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Simone A Bernstein

Washington University School of Medicine in St. Louis

Alison L Huckenpahler

Washington University School of Medicine in St. Louis

Ginger E Nicol

Washington University School of Medicine in St. Louis

Jessica A Gold

Washington University School of Medicine in St. Louis

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Recommended Citation

Bernstein, Simone A; Huckenpahler, Alison L; Nicol, Ginger E; and Gold, Jessica A, "Comparison of electronic health record messages to mental health care professionals before vs after COVID-19 pandemic." *JAMA Network Open*. 6, 7. e2325202 (2023).

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Comparison of Electronic Health Record Messages to Mental Health Care Professionals Before vs After COVID-19 Pandemic

Simone A. Bernstein, MD; Alison L. Huckenpahler, MD, PhD; Ginger E. Nicol, MD; Jessica A. Gold, MD, MS

Introduction

The COVID-19 pandemic led to a global mental health crisis,¹ with increased mental health–related visits across specialties and emergency departments.^{2,3} This study aims to quantify this increase by comparing prepandemic and postpandemic patient messaging in psychiatry. With inbox electronic health records (EHRs) volume as the main outcome, we hypothesized an increase in postpandemic messages.

Methods

The Washington University in St Louis Institutional Review Board approved this qualitative improvement study. We followed the [SQUIRE](#) reporting guideline. This study analyzed EHRs (Epic Systems) of outpatients receiving psychiatric treatment at a large Midwestern academic medical center. We reviewed patient-initiated prepandemic (June 2, 2018, to March 18, 2020) and postpandemic (March 19, 2020, to January 3, 2022) messages for patients with at least 1 scheduled appointment in either period. Trends were assessed through September 2022 to observe whether increases persisted in early (April 1, 2020, to January 31, 2021) and late (November 1, 2021, to September 30, 2022) pandemic periods.

Message volume by patient sex and self-identified race (White and other [Black, Asian, and other or not specified]) was reviewed to understand population characteristics (eMethods in [Supplement 1](#)). Heteroscedastic *t* tests compared prepandemic and postpandemic outcomes of interest. Statistical significance was defined as $P < .05$.

Results

Among 4724 patients (1636 males [34.6%]; mean [range] age, 35.4 [20.3–95.1] years; 135 Asian [2.9%], 644 Black [13.6%], 3807 White [80.6%], and 138 other or not specified [2.9%]), sending messages increased from 765 prepandemic to 4481 postpandemic messages (485.8%). Monthly message volume increased from 4661 prepandemic to 44 929 postpandemic messages (861.5%; per-patient mean [SD], 0.2 [0.1] vs 1.2 [0.4] messages; $P < .001$) (**Figure, A**). Among 174 professionals, there were 118 psychiatrists (67.8%), 15 social workers (8.6%), 13 therapists (7.5%), 13 psychiatric advanced practice clinicians, 7 psychologists (4.0%), 7 additional resource staff, and 1 case manager (0.6%). The mean number of professionals increased from 64.1 to 75.8 individuals (18.3%; $P < .001$).

Trends were assessed through September 2022 to observe whether increases persisted in periods of lower COVID-19 infection rates (**Figure, B**).⁴ The mean (SD) number of messages per month was significantly lower in the early (1398 [560] messages) vs late (3414 [273] messages) pandemic ($P < .001$).

Males sent a higher mean (SD) number of prepandemic messages than females (7.5 [11.0] vs 5.4 [7.4] messages; $P < .001$) but fewer postpandemic messages (9.4 [13.7] vs 10.4 [16.3] messages; $P = .03$). Patients with other races sent a lower mean number of messages than White patients

+ Supplemental content

Author affiliations and article information are listed at the end of this article.

