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**Effects of Telephone Follow-up on Medication Adherence and Rapid Readmission
Among Discharged Adults with Schizophrenia Spectrum Disorders (SSDs)**

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Abstract

High rates of 30-day readmission after acute care discharge are a big concern for patients with psychiatric disorders. These high rates not only reflect poor patient outcomes, but also result in higher hospital costs. For adults with schizophrenia spectrum disorders (SSDs), a review of current research shows that non-adherence to medication has been significantly associated with rapid readmissions and that using an intervention such as follow-up telephone calls after discharge can help prevent readmission through increased medication adherence. Using the Iowa model framework as a guide, the purpose of this evidence-based practice project was to pilot a post discharge procedure that implemented weekly telephone calls to improve medication adherence and decrease rapid readmission for these adults. Follow-up calls that provided treatment and medication support were initiated within 1 week of a patient's discharge and continued for 4 weeks. Weekly medication adherence data were acquired from participant recorded and reported scores using the Medication Adherence Report Scale-5 (MARS-5) self-report tool, and pre- and post-intervention 30-day readmissions information was obtained from a review of relevant patient medical records. Overall results revealed an increase in patient medication adherence and a decrease in 30-day readmissions. Consequently, the positive results of this small-scale pilot project reinforce the effective use of post discharge telephone follow-up to help prevent readmission through increased medication adherence for this patient group and provide support for a larger-scale application moving forward.

Keywords: medication adherence schizophrenia, telephone intervention schizophrenia, reduced readmissions schizophrenia, inpatient follow-up SSDs, telehealth discharge planning schizophrenia

Effects of Telephone Follow-up on Medication Adherence and Rapid Readmission Among Discharged Adults With Schizophrenia Spectrum Disorders (SSDs)

Schizophrenia spectrum disorders (SSDs) are chronic brain disorders which refer to schizophrenia and the groups of related mental disorders that share common psychotic symptoms involving disruptions in thinking, perception, and behavior (American Psychiatric Association, 2013). Although effecting less than 1% (estimated 1.5 million of the U.S. population each year), this disorder is “associated with significant distress and impairment in personal, family, social, educational, occupational, and other important areas of life, . . . making it a leading cause of disability worldwide and its financial burden high as compared to other chronic conditions” (National Institute of Mental Health, n.d. & World Health Organization, 2022).

California has the highest number of adults with schizophrenia comparing state-by-state statistics (Treatment Advocacy Center, 2017) and the Adult and Older Adult Behavioral Health Services 2016-2017 annual report notes SSDs are the most common diagnoses (40%) among adult behavioral health clients in San Diego County (County of San Diego Health and Human Services Agency, 2017). Acknowledging SSDs as a serious health concern for our nation, our state, and our county and in alignment with the Nation’s Healthy People 2030 initiative to improve health and well-being for all over the next decade, it is imperative that we seek best evidence-based treatment solutions for adults diagnosed with these disorders.

Fortunately, SSDs are treatable conditions. Unfortunately, for adults with chronic mental illnesses such as these, inpatient psychiatric hospitalizations associated with acute episodes of symptoms are common, and the transition from an inpatient hospital setting to home is a vulnerable time associated with high rates of 30-day readmissions (Reeves et al., 2021). Weiss and Jiang (2021) reported SSDs are one of the overall top 20 conditions having the highest

number (83,100) and rates (21.7%) of 30-day adult hospital readmissions in the United States. For discharged adults with SSDs, such rapid readmissions not only reflect poor outcomes and difficulty following prescribed discharge plans but also result in higher hospital costs averaging \$8,600 per person for each readmission stay (National Association of State Mental Health Program Directors, 2015).

