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DRIVING OPERATIONAL CHANGE: A FEASIBILITY STUDY OF A TARGETED QUALITY IMPROVEMENT TRAINING PROGRAM FOR INTEGRATED CARE TO ENHANCE PROVIDER KNOWLEDGE AND CONFIDENCE

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ABSTRACT

Driving operational change in healthcare requires targeted skill development to shift organizational culture toward patient-centric, integrated care. In October 2023, Southwest Network implemented a strategic 30-day educational intervention targeting healthcare providers managing patients with Serious Mental Illness (SMI) and comorbid Type 2 Diabetes Mellitus (T2DM). Recognizing a gap in communication readiness, this pilot program was designed as a feasibility study to boost provider knowledge and self-efficacy. Evaluating a cohort of ten providers with diverse tenure, pre- and post-intervention analysis revealed substantial positive outcomes. Provider knowledge increased significantly from 48% to 70%, alongside a marked improvement in communication confidence (Pretest: $M=3.80$, $SD=0.76$; Posttest: $M=4.50$, $SD=0.45$). These findings demonstrate that structured quality improvement (QI) training is a high-ROI strategy for fostering behavioral change in clinical staff, ultimately improving care delivery for complex patient populations. This session will outline the pilot's implementation framework and scalability for broader organizational adoption.

KEYWORDS: Healthcare, Integrated Care, Management, Operation, Quality Assurance, Training Program.

I. INTRODUCTION

Diabetes mellitus imposes a tremendous economic burden on the United States (US) healthcare system as ten percent of healthcare dollars are spent on direct costs associated with diabetes, and about half of diabetes-related healthcare costs are associated with potentially preventable complications [1]. Approximately nineteen million US adults experience severe mental illnesses (SMIs) and are at increased risk of developing diabetes mellitus, and they die twenty-five years earlier on average than the general population with diabetes [2],[3]. In this context, patients with SMI are defined as those who suffer from mental, behavioral, or emotional disorders that severely limit their lives for an extended period [4]. Patients with SMI also have double the risk of diabetes mellitus, as many of the antipsychotic medications used to treat SMI increase the risk of cardiovascular disease, obesity, type 2 diabetes mellitus (T2DM), dyslipidemia, and hypertension [5],[6]. The majority of Patients with SMI improve their health by reducing several major risk factors, including T2DM [6]. In addition to poor diet, obesity, inactivity, and antipsychotic medication, there are several other factors that are associated with this increased risk of T2DM [6],[7]. People with SMI may have a lower likelihood of receiving novel and intensive treatments that are affordable [7]. The majority of healthcare providers are not well-trained to handle Patients with SMI with diabetes [8]. Therefore, healthcare providers need to learn about diabetes in order to manage and minimize the life-threatening complications associated with diabetes in patients with SMI. In doing so, errors are reduced, patient care is improved, and the right thing is done [4],[9].

II. LITERATURE REVIEW

A. Knowledge Training for Healthcare Providers in Managing Patients with SMI with T2DM

There is a significant disparity in care provided to Patients with SMI due to differences in the knowledge and skills of mental health providers to deliver and support diabetes care on an individual basis [8]. A significant barrier to providing recommended care is the lack of knowledge about managing and monitoring T2DM, communicating with service users, and engaging with them [8],[10]. Moreover, mental health professionals are unaware of national and local guidelines for the treatment of Patients with SMI with T2DM [11]. In addition, healthcare professionals have reported feeling

despondent about the health of their patients with SMI, resulting in a negative impact on service user engagement and quality of care [10]. By implementing educational training programs tailored to the needs of mental health professionals, healthcare staff will be able to improve their knowledge of T2DM diabetes and develop future skills [12]. They will also be able to determine whether they possess the necessary knowledge to answer any questions about T2DM and provide relevant information in the future [12],[13].

B. Management in Healthcare Providers' Readiness Communication with Patients with SMI

The successful treatment of T2DM requires effective communication between healthcare providers and patients, especially among those with SMI [8],[14]. Communication skills are associated with increased patient satisfaction and adherence to treatment when used effectively in mental health interactions [4]. There has been evidence that patient-centered communication is associated with positive health outcomes, increased patient satisfaction, reduced medical expenditures, and the prevention of malpractice litigation [15],[16]. Considering that the care pathways of individuals with SMI and diabetes are often fragmented and complex, a communication skills knowledge training program in conjunction with patient-centered communication would facilitate long-term health improvement for Patients with SMI and their healthcare providers [17]. The implementation of a program that enhances communication with Patients with SMI will assist in identifying the level of readiness of healthcare professionals to provide information on T2DM to Patients with SMI with diabetes [18].

C. Staff Training Program Effectiveness and Quality Improvement

Developing a well-trained workforce through multimodal learning approaches and standardized training assessments is key to the success of any organization or industry [19]. A better understanding of workforce training needs will boost individual and team confidence, knowledge, and skills in any organization [19], [20], [21]. The impact of an effective one-time resilient training program that combines in-person training, brief knowledge sessions, hands-on practice, end-of-training toolkits, and ongoing online follow-up is greater than the impact of multiple self-assessment online sessions [22], [23]. A culture of quality improvement requires widespread training and adoption of QI knowledge and skills [24], [25].

