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Keywords

Telemedicine, Telepsychiatry, Outpatient setting, Outcomes, Outcome Questionnaire, Prevalence

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ABSTRACT

OBJECTIVE: With the recent surge in telepsychiatry utilization, it is important to study the effectiveness of this virtual modality.

METHOD: To determine if telemedicine visits were effective in keeping psychiatric patients stable, a retrospective study was performed in an outpatient behavioral health setting using the OQ@45.2/Y-OQ@ 30.2 assessment tool, which assesses patient reported outcomes across areas of functioning. To qualify for this study, patients needed at least two OQ scores with one being prior to the onset of telepsychiatry care and one being after returning to in-person care.

RESULTS: 51.1% of adults (n=176) improved or remained the same, whereas 48.8% deteriorated. Results indicated that 50.0% of youth (n=22) improved or remained the same, whereas 50% deteriorated. There were no significant differences in OQ scores between gender, ethnicity, adult age groups, nor number of visits. There were significant differences in adult OQ scores between payer types, and youth OQ scores between different races.

CONCLUSION: It is important to note that this study was conducted during the COVID-19 Pandemic, where, naturally, many individuals were facing hardships; therefore, to improve or remain the same during the pandemic is still an accomplishment. By assessing total OQ scores among telemedicine patients, this study is showing that telepsychiatry is a very valuable resource for psychiatric patient care. Further research with a larger sample size of qualifying patients is warranted especially post pandemic.

INTRODUCTION:

Telemedicine is the use of computer technology to deliver healthcare from a distance.¹ It involves meeting with, evaluating, and treating a patient all in a virtual mode using either a video platform or the telephone. Telemedicine greatly improves the accessibility of patient care, especially for those living in rural areas, without modes of transportation, and with limited financial resources.² The use of telemedicine in Psychiatry dates to the 1950s when physicians at the University of Nebraska used a two-way closed-circuit television to communicate with their patients and conduct research.³ The usage became sporadic in the 1960s and 1970s. It has been on the rise since the 1990s, coinciding with the advances in technology, access to smartphones and other communication modalities, and further understanding of both the psychiatric field and telemedicine.⁴ Its usage has increased even more so since the onset of the COVID-19 Pandemic, where mental health services are needed more than ever, but in-person contact poses a risk of infection.

The increased utilization of telepsychiatry visits during the COVID-19 Pandemic is due to several factors. First, with the introduction of stay-at-home orders during the beginning of the pandemic, many outpatients' medical offices had no choice but to change their visits to telemedicine. This allowed providers to continue care for patients throughout the pandemic while keeping them safe through social distancing and quarantining guidelines.⁵ In the NYU Langone

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Health System, telemedicine visits increased 683% between March 2nd and April 14th of 2020.⁶ Furthermore, the pandemic put a huge strain on the medical field as demonstrated with the well-known shortages in medical equipment, such as personal protective equipment (PPE).⁷ Telemedicine for non-urgent outpatient care allowed for more resources to be allocated towards treating those diagnosed with COVID-19 and chronic health conditions.⁵ Additionally, mental health professionals play a very important role in alleviating the suffering associated with the pandemic.⁷ Not only do global pandemics cause a drastic increase in stress-related disorders and mental health challenges, but these results are long-lasting and will continue to increase the demand for telepsychiatry services.⁸