Fueled by the desire to improve patient outcomes for these adults and seeing these concerning statistics reflected in our daily practice as nurses and future nurse practitioners within the psychiatric field, we were highly motivated to propose an evidence-based project that would decrease 30-day hospital readmissions for this patient group. A review of literature identified the first days and weeks after discharge represents a critical phase for adult patients with SSDs due to everyday difficulties that can result in symptom relapse or rapid readmission to inpatient care (Hegedus et al., 2020) and that nonadherence to medication has been significantly associated with readmissions (Basit et al., 2020). Additionally, telephone interventions represent a feasible and effective means of promoting adherence to medication (Baker et al., 2018; Basit et al., 2020; Beebe et al., 2016; Schulze et al., 2019; Uslu & Buldukoglu, 2020). Therefore, the purpose of this evidence-based project was to improve patient outcomes for discharged adults with SSDs through the use of weekly telephone follow-up calls to increase medication adherence and decrease 30-day readmissions.

Literature Review and Evidence for the Problem

As discussed previously, adults with SSDs are reported as having high rates of nonadherence to medication and 30-day readmission upon discharge from inpatient hospitalization. Therefore, the immediate period after discharge to home represents a critical time to provide interventions that may address these problems. Current research provides

evidence that telemental health (mental or behavioral health services provided through technology), incorporated as another modality to assist patients who have been discharged from a crisis service, may be used as an effective way to prevent avoidable readmissions through an expanded continuum of care for a population with high rates of readmission (Tyler, Wright, & Waring, 2019). Conducting a literature review to address the specific problems related to this patient group yielded the results discussed below which were evaluated for our use and incorporated as part of our proposal to include this element in an expanded discharge process for discharged adults with SSDs.

In their study to evaluate the effect of using telephone intervention for medication adherence in schizophrenia, Uslu and Buldukoglu (2020) provided background information supporting the concern that medication nonadherence is significantly high for these adults and often leads to many negative consequences such as relapse, hospital readmissions with increased costs, and suicide attempts. As a possible means of addressing the problem, they conducted a randomized controlled trial using telephone intervention problem solving as an intervention to increase medication adherence in this patient population. Their findings indicate that telephone intervention problem solving significantly increases medication adherence for these patients and provides evidence that using this type of intervention is a “cost-effective option to increase medication adherence with patients having schizophrenia by encouraging them to participate in their own treatment and delivering individual-specific support” (pp. 68–69).

Like Uslu and Buldukoglu, Basit et al. (2020) cited research identifying that high rate of nonadherence to medication for this patient group is associated with poor outcomes such as hospitalization. They conducted a systematic review of studies to evaluate the evidence for using telemedicine interventions (text messaging, telephone calls to patients, remote adherence

monitoring devices, and video conferencing) to specifically target increased medication adherence as an outcome for those with schizophrenia and other patient groups. Although their summary of study showed mixed results (only four of the eight reviewed studies produced a significant increase in medication adherence), all included researchers used the telephone as the primary technology for an inexpensive and often effective option to enhance patient monitoring and outcome.

Additional support for the use of telephone intervention to increase medication adherence, thereby potentially decreasing 30-day readmissions, is provided by the randomized controlled trial of Schulze et al. (2019) whose results indicated that “a personalized phone intervention for outpatients led to better medication adherence after hospital discharge” (p. 225) and by Beebe et al.’s (2016) introductory literature review of her prior studies whose summary noted that “our work consistently shows the feasibility and acceptability of a telephone delivery method and documents statistically significant improvement in psychiatric medication adherence” (p. 709).

Evidence-Based Practice Model

The Iowa model of evidence-based practice to promote quality care (hereafter referred to as the Iowa model) developed by Marita G. Titler and her colleagues at the University of Iowa Hospitals and Clinics served as a framework for this project (Titler et al., 2001). Touted for its ease of use and reports of successful application by many healthcare teams (Melnik & Fineout-Overholt, 2019), the Iowa model provides easy-to-follow steps and feedback loops to “help nurses and other healthcare providers translate research findings into clinical practice while improving outcomes for patients” (Titler et al., 2001, p. 498). Its major elements include triggered identification of potential need for change, review of related research, consideration of

change appropriateness, and continual monitoring and evaluation of process and outcome (Melnik & Fineout-Overholt, 2019). Particularly appealing as a framework for this project to increase medication adherence and decrease rapid readmission through an improved discharge practice that uses follow-up telephone intervention for adults with SSDs, the Iowa model emphasizes “pilot-testing with a smaller group of patients before instituting the change throughout designated patient care areas, and the evaluation of the change to determine if the outcomes identified in the research actually occur in practice” (Titler et al., 2001, p. 498). This small-scale initiation of weekly follow-up calls as part of the discharge process for the previously identified targeted patients from within a multi-unit inpatient psychiatric hospital facility provided an effective opportunity to evaluate the intended outcome prior to implementation at large.