As part of QI initiatives, there are three types of curriculum elements: organizational elements, participant elements, and curriculum elements [24]. Combined with formal educational strategies, experiential projects result in an improvement in the use of evidence-based guidelines by individuals and teams [26]. The implementation of a quality plan-do-study-act cycle (PDSA) will also contribute to the long-term sustainability of training programs as it is easily adaptable regardless of practice size or resources [18]. Using multimodal learning approaches in combination with PDSA and improvement model training frameworks, training programs can be tailored to the needs of an organization, with elements of each program being used to build a more comprehensive and effective training program [27], [28], [29].

III. RATIONALE

Healthcare providers are limited in their knowledge management and communication skills related to quality improvement and knowledge training for Patients with SMI with comorbid T2DM [30], [31]. A lack of knowledge among healthcare providers leads to low utilization of diabetes knowledge and poor communication [30], [31]. Through the implementation of a program enhancing communication with patients with SMI and T2DM, healthcare providers will be better able to identify their level of knowledge and readiness to provide necessary information to this population group, resulting in improved communication and greater patient engagement in care quality [31], [32], [33].

A. Problem Statement

Southwest Network (SWN) is an outpatient mental and behavioral health facility in the Greater Phoenix area. There was currently no standard diabetes education program or assessment for healthcare team members managing patients with SMI and T2DM within SWN. An educational training program was created as part of the quality improvement project to further aid the company in developing self-management programs for diabetes patients of SMI. The quality improvement project focused on the implementation of a diabetes training program for healthcare providers that improved fundamental diabetes knowledge, increased employee retention of diabetes knowledge, increased engagement, and increased confidence when delivering diabetes information to Patients with SMI. The knowledge level and confidence level were assessed before and after the educational training

program via pretest and posttest survey data collected from the educational training program during one of SWN healthcare staff's weekly meeting sessions.

Secondary care has even higher indication rates for diabetes mellitus and Patients with SMI up to thirty percent with the worst achievement target than the community or self-management programs [8], [34]. Respectively, this costs patients with SMI a burden of almost two million dollars per lifetime cost of overall treatments [35]. Despite the existence of several studies and methods pertaining to the management of patients with SMI or diabetes in the United States, no proper management model has been developed to assist healthcare providers in enhancing knowledge and communication readiness for patients with SMI with T2DM.

B. Research Questions

- (1) Will integrated healthcare team members' T2DM knowledge (DV) significantly increase following the SMI Diabetes 101 educational program (IV)?
- (2) Will integrated healthcare team members' confidence level in their ability to manage patients with SMI and DM2 (DV) significantly increase following the SMI Diabetes 101 educational program (IV)?

C. Specific Aims

This project aimed to enhance SWN-integrated healthcare team members' fundamental diabetes knowledge, reflected in the improved healthcare team members' confidence level in the ability to manage patients with SMI and T2DM. Evidence-based practices indicated that effective communication skills improved patient satisfaction and adherence to treatment [4]. It was anticipated that the SMI Diabetes 101 educational program would significantly increase the fundamental knowledge of SWN healthcare team members in T2DM by approximately 30 percent and the confidence level of SWN healthcare members in providing diabetes education to Patients with SMI by at least 20 percent.

D. Hypotheses

- (1) Integrated healthcare team member's T2DM knowledge (DV) will significantly increase following the SMI Diabetic 101 educational program (IV) as evidenced by pretest and posttest changes on the diabetes educational survey.
- (2) Integrated healthcare team members' confidence level in their ability to manage patients with

comorbid SMI and T2DM (DV) following the SMI Diabetes 101 educational program (IV) as evidenced by pretest and posttest changes on the diabetes educational survey.

IV. METHODS

A. Context

The quality improvement project was conducted at Southwest Network (SWN), Phoenix Arizona from one of the four adult clinical sites during weekly team meetings to improve healthcare providers' knowledge and communication readiness of Patients with SMI with T2DM. SWN is an outpatient non-profit Federally Qualified Health Center (FQHC) serving infants, children, adolescents, and adults with mental illnesses. The SWN offers services and treatment for adults and children with serious mental illnesses and those who need support with general mental health and substance abuse issues. Aside from helping throughout the entire recovery process, the facility also provides health maintenance and medication management services for those who are experiencing acute symptoms. SWN providers include doctors, nurses, and other direct care professionals who treat thousands of patients each year. Substance Abuse and Mental Health Services Administration (SAMHSA), Primary and Behavioral Health Care Integration (PBHCI) level of integration considers most SWN adult clinics to be level three co-located with basic collaboration onsite [36]. Most of SWN's operations take place within the same facilities. SWN is a team-based mental and behavioral healthcare organization seeking to be integrated fully. The development and execution of this Quality Improvement (QI) initiative were conducted in close collaboration with site leadership. Key stakeholders, including the Chief Operation Officer (COO) and the Senior Director of Clinical Operations, provided administrative oversight and served as primary liaisons for the integration of the training into existing clinical workflows.

