Smartphone-Delivered Animated Videos to Train Neonatal Intensive Care Unit Physicians in Communication Skills: A Feasibility Study

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ABSTRACT

Background: Physician training in the neonatal intensive care unit (NICU) emphasizes diagnosis and procedures, whereas communication training is often sporadic.

Objective: We sought to assess the feasibility of smartphone-based animated videos to teach communication skills to physicians in the NICU.

Methods: Eight videos modeling communication best practices were delivered twice weekly via text messages. Software tracked video use, and participants provided feedback through surveys.

Results: Of the 29 participants, 19 (66%) viewed some or all the videos. Participants reported implementing the communication techniques and making changes to their communication style. Two months postintervention, the 7 physicians who completed follow-up surveys reported sustained use of learned skills.

Conclusions: Communication training delivered via smartphone through short, animated videos is a feasible and well-received approach for physicians in the NICU.

BACKGROUND

Effective communication between neonatal intensive care unit (NICU) parents and physicians is essential for building trust and optimizing health outcomes. However, the most frequent complaints by parents are that physicians do not listen to their concerns, care about their problems, or provide sufficient information about treatments.[1] Ineffective communication is associated with parental stress and dissatisfaction with care, inappropriate use of therapeutic modalities, and malpractice lawsuits.[2-4]

Physicians are introduced to communication skills during medical school. During clinical rotations, including those in the NICU, medical training focuses on diagnoses, treatments, and procedures, whereas communication training is sporadic. A survey of pediatric residency program directors found that, when communication training is offered, it typically occurs 1 to 3 times per year and consists of formal didactics, role-playing, workshops, and simulated cases. Fourteen percent of programs offer no formal training.[5] Furthermore, in a national survey of graduating neonatology fellows, 41% reported no formal communication training during fellowship.[6] Training programs struggle to teach communication skills because of limited time and shortage of trained faculty. To our knowledge, no existing program formally reaches NICU physicians within the clinical setting to reinforce and facilitate practice of communication skills learned in classrooms.

This lack of preparation for effective communication is especially concerning in the NICU, where prolonged NICU stays provide abundant opportunities to build trust between parents and health care providers but may also foster distrust when communication is ineffective. Smartphones offer opportunities for situational, in-context communication training, bridging gaps that traditional didactics cannot address. We aimed to address challenges in NICU communication skills training in the NICU by developing an animated video training program delivered to physicians via smartphone.

METHODS

Study Site and Ethics Approval

The study was conducted at an academic, level IV NICU within a freestanding children's hospital. Institutional Review Board approval was obtained with a waiver for documentation of con-

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sent. Participants were provided with an informational letter, and agreement to participate was indicated by completion of the enrollment survey.

Participants

Eligible participants included pediatric residents, fellows, and attending physicians rotating in the NICU during the study period. Physician enrollment was completed through a REDCap (Research Electronic Data Capture; Vanderbilt University) survey sent via email before the start of each participant's rotation. Enrollment took place between October 2022 and May 2023. As this was a feasibility study, no power analysis was conducted to determine the sample size.

Intervention

Content identification: A literature review identified evidence-based communication techniques for physicians. These techniques were packaged into tasks commonly performed by physicians in the NICU, including communicating with families during a code event and using the SPIKES framework[7] to guide a family meeting (Figure 1A and 1B).

Animated video development: Considerations in developing the video curriculum included clinicians' rotation schedules, the goal of delivering 2 videos each week, and the need to achieve learning objectives while limiting each video's duration to 2 to 3 minutes. These considerations resulted in the creation of 8 training videos. To create each video, a script was developed to address the learning objectives. A team that included pediatric residents, neonatal fellows, and NICU parent representatives reviewed each script and provided feedback to refine the content and style. Animations were produced using PowToon (Powtoon Limited) and Vyond (GoAnimate, Inc), and narration was provided by professional voice actors. Video production involved an iterative refinement process to improve representation, ensure that the communication techniques were accurately modeled, and adjust visuals to better reflect the NICU environment. The Figure contains links for the videos.

Text-message video delivery platform: A technical platform was developed that included a website to host the videos, programming to automatically deliver text messages, and software to track participant-specific usage. Each video was delivered via a link embedded in a text message. Participants received 4 to 8 videos over 2 to 4 weeks, depending on the length of their NICU rotation. Compatibility of the delivery platform was tested across various mobile devices and phone carriers.

Figure 1A. Neonatal Intensive Care Unit Scenarios and Communication Objectives for Physician Videos 1-4

PHYSICIAN COMMUNICATION VIDEO	LEARNING OBJECTIVES
Meeting a new family  https://mcw.box.com/s/wir18tjpqtib4gh5s0eidthbavbz2or1	Acknowledge the child apart from their medical status. Sit down with parents when talking with the parents and listen without interrupting. Use names and person-first language.
Empowering families to participate in infant's care  https://mcw.box.com/s/ek2vhtg71r9vzfdl51eclfftbe3i7jop	Explain to parents what is happening to their child. Ask parents what is most important to them. Encourage parents to participate in caring for their child.
Explaining lab results using emotion words  https://mcw.box.com/s/xb6r5fl3id3c6mh4o6a0qtidun7yqsg5	Frame results with emotion words, such as happy or worrisome, to communicate what the results mean. Avoid use of the words "positive" or "negative," which may cause confusion.
Creating opportunities for empathy  https://mcw.box.com/s/ueyxxq9ievvt3kme1cyfsy7c1nald2we	Respond to cues for empathy as a human first - responding with data first only addresses part of parents' needs. Display empathy with the SAVE framework: Support, Acknowledge, Validate, Emotion name.[8]

Outcomes

Enrollment surveys (Appendix, Survey 1) collected information on demographics, previous communication experiences and training, and mobile device usage. Weekly assessments (Appendix, Survey 2) evaluated engagement, adoption of communication techniques, and discussions about these techniques with others. End-of-curriculum evaluations (Appendix, Survey 3) included feedback on video quality, perceived impact on communica-

tion, and the overall learning experience. Two months after completion of the curriculum, participants were sent follow-up surveys (Appendix, Survey 4) to assess sustained effects. Assessments were automatically delivered to participants via email through REDCap. As compensation for time completing evaluations, participants received a $4 gift card for each evaluation completed (up to $24 for completion of all evaluations).