Design

Having identified the problem of associated high rates of medication nonadherence and rapid readmission for discharged adults with SSDs and considering the evidence from our literature review as well as our parameters for implementation, we determined to pilot an expanded discharge process for adults with SSDs that used weekly telephone calls as an intervention to increase medication adherence and decrease 30-day readmission.

Although we obtained Institutional Review Board (IRB) approval for our project on September 10, 2021, we encountered obstacles as we sought permission to pilot our evidence-based project at a current workplace and had to change our project’s location and duration. Therefore, initial implementation of our project was delayed until November 17, 2021.

Shifting to a different location than the one originally intended, our project was put into practice in a small-scale pilot application within a local behavioral health hospital that manages a

broad range of adult psychiatric patients requiring acute mental health treatment that includes inpatient crisis stabilization. Based on IRB approval and an affiliation agreement with the organization, our project was overseen by one of the hospital's psychiatrists who granted us permission to implement our telephone intervention plan for his discharged adult patients with SSDs.

Participants were adult patients with SSDs who were discharged from the hospital under the care of the project's overseeing psychiatrist and who agreed to be part of the study. Following ethical standards of practice, a release of information and consent form was discussed with each of these patients for inclusion in the project. Prior to discharge, all patients were educated on the importance of follow-up care and medication adherence as part of their long-term treatment plan. During these conversations, the project and its requirements were discussed, including the use of the Medication Adherence Report Scale-5 (MARS-5) as a self-report measure of medication adherence. A total of 19 patients meeting inclusion criteria were identified, of whom 10 patients (53%) provided informed consent and 9 patients withheld consent. Those who consented were ages 20 to 59. Three (30%) were female and seven (77.8%), were male. Patients reported their ethnicity as White (30%), Hispanic (30%), Black (20%), Asian (10%), and Pacific Islander, (10%). All 10 participants remained as part of the project for their 4-week time period.

Weekly telephone protocol was established based on the use of the MARS-5 tool to assess medication adherence and several research supported questions related to follow-up care support, current state of health, and identified needs for help. Responding to patient questions or concerns also became part of the protocol. Post-discharge calls were initiated within the first week of discharge for each identified patient who agreed to participate, starting in mid-

November 2021, and continuing for a total of 4 weeks (30 days) from discharge for each patient until the end of December 2021.

Pre- and post-MARS-5 data determined the impact of the telephone intervention on medication adherence. To examine the impact of weekly telephone calls on 30-day readmissions, pre-intervention data was acquired by averaging the percentage for the prior 3 months of 30-day readmissions for discharged adult patients with SSDs under the directing psychiatrist's care. Post-intervention information was obtained by recording any participant's rapid readmission within the implementation period and calculating a 30-day readmissions percentage based on this information.

Methods and Justification

Medication adherence was assessed using a subjective means of self-report from the MARS-5. Considering previously outlined literature reviews and information from a study of its use as an adherence measure by Chan et al. (2020), this tool was chosen because of several factors. First, it is based on the Drug Attitude Inventory, a common psychiatric adherence survey. Second, it was designed and first validated for patients with schizophrenia. Third, it was used in the majority of previously reviewed evidence-based literature studies. Finally, it is easy to administer.

We specifically chose to use the shorter MARS-5 form of the MARS because it has items which describe a range of nonadherent behaviors and a 1–5 Likert response scale that allows the categorization of patients in terms of their position along the “adherence dimension” rather than on the basis of a “yes/no” response like the longer MARS-10. In addition to allowing a quicker completion, this ability to reflect an increase or decrease along a continuum of adherence behavior was more desirable for this application.