A key stakeholder in this project was the upper quality and training management team, which included the Chief Operation Officer (COO) and the Senior Director of Clinical Operations. Additional stakeholders included psychiatrists, primary care providers, nurses, and healthcare staff at adult sites. Participants in the training program included on-site stakeholders such as primary care providers, behavioral health providers, site coordinators, social workers, and other administrative staff. The upper management administrative team was responsible for deciding whether to launch the intervention, including the Senior Director of Clinical Operations

and COO. Stakeholder engagement was conducted using a PDSA approach [37]. An initial step in identifying the problem was to interview the program lead, the Senior Director of Clinical Operation and Quality Compliance Chief, about the intervention expectations and project scope through a scheduled weekly Zoom meeting. As a next step, the overview plan PowerPoint presentation was designed to propose intervention ideas and implementations for approval by the project champion. During presentation sessions or through email communications, feedback was gathered from the project champion. The project champion selected an adult site for data collection during an on-site mandatory weekly team meeting once the program and survey had been approved. Health care adhered to the upper management team's final decision regarding company training. Weekly internal announcement emails were sent to on-site healthcare team members regarding the training program intervention.

The quality improvement project attempted to improve the knowledge and confidence of SWN healthcare staff regarding communicating with Patients with SMI who have comorbid diabetes. Internal and external team communication was included, as was staff scheduling for training and surveys. Further, the training program reviewed staff training policies as well as historical usage records of toolkit documents containing fundamental information about diabetes for healthcare providers, diabetes emergency care steps, healthy-eating plans for diabetic patients focusing on people of middle- to low-income groups, communication steps with patients with SMI, and external resources about diabetes and SMI patients.

B. Intervention

The educational training program in T2DM for Patients with SMI at SWN session was developed based on the summary of American Diabetes Association 101 for the Behavioral Health Professional courses. The training included a mixture of learning videos, quizzes, and case examples.

An effective survey methodology was developed by following a seven-step approach to implement training with healthcare staff. The approach involved conducting a literature review, conducting routinely attempted weekly interviews with key stakeholders, providing coaching, synthesizing the results from the literature review and interviews, developing questions, establishing content validity through expert interviews, conducting in-person face validity cognitive interviews, and conducting pilot testing.

The training was conducted for SWN healthcare providers and staff from one of SWN adult sites with pretest and posttest-survey using Kirkpatrick's evaluation four-level implementation

The pretest and posttest evaluation surveys were conducted for the healthcare professionals participating in the training program before and after the training sessions that identified the training effectiveness. The pretest and posttest evaluation surveys were based on the Centers for Disease

Control and Prevention (CDC) guidelines for effective training development [39].

Following the training day, a weekly follow-up survey was sent via email to the same group of participants for four weeks to evaluate training effectiveness and program likeness. Toolkits were developed and delivered to the participant team as part of the training slide deck to use as an assisting tool during work hours (See Figure 1 for SWN Diabetes Toolkit Samples).

