to test for pre to post change in responses were done for the Thriving metrics and NPS, and estimated mean difference on a 0-10 scale for the NPS.

Intervention

The intervention studied was an intensive 2-week inpatient EHR training, personalization, and system configuration, which we called sprint. The sprint was modeled after a successful outpatient intervention at our institution.[5] The intervention included 3 components, all of which included training on EHR functionality and personalization: a group introductory session on core topics, 2 separate 90-minute individualized one-on-one training sessions for each provider, a final group training session to consolidate the highest yield training tips, and EHR tool development during the 2-week sprint. The introductory session contained suggested personalization that was applicable to all APPs. Optimizing the default screen setup and homepage settings, demonstrating functionality, customizing the format of patient lists, and identifying the APP as a member of the patient's team were topics covered. For the individual training sessions, checklists of competencies were used during each session. Items on the checklist included searching the chart, creating filters to quickly find commonly searched items in the chart, incorporating reports into charts, finding outside records, use of speech recognition software, and developing methods to quickly incorporate frequently used blocks of text into notes. Furthermore, common orders and personalized ordering were discussed. Functionality to securely text message with other providers inside the EHR and the use of an application on personal handheld devices were topics covered. Training materials were provided at the end of the intervention. Two inpatient physicians trained the APPs, and 1 nonclinical trainer was available intermittently. The configuration component was based on the needs analysis. New EHR tools were developed, implemented, and modified to meet the clinical team requests. Two to 3 analysts were available daily for new tool creation in the EHR.

RESULTS

We identified that the vast majority of clinical and EHR work for this hematologic malignancy service was performed by the specialized APP group. Because of this, and because only 2 of the 8 physicians on the unit participated substantially in the sprint intervention, the efforts were focused on the APP group. Of the 19 APPs who staff this inpatient service, 18 completed 2 or more of the one-on-one training sessions.

The 2 physician leaders and 2 APPs helped identify the new EHR content that would improve provider efficiency. This content included 1 electronic tool for handoffs from provider to provider, 10 custom history and physical note templates, 7 order sets, 3 electronic care pathways, and 1 analytics report. The APPs participated in 37 one-on-one sessions with an average of 2.8 hours of individual training per provider. Query of the information technology help desk system revealed that zero requests had been submitted by any of the bone marrow transplant providers in the 6 months prior to the intervention.

NPSs, which assesses likelihood to recommend, for the EHR were measured (-100 [worst] to +100 [best]). Presprint, the APP NPS for the EHR was 6, indicating a low level of satisfaction. Postsprint, the NPS was 60 (mean difference 1.0; 95% confidence interval, 0.3-1.8; $P = .01$). Satisfaction with the sprint intervention itself was also assessed with NPSs, with a remarkably high NPS score of 93.

The Emotional Thriving, Emotional Recovery (modified), and Emotional Exhaustion Scales[9] were also measured. Table 1 includes the statements evaluated in the pre- and postintervention surveys and the percentage of responses of "agree slightly" or "agree strongly" on a Likert-type scale. Higher scores on the Emotional Thriving and Recovery Scales and lower scores on the Emotional Exhaustion Scale correlate with burnout. Although the aggregate scores trended in a positive direction, none of the metrics showed a statistically significant change.

Reporting tools provided by the EHR showed that the average number of minutes in the EHR per day increased by 25 minutes (range, 173-198 minutes; $n = 13$, providers and with insufficient data were excluded). On the other hand, postsprint surveys indicated that 40% of the respondents felt time in the EHR had decreased as a result of the interventions (compared with 46.7% of responders reporting the same or 13.3% increased amount of time in the EHR).

Table 1. Emotional Thriving Scale, Emotional Recovery Scale (Modified), and Emotional Recovery Scale[10]