Ethical Considerations

This study was approved by the IRB of the University of San Diego, Hanh's School of Nursing (IRB-2022-26). Ethical considerations related to informed consent, voluntary participation, confidentiality, promotion of autonomy, beneficence, justice, and non-maleficence (Haddad, 2021) remained an on-going priority throughout the implementation of this project and all aspects were honored through patient education, voluntary consent, maintaining confidentiality, doing no harm, and treating participants in a non-judgmental and equitable manner.

Results

Because of a singular psychiatrist's approval to implement our project using only his adult discharged patients with SSDs as study participants, our results are limited to only reflecting outcomes of patients under his care.

The MARS-5 scale uses the following five self-report considerations: (a) I take less than I am instructed to; (b) I decide not to take a dose; (c) I stop taking my medicines for a while; (d) I change the dose of my medicines; (e) I forget to take my medicines, to evaluate a patient's behavior related to medication adherence. Participants are asked to rate the frequency with which different medication-taking behaviors occur, scoring each item on a 5-point scale (5 = *never*, 4 = *rarely*, 3 = *sometimes*, 2 = *often*, 1 = *always*), with higher scores indicating higher reported adherence.

Pre-intervention baseline MARS-5 data were acquired prior to discharge by asking participating patients to complete the questionnaire based on a self-report of their medication taking behavior before being hospitalized. Resulting individual scores were averaged together for each of the five non-adherent behaviors:

- I take less than I am instructed to (1.8 average).
- I decide not to take a dose (1.5 average).
- I stop taking my medicines for a while (1.3 average).
- I change the dose of my medicines (3.3 average).
- I forget to take my medicines (2.1 average).

These values were then added together to get a total average MARS-5 score of 10. Figure 1 illustrates this pre-average at “0 weeks” as part of a bar graph representation comparing pre- and post-medication adherence. With a MARS-5 score range of 5–25 where 5 represents the least adherence and 25 indicates the greatest adherence, a score of 10 reflects low adherence to medication behavior pre-intervention.

MARS-5 data was tracked weekly throughout the intervention period as part of the telephone call protocol to monitor adherence by asking each of the 10 participants to provide their self-assessment answers based on what best describes their behavior regarding their medication during the past week. To obtain post-intervention MARS-5 data, we averaged together the individually reported week 4 scores for each of the five non-adherent behaviors, summarized as follows:

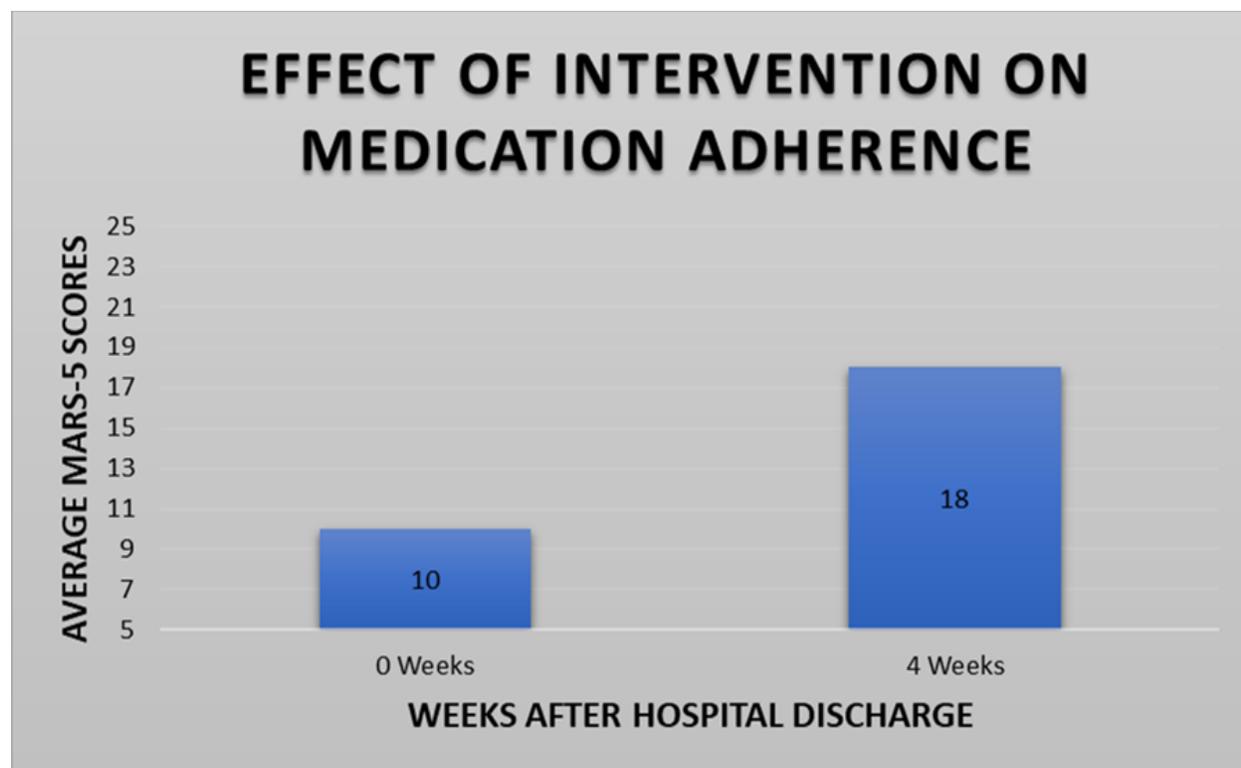
- I take less than I am instructed to (3.9 average).
- I decide not to take a dose (3.1 average).
- I stop taking my medicines for a while (3.3 average).
- I change the dose of my medicines (4.2 average).
- I forget to take my medicines (3.5 average).