Research regarding the effectiveness of telemedicine in a psychiatric setting thus far has generated overall positive results. A study performed by researchers at the University Clinic of Psychiatry in Skopje found an 80.22% satisfaction rate among telemedicine participants.⁹ A randomized controlled trial (RCT) conducted by Ruskin et al on the management of patients with depression compared outcomes between groups randomized to telepsychiatry visits or in-person visits.¹⁰ Ruskin et al found that patients who participated in telepsychiatry for 6 months showed comparable improvement to the in-person group in their depression outcomes and equivalent levels of patient adherence, satisfaction, and health care cost.¹⁰ A systematic review of 10 studies looking at the effectiveness of telepsychiatry in maternal depression found that 8 out of 10 of the studies reported significant improvement in depression scores post telecare.¹¹ Unfortunately, many of these studies are limited by small sample size and a lack of represented diagnoses. With the surge in telepsychiatry services during the COVID-19 Pandemic, it is important to study the effectiveness of this virtual modality. Therefore, the purpose of this study was to determine whether the use of telepsychiatry in an outpatient setting led to increased clinical stability. Stability was measured by measuring the patients' OQ scores before beginning telepsychiatry and comparing that to their OQ score after having telepsychiatry services throughout the pandemic.

METHODS

This is a single center, retrospective study, of psychiatric patients in an outpatient setting. A chart review of the Electronic Medical Record (EMR) was used to gather data about these patients. The patient population studied includes all patients who were

seen in the psychiatry outpatient center. Data collected from charts included diagnoses, medications, dates of telepsychiatry and outpatient visits, and the number of outpatient visits, telepsychiatry visits, hospitalizations, and emergency visits during the study period. Demographic data including gender, age range, race, ethnicity, and insurance type was obtained for each patient.

Patients who received in-person psychiatric care prior to the onset of the COVID-19 Pandemic, telemedicine care during the COVID-19 Pandemic, and then returned to in-person care at some point during the pandemic were initially included in the study. Their progress was monitored using the Outcome Questionnaire (OQ® 45.2/Y-OQ® 30.2) assessment tool. The OQ® 45.2 was created by Dr. Lambert in 1996 and has become the most peer-reviewed patient-reported outcome measure used globally.¹² This is a self-reported tool designed to monitor a wide range of mental health characteristics over the course of treatment. It is quick to administer, making it easy for routine use. It consists of 45 questions that report a total score as well as Symptoms Distress score, Interpersonal Relations score, and Social Role score for adults. The higher the score, the more distressed the individual.¹² Similarly, the Y-OQ® 30.2 consists of 30 questions that report a total score as well as Somatic score, Social Isolation score, Conduct Problems score, Aggression score, Hyperactivity/Distractibility score, and Depression/Anxiety score for children and adolescents.¹³ These tools have proven to have stable scores across time outside of a treatment setting and have a high sensitivity to changes in psychological functioning over short periods of time.¹⁴ Furthermore, it provides objective measurements in the assessment of clinical improvement and deterioration.¹⁵ At this outpatient behavioral health setting, it was only administered during in-person visits. The adult version ranges from 0-180 points whereas the youth version ranges from 0-120 points.^{16,17} A score above 63 for adults and 29 for youth indicates that the patient has many symptoms of distress, such as anxiety, depression, and stress, as well as interpersonal difficulties in their personal life.^{16,17} In contrast, a score below those values suggests that the patient is functioning in the same range as anyone from the general population.^{16,17}

To qualify for this study, patients needed at least two OQ scores with one being prior to the onset of telepsychiatry care and one being after returning to in-person care. 176 adults and 22 youth qualified for this study, which is only 33% of the total patient population. Their total score was calculated, which is their final OQ score minus their first OQ score pri-

Table 1. Sample Demographics

Characteristic	N	(%)
Gender		
Male	73	36.9
Female	125	63.1
Race		
Caucasian	155	78.3
African American	12	6.1
Other	27	13.6
Unknown	4	2.0
Ethnicity		
Hispanic or Latino	43	21.7
Non-Hispanic or Latino	153	77.3
Unknown	2	1.0
Age Range		
12-17	22	11.1
18-29	48	24.2
30-49	73	36.9
50-64	42	21.2
65 and above	13	6.6
Payer Type		
Medicare	41	20.7
Medicaid	20	10.1
Private Insurance	128	64.6
Self-Pay	9	4.5
Diagnosis		
ADHD	19	9.6
Adjustment Disorder	7	3.5
Anxiety Disorder	25	12.6
Autism Spectrum Disorder	5	2.5
Bipolar or Related Disorder	36	18.2
Depressive Disorder	73	36.9
Disruptive Behavior Disorder	3	1.5
Eating Disorders	1	0.5
Personality Disorders	2	1.0
Schizophrenic or Psychotic Disorder	12	6.1
Substance Related Disorder	1	0.5
Trauma or Stress Related Disorder	14	7.1

