Optimization of a Tablet-based Depression Screening Workflow in Rural Primary Care

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Abstract

Depression is a common mood disorder with 8.3% of Americans above the age of 15 reporting a major depressive episode in 2021. This quality improvement (QI) project took place at a primary care clinic serving a rural community in Oregon where roughly a quarter of adults reported having depression in 2017. This QI project sought to improve staff perceptions of accuracy and efficiency of the Clinic's depression screening process, achieve greater staff satisfaction with provider notification of screening results, and increase depression screening rates. An educational video was created to bolster the tablet-based depression screening workflow and introduce the new workflow for provider notification of depression screening results. Pre- and post-surveys measured staff perceptions of tablet-based depression screening and staff satisfaction. Improvements were seen in staff perception of the efficiency of tablet-based depression screening and staff satisfaction with the workflow for provider notification of results. While there was no significant change in perceived accuracy following the intervention, respondents reported high perceptions of accuracy on the pre- and post-survey. Depression screening rates increased after the implementation of tablet-based screening and again after the training video intervention. These findings support current literature by demonstrating the acceptability of tablets as an effective modality for depression screening and means for improving screening efficiency and rates. Staff training is likely an effective tool for reinforcing new technology and workflows and can positively affect depression screening rates. Implementing processes to ensure provider notification of depression screening results presents an opportunity to increase satisfaction with screening practices.

Optimization of a Tablet-based Depression Screening Workflow in Rural Primary Care

Depression is a common mood disorder that causes significant morbidity and mortality in the United States (U.S.). In the U.S. depression is one of the leading causes of disability in individuals above the age of 15 (Siu, 2016). According to the 2021 National Survey on Drug Use and Health, 8.3% of Americans aged 18 years and older experienced a major depressive episode in the last year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2022). At the local level, 26.8% of adults in Douglas County reported having depression in 2017 (Umpqua Health Alliance [UHA], 2018).

The U.S. Preventive Services Task Force (USPSTF) (2023) recommends depression screening in adults, as the benefits of depression identification and treatment outweigh the risks of screening. A standard screening instrument for the identification of depression is the Patient Health Questionnaire (PHQ), which incorporates DSM-V criteria for depression and is used to diagnose and guide treatment (American Psychological Association [APA], 2022; Siu, 2016). The most common versions are the PHQ-2 and the PHQ-9 (see Appendix A). The PHQ-2 is a brief two-question screening that, if positive, triggers administration of the PHQ-9 (APA, 2022).

This quality improvement (QI) project took place at a primary care clinic in rural Oregon, which will hereafter be referred to as the Clinic. While routine depression screening was a standard of care at the Clinic, depression screening was further motivated by coordinated care organization (CCO) incentive measures and state quality measures that request documentation of annual screening of patients with Medicaid (Oregon Health Authority, 2022; State of Oregon Office of Health Analytics, n.d.). Documentation of screening results involved manual data entry and document scanning. Results were entered within the chart; however, there was no consistent method for notifying providers of results (see Appendix B). This lack of standardization created

space for missed screening opportunities, inaccurate documentation, and the potential for undertreated depression. Key stakeholders at the Clinic determined that a standardized depression screening workflow would positively impact patient care and CCO metrics.

Available Knowledge

Depression is a commonly underdiagnosed mental health condition (Kim & Lee, 2021; Pfoh et al., 2020). A systematic review by Costantini et al. (2021) found that the PHQ-9 is widely available in primary care settings and is a validated form of depression screening. The PHQ-9 is easily accessible, but there are varying methods of administration, including written, verbal, and electronic. New methods of digital screening can improve efficiency by decreasing the time it takes to conduct screenings (Costantini et al., 2021). New technology may improve productivity by increasing screening rates and decreasing costs (Kim & Lee, 2021). A meta-analysis by Kim & Lee (2021) found that tablet- and smartphone-based PHQ-9 administration have the same reliability as traditional verbal and written formats. Tablet and smartphone PHQ-9 administration was also found to be effective in the primary care setting (Kim & Lee, 2021; Pfoh et al., 2020). Conversely, there is evidence that verbal administration can create discrepancies in PHQ-9 validity and sensitivity (Ford et al., 2020; Pfoh et al., 2020). Emerging evidence suggests that novel forms of PHQ-9 administration, including online chatbox and voice-based screening, may be effective (Beaman et al., 2022; Dosovitsky et al., 2021).

Data also indicates that staff training can bolster depression screening efforts by positively impacting the effectiveness and efficiency of screening (Costantini et al., 2021; Pfoh et al., 2020). Evidence suggests that organizational training and focus on depression screening can improve screening rates; however, these findings did not control for simultaneous changes, such as the implementation of electronic medical record (EMR) alerts (Pfoh et al., 2020).

There is a dearth of literature on the topic of provider notification of depression screening results and its impact on patient outcomes. A systematic review found that routine depression screening in the primary care setting increased depression identification when screening results were relayed to providers (Habtamu et al., 2023). Additionally, evidence cited in the development of the USPSTF screening recommendation determined that informing providers of depression and suicide screening results improved patient outcomes (USPSTF, 2023). This QI project examined one approach to provider notification of results with the intent of contributing to this this gap in the literature.

In summary, current evidence favors electronically delivered depression screening over verbal screening to improve accuracy. Digital PHQ-9 administration via tablet can be an effective way to identify patients in the primary care setting who need further evaluation by a provider for a potential diagnosis of depression. Staff training may improve the effectiveness, efficiency, and success of clinic-based depression screening initiatives. Finally, provider notification of depression screening results may positively impact patient outcomes.

Rationale

Through a root cause analysis and a cause-and-effect diagram (see Appendix B) it was determined that variation in screening and documentation workflows decreased depression screening efficiency and accuracy and, in turn, may have negatively affected screening rates. Additionally, manual transcription practices increased the risk of inaccurate documentation and, consequently, missed opportunities for depression diagnosis and management by providers. Based on current research, the implementation of a workflow centered on tablet-based depression screening was deemed likely to improve efficiency, accuracy and screening rates in the Clinic's target population. The lack of a standardized approach to notify providers of results

prompted an update to the Clinic's provider-MA paper handoff form to include the PHQ-9 result and the patient's response to the suicidal ideation (SI) question in the PHQ-9 (see Appendix C). This form was revised with input from the clinic manager and a nurse practitioner at the Clinic.

