Utilization of Patient-Centered Digital Tools to Improve Adherence Rates for Outpatient Screening Colonoscopies in a Metropolitan Hospital

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ABSTRACT

Colorectal cancer (CRC) is the second leading cause of cancer-related deaths in the United States [1]. We performed a retrospective analysis on a prospectively maintained database on CRC screening adherence rates between July 2019 to March 2022 in a Metropolitan hospital gastroenterology clinic. Screening colonoscopies (SC) scheduled during the study time period were included and we compared SC performance rates, prior to and after the implementation of a digital navigation program (DNP) of generating automated text-messages containing appointment reminders and links for bowel prep and driving instructions; developed by a private company and EPIC-EMR generated personal health app called MyChart. All participants were offered access to both interventions on their smartphones. A total of 3584 procedures scheduled during the study period. Pre-intervention period (n=1057), 48% procedures were performed and 52% were cancelled; and in Post-intervention period (n=2527), 85% SC performed with 15% cancelled (p<.001) with a percent increase of 74%. In Post-intervention group, DNP enrolled 90 patients of which 87% presented for procedure. Patients who did not present, received additional reminders. Bowel prep between the groups showed no significant difference in quality. Our study highlights a significant increase in performance rates of scheduled screening colonoscopies with utilization of digital tools. Usefulness of digital applications in improving adherence and reducing no show rates of colonoscopy procedures, have been well studied in literature but data on implementation on a larger scale is lacking. Especially after COVID-19 pandemic, use of technology to increase adherence to CRC screening and surveillance seems more warranted.

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INTRODUCTION

Colorectal cancer (CRC) is the second leading cause of cancer-related deaths in the United States[1]. Screening through stool testing i.e., gFOBT, FIT, multi-targeted DNA test (FIT-DNA) or colonoscopy is the standard of care for all ages between 50 to 75 years, but national rates of procedures remain sub-optimal [2]. Digital applications i.e., frequent automated text-based reminders and assess through personalized healthcare apps on smartphones, can be effective tools to overcome barriers to screening colonoscopy adherence thus improving the outcomes.

METHODS AND MATERIALS

❖ *Study Design*: We performed a retrospective study on a prospectively maintained database on CRC screening adherence rates between July 2019 to March 2022 in a Metropolitan hospital gastroenterology clinic.

❖ *Inclusion Criteria:* Only screening colonoscopies (SC) scheduled during the study time period were included.

❖ *Data Collection:* Data on demographics and health-care resources utilization were reviewed and analyzed.

❖ *Digital Applications*: A digital navigation program (DNP) developed by a private company that consisted of generating automated text-messages containing links for bowel-preparation instructions, appointment reminders, driving instructions to hospital and a short informative procedure video embedded within the text and EPIC-EMR generated personal health app called MyChart. All participants were offered access to DNP through a digital platform and MyChart app set up on their smartphones.

❖ *Primary Outcome:* Comparison between SC performance rates, prior to and after implementation of digital applications.

RESULTS

➢ Total of 3584 SC were scheduled during the study period.
➢ Overall age was 60±9.6 years and majority were males at 55%; Hispanics were 49% with Non-Hispanic at 51%.
➢ Pre-intervention period (n=1057), 48% of SC performed and 52% cancelled; and in Post-intervention period (n=2527), 85% SC performed with 15% cancelled (p<.001) with a percent change of 74% increase in procedures.
➢ In Post-intervention group, DNP enrolled 930 patients of which 87% presented for procedure. Patients who did not present, received additional reminders.
➢ Bowel prep between groups showed no significant difference in quality.

Table 1. Baseline Characteristics of Study Cohort in Pre and Post Intervention groups.