or to the pandemic.^{16,17} An improvement is defined as a decrease in OQ score by any amount, whereas a statistical improvement is defined as a decrease of 14 points or more for adults and 10 points or more for youth.^{16,17} The same definitions apply to a deterioration and significant deterioration with an increase of either 14 points or 10 points respectively.^{16,17} By calculating the change in patients' OQ scores, we were able to determine if the patients improved, deteriorated, or remained the same throughout telemedicine services. The reference to the statistical significance of a 14 point change for adults and a 10 point change for children came from the manuals for the OQ® 45.2/Y-OQ® 30.2, which is based on development research.^{16,17}

Study data were collected and managed using RED-Cap electronic data capture tools hosted at Tower Health.^{18,19} After the completion of data collection, the data was exported into Statistical Package for the Social Sciences (SPSS version 28.0) for statistical analysis. Summary statistics were made using proportions, mean/median and standard deviation/interquartile range. The level of significance was set at $p < 0.05$.

RESULTS

Demographic variables collected include race, ethnicity, and age (*Table 1*). The sample population was representative of the overall practice population regarding race, ethnicity, and mental health diagnoses. The study determined that 48.3% of adults improved or significantly improved, 2.8% remained the same, and 48.9% deteriorated or significantly deteriorated throughout the use of telepsychiatry care. 36.4% of youth improved or significantly improved, 13.6% remained the same, and 50% deteriorated or significantly deteriorated (*Figure 1*). The average OQ score before onset of care was 67.31 for adults and 35.86 for youth; the average OQ score post-telepsychiatry was 67.29 for adults and 38.86 for youth (*Figure 2*). In the adult population, there were no statistically significant differences in outcomes between race, gender, ethnicity, age ranges, number of telemedicine visits, nor diagnoses (*Figure 3A*). A statistically significant difference in outcome was found between adult payer type, with those with private insurance having better outcomes ($p=0.000$) (*Figure 4*). In the youth population, there were no statistically significant differences in outcomes between gender, ethnicity, age ranges, payer type, number of telemedicine visits, nor diagnoses (*Figure 3B*). A statistically significant difference in outcome was found between youth races with those that identify as Black or African American having better outcomes ($p=0.033$).

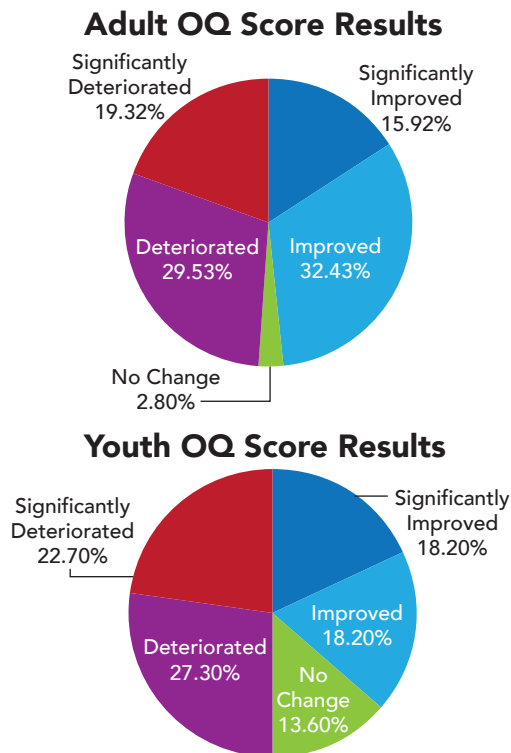


Figure 1. Adult and Youth Total OQ Score Results. 51.1% of adults significantly improved, improved, or remained the same, whereas 48.9% deteriorated or significantly deteriorated. Significance for the adult OQ indicates a 14-point change in either direction. 50% of youth significantly improved, improved, or remained the same, whereas 50% significantly deteriorated