This QI project utilized the Institute for Healthcare Improvement (IHI) Model for Improvement (MFI). The MFI framework includes defining an aim, identifying how to measure change and improvement, and determining what change will be tested (Institute for Healthcare Improvement [IHI], n.d.). The MFI then turns to the dynamic work of improvement with the Plan, Do, Study, Act (PDSA) cycle. The PDSA cycle is a four-step process used to rapidly test changes, make observations, and alter the intervention based on insight from each PDSA cycle. This cycle is typically iterative and can be repeated any number of times during the improvement process (IHI, n.d.). This model assisted in the successful establishment of a standard workflow that incorporated tablet-based PHQ-9 screening, seamless electronic documentation, and standardized provider notification of results through one PDSA cycle.

Specific Aims

The aim of this project was for staff to report increased accuracy and efficiency with the Clinic's tablet-based depression screening process and greater satisfaction with provider notification of results following staff training and implementation of the updated workflow. In addition, this project sought to support the Clinic in achieving higher depression screening rates.

Methods

Context

This QI project took place in a rural primary care clinic. There were five clinicians at the Clinic, including physicians, nurse practitioners, and a physician assistant, who will be subsequently referred to as providers. Other staff included six medical assistants (MAs), three

receptionists, and one scribe. There was one clinic manager who oversaw Clinic operations and supported QI projects. MAs were responsible for rooming patients, assisting in the completion of paperwork, taking vital signs, and making patient calls. Receptionists assisted with patient check-in, payment, scheduling, answering patient calls, and relaying messages to providers.

The local community has limited access to licensed mental healthcare professionals. Due to the scarcity of psychiatrists and psychiatric mental health nurse practitioners locally, many patients face extended wait times or referral to providers outside of the county. In Southern Oregon the licensed mental health prescriber to patient ratio was 8:10,000 in 2019 (Hemeida et al., 2019). Local primary care providers can help improve health equity and reduce barriers to mental healthcare services by increasing their knowledge of the diagnosis and management of common psychiatric conditions, such as depression. Furthermore, primary care practices are eligible for financial incentives from CCO metrics to screen patients for depression annually. This environment created a context in which the need for depression screening and treatment aligned with community needs and financial incentives for addressing this issue.

Interventions

An educational training video was created and distributed to all Clinic staff via email. This training provided guidance on the revised screening process incorporating the implementation of tablet-based depression screening, which was introduced in April 2023 with no associated formal training. The video also provided education on depression, screening criteria, and the new workflow for provider notification of PHQ-9 results.

A staff pre-survey was conducted prior to dissemination of the video. The survey used a five-point Likert scale and queried staff on their knowledge of depression screening, comfort explaining PHQ-9 screening, perceived value of depression screening, and the burden of

screening on their workload. Questions also explored staff perception of the impact of tablet-based screening on efficiency, accuracy, and screening rates since implementation (see Appendix D). The pre-survey results were analyzed and used to inform the development of the staff training video. The video was made available to all Clinic staff for one month, and the updated provider notification process was implemented immediately afterward. The post-survey was distributed one month following the implementation of the new handoff form (see Appendix E). The project PDSA cycle spanned the months of August-November 2023 (see Appendix F).

Study of the Intervention

The impact of the intervention was evaluated through post-survey responses. These were compared to pre-survey results to assess if the educational video and the implementation of the new handoff form impacted staff perception of depression screening, tablet use, and provider notification of results. A summary of monthly depression screening rates was internally generated by the Clinic for the period of January 1st, 2023, through December 31st, 2023, to evaluate for a change in screening rates after the intervention.

Measures

The primary outcome measure for this project was the change in staff perception of tablet-based depression screening accuracy and efficiency and staff satisfaction with the Clinic's process for notifying providers of PHQ-9 results. The secondary outcome measure for this project was the average monthly screening rate of patients with Medicaid insurance aged 18 years and older screened for depression between January 1st and December 31st, 2023. This measure evaluated for a change in depression screening rates following both the tablet implementation in April 2023 and the project intervention in October 2023. Process measures included a post-intervention staff survey question assessing intent to continue using the updated

workflow. A balancing measure for this project evaluated the burden of the screening process on staff. This intervention did not increase Clinic costs as the purchase of the tablet was made prior to the 2020 COVID-19 pandemic. The intervention potentially increased reimbursement by assisting the Clinic in meeting CCO metrics.

Analysis

Survey data was collected and compiled anonymously using Qualtrics. Quantitative analysis of the Likert scale responses was displayed using bar graphs to evaluate changes in staff knowledge, comfort with screening, and perception of the impact of the tablet-based screening and the updated workflow. Data on depression screening rates were analyzed within Excel and displayed using run-charts.

Ethical Considerations

All Clinic staff were informed of the project and participation in the survey and training was voluntary. Survey responses were collected anonymously; the only survey participant identifier was the respondent's role within the Clinic. The participating clinical site gave consent to the project by signing a letter of support. The author had no conflict of interest in conducting this QI project. This project was submitted to the OHSU Institutional Review Board and was deemed not human research and did not require further review.

Results

Fourteen staff members completed the pre-intervention survey, and 11 staff members completed the post-intervention survey. Data suggested that while respondents' perception of the efficiency of tablet-based depression screening improved (see Figure G1), there was no meaningful change in their perception of accuracy post-intervention (see Figure G2). However, respondents' perception of accuracy was consistently positive both pre- and post- intervention.

Clinical staff (provider and MA respondents) reported a significant increase in satisfaction with provider notification of depression screening results (see Figure G3) and a subtle increase in satisfaction with notification of SI results (see Figure G4). Of note, respondents reported an overall high satisfaction rate with both notification processes on the pre- and post-survey.

