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Review Article

Quality Improvement Strategies in Cancer Screenings Interrupted by COVID-19 in Primary Care

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Abstract

COVID-19 caused a quarantine that closed many primary care offices where patients were unable to receive their routine cancer screenings. The delayed cancer screenings lead to increased morbidity and mortality. A literature review of Breast, Cervical, and Colorectal (BCC) cancer screening compared to 2019 indicates that screenings have not returned to pre-pandemic levels. Several strategies were adopted to counteract this disruption including active outreach to at-risk patients, expanding the use of telehealth appointments, and offering home stool assay kits conducted at the patient's convenience. We looked at whether strategies were effective in a primary care office in NJ. We found that COVID-19 has increased the popularity of using stool-based home kits and made up the majority of CRC screenings, although overall screenings have remained below pre-pandemic levels. Cervical cancer screenings remain at low rates and may benefit from other routes of testing. Home HPV kits could be beneficial in diminishing the deficit and has already seen promising data in prior studies. Breast cancer screenings do not have a home-testing equivalent, however the popularity of telehealth appointments offers the opportunity to reiterate the importance of routine screenings. Telehealth has been shown to be beneficial in getting patients to complete their wellness visits and routine BCC cancer screenings as shown by the increase of wellness visits in the summer of 2020. Despite ongoing efforts, routine BCC cancer screenings remain 5% below what they were compared to 2019 and these strategies must continue beyond COVID-19 to address the BCC cancer screening deficit.

Keywords: COVID-19; Cancer screenings; Primary care

Introduction

Cancer screenings are recommended based on the extensive research done regarding the risks and benefits of increasing the rate of cancer detection and decreasing the morbidity and mortality from detecting late-stage cancers. Unfortunately, there were fewer cancer screenings due to the COVID-19 pandemic that led to delayed detection and treatment of cancers. The implication of this on the general population will be increased cancer morbidity and mortality in the years that follow [1-8].

During COVID-19, resources were being allocated to relief efforts and patients were reluctant to risk exposure by seeking routine screening or elective procedures. The number of cancer screenings declined by 90% for breast cancer and 80% for Colorectal Cancer (CRC) during March and April 2020. Post-pandemic monthly screenings still indicate more than a 13% decline compared to pre-pandemic levels for CRC screenings. Meanwhile, monthly breast screenings have returned to pre-pandemic levels. The groups most affected from the decreased screenings appeared to be in the northeast and with low Socioeconomic Status (SES) [3,5,6].

Several strategies have been applied in literature to combat the decline in cancer screenings. Overall themes include providing screening tools outside of physician offices to reach as many patients as possible and addressing gaps in healthcare access [2]. For example, CRC screenings shifted from offering colonoscopies to stool-based home testing to provide patients the flexibility of screenings on their time. Physicians are opting to discuss and assess cervical cancer screenings via telehealth to increase awareness of concerning signs and symptoms to bolster the importance of detection instead of offering pap smears immediately. Other strategies have been to educate staff on identifying patients that are due for screenings and are at risk for misaddressing health gaps. Unfortunately, except for CRC stool-based home testing, most formal cancer screenings continue to require in-office visits for a proper assessment [4].

McBain et al. conducted a study that looked at the decline and return of routine cancer screening rates in commercially insured individuals during the first seven months of the COVID-19 pandemic in 2020. Mammograms and colonoscopies declined by over 90% after the national emergency declaration. They found that screening numbers rebounded towards pre-pandemic baseline numbers towards the end of the summer months despite spiking COVID-19 numbers. This rebound indicated that health resources were being redistributed appropriately to address the concern of declining cancer screenings. They found that the sharpest decline in colonoscopy screenings was prevalent in those with a lower SES [3 5,6]. Ultimately, nationwide cervical cancer screenings remained 3% below pre-pandemic levels [15,16].

In 2020, the American Cancer Society (ACS) partnered up with Federally Qualified Healthcare Systems (FQHC) to participate in a *cancer screening during covid-19* from August 2020 to December 2021

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to facilitate a resumption of cancer screenings to decrease morbidity and mortality. The project consisted of implementing electronic health record enhancements, developing streamlined screening and referral processes, and reviewing data to assess areas that required improvement to reach pre-pandemic cancer screening levels. The project analyzed breast, cervical, and CRC screenings [2,4,7].

CRC Screenings

Originally, 50% percent of centers utilized stool-based home testing kits for CRC screenings which jumped up to 71% during the pandemic. This establishes the unique advantage of CRC screening in comparison to other cancer screenings - an at-home CRC screening alternative exists whereas other cancer screenings do not have this luxury [4].