DISCUSSION

It is important to emphasize that the study was conducted during the COVID-19 Pandemic, which has caused and contributed to a tremendous amount of suffering world-wide. As society has been forced to adapt to a new way of living while managing their concerns and fears over the health of themselves and loved ones, and their finances in the wake of numerous layoffs, the mental health of society has taken many hits. This pandemic may have also exacerbated mental health concerns and conditions in susceptible individuals. When taking this into account, it is remarkable that 51.1% of adults and 50.0% of children/adolescents ages 12 to 17 improved or remained the same in this study. This is an accomplishment in and of itself. Considering that this study took place during a pandemic, it is hypothesized that there may

Average OQ Score for Outpatients Before and After Telemedicine

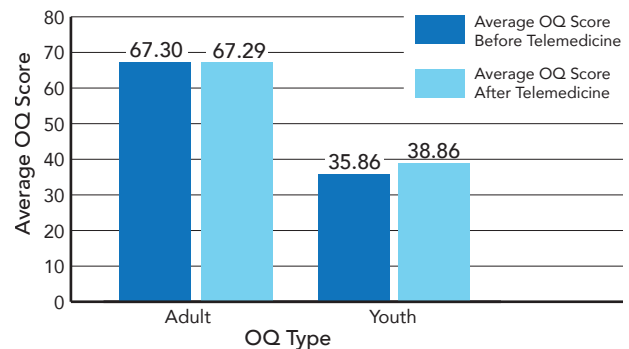
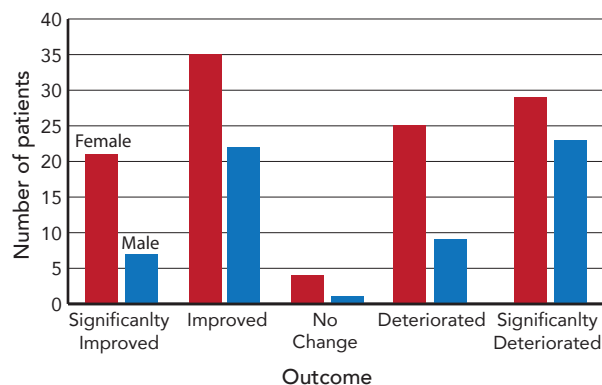


Figure 2. Average Total OQ Scores Before and After Receiving Telemedicine Care. The OQ Assessment tool was used to assess patient reported outcomes with respect to their mental health. The average OQ scores for both adult and youth individuals were calculated both prior to and after undergoing telemedicine. The Adult OQ assessment tool has scores ranging from 0-180, with a score of 63 or more indicating symptoms of clinical significance. The Youth OQ assessment tool has scores ranging from 0-120, with a score of 29 or more indicating symptoms of clinical significance.

have been more individuals improving or remaining the same had the study been conducted outside of a global pandemic.

An important limitation with this study is the fact that the sample population is not truly representative of the actual patient population at this clinic. This is because only 33% of the patient population qualified for the study. Therefore, we cannot generalize findings to the entire population. Many patients were eliminated for not having an OQ score before and/or after the onset of telepsychiatry and for discontinuing care. This is important as those who discontinued care may have done so because they were afraid to leave their homes due to the pandemic and/or were unable to connect through telemedicine. Some of the patients who were eliminated for not having a follow-up OQ were still attending sessions using telemedicine; these patients did not have a follow-up OQ since these questionnaires are only administered during in-person visits. If any of these groups had returned to in-person outpatient visits, they would have undergone another OQ as-