Process measures were addressed by the post-survey question assessing intent to continue using the updated workflow, with 72% of respondents reporting that they were somewhat or extremely likely to continue to use the updated workflow in the future (see Figure G5). Results for the balancing measure that evaluated the burden of the screening process on staff were equivocal, with a greater proportion of neutral responses post-intervention (see Figure G6).

Respondents were asked to identify challenges to tablet screening and recommendations for improving tablet use. In both the pre- and post-survey respondents indicated that patients not knowing how to use the tablet was the primary challenge to tablet use (see Figure G7). On the post-survey the majority of respondents agreed that increasing patient awareness (73%) and providing patients with more assistance (64%) would improve tablet use (see Figure G8). The surveys also queried staff on challenges they experienced when notifying providers of PHQ-9 results. In both the pre- and post-survey the majority of respondents agreed that major barriers included competing clinical tasks and competing patient concerns.

Post-survey data suggested that respondents experienced increased comfort explaining the purpose of the PHQ-9 and interpreting results after viewing the educational video. Findings also demonstrated that respondents had a slightly greater awareness of the value of depression screening for patients and the Clinic on the post-survey. While not outcome measures, improved staff comfort, awareness, and knowledge were associated benefits of the intervention.

Between January 1st and March 31st, 2023, the Clinic had an average monthly depression screening rate of 8.3 patients from the Clinic's target population. The implementation of clinic-wide tablet-based depression screening occurred in April 2023. The average monthly depression screening rate after tablet implementation increased to 24.6 patients for April through October of 2023. The Clinic maintained an average monthly screening rate of 29 patients after the end of the project period in November through December of 2023 (see Figure G9). The Clinic screened 49% of eligible patients during 2023, exceeding their CCO metric goal of 48.5%.

Discussion

Summary

This project sought to improve staff perception of accuracy and efficiency with the Clinic's depression screening process and achieve greater satisfaction with provider notification of results following a virtual staff training and implementation of an updated workflow. In addition, this project sought to support the Clinic in achieving higher depression screening rates. This QI project employed the IHI's MFI framework to plan and conduct one PDSA cycle and used pre- and post-surveys to evaluate the impact of training on staff perspectives. Post-survey results demonstrated an improvement in staff perception of the efficiency of tablet-based depression screening. No significant change was noted in staff perception of accuracy of tablet-based depression screening; however, perception of accuracy was high on both the pre- and post-survey. Among clinical staff (providers and MAs) there was a significant increase in satisfaction with provider notification of depression screening results and a small increase in satisfaction with notification of SI results following the intervention. Generally high satisfaction with both notification processes was reported on the pre- and post-survey. Monthly depression screening rates increased after the implementation of tablet-based screening between April and October 2023, and again after the end of the project period in November and December 2023.

Interpretation

The outcomes of this QI project included improved staff perception of the efficiency of tablet-based depression screening, improved satisfaction with the Clinic's workflow for provider notification of depression screening results and a small increase in satisfaction with SI result notification. Furthermore, there was an increase in depression screening rates after the initiation of tablet-based screening and again after the intervention.

Findings from this project cannot be directly attributed to the intervention. Staff perception of tablet use on the post-survey may have been influenced by a longer time interval from implementation; it is possible that the passage of time, rather than the intervention itself, may have led to greater familiarity with the tablet-based workflow. Due to the qualitative nature of this project's primary aim, no direct correlation between survey findings and screening rates was made. It is also worth noting the opportunity costs of this project. A major challenge to tablet use identified in the pre- and post-surveys included improving patient comfort with tablet use; however, further efforts to bolster tablet-use and acceptability among patients may take time and resources away from other clinic processes. From a systems perspective, patient experience may pose another opportunity cost, as their lack of comfort with this technology may have impacted their experience of the check-in process. While this was not a focus of this project, patient experience may warrant evaluation in future PDSA cycles.

The outcomes of this project reflected findings from current literature and support tablet use as an acceptable modality for depression screening. First, as suggested by Costantini et al. (2021), this project found that staff perceptions of the efficiency of tablet-based depression screening were high on both the pre- and post-survey. Furthermore, there was an increase in perceived tablet efficiency on the post-survey that was in line with the work of Costantini et al.

(2021) and Pfoh et al. (2020) who found that staff training can bolster depression screening efforts by positively impacting the effectiveness and efficiency of screening. Second, positive perceptions of the accuracy of tablet-based screening on both the pre- and post-survey were consistent with findings from Ford et al., (2020) and Pfoh et al. (2020). The lack of change in perceived accuracy may be due to the fact that tablets were implemented prior to the pre-survey, and thus the impact of the standardized result entry into the EMR was experienced prior to the pre-survey and was not affected by the intervention. Since the tablet-based workflow was introduced prior to the pre-survey, no measurement of baseline perceptions of accuracy was collected. Third, as the literature suggested, depression screening rates increased after the implementation of the tablet-based workflow, with further increases seen after staff training. (Costantini et al., 2021; Kim & Lee, 2021; Pfoh et al., 2020). These findings reinforce the benefits of tablet-based screening and reaffirm the value of staff training.

While findings showed positive perceptions of both depression screening and SI result notification before and after the modification of the handoff form, clinical staff reported a significant increase in satisfaction with depression screening result notification after the intervention. There was a more subtle increase in clinical staff satisfaction with SI notification post-intervention. Satisfaction outcomes were focused on respondents in clinical roles who actively interacted with the updated workflow. When administrative staff were included in this analysis there was no meaningful difference in satisfaction with result notification on the pre- and post-surveys, likely due to their lack of interaction with the updated results notification workflow in their role at the Clinic. These findings reinforce the importance of establishing a system to communicate screening results and demonstrate that clinical staff felt that the modification of the handoff form was an acceptable format to convey these results.

