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Effective Remote Human Factors Support During COVID-19: Challenges and Lessons Learned

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ABSTRACT

As an organization providing human factors, patient safety, and risk management support nationally to healthcare institutions, the COVID-19 pandemic has provided the opportunity to adapt our established processes to find innovative solutions to continue our research and support healthcare. Namely, we have had to work remotely with our partners and collaborators, which severely restricts opportunities for field work and first-hand observations. We present a number of strategies and best practices, including the use of electronic tools and tips for engagement and collaboration during virtual sessions. We present these techniques within the context of a patient safety project conducted over the past year.

Keywords: Remote work, FMEA, Human factors, Facilitation, Electronic tools

INTRODUCTION

As with many aspects of our personal and professional lives, the COVID-19 pandemic has impacted the way that human factors researchers and specialists are able to conduct their work (Galanti et al. 2021). As an organization providing support in human factors, patient safety, and risk management nationally to healthcare institutions, we have had to adapt our established processes to find innovative solutions to continue our research and our work. Namely, we have worked remotely with our partners and collaborators, which introduces new challenges for conducting field work and first-hand observations. Besides the obvious challenges with technology and connectivity issues, we had to be mindful of our stakeholders and participants knowing that 'Zoom fatigue' may impact individuals both mentally and physically. As well, as practitioners, building a rapport with various end users can be challenging, which is an essential component for understanding the stakeholder needs. We present a number of strategies and tips, including the use of electronic tools and tips for engagement and collaboration during virtual sessions. We present these techniques within the context of a patient safety project conducted over the past year.

FAILURE MODE AND EFFECTS ANALYSIS

In 2021, the Healthcare Insurance Reciprocal of Canada (HIROC) collaborated with one of its Subscribers, a Canadian healthcare institution, on a virtual Failure Mode and Effects Analysis (FMEA). An FMEA is a method of systematically identifying gaps in a process or procedure through the identification and prioritization of "failure modes". These failures modes are rated by multiple dimensions, and assigned aggregate scores based on the ratings. The failure modes are prioritized based on scores, whereby solutions can be generated for the highest priority failure modes. The FMEA sessions are designed to incorporate the perspectives from multiple stakeholders in the organization. HIROC was asked to participate in the sessions as an objective third-party facilitator, which promoted the Subscriber stakeholders to speak openly and honestly about potential patient safety issues in their organization.

FMEA sessions are typically conducted in-person, as the process involves a large number of stakeholders from across the organization in developing a comprehensive understanding of the failure modes. Conducting these sessions in-person can encourage a more fruitful discussion, as people are better able to connect, are naturally more engaged. Indeed, oftentimes comments of one individual will spark a conversation from other stakeholders to develop a more complete view of the issue. This is especially true when stakeholders are presented with an accurate, comprehensive diagram or model of the process being examined. However, in a remote setting, the benefits of in-person communication when sharing the same physical space, are absent (Mai et al. 2020). The following highlights some of the challenges related to facilitating a virtual FMEA.

CHALLENGES TO CONDUCT AN EFFECTIVE REMOTE FMEA

Technological

Current audio/video technology solutions may have difficulty filtering ambient noise in microphones, making it difficult to hear the speaker unless every other attendee is muted. This of course requires effort, resulting in lapses and the familiar "You're on mute" scenario. As well, the connectivity issues pervade and may impede a fluid conversation. In addition, we recognize the effects of "Zoom fatigue", where long virtual meetings result in a temporary decrease in concentration, focused attention. These minor inconveniences may add up, resulting in friction against open and honest discussions of safety.

Logistical

With respect to scheduling virtual sessions with stakeholders, schedules must be juggled with time zone restrictions as some may be working remotely. As well, related to the technology challenges of moderating sessions remotely, the facilitator has the additional responsibility of dealing with running the virtual meeting (letting in speakers into the meeting room, addressing audio/video issues, handling screen sharing and visual presentation, etc.) In anticipation of these challenges, we decided to have a dedicated facilitator as well as a

note-taker, to avoid cognitive overload and a single person having to time-share between a number of responsibilities at the expense of a productive conversation.