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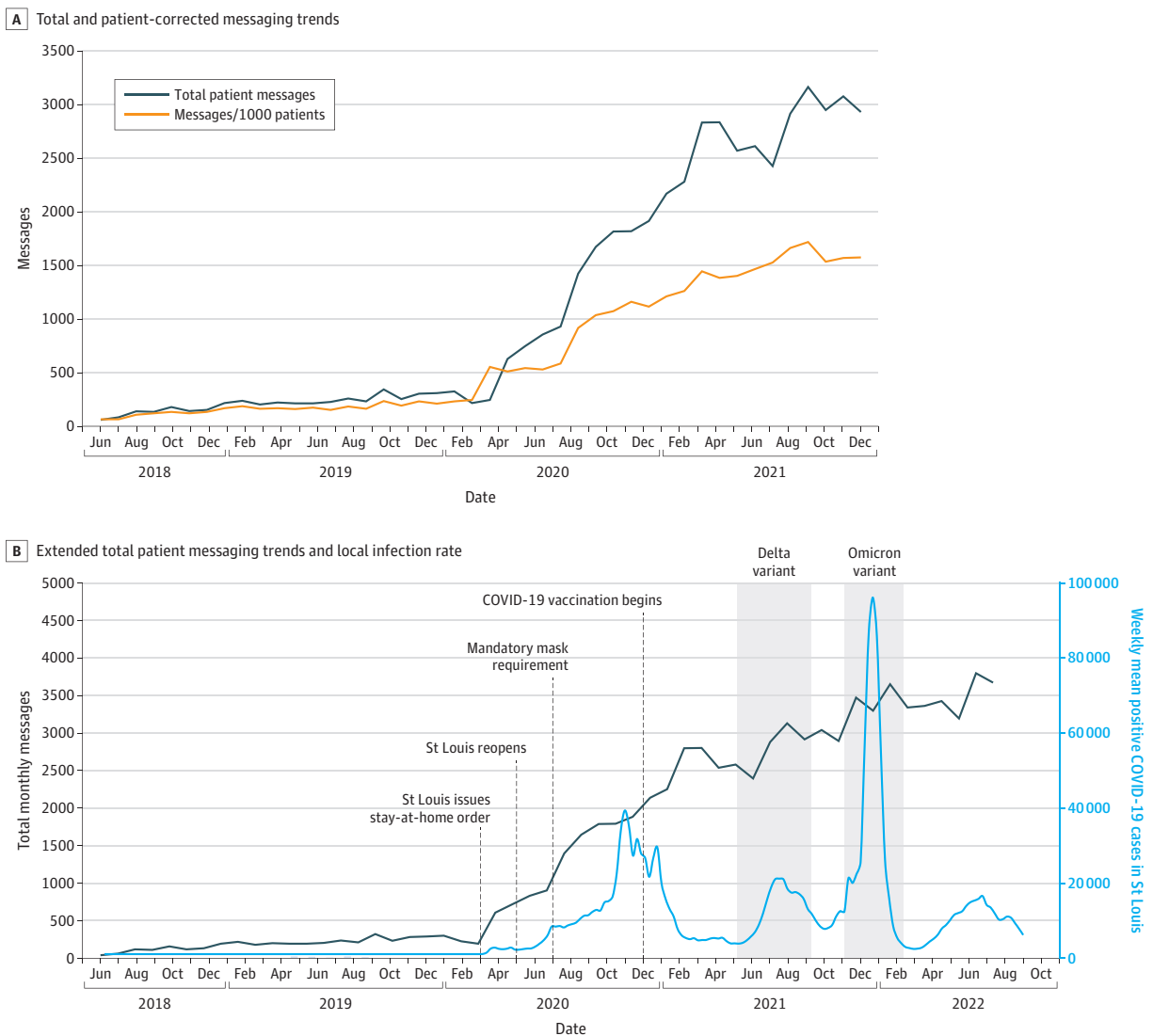
before (4.1 [4.4] vs 6.4 [9.5] messages; $P < .001$) and during (8.8 [12.5] vs 10.3 [16.0] messages; $P < .001$) the pandemic.

Patients messaged to ask medication questions (55.7%), general medical questions (40.4%), or their history (3.5%); cancel or request an appointment (0.2%); or request refills (0.2%). Patients primarily used the internet to send messages (60.7%), followed by the MyChart application (iOS: 28.1%; Android: 11.2%). Mean (SD; maximum) message length was 192 (234; 6651) characters.

Discussion

Demand for mental health care increased profoundly during the pandemic, worsening patient access to mental health professionals. To our knowledge, this quality improvement study is the first to examine messaging volume in mental health care professionals. We report increased mental health service demand and increased messaging during the pandemic. This is consistent with observations

Figure. Messaging During the COVID-19 Pandemic



During COVID-19, there was an increase in total messages sent and messages sent per patient. Additional observations in the extended study timeline show that message volume continued to increase independently of COVID-19 infection rates.

of other specialty trends at another institution.⁵ The increase persisted well past the acute phase of the pandemic through subsequent infection surges.⁴ Increased messaging burden in this study reflects the sustained increase in patient need, which likely extends beyond psychiatry.