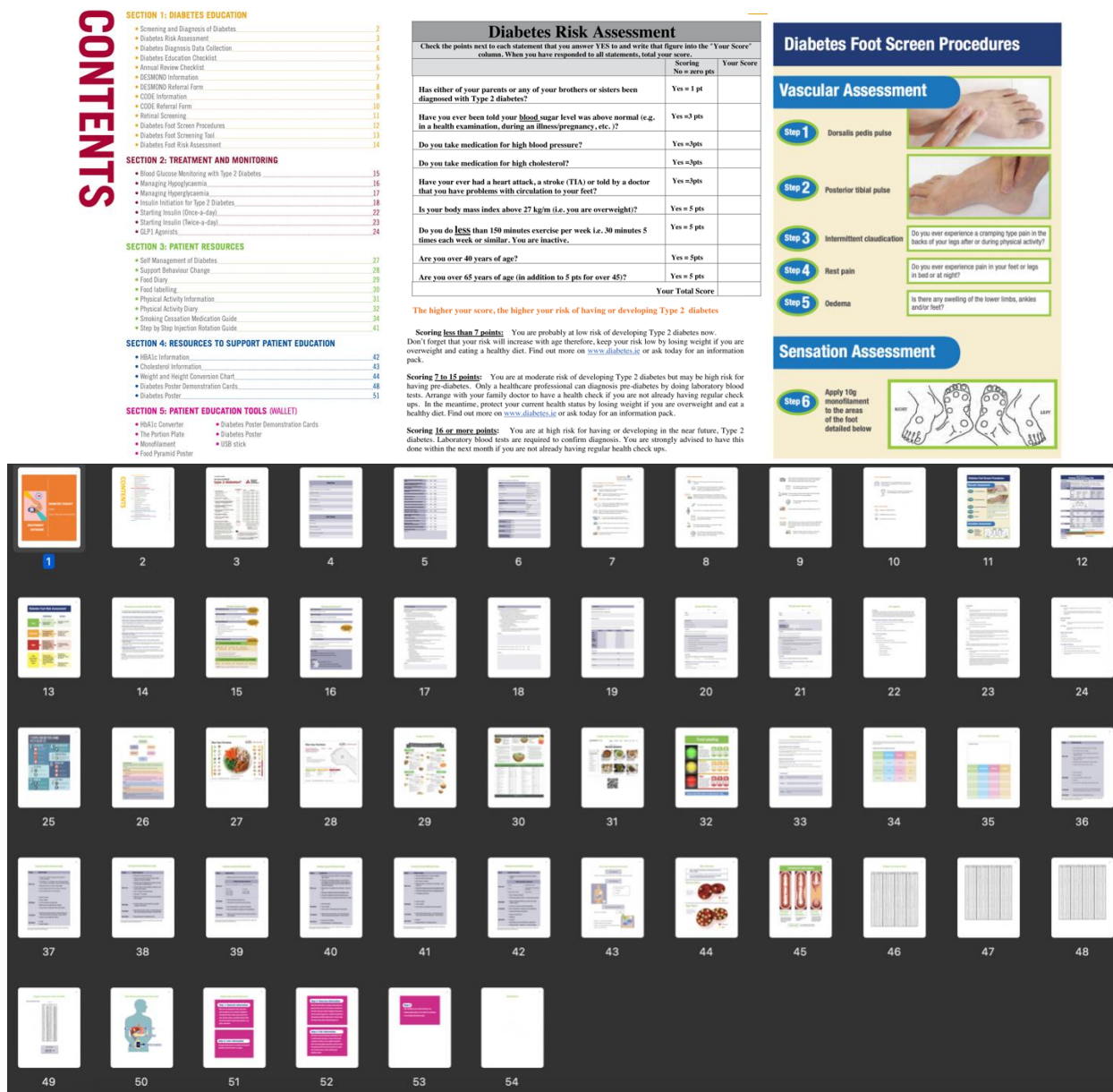


Figure 1: SWN Diabetes Toolkit

1) Steps for Completing the Project

The educational training program for healthcare staff knowledge in T2DM used Analyze, Design, Develop, Implement, and Evaluate (ADDIE) [39]. After upper management level preferences were

analyzed regarding training approaches via interview, a Microsoft PowerPoint presentation design was developed with embedded short learning videos and quizzes between each video session. The number of embedded videos was based on the training session granted by key stakeholders. The

content included a Diabetes overview, T2DM urgent care, T2DM management, and communication skills for Patients with SMI. The video programs were selected using CDC diabetes basics (CDC, 2019). For data security, all pretest and posttest surveys were completed in one setting of the educational training sessions in an RCT weekly team meeting via a paper-based handwritten survey. Additionally, there was a weekly follow-up survey on change in knowledge for 4-5 weeks.

2) *Study of the Intervention*

The purpose of the intervention was to increase SWN healthcare staff's T2DM fundamental knowledge and confidence level in communication readiness with Patients with SMI with T2DM. A pretest and posttest quantitative research was used with two measurement points, a pretest survey, and a posttest survey, that evaluated the educational training intervention's effectiveness. A pretest and posttest surveys measured the effects of the intervention on the healthcare staff's T2DM knowledge and confidence level with Kirkpatrick's evaluation model implementation as well as the use of the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule and Electronic Health Information protocols during the collection process of the data from the participants. Results were compared before and after the intervention. The project also relied on statistical methods to adjust for potential confounding variables, including professional role, years in practice, years at the site, and language proficiency. Furthermore, all findings, including unintended consequences such as provider burnout and scheduling disruptions, were formally presented to and reviewed by the organization's executive leadership. The COO and Senior Director of Clinical Operations have reviewed and approved the disclosure of these results for external presentation and publication, recognizing the findings as a transparent contribution to organizational learning and future QI strategy

V. MEASURES

A. *Knowledge-Based Cross-Sectional Pretest and Posttest Survey*

There were both open and closed ended questions on the knowledge-based pretest and posttest surveys. There were altogether 14 questions in the survey, including closed-ended questions on a Likert scale and multiple-choice questions with one response or multiple responses depending on the questions. The Likert scale ranges from 1 = "Very

Low" to 2 = "Low", 3 = "Neutral", 4 = "High", and 5 = "Exceptional", rating scales. In addition, for multiple choice responses, each answer was labeled with a score, which was added up to the total score. The range of multiple-choice responses was divided into 4 ranges of 0-14 = "Fundamental," 15-30 = "Novice," 31-46 = "Intermediate," and 46+ "Advanced." The measurement was selected for the intervention because it assessed healthcare staff's perceptions of changes in their knowledge and skills, personal attributes, or impact on their future behavior and aspirations. Healthcare staff was asked to assess their base knowledge of diabetes and their ability to communicate with SMI to determine if they possess the necessary skills to perform on the job. Using face and criteria-related validation to facilitate staff's knowledge so that respondents who performed poorly in the pretest survey section were expected to perform better in the posttest survey section. DV1 was evaluated by the survey, which reflected the healthcare staff's knowledge and experience with T2DM and patients with SMI. The measure was chosen because it met the needs of the leadership team and aligned with the quality team's expectations.