These values were then added together to get a total average MARS-5 score of 18. Figure 1 illustrates this post-average at “4 weeks.” As discussed previously, the higher the score, the

greater the adherence behavior. Therefore, a score of 18 on a maximum 25-point scale reflects high adherence to medication behavior post-intervention. The relative comparison of pre- and post-averages showing improvement in adherence behavior can be clearly seen here as well.

Figure 1

Pre- and Post-intervention MARS-5 Average Scores



Note. The higher the score, the greater the adherence.

Figure 2 reflects the pre-intervention relative frequencies for reasons of non-adherent behavior as identified by the individually acquired pre-MARS-5 data. Shown by the significant number of “always” and “often” responses, baseline non-adherent behavior was high. Shown below, the most common pre-intervention reason for medication non-adherence was to stop taking it for a while.

Figure 2

Pre-intervention MARS-5 Data Reflecting Relative Frequencies for Reasons of Non-adherence

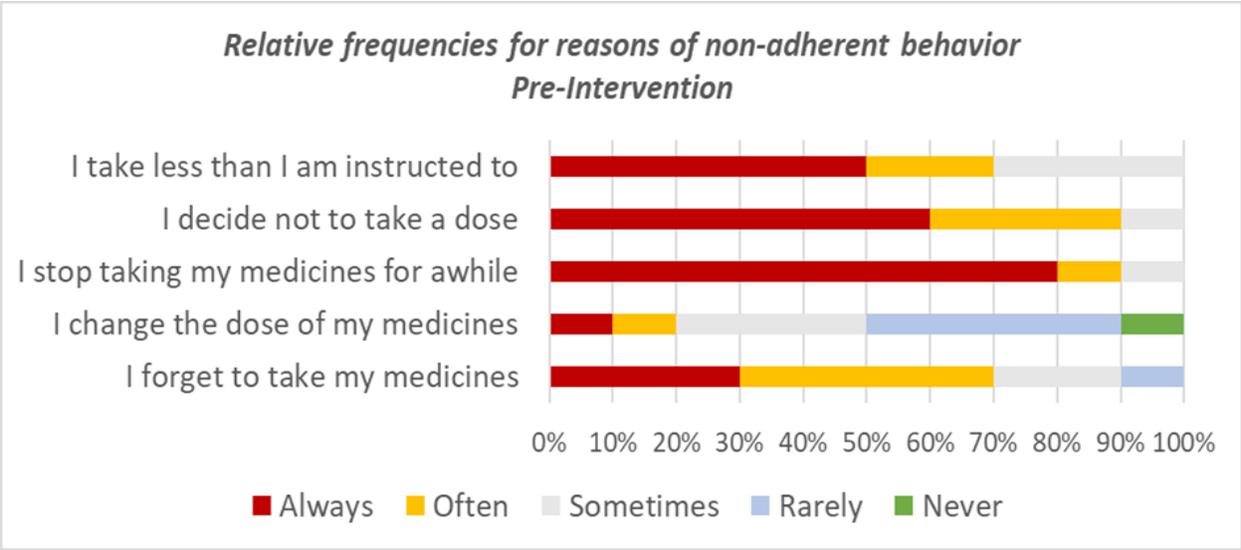
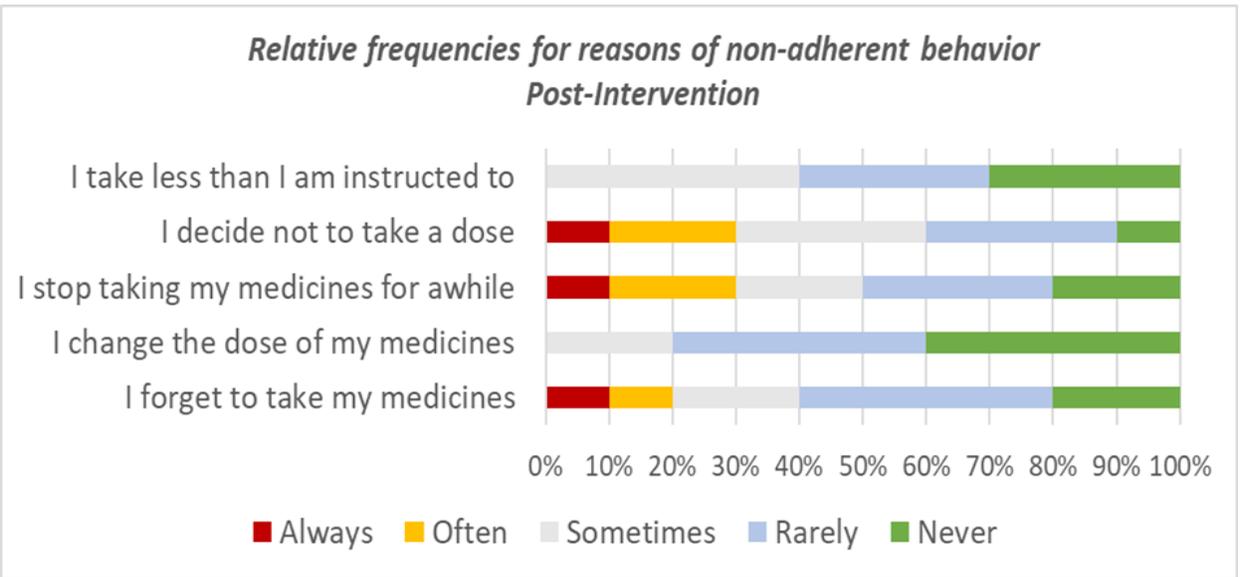


Figure 3 reflects the post-intervention relative frequencies for reasons of non-adherent behavior as identified by the individually acquired post-MARS-5 data. Evidenced by the significant number of “rarely” and “never” responses, post-intervention non-adherent behavior was low. Shown below, the most common post-intervention reason for medication non-adherence was to decide not to take a dose.