A. Adult Male vs. Female Outcomes



B. Youth Male vs. Female Outcomes

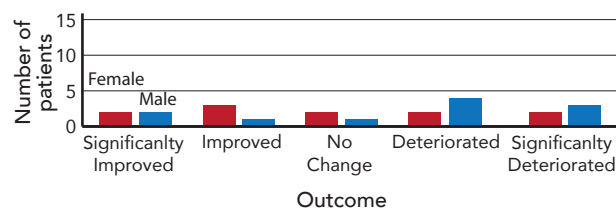


Figure 3. Male vs. Female Outcomes. A. There is no significant difference in outcomes between genders within the adult population ($p=0.281$). B. There is no significant difference in outcome between gender within the youth population ($p=0.699$).

assessment; therefore, it is possible the data would have shown more patients in the improved or significantly improved category. Furthermore, 61.1% of the sample population had private insurance, which is the opposite of what occurs in the practice setting; prior data has shown that the payer split is 60% public insurance (Medicare and Medicaid) and 40% private insurance for this patient population.

Additionally, although we did not find statistically significant differences between adult subpopulations within our research study, it is important to note that there were not equal distributions of gender, race, ethnicity, and age range. For example, there were almost twice as many women than men (114 vs. 62, respectively). There was also a disproportionate amount of non-Hispanic (77.8% of the adult population) and White (81.8% of the adult population) individuals. This makes it difficult to generalize the findings between sub-populations.

There was a statistically significant difference between payer type in the adult population; however, this may be skewed. An important implication of those that were eligible for this study is the necessity for computer or smartphone access with excellent Wi-Fi connection to participate in Video Telemedicine for the best therapy results. Therefore, it is possible that some individuals were unable to continue care during the pandemic if they did not have access to technological resources. This is an important consideration that warrants further research, especially since it has been documented that those with lower income, who may be unable to afford such resources, have worse health outcomes. In research conducted by Rajasekaran, it was found that about 30%

Adult Patient Outcome by Payer Type

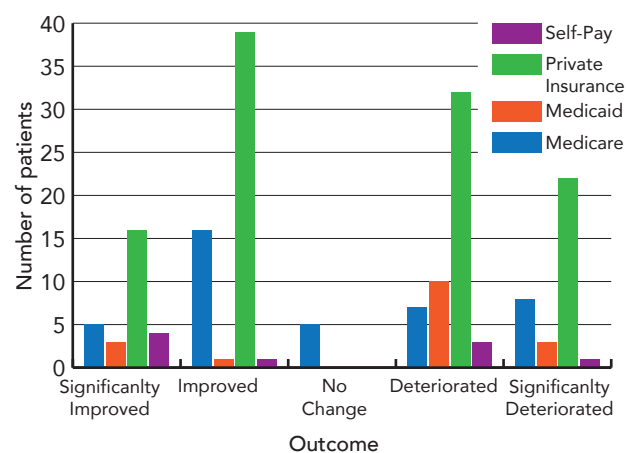


Figure 4. Adult Patient Outcomes Based on Payer Type. There were statistically significant outcomes between payer type for the adult population, with those with private insurance having better outcomes ($p=0.001$). It is important to note that the payer split between private insurance and all other pay-types was 60:40, whereas historically at this behavioral health outpatient services clinic, it has been the opposite: 60% public insurance, 40% private.

of patients in an otolaryngology practice were not able to participate in telemedicine due to their lack of access to technological resources. This researcher described this phenomenon as a “digital divide” which can present a challenge to the older and less educated patients that suffer poorer health outcomes and have a more difficult time accessing telemedicine technology.²⁰

There was a statistically significant difference between youth race groups; however, this is skewed due to the small sample size of only 22 youth. Of the 22 youths, 11 identified as White or Caucasian, 4 as Black or African American, 4 as Other, and 3 were marked as unknown. Due to the disproportionate amount of White/Caucasian youth compared to the other groups, it is difficult to make any accurate assumptions. Furthermore, only 41.5% of the youth patient population qualified for this study. Research conducted by Dong et al has shown that youth have struggled with the transition to online learning in the school setting.²¹ It is also important to consider that the transition to telemedicine may have been especially difficult for this patient population too. In a systematic review conducted by Jones et al, researchers found that adolescents world-wide have higher rates of anxiety, depression, stress, and substance use than previously reported. These researchers also noted that positive coping skills and social support can help mitigate these mental health concerns.²² It is important to investigate what obstacles prevent patients from participating in telemedicine so that no specific subpopulations are inadvertently excluded, and so that they can receive appropriate treatment.