B. *Confidence-Based Assessment Pretest and Posttest Survey*

As a part of the pretest and posttest survey, five individual close-ended questions assessing the confidence level of healthcare staff were administered by the participants anonymously. Each of the knowledge check questions included a confidence level check question embedded within it. There was also a Likert Scale ranging from 1 = "Very Low" to 2 = "Low", 3 = "Neutral", 4 = "High", and 5 = "Exceptional", rating scales, and multiple-choice responses. It was intended to assess healthcare personnel's sense of confidence in their ability to deliver diabetes and SMI messages to Patients with SMI by asking knowledge questions that rechecked their understanding. The inter-rater reliability indicator indicated the likelihood that test scores were consistent if the test was scored by two or more raters. Evaluating healthcare staff's confidence level of readiness in managing communication with Patients with SMI with T2DM using content and face validity. DV2 was evaluated by the pretest and posttest survey to reflect on the healthcare staff's level of confidence in communication readiness for Patients with SMI with type 2 diabetes. In addition to meeting the goals of the company's quality team, this measure was selected to meet the leadership team's requests.

C. Posttest-Training Follow-Up Survey

Individual participant received an email of the posttest-training follow-up survey every week for four to five weeks following the training program. The survey of a posttest training evaluation checked for staff's satisfaction and the training effectiveness. The questions were the Likert scale ranges from 1 = "Strongly Disagree" to 2 = "Disagree", 3 = "Neutral", 4 = "Agree", and 5 = "Strongly Agree", rating scales. The intended questions identified the delayed confidence level and knowledge used after the training. The inter-rater reliability indicator indicated the likelihood that test scores were consistent if the test was scored by two or more raters. After the training, a follow-up survey determined the healthcare staff's level of confidence in communicating, program effectiveness, and likeness. DV2 was evaluated for any significant changes. The measure was chosen based on meeting the leadership team's needs to align with the quality team's expectations.

D. Analyses

This quality improvement project improved SWN healthcare staffs' T2DM knowledge and confidence level when communicating with Patients with SMI with T2DM. Methods that were used in data analysis by the DBH student to make significant changes included descriptive statistics that summarize the demographic data from the demographic section, including gender, ethnicity, position level, and length of work for the company. For healthcare staff knowledge checks, pretest and posttest paired

samples *t*-tests were used to test for differences between pretest and posttest scores.

Furthermore, the confidence level of healthcare staff was also measured using paired samples *t*-tests comparing pretest and posttest scores in a set of paired samples using two-tailed tests. As opposed to one-tailed tests, this test tests for the possibility of an effect in two directions of positive and negative effects on two critical regions instead of just one direction. An alpha level of $p \leq .05$ was used to determine the significance of the results.

VI. RESULTS

A. Implementation

Following the approval of the educational program training proposal by the COO, project champion, the training was conducted the following week at clinical sites selected by the upper management team for implementation. Site selection was based on criteria set by management and site liaison. Inclusion includes healthcare providers with more than one year's experience working at the adult mental health clinic site and the site with the highest number of Patients with SMI with T2DM. Training was conducted during weekly team meetings with 2 participants selected. From beginning to end, Figure 1 illustrates the process of the SWN educational training program. The same group of participants was assessed both before and after the educational training program in terms of their knowledge and confidence in communicating with Patients with SMI with diabetes comorbid with SMI.