Figure 3

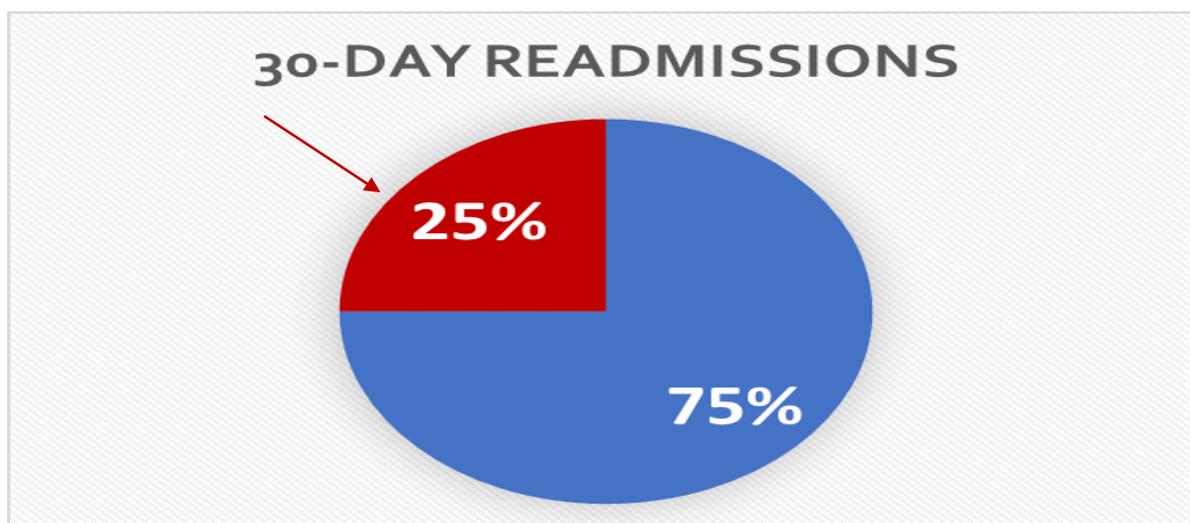
Post-intervention MARS-5 Data Reflecting Relative Frequencies for Reasons of Non-adherence



To assess the impact of the weekly telephone calls on 30-day readmissions, pre-intervention baseline information was determined by examining the record of the directing psychiatrist's discharged adults with SSDs in the 3 months prior to intervention and averaging the 30-day readmissions for these patients (25%; see Figure 4).

Figure 4

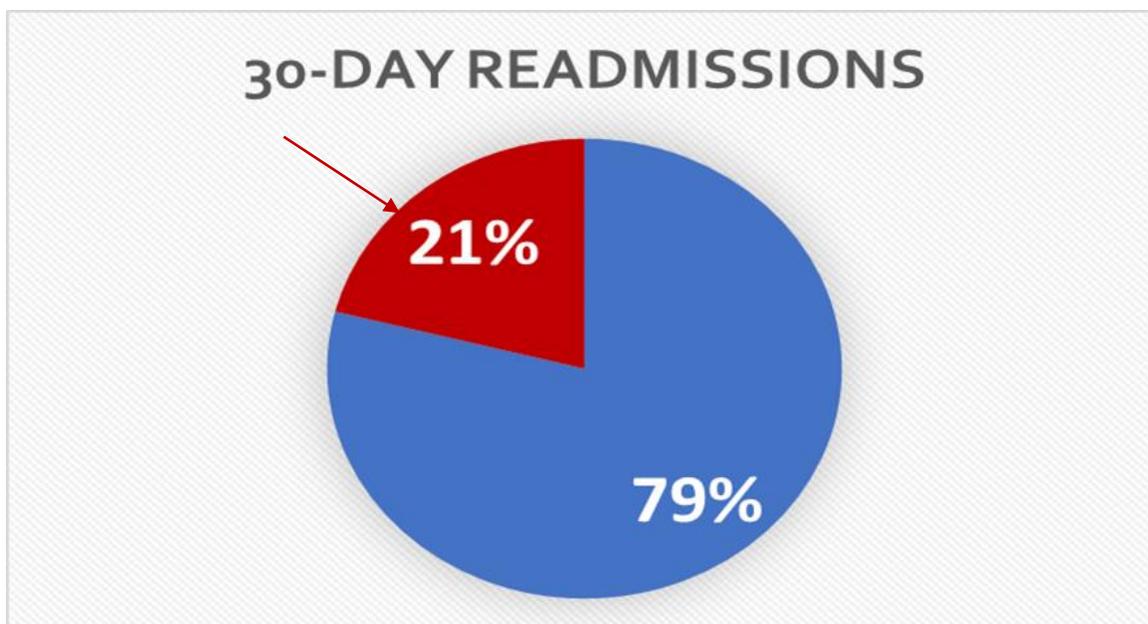
Pre-intervention Baseline Percentage of 30-day Readmissions



Post-intervention percentage of rapid readmissions (21%) is reflected in Figure 5. This average percentage accounts for both (1 of 10 participants) and (3 of 9 non-participants) who had 30-day readmissions. Overall, there was a 4% decrease in 30-day readmissions for discharged adult patients with SSDs during the period that included telephone follow-up intervention for 10 of 19 patients. Examined in terms of just those who participated in the study, only 10% experienced a readmission within the intervention period, indicating a 15% decrease.