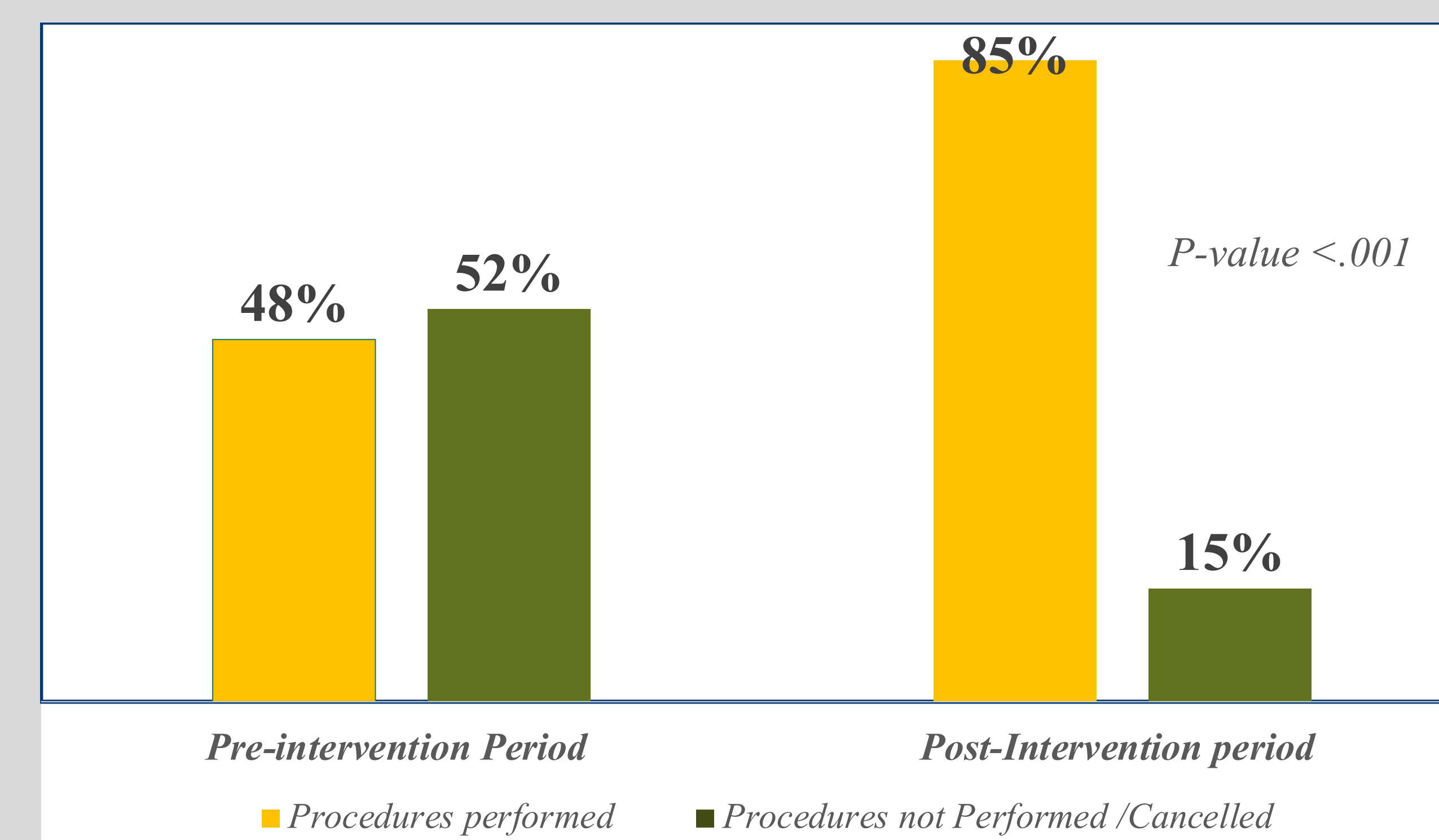| No. of Study Participants	Pre-intervention Period	Post Intervention Period
N= 3584	1057	2527
Age	60.4±7.7	58.9±9.0
Gender		
Male	460 (43.5%)	1068 (42.3%)
Female	594 (56.2%)	1430 (56.6%)

Chart 1. Comparison between SC performance rates among Pre and Post-intervention groups, with (P-value <0.05) as statistically significant

DISCUSSION

Our study highlights a significant increase in performance rates of scheduled screening colonoscopies with a 74% increase after implementation of a DNP and MyChart app utilization. Usefulness of digital applications in improving screening colonoscopy adherence and reducing no show rates, has been well studied in literature with promising results, but implementation on a larger scale is lacking. Especially after COVID-19 pandemic, it is warranted with technology to increase adherence to CRC screening and surveillance.

CONCLUSION

Improved patient's adherence to screening colonoscopies with utilization of digital technologies and applications could have significant impact on reducing morbidity and mortality related to CRC. It can help the clinicians to achieve the goal of early detection and treatment that have potential benefits for both patients and populations, therefore, studies to assess the effectiveness of such interventions on a broader scale are warranted.

REFERENCES

1. Siegel R, Desantis C, Jemal A. Colorectal cancer statistics, 2014. CA Cancer J Clin. 2014;64(2):104-117.
2. Levin B, Bond JH. Colorectal cancer screening: recommendations of the U.S. Preventive Services Task Force. American Gastroenterological Association. Gastroenterology. 1996;111(5):1381–4.

Abbreviations:

gFOBT: guaiac fecal occult blood testing
FIT: Fecal Immunohistochemical testing.
SC: Screening Colonoscopy
DNP: Digital Navigation program
EMR: Electronic Medical Record