The retrospective nature of this study led to some flaws. Prior to the beginning of the COVID-19 Pandemic, the OQ® 45.2/Y-OQ® 30.2 questionnaires were only administered at set intervals during in-person visits only. With the abrupt change to telemedicine during the pandemic, a system was not in place to administer these questionnaires electronically. In this retrospective study, the questionnaires were used as an assessment for clinical improvement; therefore, all patients that did not return to in-person visits automatically did not qualify for the study since we would not be able to calculate a total OQ score for them. If this was a prospective study, then a system could have been set up ahead of time to administer OQ® 45.2/Y-OQ® 30.2 electronically and to ensure patient access to telemedicine. If the study was set up prospectively in that manner, then more patients would have qualified for this study and the issue of losing patients due to lack of internet access could have been mitigated. Nonetheless, this study provides direction for future studies.

CONCLUSION

As telemedicine has become increasingly utilized, especially since the beginning of the COVID-19 Pandemic, it has become extremely important to assess the utility of this virtual modality. Several studies have used the OQ® 45.2/Y-OQ® 30.2 assessment tool as a measure of patient progress, making this tool appropriate to assess clinical stability in telemedicine patients. To date, no similar studies using this tool in the context of telemedicine exist. By assessing total OQ scores among telemedicine patients, this study has established that telepsychiatry is a very valuable resource moving forward with psychiatric patient care. However, more research with a larger sample size and higher percentage of qualifying patients should be conducted at a time when the COVID-19 Pandemic is not wreaking havoc on the emotional state of individuals to adequately assess the effectiveness of telepsychiatry at increasing clinical stability.