Increased messaging may also be associated with patient satisfaction, given that it is associated with message response time and more messages take more time.⁶ Patients may additionally have experienced disproportionate outcomes by race given that those identifying as White were more likely to send messages. This may have contributed to disparities in health care professional access.

This study has limited generalization to all clinical settings, including other specialties within our hospital. It included no analysis of message content, telephone calls, emails, or other patient–health care professional communication.

The pandemic led to a mental health crisis, which the messaging burden further demonstrates. Understanding patient-centric barriers to health care professional access and communication is critical to driving health system changes to improved patient care quality beyond the pandemic.

ARTICLE INFORMATION

Accepted for Publication: June 9, 2023.

Published: July 24, 2023. doi:10.1001/jamanetworkopen.2023.25202

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Corresponding Author: Jessica A. Gold, MD, MS, Department of Psychiatry, Washington University School of Medicine in St Louis, Campus Box 8134, 660 S Euclid Ave, St Louis, MO 63110 (jgold@wustl.edu).

Author Affiliations: Department of Psychiatry, Washington University School of Medicine in St Louis, St Louis, Missouri.

Author Contributions: Drs Bernstein and Huckenpahler had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Drs Bernstein and Huckenpahler co–first authors.

Concept and design: All authors.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: All authors.

Critical review of the manuscript for important intellectual content: All authors.

Statistical analysis: Huckenpahler.

Obtained funding: Nicol, Gold.

Administrative, technical, or material support: Bernstein.

Supervision: Nicol, Gold.

Conflict of Interest Disclosures: Dr Nicol reported receiving personal fees from Alkermes Inc, CarelonRx, Otsuka America Pharmaceutical Inc, and Sunovion and an investigational drug for an investigator-initiated study from Usona Institute outside the submitted work. No other disclosures were reported.

Funding/Support: This publication is supported by the Health Resources and Services Administration (HRSA) of the US Department of Health and Human Services as part of an award totaling \$2 322 000 with 0% financed with nongovernmental sources. For more information, please visit [HRSA.gov](https://www.hrsa.gov). This work was supported in part by grant R25-MH112473 from the Washington University Psychiatry Resident Research Education Program and U3M45389 from the HRSA (Precision digital engagement for health care worker mental health federal award). This work was also made possible by the Center for Employee and Family Wellness and the Healthy Mind Lab in the Department of Psychiatry Washington University in St Louis.

Role of the Funder/Sponsor: The funders had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Disclaimer: The contents are those of the authors and do not necessarily represent the official views of, nor an endorsement, by the Health Resources and Services Administration, Department of Health and Human Services, or US government.

Data Sharing Statement: See [Supplement 2](#).

Additional Contributions: The authors would like to thank Mr Ken Scholl (Washington University School of Medicine) for his assistance in accessing and managing data that were analyzed in this report. He was not compensated for this work.

REFERENCES

1. How the COVID-19 pandemic has affected depression and anxiety around the world. *The Lancet*. Accessed May 28, 2023. <https://www.thelancet.com/infographics-do/covid-mental-health>
2. Holland KM, Jones C, Vivolo-Kantor AM, et al. Trends in US emergency department visits for mental health, overdose, and violence outcomes before and during the COVID-19 pandemic. *JAMA Psychiatry*. 2021;78(4):372-379. doi:10.1001/jamapsychiatry.2020.4402
3. Stephenson E, O'Neill B, Kalia S, et al. Effects of COVID-19 pandemic on anxiety and depression in primary care: a retrospective cohort study. *J Affect Disord*. 2022;303:216-222. doi:10.1016/j.jad.2022.02.004
4. COVID data tracker. Accessed June 14, 2023. <https://health.mo.gov/living/healthcondiseases/communicable/novel-coronavirus/data/public-health/>
5. Nath B, Williams B, Jeffery MM, et al. Trends in electronic health record inbox messaging during the COVID-19 pandemic in an ambulatory practice network in New England. *JAMA Netw Open*. 2021;4(10):e2131490. doi:10.1001/jamanetworkopen.2021.31490
6. Liederman EM, Lee JC, Baquero VH, Seites PG. Patient-physician web messaging: the impact on message volume and satisfaction. *J Gen Intern Med*. 2005;20(1):52-57. doi:10.1111/j.1525-1497.2005.40009.x

SUPPLEMENT 1.

eMethods. Race Demographics

SUPPLEMENT 2.

Data Sharing Statement