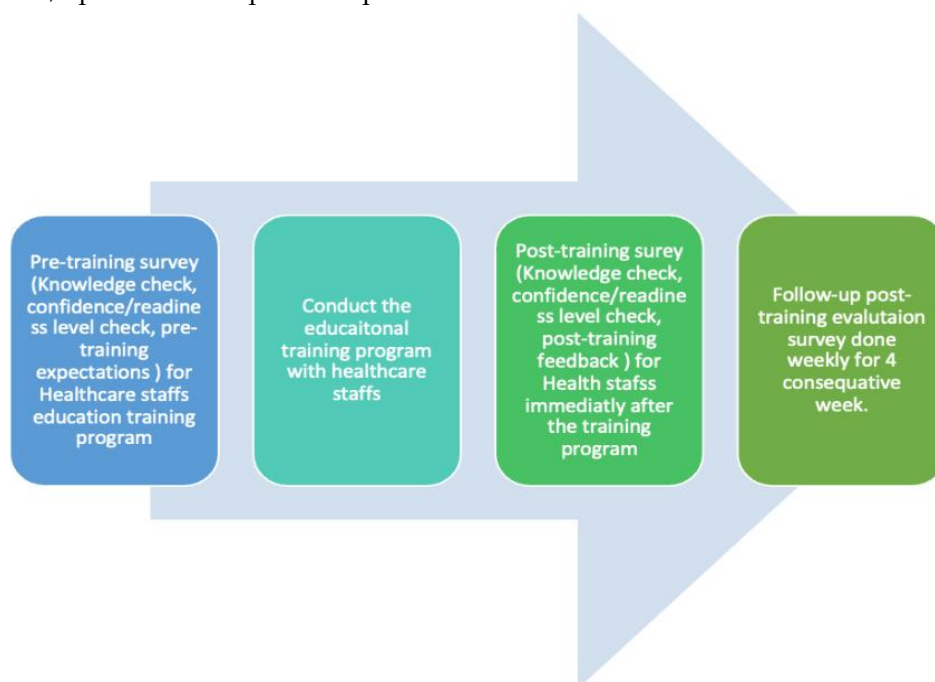


Figure 2: SWN Educational Training Program Framework

To assess each participant's understanding of diabetes as well as their level of confidence in communicating diabetes knowledge to their patients, a pretest questionnaire was administered before the 30-minute educational program began. The training session provided ten participants with an opportunity to interact with the trainer regarding any questions they may have regarding the training program. After completing the training program, the same group of participants were given the same questionnaire to assess their knowledge and confidence. After training, participants completed weekly questionnaires for four weeks to determine their satisfaction, knowledge, and confidence, with confidence and satisfaction increasing and knowledge decreasing.

Most participants were cooperative and attentive to the training program. Due to the nature of the SMI clinical site, some weeks, clinicians were much busier

than others, resulting in some delays in survey responses. Staff preferred in-person interaction with the site rather than virtual interaction throughout the intervention since all participants completed all survey questionnaires. As opposed to in-person interactions, surveys sent via email had fewer participants who successfully completed them.

VII. INTERVENTION OUTCOMES

A. Data Quality

Descriptive data for all study variables are presented in Table 1. There were no missing data in the study. The staff were relatively diverse; most identified as White. A slight majority were general healthcare providers, followed by Managers, Senior Managers, and other positions. Moreover, most staff had over a decade with the company, followed closely by staff with 2-5 years with the company.

Table 1: Variable Descriptive for All Study Variables

Categorical Variables	Frequency	%		
Gender				
Female	4	40%		
Male	6	60%		
Other	0	0%		
Staff Race/Ethnicity				
Black/African American	1	10%		
White	5	50%		
Hispanic or Latino	3	30%		
Asian	0	0%		
American Native or Alaskan Native	1	10%		
Native Hawaiian or Other Pacific Islanders	0	0%		
Staff Role				
CEO & C-Suite	0	0%		
Senior Director	1	10%		
Director	0	0%		
Manager	1	10%		
Healthcare Providers	6	60%		
General Administrative Staffs	0	0%		
Other	1	10%		
Staff Tenure				
Less than 1 year	0	0%		
2-5 years	4	40%		
5-10 years	1	10%		
10+ years	5	50%		
Continuous Variables	<i>M</i>	<i>SD</i>	Min	Max
Knowledge				
- Pretest	50%	0.12	29%	71%
- Posttest	70%	0.13	57%	93%
Confidence				
- Pretest	3.77	0.86	2.53	4.68
- Posttest	4.53	0.45	3.64	5.00
Weekly Follow Up	4.55	0.59	3.11	5.00

At the pretest, the mean knowledge score showed that participants only answered half of the questions correct. This was influenced by one outlier, who achieved a 29%. There were no outliers in the confidence data set with scores that

were close to the mean or higher. Cronbach's alpha the confidence measure at pretest was .81, which represents a good reliability of the measure. At posttest, Cronbach's alpha was .84, which again represents good reliability. Additionally, the

weekly follow-up survey showed 4.6 on a 5-point satisfaction scale, which indicated high satisfaction.

B. Hypothesis Testing

Integrated healthcare team members' T2DM knowledge (DV) will significantly increase following the SMI Diabetic 101 educational program (IV), as evidenced by pretest and posttest changes on the diabetes educational survey. A paired samples *t*-test was conducted to determine whether the knowledge

about T2DM increased following the SMI Diabetic 101 educational program (see Table 2). As shown in Figure 11, on average, participants scored lower on the knowledge survey prior to intervention ($M = 48\%$, $SD = 1\%$) compared to after the intervention ($M = 70\%$, $SD = 2\%$). This difference was statistically significant [$t(9) = -6.15$, $p \leq .001$]

Table 2: Result of Paired *t*-tests

	<i>t</i>	<i>df</i>	<i>p</i>
Knowledge Test	-6.15	9	$\leq .001$
Confidence	-4.27	9	$\leq .001$