REFERENCES

- Chakrabarti S. Usefulness of telepsychiatry: A critical evaluation of videoconferencing-based approaches. *World J Psychiatry* 2015; 5(3): 286. <https://doi.org/10.5498/wjp.v5.i3.286>
- LaBelle B, Franklyn AM, PKH Nguyen V, Anderson KE, Eibl JK, Marsh DC. Characterizing the use of telepsychiatry for patients with opioid use disorder and cooccurring mental health disorders in Ontario, Canada. *Int J Telemed Appl* 2018; 2018: 1–7. <https://doi.org/10.1155/2018/7937610>
- Wittson CL, Benschoter R. Two-way television: helping the Medical Center reach out. *Am J Psychiatry* 1972; 129(5): 624-627. <https://doi.org/10.1176/ajp.129.5.624>
- Doarn CR. Telemedicine and Psychiatry—a natural match. *Mhealth* 2018; 4: 60. <https://doi.org/10.21037/mhealth.2018.12.04>
- Colbert GB, Venegas-Vera AV, Lerma EV. Utility of telemedicine in the COVID-19 era. *Rev Cardiovasc Med*. 2020;21(4):583-587. <https://doi.org/10.31083/j.rem.2020.04.188>
- Mann DM, Chen J, Chunara R, Testa PA, Nov O. COVID-19 transforms health care through telemedicine: Evidence from the field. *J Am Med Inform Assoc*. 2020;27(7):1132-1135. <https://doi.org/10.1093/jamia/ocaa072>
- Pandarakalam JP. Digital psychiatry: implications for patients and services. *Br J Hosp Med (Lond)*. 2021;82(12):1-10. <https://doi.org/10.12968/hmed.2021.0382>
- Čosić K, Popović S, Šarlija M, Kesedžić I. Impact of Human Disasters and COVID-19 Pandemic on Mental Health: Potential of Digital Psychiatry. *Psychiatr Danub*. 2020;32(1):25-31. <https://doi.org/10.24869/psyd.2020.25>
- Haxhihamza K, Arsova S, Bajraktarov S, Kalpak G, Stefanovski B, Novotini A, Milutinovic M. Patient satisfaction with use of telemedicine in University Clinic of Psychiatry: Skopje, North Macedonia during COVID-19 pandemic. *Telemed J E Health* 2021; 27(4): 464-467. <https://doi.org/10.1089/tmj.2020.0256>
- Ruskin PE, Silver-Aylaian M, Kling MA, Reed SA, Bradham DD, Hebel JR, Barrett D, Knowles F, Hauser P. Treatment outcomes in depression: Comparison of remote treatment through telepsychiatry to in-person treatment. *Am J Psychiatry* 2004; 161(8): 1471-1476. <https://doi.org/10.1176/appi.ajp.161.8.1471>
- Nair U, Armfield NR, Chatfield MD, Edirippulige S. The effectiveness of telemedicine interventions to address maternal depression: A systematic review and meta-analysis. *J Telemed Telecare* 2018; 24(10): 639-650. <https://doi.org/10.1177/1357633X18794332>
- OQ Measures. OQ®-45.2, <https://www.oqmeasures.com/oq-45-2/> (accessed 20 February 2022).
- OQ Measures. Y-OQ® 30.2, <https://www.oqmeasures.com/y-oq-30-2/> (accessed 20 February 2022).
- Boswell DL, White JK, Sims WD, Harrist RS, Romans JSC. Reliability and Validity of the Outcome Questionnaire–45.2. *Psychol Rep* 2013; 112(3): 689-693. <https://doi.org/10.2466/02.08.PR0.112.3.689-693>
- Espiridon ED, Oladunjoye AO, Millsaps U, Yee MR. A Retrospective Review of the Clinical Significance of the Outcome Questionnaire (OQ) Measure in Patients at a Psychiatric Adult Partial Hospital Program. *Cureus* 2021; 13(3): e13830. <https://doi.org/10.7759/cureus.13830>
- Lambert MJ, Hansen NB, Umphress V, Lunnen K, Okiishi J, Burlingame GM, Reisinger CW. Administration and scoring manual for the Outcome Questionnaire (OQ-45.2). Wilmington, DE: American Professional Credentialing Services. 1996;35.
- Burlingame GM, Dunn T, Cox J, Wells G, Lambert MJ, Brown GS. Administration and scoring manual for the Youth Outcome Questionnaire-30 (YOQ-30). Salt Lake City, UT: Outcome Questionnaire Measures. 2004.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, JG. Conde, Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009 Apr;42(2):377-81. <https://doi.org/10.1016/j.jbi.2008.08.010>
- Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O’Neal L, McLeod L, Delacqua G, Delacqua F, Kirby J, Duda SN, REDCap Consortium. The REDCap consortium: Building an international community of software partners. *J Biomed Inform* 2019 May 9; 95. <https://doi.org/10.1016/j.jbi.2019.103208>
- Rajasekaran K. Access to telemedicine—are we doing all that we can during the COVID-19 pandemic? *Otolaryngol Head Neck Surg* 2020; 163(1): 104–106. <https://doi.org/10.1177/0194599820925049>
- Dong C, Cao S, Li H. Young Children’s online learning during COVID-19 pandemic: Chinese parents’ beliefs and attitudes. *Child Youth Serv Rev* 2020; 118: 105440. <https://doi.org/10.1016/j.childyouth.2020.105440>
- Jones EA, Mitra AK, Bhuiyan AR. Impact of covid-19 on Mental Health in Adolescents: A systematic review. *Int J Environ Res Public Health* 2021; 18(5): 2470. <https://doi.org/10.3390/ijerph18052470>