RESULTS

Seventy-nine physicians were eligible to participate, including 58 residents, 6 fellows, and 15 attending physicians. Invitations were sent via email, and 29 physicians (37%) enrolled, including 19 residents, 5 fellows, and 5 attending physicians. Most (69%) identified as non-Hispanic White, 17% identified as Asian, 14% as Black, and 7% as Hispanic. Thirteen participants (45%) reported no prior communication skills training. Among those with prior training, common methods included role playing, simulations, small-group discussions, and lectures.

Nineteen physicians (66%) watched 1 or more videos. Due to varying NICU rotation lengths, 77 total weekly impact assessments were sent, of which 28 (36%) were completed. Among these, 15 (54%) indicated that they had discussed the video content with colleagues. In 16 (57%) assessments, participants reported practicing techniques presented in the videos during family interactions in the NICU, and 21 (75%) reported that viewing the videos caused a change in their communication style. Open-ended feedback highlighted techniques physicians implemented, such as using lay language and active listening.

At the end of the curriculum, 88% of the respondents rated their learning experience as good or excellent. Two months postintervention, 7 physicians completed the follow-up survey, reporting a median score of 8/10 for content retention and 7/10 for application of the techniques in clinical practice. All respondents expressed interest in receiving similar videos in the future.

Figure 1B. Neonatal Intensive Care Unit Scenarios and Communication Objectives for Physician Videos 5-8

PHYSICIAN COMMUNICATION VIDEO	LEARNING OBJECTIVES
Using teach-back to confirm understanding	
	Prepare parents to make a phone call about the information to their loved ones. Invite teach-back using language that places responsibility for clarity on the physician.
https://mcw.box.com/s/8pv68l5m5lcftxoom1rkwmlkukk6w04j	
Communicating with families in the delivery room	
	Ask about the child's name and use pronouns matching the baby's sex. Prepare parents based on the level of infant risk. Tell parents that while treating the child, the physician may not have the time to talk to them.
https://mcw.box.com/s/slktzf6r5uiylowo7h1pqomsygyi1e33	
Leading a family meeting	
	Structure a family meeting with the SPIKES framework: Set up the meeting time and place, assess the family's Perception of the situation, obtain the family's Invitation to proceed the discussion, share the new Knowledge, address the family's Emotion and respond with Empathy, then briefly Summarize the meeting and create a Strategy for moving forward.[7]
https://mcw.box.com/s/kyg9hvyofe2669x47fs2zs108n5po1xe	
Communicating with families during a code blue	
	Designate someone on the medical team to talk to and support the parents. Remind parents the situation is not their fault. If the infant is not improving, prepare parents for a possible bad outcome in a stepwise fashion. Avoid asking the family for permission to stop interventions. Avoid euphemisms like "passed away."[10]
https://mcw.box.com/s/8vnmh9x28ise2pv4mju21vzs27zb71nk	

DISCUSSION

Our innovative animated videos harness ubiquitous mobile technology to teach communication skills, making them easily accessible to physicians in the fast-paced NICU environment. Most enrolled physicians watched the videos sent to them, demonstrating the convenience and effectiveness of this delivery method. Participant feedback suggested that the program positively influenced communication behaviors.

Our results are consistent with previous research, reinforcing the idea that smartphones are a practical platform for delivering educational content to physicians. A 2014 survey found that 77% of medical students and resident physicians used their smartphones multiple times daily to access medical resources.[9] Additionally, our findings supports prior research demonstrating that mobile learning, particularly through text messages, is an effective and efficient

educational strategy in medicine.[11] Beyond their widespread availability, smartphones offer the advantage of tracking curriculum engagement while allowing physicians to learn at their convenience.

By integrating communication skills training into the clinical setting, our curriculum enabled physicians to immediately apply newly learned techniques during interactions with parents. Trainees have reported that practicing communication skills in real clinical scenarios enhances the effectiveness of communication training.[12] Additionally, communication skills are best developed through continuous professional education.[12] To support this approach, we included residents, fellows, and attending physicians, fostering team-based learning that reinforces communication skills across all levels of experience.

Limitations

Our study is limited by its sample size. Recruiting physicians and integrating a new curriculum into an already busy NICU rotation proved challenging. The enrollment survey and weekly evaluations were distributed via email and were often overlooked; delivering these assessments by text message may improve response rates. Additionally, the communication skills taught in the curriculum are relevant beyond the NICU, and the program could be expanded to physicians in outpatient settings or other inpatient units where greater flexibility for education may exist.

Another limitation is reliance on survey data alone to assess impact. Future studies incorporating additional forms of feedback, such as qualitative interviews or assessments of actual communication behaviors, could provide further insight. Finally, the absence of a comparison group limited our ability to evaluate changes beyond participants' self-reported perceptions.

CONCLUSIONS

This study demonstrates that smartphone-delivered animated videos modeling evidence-based physician communication skills are a feasible and well-received method for improving parent-physician communication in the NICU.

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Appendix: Available at www.wmjonline.org

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