Breast & Cervical Screenings

Physicians attempted to provide regular screenings via telemed during the pandemic, but the inability to have discernable diagnostic tests proved a significant limitation. Alternately, FQHC attempted to expand office hours and create new waiting room protocols to accommodate patients within social limitations. However, this increased office workload and a backlog of patients who were ultimately referred to other facilities [2,4,6,7].

Part of getting CRC screenings back to pre-pandemic levels may be the ease of administering home test kits. The potential to administer HPV home kit testing may also see the same success as CRC screenings [9,15-17]. In Australia and the UK, HPV home kits with PCR testing have been approved for use to improve outreach to underserved areas. Studies have shown that HPV collection with PCR testing had similar sensitivities for precancer and cancerous samples as physician collected samples [9]. Kaiser Permanente conducted a Home-Based Options to make Cervical Cancer Screening Easy (HOME) trial to address the low rates of routine cervical cancer screenings by mailing HPV self-sampling kits [16]. They showed that self-sampling returned high acceptability amongst women and no significant study in detecting CIN2+ in women who returned the home kits compared to usual care [15-17]. Approximately 59% of women with HPV-16 or HPV-18 positive results followed up in clinic. They found that mailing HPV kits to under screened women increased the rate of screening (26%) compared to usual care alone (17%) [15]. This increase suggests that HPV kits may play a part in addressing low rates of cervical cancer screenings.

Chen et al. conducted a national study looking at breast, colorectal, and prostate cancer screenings. He found that although the monthly rate of screenings appeared to be recovering, there remained a deficit in **total screening** from January to July 2020 compared to 2019. In other words, there was a deficit across the US population of 3.9 million women for breast cancer screening and 3.8 million men and women for colorectal cancer screening compared to screenings in 2019. Similar to McBain et al., Chen et al. also found the largest deficit in screening amongst lower SES indexes. They concluded that while **monthly** breast cancer screening rates seemed to recover fully by July 2020, CRC **monthly** screening rates continued to be 13% lower than in 2019 [1]. They found a positive association between using telehealth and cancer screening when adjusting for the SES index. Expanded telehealth use is advantageous in enabling patients to receive any type of medical attention and is not limited to prescribing stool-based assay kits or reminders to get routine cancer screenings [1,6].

Local Effects in NJ

In March 2020, a state-wide lockdown required a primary care office in Southern New Jersey to pause their services, causing them to employ similar strategies discussed above - identifying patients with overdue wellness visits, reaching out to patients about rescheduling said visits, and expanding telehealth services. We looked at annual wellness visits (Figure 1), then looked at metrics for cancer screenings - specifically breast, cervical, and colorectal - in 2019, 2020, and 2021 (Table 1). Finally, we assessed the number of stool-based home kits ordered within this timeframe (Table 2).

Figure 1 looks at the annual wellness visits that included CRC, breast, and cervical cancer screenings conducted in 2019, 2020, and 2021. As expected, overall cancer screenings dramatically declined in March 2020. Wellness visits began rebounding to exceed pre-pandemic levels from June to December 2020. While looking at 2021 data, one would expect numbers to continue to return to 2019 baseline levels or even exceed it to account for "catch-up" visits. However, wellness visits appeared to decrease in 2021 compared to

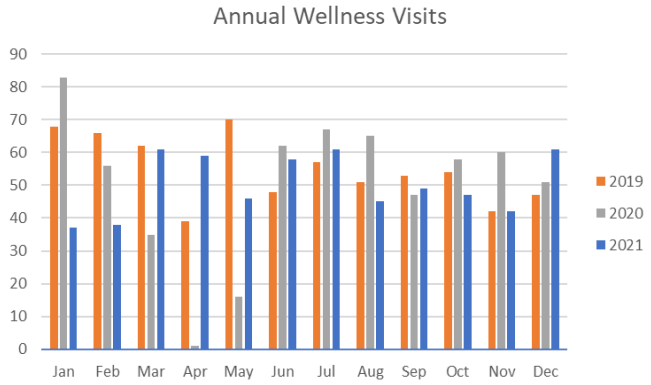

Figure 1: Annual wellness visits for 2019, 2020, and 2021. Arrow indicates a national emergency declaration and nationwide quarantine in March 2020.

Table 1: Measure of cancer screenings for eligible patients from 2019, 2020, and 2021 between Jan 1st through Dec 31st.

Measure	2019 Result	2020 Result	2021 Result
Breast	77.25%	72.88%	69.79%
Cervical	44.4%	37.65%	33.66%
Colorectal	79.14%	74.46%	74.05%

Table 2: Total CRC screening ordered in 2019, 2020, and 2021. Change from 2019 baseline reflects percent decrease in total CRC screening in 2020 and 2021.