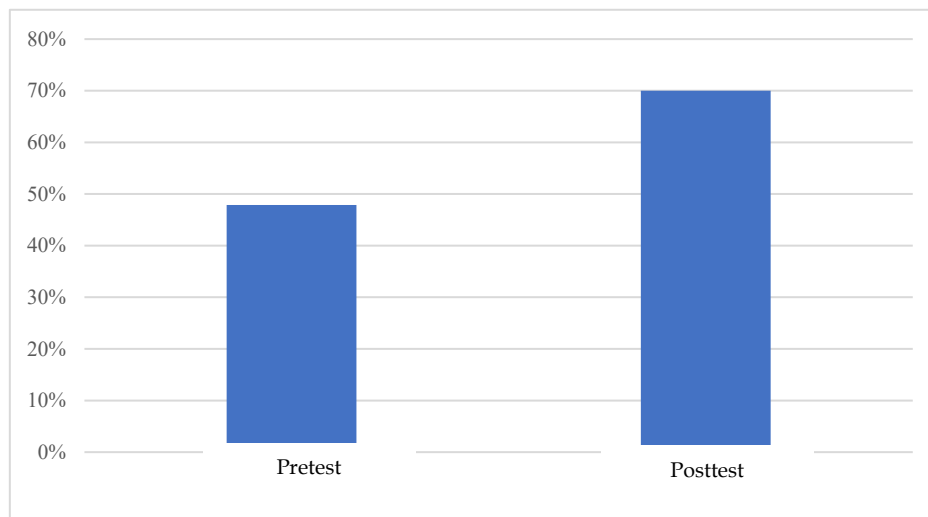


Figure 3: A Pretest vs. Posttest Comparison of T2DM Knowledge Scores

Integrated healthcare team members' confidence level in their ability to manage patients with comorbid SMI and T2DM (DV) following the SMI Diabetes 101 educational program (IV) as evidenced by pretest and posttest changes on the diabetes educational survey. A paired samples *t*-test was conducted to determine whether the confidence

score percentage changed following the SMI Diabetic 101 educational program (see Table 2). As shown in Figure 12, on average, participants scored lower on the confidence survey prior to intervention ($M = 3.77$, $SD = 0.58$) compared to after the intervention ($M = 4.53$, $SD = 0.20$). This difference was statistically significant [$t(9) = -4.27$, $p \leq .001$].

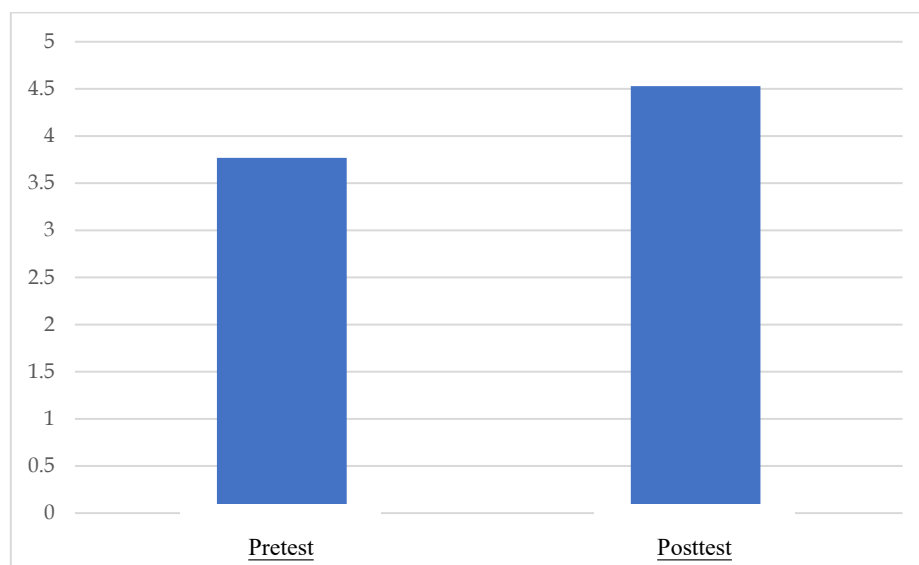


Figure 4: A Pretest vs. Posttest Comparison of T2DM Confidence Scores

C. *Unintended Consequences*

Unintended consequences unrelated to the hypotheses were observed. Regarding positive consequences, the site leader has decided to incorporate the training template into future training programs for healthcare providers. In addition, the site leader and senior director acknowledged the positive feedback they received from patients who have attended the educational training program regarding their communication with healthcare providers.

On the other hand, negative consequences resulted from the training course taking longer than anticipated. Some of the team members had to sacrifice their breaks or their patient appointments, causing a minor disruption to their weekly schedules. A consequence of this was the unintended outcome of burnout in healthcare providers due to disruptions in the daily work schedule. Since burnout is associated with staff turnover and a reduction in work hours, it can result in additional expenses for the organization. Therefore, if burnout rates remained the same or did not decline in the long run, it might affect patient intake and revenue.

VIII. DISCUSSION

A. *Summary*

Most healthcare providers are not well-trained to treat patients with SMI and diabetes[8]. There is no evidence-based intervention targeting patients with SMI and comorbid diabetes. As part of the quality improvement intervention, healthcare providers attended in-person educational training sessions on diabetes. The participants were tested on their knowledge of diabetes before and after the training program to determine whether they had the knowledge base and communication skills to communicate with patients with SMI. Results suggest a promising direction for future educational programs targeting communication between healthcare providers and patients with SMI. According to the outcome of the training program, the healthcare providers were able to increase their knowledge and gain a greater level of confidence in communicating with patients with SMI and other patients with diabetes after completing this program.