Figure 5

Post-intervention Percentage of 30-day Readmissions



Study Limitations

This study has several limitations. The first limitation was that a small number of treated patients by only one psychiatrist were included in the study. Future studies should include a larger number of treated patients by different psychiatrists to generalize results more reliably to the targeted population of discharged adults with SSDs. The second limitation was that the study had a short implementation period. Future studies should have longer implementation periods to help assess the impact of post discharge telephone contact on medication adherence and 30-day readmissions over a greater period. The third limitation was using a self-report to measure medication adherence behavior. Because patients may not be truthful or able to assess themselves accurately, results may not be valid. Future studies may want to combine multiple measures of adherence if feasible.

Discussion

It is well documented that medication is an important treatment component for adults with SSDs and that non-adherence is a problem that often leads to relapse and having to be hospitalized. A review of literature indicates telephone intervention delivered post discharge may

be effective at increasing medication adherence thereby, decreasing hospitalizations. In this pilot study, the effect of telephone follow-up on medication adherence and 30-day readmission in discharged adults with SSDs was examined. Our findings support the literature. Accordingly, discharged patients with SSDs who participated in the study showed greater adherence (40% increase) to medication (less non-adherent behavior) after 4 weeks of weekly telephone calls in comparison to prior (baseline) adherence behavior. A percentage comparison of 30-day readmissions for study participants after intervention showed a decrease of 15% as compared to the average percentage of 30-day readmissions for the directing psychiatrist's discharged adults with SSDs for the 3 months prior to project implementation. Ultimately, the potential impact on the lives of these patients is immeasurable.

Evidence to Action

Weekly follow-up calls for discharged adults with SSDs should be considered as a routine standard of care to provide better patient outcomes for discharged adults with SSDs. Based on literature review and pilot study outcomes, telephone intervention implemented in this manner allows for early intervention if a patient's health is deteriorating, presents a low-cost and effective option for increasing medication adherence and decreasing 30-day readmission, and improves patient satisfaction through connection and support.

Implications for Future Research

Knowing that discharged adults with SSDs are at high risk for 30-day readmission and poor outcomes, the goal should be to develop an evidence-based intervention of help that is effective in terms of impact and cost as part of a standard discharge procedure. Therefore, using the Iowa model as a reference and based on the positive outcomes associated with this pilot study, future research should focus on implementing this post discharge intervention on a larger

scale to determine if results are conclusive enough to warrant becoming part of a standard discharge process for this patient group. Further, additional research that aligns with this goal and potentially increase the positive outcomes may include ideas such as investigations into varying lengths of implementation, different telephone protocols, other methods of measuring medication adherence, or more forms of technology. Research into using this intervention with other mental health diagnoses could result in a valuable expansion of its use in helping others.

Conclusion

Unfortunately, high rates of 30-day readmission after acute care discharge are a big problem for adult patients with SSDs and hospitals. Current research substantiates that non-adherence to medication is a major reason for such readmission. A review of the results from our piloted evidence-based solution to address this problem support using weekly telephone follow-up calls as part of an expanded discharge plan for adults with SSDs. As an inexpensive, simple-to-implement intervention, this study's outcomes show brief telephone contact after discharge increases medication adherence and decreases 30-day readmission. Based on previously cited statistics that reflect the tremendous impact of SSDs at societal and individual levels, there is a clear need to determine and use interventions leading to improved well-being and reduced hospital costs. Our hope is that future studies will build upon this pilot study and that their results will produce and reinforce these positive outcomes so that adding this intervention as part of the discharge process for adults with SSDs becomes part of standard care.

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