Question	APP pre (n = 16)	APP post (n = 15)	Differential mean estimate (95% CI), *P* value (18 subjects, 31 observations)
Emotional Thriving Scale, aggregate score	81.3	86.6	4.2 (−3.9 to 12.2), .3
I have a chance to use my strengths every day at work.	75.0 (12)	86.7 (13)	
I feel like I am thriving at my job.	68.8 (11)	86.7 (13)	
I feel like I am making a meaningful difference at my job.	93.8 (15)	86.7 (13)	
I am often pleasantly fascinated by things that happen at my job.	87.5 (14)	86.7 (13)	
Emotional Recovery Scale, modified, aggregate score	84.4	91.7	4.1 (−4.3 to 12.5), .3
I always bounce back quickly after difficulties.	75.0 (12)	86.7 (13)	
I always find a solution when something unforeseen happens.	87.5 (14)	93.3 (14)	
I can adapt to events in my life that I cannot influence.	87.5 (14)	93.3 (14)	
My mood reliably recovers after frustration and setbacks.	87.5 (14)	93.3 (14)	
Emotional Exhaustion Scale, aggregate score	33.8	30.7	−3.3 (−12.1 to 5.5), .4
Events from this work setting affect my life in an emotionally unhealthy way.	18.8 (3)	13.3 (2)	
I feel burned out by my work.	37.5 (6)	46.7 (7)	
I feel fatigued when I get up in the morning and have to face another day on the job.	31.3 (5)	26.7 (4)	
I feel frustrated by my job.	37.5 (6)	26.7 (4)	
I feel I am working too hard.	43.8 (7)	40.0 (6)	

Values are % (n) or %, unless otherwise indicated. Data are aggregated responses of "agree strongly" and "agree slightly."
APP: advanced practice provider; CI: confidence interval.

DISCUSSION

This is the first evaluation of a focused inpatient clinician EHR training, personalization, and content configuration effort and its effect on burnout that we are aware of. We found that inpatient sprints can improve satisfaction with the EHR, and clinicians have a positive experience engaging in this type of intervention. Forty percent of participants perceived reduced times spent in the EHR, but this was not reflected in the EHR user log. It is not clear what factors contributed to the additional time spent in the EHR during the 6-week measurement period. The postintervention report excluded the days of the actual sprint and 9 days after the sprint, to exclude time spent on additional personalization. However, it is possible that users continued to spend increased time in EHR due to ongoing personalization. Although the thriving scores showed an improvement trend, none of the metrics achieved statistical significance. Long-term data were not collected after the sprint, and future endeavors should attempt to collect data over 6 or more months to determine if a sustained effect on time spent and wellness was seen.

Improvement in provider opinion about the EHR was achieved through the 3-pronged intervention of dedicated provider training on use of the EHR, facilitating individual clinician EHR personalization, and delivery of EHR content optimizations. These 3 interventions worked synergistically because personalization could be done immediately with training on the newly configured tools delivered. It was critical that we involve the frontline clinicians in the design of each intervention to ensure each piece fit into their workflows. Empowering the providers in this way may have contributed to the perception of improved efficiency after the sprint intervention, although measured efficiency did not improve. Perception of efficiency may be a more important metric if the goal is improvement in clinician resiliency and decreased burnout.

There were some limitations. It is unclear why there was an increase in the EHR minutes based on the user log. The EHR measurement of provider time is still undergoing development. While it measures "days worked," it may not be an accurate reflection of work done by providers on rotating shifts over the 2-week period. Future inpatient sprints may need to be over a longer period due to the frequency of providers rotating on and off shift; not all providers saw patients during the 2-week intervention. We had very limited participation by attending physicians, which limited the optimization benefit to the specialty team. The size of the intervention team (6) was insufficient to train or optimize work for nurses on the unit (over 150). We conducted the sprint on 1 closed unit (patients of only 1 specialty). It is unclear how this intervention would scale to hospital units with many specialty teams (eg, open units) or to physician groups with consulting privileges without an associated nursing unit.

CONCLUSION

Inpatient sprints can be an effective way to improve provider satisfaction with the EHR. We are hopeful that we and other organizations can learn from this experience to evolve and deploy more effective EHR and teamwork optimizations in the future.

AUTHOR CONTRIBUTIONS

JS, CTL, AS, and JP were involved in conception and design of work. JS, SS, and JP were involved in acquisition of data; JS, CTL, AS, and JP were involved in interpretation of data; and JS, CTL, AS, SS, and JP were involved in analysis of data. JS and JP were involved in drafting the work for important intellectual content. CTL, AS, and SS were involved in critical revision of the work for important intellectual content. JS, CTL, AS, SS, and JP gave final approval of the version to be published, and agreement to be accountable for all aspects of the work in ensuring questions related to accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST STATEMENT

None declared.

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