Wanna Chat? A quick study using an AI chatbot for COVID-19 Screening

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PROJECT BACKGROUND

The Mayo Clinic brand is synonymous with world class healthcare guided by its unwavering commitment to patient care, education, and groundbreaking research. The foundation of this commitment is cemented in the culture of patient centric clinical care and innovation. At the onset of the COVID-19 pandemic in 2020, the Centers for Disease Control and Prevention issued guidelines for safety measures with respect to screening high-risk patient populations for exposure. Additionally, healthcare organizations were urged to limit in-person contact when possible, to reduce transmission rates.

OBJECTIVE

To determine the feasibility of an AI enabled text-based chatbot for COVID-19 screening for patients prior to radiology appointments.

METHODS

Multiple stakeholders were consulted including Radiology Physicians, Radiology Administrative Leadership, Center for Digital Health Administrative Leadership, Allied Health Staff, and Nursing. A multidisciplinary project team was assembled with champions from Radiology to pilot a HIPAA-approved, IRB-waived study implementing an AI chatbot into the clinical practice for four months in 2020. The team partnered with an external vendor to customize a secure AI chatbot to screen patients for COVID-19 symptoms prior to a scheduled radiology exam. The initial pilot group consisted of patients scheduled for ultrasound exams, and then, subsequently, MRI exams in outpatient settings across all regional campuses. The SMS- based AI chatbot routed patients into several pathways depending on response to COVID screening survey.

RESULTS

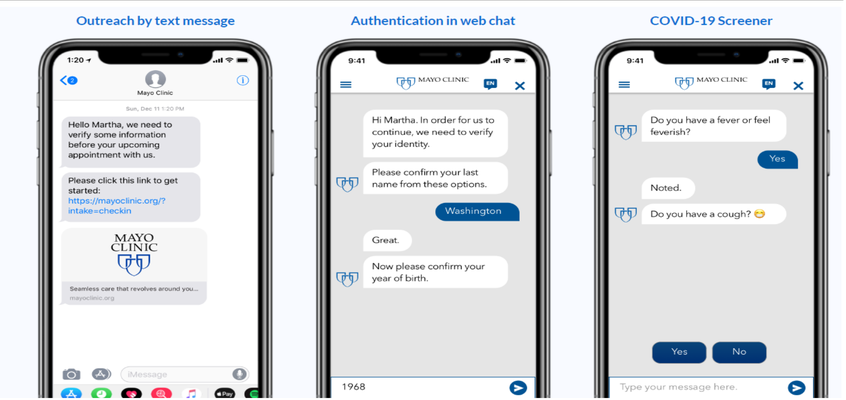
The chatbot COVID-19 screening text was sent to 4,687 patients. Of these patients, 2,722 (58.1%) responded. Of the respondents, 46 (1.7%) reported COVID-19 symptoms; 34 (1.2%) had COVID-19 tests scheduled or pending. Of the 1,965 nonresponders, authentication failed for 174 (8.8%), 1,496 (76.1%) did not engage with the text, and 251 (12.8%) timed out of the survey. The mean rating for the chatbot experience was 4.6. In a multivariable logistic regression model predicting response rate, English written-language preference independently predicted response (odds ratio, 2.71 [95% CI, 1.77-2.77]; *P*=.007). Age (*P*=.57) and sex (*P*=.51) did not predict response rate.

TABLE 1

	No. (%)[a]		
Variable	**Responders n=2,722**	**Nonresponders n=1,965**	**P value**
Age, median (IQR)	59.0 (46-68)	58.0 (46-68)	.91
Male sex	1,257 (46.2)	890 (45.3)	.55
Age			.23
Generation Z, <25 y (n=193)	113 (4.1)	80 (4.1)	
Generation Y, 25-46 y, (n=590)	336 (12.3)	254 (12.9)	
Generation X, 41-56 y, (n=1,362)	743 (27.3)	583 (29.7)	
Baby Boomers, ≥57 y (n=2,578)	1,530 (56.2)	1,048 (53.3)	
Written language preferences			<.05
Non-English (n=87)	38 (43.7)	49 (56.3)	
English (n=4,600)	2,684 (58.3)	1,916 (41.6)	

Abbreviation: IQR, interquartile range.
[a] Data presented as No. (%) unless indicated otherwise.

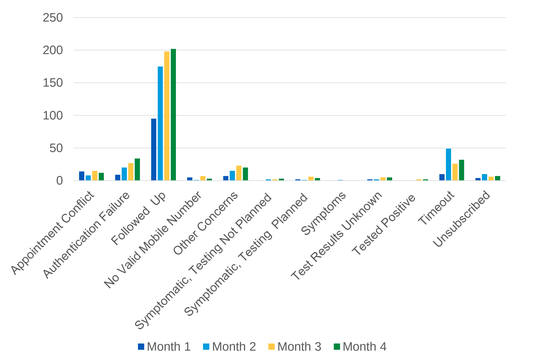
FIGURE 1



IMPLEMENTATION

- Patients were first identified from the EMR of scheduled appointments meeting the criteria.
- Patients were notified about COVID-19 screening via a text message containing a link to access a secure website where they would answer screening questions.
- Upon activation, patients were verified, and the AI chatbot used a decision-tree algorithm capable of routing patients into several pathways depending on their responses to the COVID-19 screening questions.
- Patients who reported symptoms were then directed to a COVID-19 testing site before their appointment.
- Asymptomatic patients were routed to confirm appointments, and patients with questions were identified so that an outbound call to the patient could be made.
- User experience and overall satisfaction was assessed via a questionnaire based on a 5-point Likert scale (1 = poor and 5 = outstanding).

FIGURE 2



NEXT STEPS

- Identify other use cases for AI enabled chatbot technology within the clinical practice.
- Pursue integration with the electronic medical record for further expansion of AI enabled chatbot technology
- Create a digitally enabled practice mechanism to leverage AI technology for an end-to-end comprehensive digital experience
- Share successes and best practices with other specialties to benefit from a similar innovative approach to patient care delivery.