Limitations

The generalizability of this project may be limited due to the small sample size and specific constraints unique to the project site. First, the Clinic chose to utilize an existing paper handoff form to notify providers of depression screening results since this form was already in use. Other sites may have the capability to implement EMR-based notification systems, thus warranting further investigation of different formats for notifying providers of depression screening results. Second, the Clinic was only able to purchase one tablet due to limited resources. Expanding the use of this technology may further increase screening rates. Third, the Clinic implemented tablet-based screening prior to the creation of the pre-survey; consequently, there was no baseline data on staff perceptions of this technology.

Conclusions

Incorporating tablet-based screening and provider notification processes into depression screening workflows can increase the acceptability of screening processes, especially when combined with staff training. Furthermore, tablet-based screening has the potential to expand depression recognition and treatment by increasing screening efficiency and accuracy as well as screening rates. Integration of provider notification systems is important to staff satisfaction and depression identification. In this Clinic written communication was selected to conform with current practices; however, a similar notification process may be replicated electronically to serve different contexts. Tablet-based depression screening presents an opportunity for a similar application to screening for other mental health conditions, such as anxiety and bipolar disorder. Finally, while depression screening rates increased at the Clinic over the course of this QI project, patient outcomes related to depression screening and provider notification of results were outside the scope of this project but are a valuable topic for further inquiry.

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Appendix A

PHQ-2 and PHQ-9 Screening Forms

Patient Health Questionnaire-2 (PHQ-2)

Over the last *2 weeks*, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3

For office coding: _____0_____+_____+_____+_____

= Total Score _____

(Stanford University Medicine, n.d. a)

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

ID #: _____ **DATE:**_____

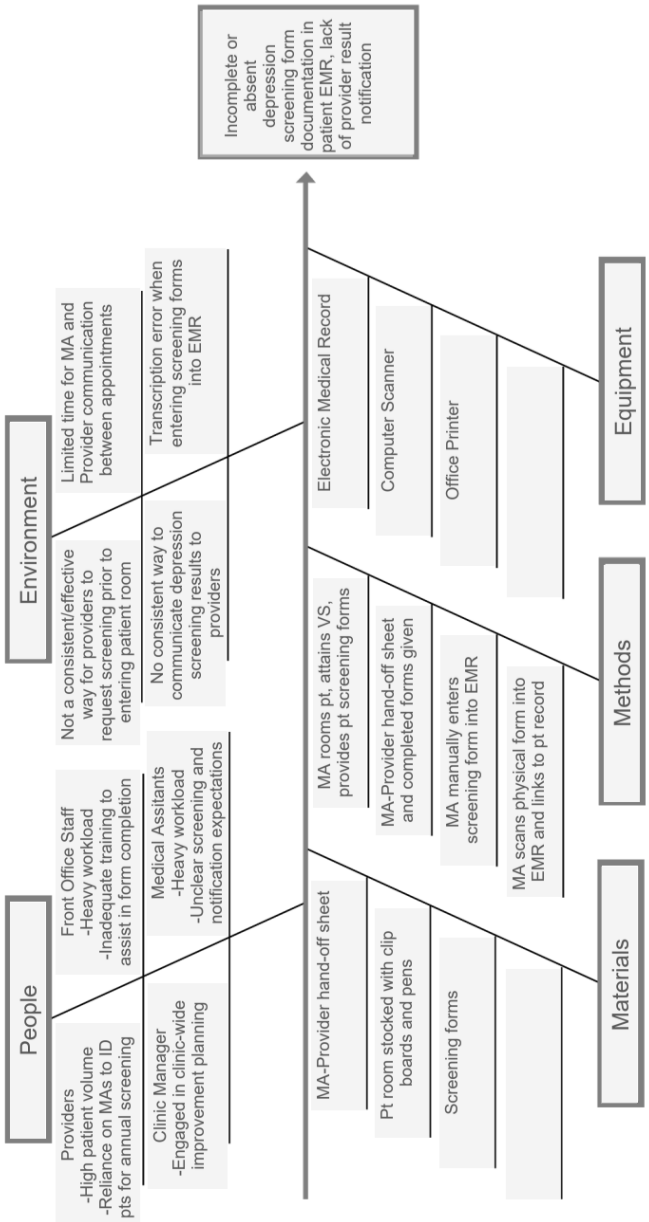
Over the last *2 weeks*, how often have you been bothered by any of the following problems? *(use "✓" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite — being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3
		add columns	+	+

(Healthcare professional: For interpretation of TOTAL, please refer to accompanying scoring card). TOTAL:

(Stanford University Medicine, n.d. b)

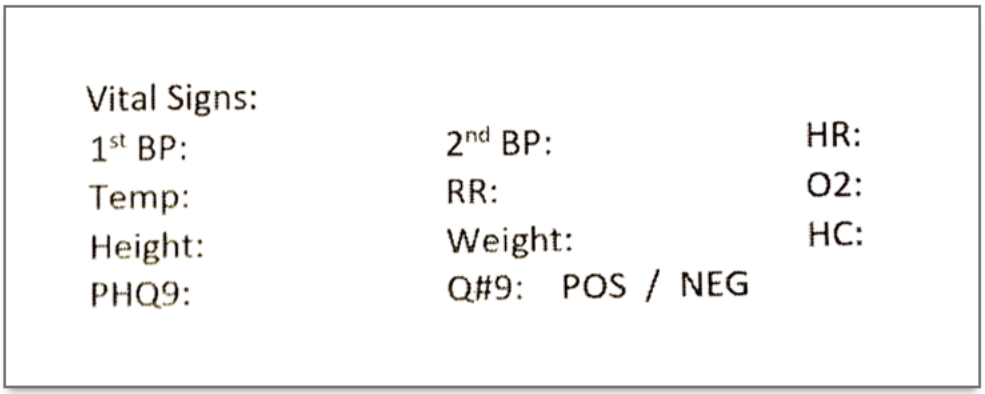
Appendix B

Cause and Effect Diagram



Appendix C

Updated Handoff Form



Appendix D

Pre-Survey

I feel comfortable explaining the purpose of the PHQ-9.	Extremely comfortable	Somewhat comfortable	Neither comfortable nor uncomfortable	Somewhat uncomfortable	Extremely uncomfortable
I am aware of the value of depression screening for patients.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am aware of the value of depression screening for the clinic.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel comfortable interpreting PHQ-9 results.	Extremely comfortable	Somewhat comfortable	Neither comfortable nor uncomfortable	Somewhat uncomfortable	Extremely uncomfortable
Since the clinic started using tablets for depression screening, I have noticed that the screening process is more efficient.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Since the clinic started using tablets for depression screening, I have noticed that screening results in the electronic medical record (EMR) are more accurate.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Since the clinic started using tablets for depression screening, I have noticed	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

