



## Introduction

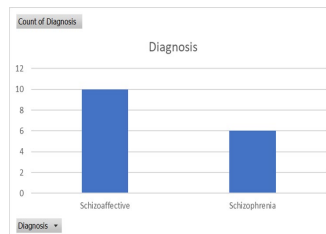
- Schizophrenia and other related disorders including schizoaffective disorder are chronic and serious mental health conditions and affect 60-70% of the served mental health population.
- To effectively manage the illnesses, medication adherence is essential to positive outcomes of reduced number of hospitalizations, reduced patient suffering, improved overall functioning, and a decrease in annual costs related to the disorders (Chong et al., 2016).

## Background/Significance

- Nonadherence to needed medications negatively impact patients' health functioning and have a negative financial strain on society.**
- Symptoms from schizophrenia may result in self-injury, social isolation, poor daily functioning, homelessness, or violence/impulsivity (Sadock, et al., 2015).
- Schizoaffective disorder is similar to schizophrenia but involves a mood disorder (abnormally heightened mood or depression).
- Worldwide, approximate nonadherence rates in schizophrenia is 50%.
- Number of individuals hospitalized with schizophrenia in NJ in 2016 was 13,798 (New Jersey State Health Assessment Data, 2019).
- There are benefits in using psychoeducation and technology with alarms to assist patients in properly taking their medications** (Acosta, et al., 2012; Shadare et al., 2017).
- Medisafe app., which was used to assist clients to take medications on a daily basis, was ranked #1.** It was considered very engaging, entertaining, very interactive, easy to operate, and carrying high-quality information with visual appeal via the Mobile Adherence Rating Scale (MARS) (Santo et al., 2016).

## Methods

- Design** – Quality Improvement Approach
- Setting** – Adult partial hospitalization outpatient program in NJ
- Sample** – 16 participants – English-speaking men & women; 18 and older; diagnoses of either schizophrenia or schizoaffective disorder



## Measures

- Participant Demographics
- Client-centered**
  - Medication Adherence Rating Scale (MARS) -10 questions measuring adherence behavior and attitudes pre-, post-, and post-post- evaluation
  - Weekly medication adherence percentage reports – Average weekly adherence measurement administered
  - Mobile Device App Satisfaction Survey (MDASS)- 5 questions assessing app satisfaction pre- and post-intervention
- Clinician-centered**
  - Clinical Global Impressions Scale (CGI)- 2 questions measuring severity of illness and global improvement pre- and post-intervention

## Analysis

- 16 participants over 4 meetings
- 48 MARS questionnaires returned to co-investigator
- 32 Mobile Device App Satisfaction Surveys returned to co-investigator
- Descriptive Statistics for Demographics
- Cochran's Q Test pre-, post-, and 1-month post intervention for MARS
- Weekly medication adherence percentage reports trend via scatterplot
- Wilcoxon Rank Sum CGI scale pre- and post-intervention
- McNemar's Test pre- and post-intervention for MDASS questions 1-4
- Cohen's Kappa pre- and post-intervention MDASS for question 5

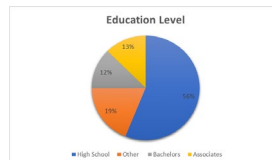
## Results

Statistically significant change in baseline medication adherence in adult outpatient population with schizophrenia/schizoaffective disorder via CGI scores.

### Results of CGI pre- and post-intervention

- Significant difference
- Pre- and post-intervention CGI Question 1
- $P < .05$  at  $Z = 3.16$ ,  $p = .002$
- Post-intervention CGI Question 2
- $P < .05$  at  $Z = 2.65$ ,  $p = .008$

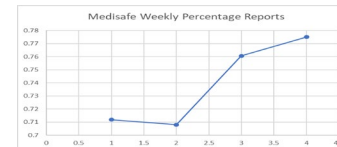
**Participant Demographics:** Gender – 31% F, 69% M. Age – 22-60 years. Race/Ethnicity- 63% White, 25% Hispanic, 13% Black. Education Level – 56% High School, 13% Bachelors Degree, 13% Associates Degree, 13% 1<sup>st</sup> year college, 6% 9<sup>th</sup> Grade. Diagnosis – 63% Schizoaffective, 38% Schizophrenia. Employment – 82% Unemployed, 13% Work in Café, 6% Work in Workshop



### Results of MARS pre-, post-, and post-intervention

- 10 MARS questions- no significant difference
- $P > 0.05$

### Results of weekly medication adherence percentage reports trend via scatterplot



### Results of MDASS pre- and post-intervention

- McNemar Test questions 1-4 – no significant difference
- $P > .05$
- Cohen's Kappa question 5 – no significant difference
- $P > .05$
- Pre- and post-intervention results regarding questions 1 and 2,  $p = .500$  and for questions 3 and 4,  $p = 1.00$
- Pre- and post-intervention results for question 5 indicated that there was no statistical difference in overall participant rating of usefulness of the app ( $K = .06$ ,  $p = .78$ ).