Total CRC Screening			
Order	**2019**	**2020**	**2021**
FIT Kits	53 (94.6%)	24 (92.3%)	8 (18.2%)
Cologuards	0 (0%)	0 (0%)	19 (43.2%)
Colonoscopy	3 (5.4%)	2 (7.7%)	17 (38.6%)
Total	56	26	44
Change from 2019 baseline	—	-53.6%	-21.4%

2019. This data corresponds well with prior studies looking at the impact of COVID-19 on annual wellness visits [1,2,3,4,7].

We broke down the percentages of eligible patients who completed their breast, cervical, and CRC (BCC) cancer screenings in Table 1. We see that the highest rate of BCC cancer screening occurred in 2019 and treated it as baseline pre-pandemic levels. In 2020, screenings dropped about 5% across the board, with cervical screening having the highest decrease at 6.7%. The rate of cervical screenings in this office may not accurately reflect completed cervical screenings as most women tend to have their pap smears done at an outside facility (OBGYN). In 2021, we see that breast and cervical cancer screenings continued to decline while CRC screenings have remained relatively stable. Routine cervical cancer screening remained at the lowest levels compared to its counterparts. Overall, BCC cancer screenings have not returned to their baseline pre-pandemic rates compared to 2019.

Next, we looked at the number of stool-based tests ordered for 2019, 2020, and 2021 and compared them to traditional colonoscopy orders in Table 2. These included both FIT kits and Cologuard orders. Again, we treated 2019 to be our pre-pandemic baseline. FIT kits declined by over 50% between 2019 and 2020 and decreased by 67% from 2020 to 2021. At the same time, Cologuard orders increased to 43% of total CRC screening in 2021. This may be a reflection of provider preference to Cologuard's superior sensitivity (92%) compared to FIT kits (75%) [18]. Interestingly, colonoscopies remained a minority of total CRC screening in 2019, 2020, and 2021. This may indicate a patient's preference for stool-based home CRC screening as opposed to traditional colonoscopies. Although CRC screenings increased from 2020 to 2021, there continues to be a deficit from our 2019 baseline similar to national trends. Unfortunately, complete Cologuard records could not be retrieved for 2019 and 2020 due to a technical electronic record error, but this technicality does not affect the overall trend of patient preference towards stool-based home CRC screening.

Discussion

The true extent of COVID's impact will not be assessed until much later, but the effects of delayed cancer screenings are present in the clinical setting. A delay in screenings can lead to late-stage cancer and increased morbidity and mortality, the importance of cancer screenings must be reiterated [10]. Though primary care offices are focused on addressing the problem through outreach and providing alternatives to standards of care, screenings have not returned to their pre-pandemic levels. 'Catch-up after stop' modeling has shown that a delay of 3 and 6 months resulted in the least disruption to advanced cancer staging [9]. As screenings became delayed to 9 and 12 months, higher cancer-specific comorbidities were seen [6].

National CRC screenings have not yet returned to their pre-pandemic numbers. In 2020, CRC screenings were conducted at 61% for insured and 74% for medicare patients in 2020, furthering the goal of getting >80% of eligible patients screened. Unfortunately, national data collection for CRC screening has been suspended, with no new data for 2021 [11,12]. As seen in this primary care setting, CRC screenings have remained stagnant for 2021. Therefore, further research on effective measures is necessary to get screenings back to their pre-pandemic levels, at the very least.

Although monthly cancer screenings have returned to pre-pandemic baselines in certain studies [1-4,6,9], we saw a stagnant rebound from 2020 to 2021 across the board for BCC cancer screenings. During the March 2020 quarantine, patient outreach to schedule their routine wellness exams were made, along with educating them on the importance of cancer screenings. This may have played a role in the uptick of wellness visits seen in the summer months. Despite these ongoing efforts, routine BCC cancer screenings remain 5% below their numbers in 2019.

Even before March 2020, cervical cancer screening was at the lowest rates compared to its counterparts and may benefit from alternative screening methods. These rates could be explained by patients preferring to visit an OBGYN for their regular cervical cancer screenings [13]. In this case, screenings were recorded if patients had received their pap smears in-office as opposed to having it done at other facilities. Modeling after stool-based CRC home testing, Kaiser Permanente demonstrated that HPV home kits could address the lack of accessibility and discomfort of cervical cancer screenings [15].

Conclusion

During the pandemic, primary care offices employed different educational methods and alternative strategies to provide patient care amid a nationwide quarantine. These included offering more telehealth appointments, stool-based CRC home testing in place of colonoscopies, and regularly scheduled phone calls to remind patients of their annual wellness visits [2,7,8,9]. In some cases, outreach and the extension of healthcare visits by telehealth are beneficial in getting patients to complete their wellness visits and routine BCC cancer screenings [2,7,8,9]. These strategies must continue and beyond to effectively address the deficit that COVI-19 has brought on.

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