that more patients are being screened for depression.					
Challenges I have noticed with tablet use include (select all that apply):	- Patients do not know how to use the tablet. - Staff are unsure how to use the tablet. - The tablet is out of battery when needed. - Other:				
Depression screening tasks add time to my already busy workday.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am satisfied with our clinic's system to notify providers of PHQ-9 results.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am satisfied with our clinic's system to notify providers of suicidal ideation from the PHQ-9 screening.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Challenges I have noticed for notifying providers of PHQ-9 results include (select all that apply):	-No time for verbal communication of results between MA and provider. -No written option for provider notification of results. -Too many competing patient concerns. -Too many competing clinical tasks. -Other:				

Appendix E

Post-Survey

Have you viewed the training video on depression screening and the workflow updates?	Yes		No		
I feel comfortable explaining the purpose of the PHQ-9.	Extremely comfortable	Somewhat comfortable	Neither comfortable nor uncomfortable	Somewhat uncomfortable	Extremely uncomfortable
I am aware of the value of depression screening for patients.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am aware of the value of depression screening for the clinic.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel comfortable interpreting PHQ-9 results.	Extremely comfortable	Somewhat comfortable	Neither comfortable nor uncomfortable	Somewhat uncomfortable	Extremely uncomfortable
Since the clinic started using tablets for depression screening, I have noticed that the screening process is more efficient.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Since the clinic started using tablets for depression screening, I have noticed that screening results in the electronic medical record	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

(EMR) are more accurate.					
Since the clinic started using tablets for depression screening, I have noticed that more patients are being screened for depression.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Challenges I have noticed with continued tablet use include (select all that apply):	-Patients do not know how to use the tablet. -Patients feel that tablet use takes too long. -Staff are unsure how to use the tablet. -The tablet is out of battery when needed. -Staff are unaware of tablet use. -Other:				
Ways the clinic can improve tablet use include (select all that apply):	-Improve patient awareness about tablet use (e.g. signage, instruction card, etc). -Provide patients with more assistance with tablet use. -Provide staff with more training on tablet use. -Create a process for tablet maintenance (charging, system updates). -Other:				
Have you seen or used the updated handoff form which includes a recording of PHQ-9 results?	Yes		No		
For the following 4 questions, please reflect on your experience <u>following</u> the implementation of the updated handoff form:					
Depression screening tasks add time to my already busy workday.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am satisfied with our clinic's system to notify providers of PHQ-9 results.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am satisfied with our clinic's system to notify providers of suicidal ideation from the PHQ-9 screening.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Challenges I have noticed for notifying	-No time for verbal communication of results between MA and provider. -Staff are not using the updated handoff form to notify providers of results. -Too many competing patient concerns.				

providers of PHQ-9 results include (select all that apply):	-Too many competing clinical tasks. -Other:				
How likely are you to continue to use the PHQ-9 section on the updated handoff form?	Extremely likely	Somewhat likely	Neither likely nor unlikely	Somewhat unlikely	Extremely unlikely
Please share any additional thoughts on how the clinic can improve its depression screening process:					

Appendix F

Project Timeline

	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan-March
Finalize project design and approach (703A)	X	X	X	X						
Implementation of Tablet-based depression screening at project site	X									
Complete IRB determination or approval (703A)					X					
PDSA Cycle (703B)					X	X	X	X		
• Pre-survey					X					
• Intervention: training video						X				
• Implementation of updated handoff form							X			
• Post-survey								X		
Final data collection of screening rates (703B)									X	
Final data analysis, write sections 13-17 of final paper (703B)										X
Prepare for project dissemination (703B)										X