## Discussion

### Medication Adherence Rating Scale

- $P$ -values were not statistically significant at  $P > .05$  for each question, indicating no significant difference in patient perceived medication adherence behavior pre-, post-, and one-month post-intervention.
- Although results were not statistically significant, they were clinically significant.
- Psychoeducation and benefits of the mobile device app may be linked to medication adherence and can be used in other facilities.

### Weekly Medisafe Adherence Percentages

- Medisafe percentage reports indicated a steady increase in average weekly adherence via scatterplot at 71.19% at Week 1; 70.81% at Week 2; 76% at Week 3; and 77.5% at Week 4.
- Participants also verbalized that the app was helpful.
- Safety may improve as participants continue to show adherence, reducing the risks of negative consequences from non-adherence.
- Coordination of care may improve and assist with patient safety via availability of health information from the app.

### Clinical Global Impressions Scale

- $P$ -values were statistically significant at .002 for question 1 "Considering your total clinical experience with this particular population, how mentally ill is the patient at this time?" and .008 for question 2 "Rate total improvement whether or not, in your judgment, it is due entirely to drug treatment. Compared to his condition at admission to the project, how much has he changed?" Results indicated significant differences in provider's perceived illness severity and global improvement of participants pre- and post-intervention

Providers can view patients' weekly/monthly adherence on the app and further education may result in viewing laboratory test results, vital signs, etc. The app may assist patients in becoming self-care oriented.

### Mobile Device App Satisfaction Survey

- $P$ -values were not statistically significant. Participants believed the app to be useful in assisting with medication-taking, liked the design, and would recommend it to their friends.
- Although the test was not statistically significant for each question, average participant app rating was 4.5/5 both pre- and post-intervention in terms of finding it useful
- Patients are likely to continue to use the app for aiding them with medication-taking in the future.

### Plans for Future Scholarship

- The future quality improvement project regarding use of a mobile device app to improve medication adherence would be for the providers to use the app more consistently in the clinical area. Also, a larger population size would be needed to obtain more information.

## Summary

- Medisafe and psychoeducation have shown to be effective in improving baseline medication adherence in the schizophrenia population. The interventions have great implications for clinical practice, healthcare policy, quality and safety, education, etc.,

## Reference List

- Chong, H. Y., Teoh, S. L., Wu, D. B., Kotirum, S., Chiou, C. F., & Chaiyakunapruk, N. (2016). Global economic burden of schizophrenia: a systematic review. *Neuropsychiatric Disease and Treatment*, 12, 357-73. doi:10.2147/NDT.S96649
- New Jersey State Health Assessment Data (2019). New Jersey public health data resources. Retrieved from <https://www.doh.state.nj.us/doh-shad/query/result/njbrfs/MentHlthTreat/MentHlthTreatCrude11.html>
- Sadock, B., Sadock, V., & Ruiz, P. (2015). *Kaplan & Sadock's synopsis of psychiatry*. 11<sup>th</sup> Edition. Philadelphia, PA: Wolters Kluwer.
- Santo, K., Richtering, S. S., Chalmers, J., Thiagalangam, A., Chow, C. K., & Redfern, J. (2016). Mobile phone apps to improve medication adherence: A systematic stepwise process to identify high-quality apps. *Journal of Medical and Internet Research mHealth and uHealth*, 4(4), 132. doi:10.2196/mhealth.6742
- Shadare, E., Williams, C., Hanisch, T., & Webb, B. (2017). *Increasing medication adherence and compliance in adults with schizophrenia/schizophrenia spectrum disorder (SSD) by using mobile app alarm reminder for medication administration*. ProQuest Dissertations Publishing. Retrieved from <http://search.proquest.com/docview/1947584036/>

## Contact Information

- Meghann Alcalá, BSN, RN
- Meghcalca@gmail.com