Distractions

Remote work may also impose additional challenges for running a smooth session, in particular with respect to distractions during the sessions: phone calls, text messages, emails and personal life matters may distract stakeholders from maintaining focused attention on the matter being discussed. As well, we wish to avoid having stakeholders trading off cognitive performance for increased speed and higher levels of stress when distracted (Mark et al. 2008).

Impact on Psychological Safety

Furthermore, we acknowledge the impact of virtual or remote FMEA sessions on psychological safety (Gibson and Gibbs, 2006), as a number of factors including personality types and organizational culture might influence one's willingness to speak up (Remtulla et al. 2021). In particular, virtual sessions present an interesting challenge with respect to body language, which communicates information about the tone and intent through non-verbal means. On one hand, speaking remotely may encourage speaking freely; however, being physically apart may also make people feel disconnected and less likely to contribute to the conversation. In these situations, more effort is required from the facilitator to create an environment where participants feel safe to speak up.

CASE STUDY: FACILITATING A VIRTUAL FMEA

The FMEA was conducted remotely via Zoom with five two-hour sessions. Stakeholders included healthcare providers working at the Subscriber site involved in assessing patients for their risk of choking (e.g., Registered Dieticians, Occupational Therapists, Food Services, and Front-line Nurses). In order to balance time commitments and Zoom fatigue, two-hour sessions were scheduled once a week. This was found to be sufficient for productive discussions while also respecting stakeholders' schedules and care responsibilities. Scheduling a larger number of shorter sessions would have delayed the completion of the FMEA and scheduling fewer longer sessions would have required more coordination and coverage at the unit level.

These sessions were organized as follows:

- Meeting 1: Map the Subscriber's Choking Risk Assessment process in its current-state.
- Meeting 2: Identify barriers and potential failures that could occur at each step in the process. Following this meeting, a thematic analysis of the barriers was completed to identify failure modes with the Choking Risk Assessment process.

Table 1. List of scales and descriptors for failure mode and effects analysis.

Scale	Ratings and Descriptions
Severity	1 = No apparent harm (Event reached person but caused no apparent harm); 2 = Minor harm (Event caused short-term harm and required minimal intervention); 3 = Moderate harm (Event caused short-term harm and required immediate intensive intervention); 4 = Serious harm (Event caused long-term harm and required immediate intensive intervention); 5 = Critical harm (Event caused death, near-death or severe permanent harm)
Occurrence	1 = Remote (Unlikely to occur); 2 = Uncommon (Possible to occur); 3 = Occasional (Probably will occur); 4 = Frequent (Likely to occur immediately or within a short period)
Detectability	1 = Always (Detectable 100% of the time); 2 = Likely (Detectable greater than or equal to 50% of the time); 3 = Unlikely (Detectable less than 50% of the time); 4 = Never (Undetectable)

- Meeting 3: Generate a risk priority number (RPN) for each failure mode based on severity, occurrence, and detectability. The RPNs were used to prioritize the failure modes.
- Meetings 4 and 5: Discuss each failure mode in detail to identify mitigation strategies currently in place and to brainstorm new strategies to further mitigate these failure modes.

The FMEA was conducted virtually with one dedicated facilitator and one note-taker. During Meetings 1 and 2, the note-taker shared their screen and created the process map in real-time using Visio. This allowed for stakeholders to follow along and provide input if information was not captured accurately.

For Meeting 3, we used Microsoft PowerPoint to present each failure mode with its associated barriers on each slide. During the meeting, we reviewed the barriers with stakeholders, then asked them to provide their subjective scores for severity, occurrence, and detectability for the identified failure mode. To collect scores, we used Menti, a web-based interactive presentation tool to engage participants in real-time (Mentimeter, 2022) that provides real-time presentation and polling tools. For each failure mode, we displayed the severity, occurrence, and detectability scales to guide scoring, with the descriptions indicated in Table 1. The scales were adapted from those developed by the Institute for Safe Medication Practices (ISMP) Canada (2007) to fit the needs of the project.