Appendix G

Survey Data

Figure G1

Staff Perception of Tablet-based Depression Screening as More Efficient

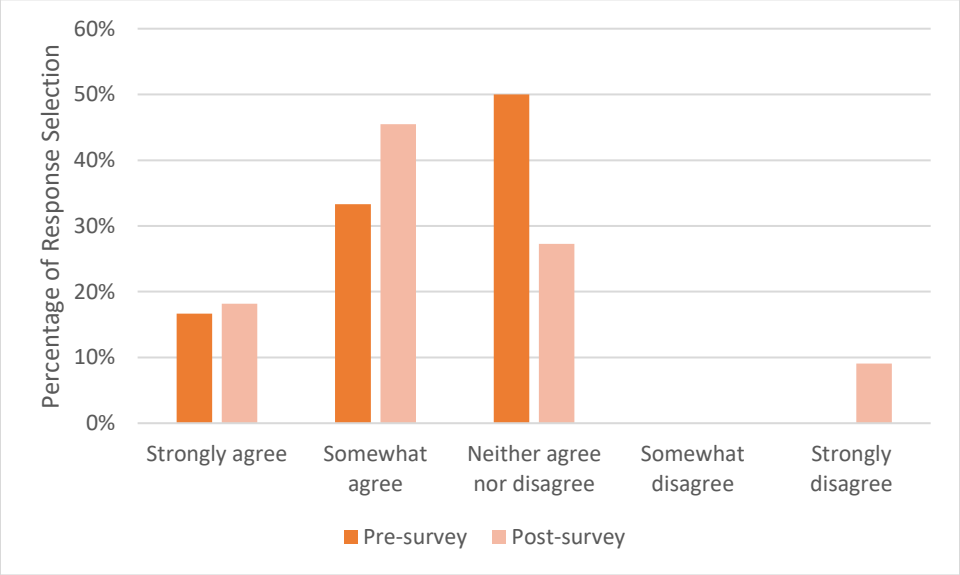


Figure G2

Staff Perception of Tablet-based Depression Screening as More Accurate

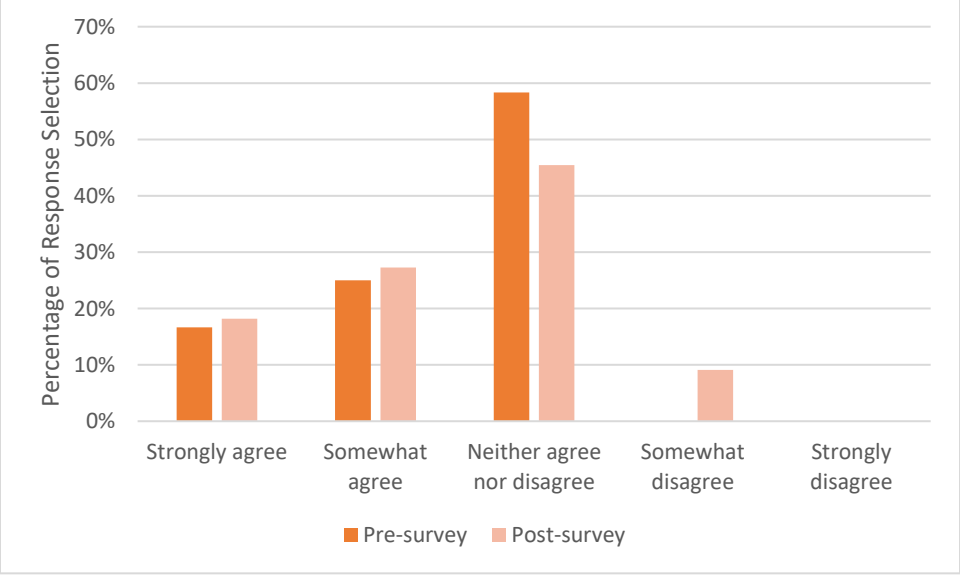


Figure G3

Clinical Staff Satisfaction with Provider Notification of Depression Screening Results