B. *Interpretation*

During this project, it was observed that healthcare providers' knowledge of T2DM for patients with SMI had significantly improved. From the existing literature review, specialized training

programs for mental health professionals can help healthcare professionals better understand T2DM diabetes, which supports the first hypothesis of knowledge training enhancement [12]. Moreover, other findings differed from those reported in other studies, which reported that most healthcare providers are not aware of the national and local guidelines for treating patients with SMI with T2DM [11]. The results of the intervention showed that most healthcare providers from selected clinical sites were aware of the national and local guidelines for patients with SMI with T2DM, but they did not acknowledge the importance of implementing these guidelines in their daily work routines. Performance assessment measures, audits, and feedback can be used to promote and sustain healthcare provider adoption of practice guidelines. These measures should be regularly reviewed and updated to ensure the guidelines are effective. Healthcare providers should also be trained and educated on the guidelines to ensure their successful implementation. Finally, healthcare providers should have access to adequate resources to ensure successful implementation of the guidelines.

Furthermore, based on the existing literature review regarding the confidence level of healthcare providers, patient-centered communication skills help facilitate long-term health improvement for patients with SMI and their healthcare providers[17]. The literature review aligns with the intervention strategy of improving healthcare providers' confidence level in communicating with patients with SMI who have comorbid T2DM. Results of the intervention indicated that clear, concise, and personalized communication is the most effective means of improving patient-provider relationships. It is also essential that healthcare providers use language that is easy to understand, as well as taking the time to listen to patients. In addition, they should strive to develop a positive relationship with their patients based on trust and rapport [4].

C. *Limitations*

A quality improvement design inherently limits the ability to infer causal relationships between interventions implemented and observed outcomes. One of the first internal validity elements observed from the intervention was maturation [41]. Based on an in-person interview after the training sessions, some healthcare providers became tired and bored during the survey sessions due to their day-to-day workload, which affected the weekly results of the intervention. Furthermore, due to the short 30-day

intervention period and potential staff resistance to change, the project's internal validity was compromised. These factors may have influenced the results. Additionally, the data collected may not accurately reflect the long-term effects of the intervention, as the long-term effects of an intervention may not be seen for weeks or months. Finally, the small sample size may have limited the power of the study to detect meaningful differences in outcomes. As such, further research with a larger sample size and a longer intervention period is needed to determine the effectiveness of the proposed intervention. Further research is needed to more accurately determine the effectiveness of the intervention. This could include follow-up studies with larger sample sizes, longer durations of data collection, and better-designed study protocols.

As far as external validity and generalizability are concerned, the findings of this intervention may be limited beyond the specific context in which they were conducted. SWN is characterized by unique characteristics, such as their size and demographic diversity, which may limit the generalizability of this intervention's conclusions. Moreover, the research was conducted in a single city and may not be representative of other contexts. Therefore, caution should be exercised when interpreting the results of this intervention. Furthermore, the intervention was not conducted in a controlled setting, making it difficult to assess its generalizability. Finally, the intervention was a relatively short term, which may not provide an accurate indication of the long-term effects of this type of intervention. Therefore, further assessment is needed to evaluate the long-term effects and generalize the results to other contexts.

There were also several trade-offs; for example, the site had to sacrifice some of the healthcare providers' weekly check-in meetings to accommodate the educational training programs. Moreover, the educational training program also required some healthcare providers to miss their weekly group patient visits at the site, which may have contributed to the delay in other conventional programs. To mitigate the delay in other conventional programs, one possible solution is to reschedule the missed weekly focus groups with the patients at a different time that does not conflict with the educational training program. Additionally, the site could consider implementing virtual check-in meetings for healthcare providers, allowing them to participate remotely and minimize the impact on their schedules.

IX. CONCLUSIONS

The intervention has increased the knowledge of healthcare providers in diabetes as well as their communication readiness for patients with SMI who are usually overlooked by the healthcare system. A similar intervention model could be developed for other mental health clinical sites with similar settings if more time is spent on the training program. Long-term sustainability and scale up of the program will be assured by ongoing PDSA and SMART reviews by the institute quality team. It may be helpful to conduct a needs assessment at each site to identify specific challenges and areas of improvement before adapting the intervention model. Individuals with SMI faced specific challenges, such as limited access to mental health resources, inadequate training in addressing SMI patients' needs, a lack of coordination between mental health and physical health services, stigma and discrimination, and gaps in healthcare communication, among others. Conducting a needs assessment is crucial to determining the intervention model's suitability for each clinical setting. Collaboration with local healthcare providers can also enhance the effectiveness and relevance of the training program. Healthcare organizations should also explore ways to reduce employee burnout, such as providing more staff support, offering flexible work hours, and providing access to mental health resources. Finally, the intervention model should be regularly reviewed and updated based on feedback and lessons learned from each site. Communication programs can be improved for other comorbid conditions with SMI through further research and interventions.

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