We presented these scales for every failure mode, to obviate recall from long term memory and to lower mental workload, so stakeholders could easily refer to them as they completed their individual assessments. Following this meeting, the individual scores were aggregated for each failure mode by

multiplying the scores for severity, occurrence, and detectability to calculate the failure mode's RPN.

For Meetings 4 and 5, we used Microsoft Excel to list the failure modes prioritized by RPN and began with addressing those with the highest RPN numbers. We focused the discussions on identifying existing mitigation strategies for each failure mode, and also brainstormed ideas for new mitigation strategies. Stakeholders were encouraged to think system-focused solutions, such as, creating standardized processes.

DISCUSSION

Our method of using a series of two-hour sessions was an effective approach that required some time at the onset of each meeting to quickly recap previous discussions. This setup was more conducive to the stakeholders' availability as it did not require them to dedicate one to two full days as a possible alternative which would have been more disruptive to their schedules. Having a dedicated facilitator ensured sessions were productive and did not suffer from long bouts of silence that often coincide with facilitators who also act as note-takes and often pause discussions for documentation before moving onto different discussion topics.

Documents were prepared ahead of each meeting with a plan to enter new or modify information during discussions with stakeholders. Displayed information was concise and easy to follow to help facilitate each meeting. Having a dedicated facilitator and a dedicated note-taker allowed the facilitator to focus on engaging stakeholders to maintain a fluid conversation and to ensure discussions progressed efficiently.

CONCLUSION

We anticipate that hybrid and remote work will continue to be part of the work reality for human factors specialists in healthcare for the foreseeable future. We have adopted these techniques into our standard practice, and believe that human factors practitioners will value hearing details about conducting these sessions in a remote setting. In particular, the lessons learned for scheduling and preparing for the sessions, collecting user data using a web-based voting system, and the challenges of logistics of running remote sessions will be carried forward to our future patient safety projects. We hope these insights will be practical and useful for specialists and researchers planning to conduct remote sessions with healthcare providers.

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REFERENCES

Galanti, T., Guidetti, G., Mazzei, E., Zappalà, S. & Toscano, F. 2021, "Work from Home during the COVID-19 Outbreak: The Impact on Employees' Remote Work Productivity, Engagement and Stress", *Journal of occupational and environmental medicine; J Occup Environ Med,* vol. 63, no. 7, pp. e426–e432.

Gibson, C.B. & Gibbs, J.L. 2006, "Unpacking the Concept of Virtuality: The Effects of Geographic Dispersion, Electronic Dependence, Dynamic Structure, and National Diversity on Team Innovation", *Administrative Science Quarterly,* vol. 51, no. 3, pp. 451–495.

Institute for Safe Medication Practices Canada. 2007. *Canadian Failure Mode and Effects Analysis Framework: Proactively Assessing Risk in Healthcare*. Toronto: CJ Graphics.

Mai, B., Garcia, B., Xie, L., McCubbins, O.P. & Seo, J. 2020, "Teamwork in Virtual World - Impact of "Virtual Team" on Team Dynamic" in Springer International Publishing, Cham, pp. 119–127.

Mark, G., Gudith, D. & Klocke, U. 2008, "The cost of interrupted work: more speed and stress", *Conference on Human Factors in Computing Systems*, CHI, pp. 107–110.

Mentimeter. 2022. *The Mentimeter Website*. Available at: https://www.mentimeter.com (Accessed: 11 Feb 2022).

Remtulla, R., Hagana, A., Houbby, N., Ruparell, K., Aojula, N., Menon, A., Thavarajasingam, S.G. & Meyer, E. 2021, "Exploring the barriers and facilitators of psychological safety in primary care teams: a qualitative study", *BMC health services research; BMC Health Serv Res,* vol. 21, no. 1, pp. 269.