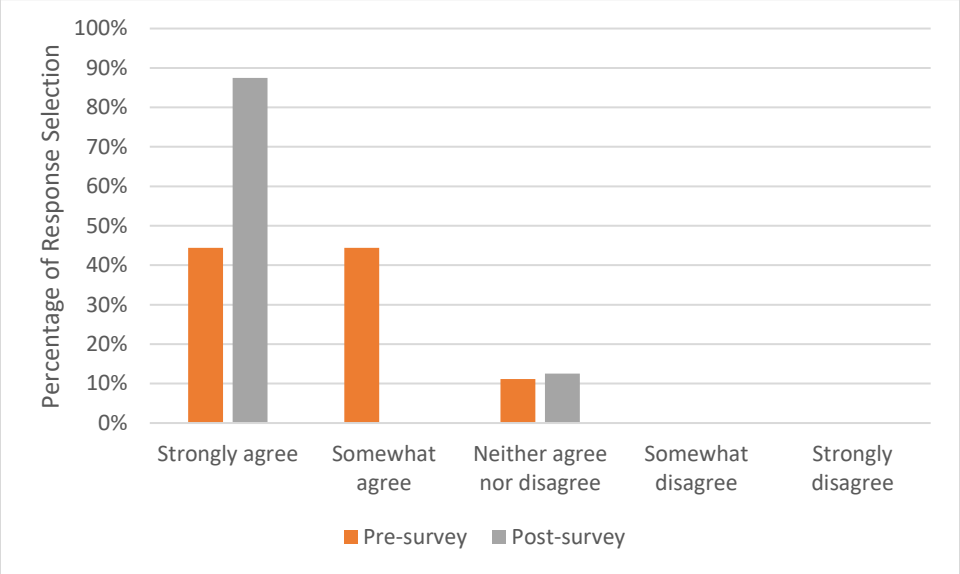


Figure G4

Clinical Staff Satisfaction with Provider Notification of Suicidal Ideation

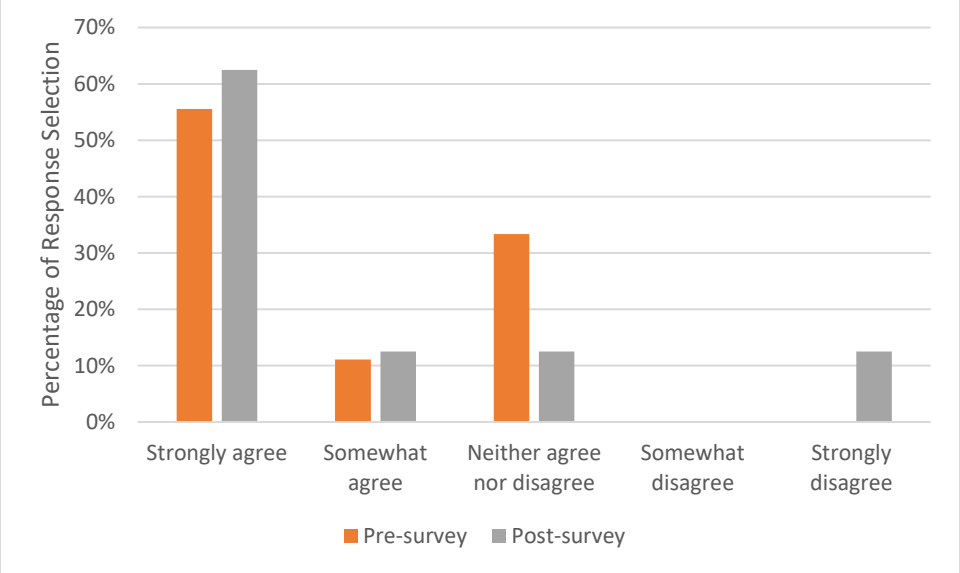


Figure G5

Likelihood of Continued Use of Updated Handoff Form

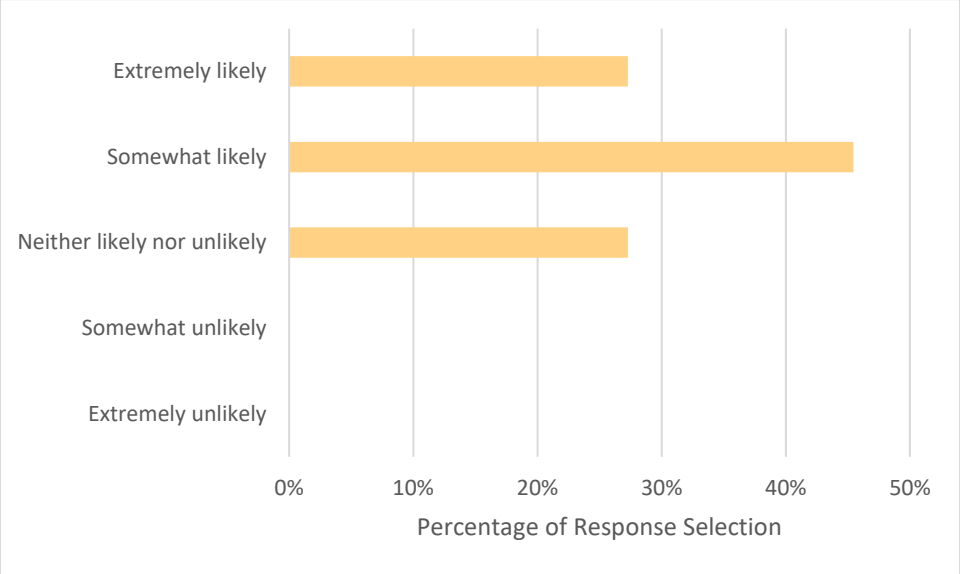


Figure G6

Depression Screening Tasks Add to Staff Burden

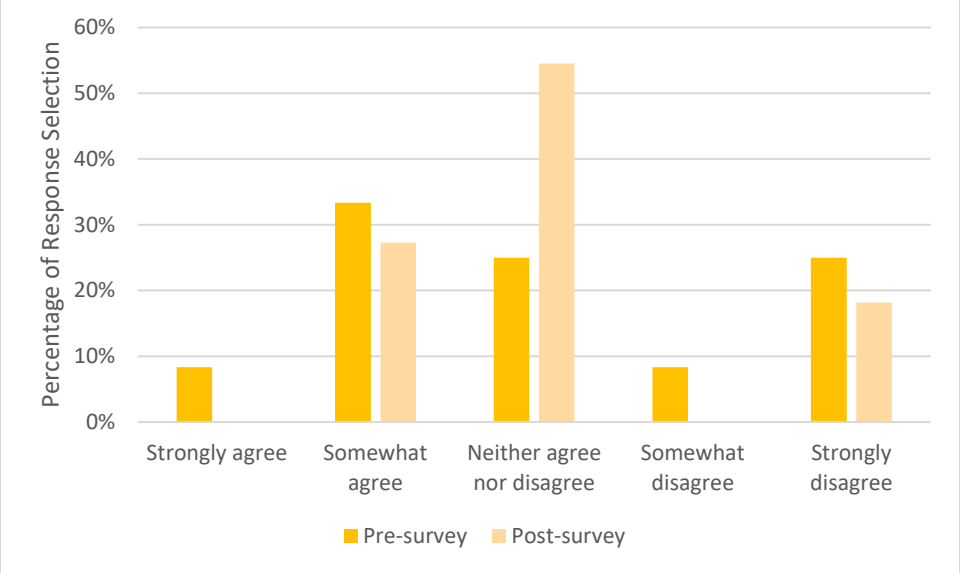


Figure G7

Challenges to Tablet Use Identified by Staff

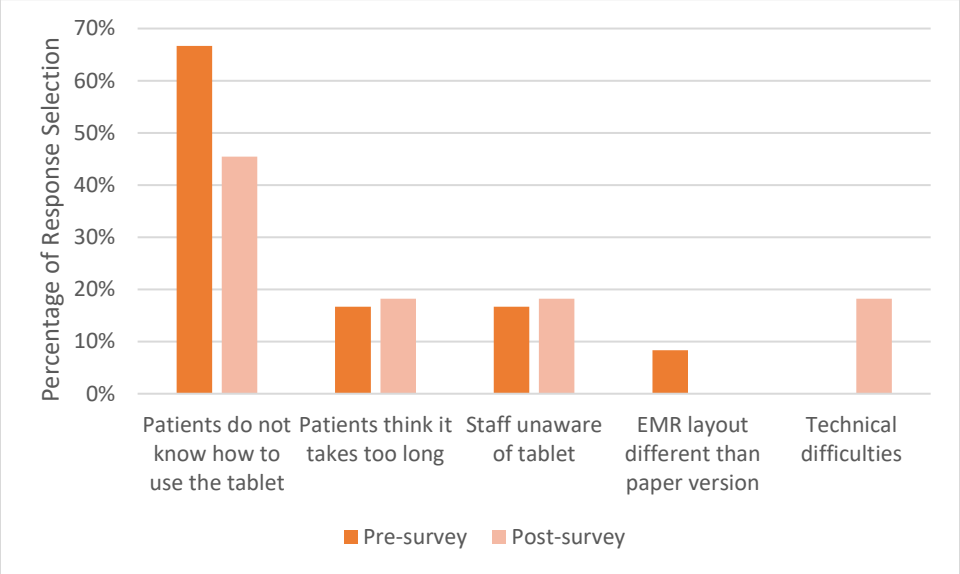


Figure G8

Staff Suggestions to Improve Tablet-use

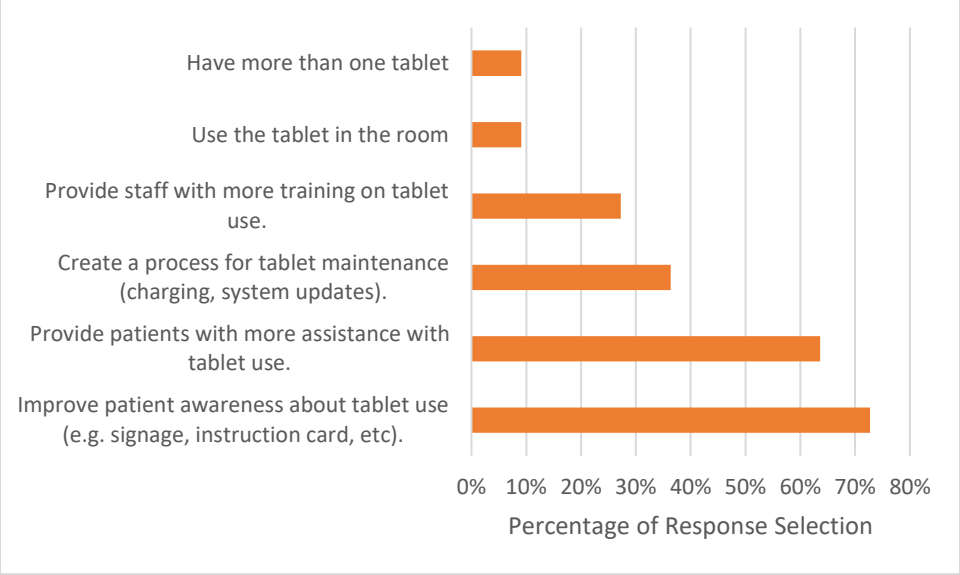
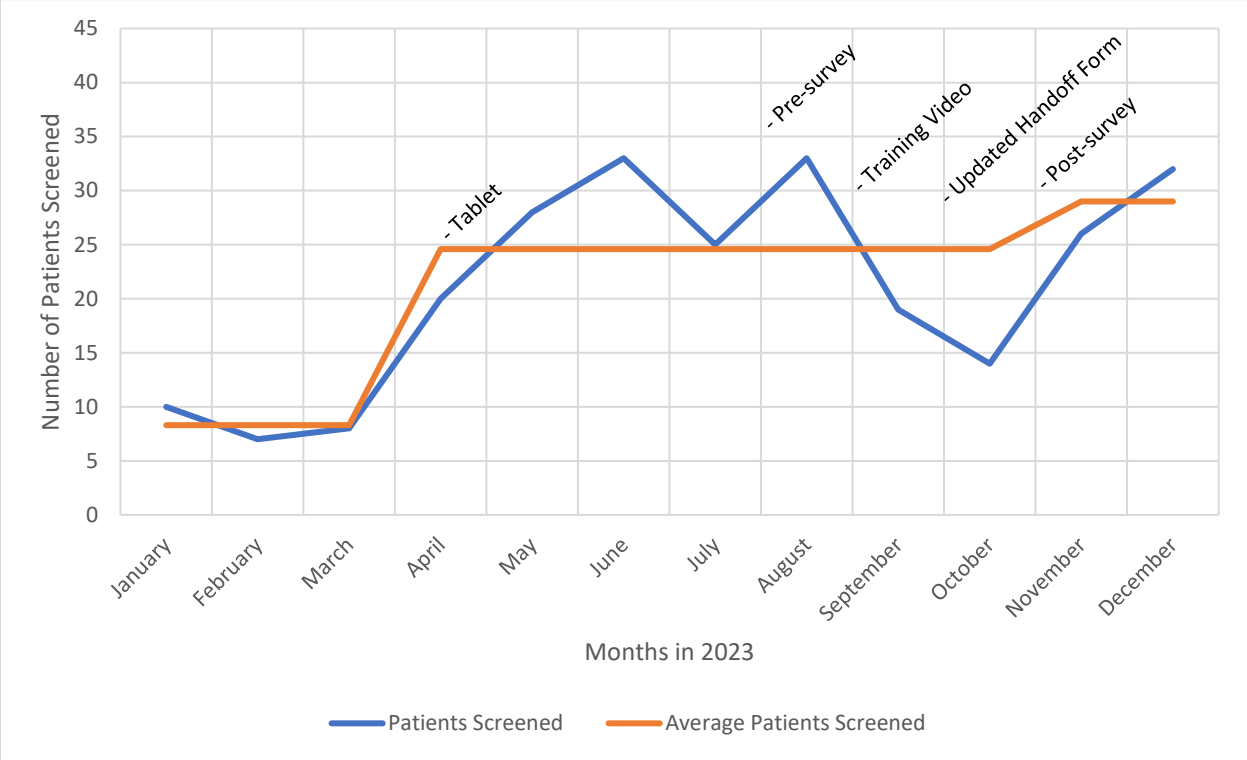


Figure G9

Clinic Patients Screened for Depression



Appendix H

Letter of Determination from IRB

OREGON HEALTH & SCIENCE UNIVERSITY

IRB MEMO

Research Integrity Office
3181 SW Sam Jackson Park Road - L106RI
Portland, OR 97239-3098
(503)494-7887 irb@ohsu.edu

NOT HUMAN RESEARCH

August 3, 2023

Dear Investigator:

On 8/3/2023, the IRB reviewed the following submission:

Title of Study:	Quality Improvement Project: Optimization of a Tablet-based Depression Screening Workflow in a Rural Primary Care Clinic
Investigator:	Jean McCalmont
IRB ID:	STUDY00026129
Funding:	None

The IRB determined that the proposed activity is not research involving human subjects. IRB review and approval is not required.

Certain changes to the research plan may affect this determination. Contact the IRB Office if your project changes and you have questions regarding the need for IRB oversight.

If this project involves the collection, use, or disclosure of Protected Health Information (PHI), you must comply with all applicable requirements under HIPAA. See the HIPAA and Research website and the Information Privacy and Security website for more information.

Sincerely,

The OHSU IRB Office