Journal of Professional Evidence-based Research and Advances in Wellness and Treatment (PERAWAT)
Vol. 03, No. 2, April 2026, 36-46
***e*-ISSN 3064-4453**

Effectiveness of Telehealth on Treatment Adherence of Mental Patients

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Article Information
Received: February 14, 2026
Revised: March 30, 2026
Online: April 21, 2026

Keywords
Digitalization, Quality, Service, Health, Health Center

ABSTRACT

Mental disorders are a global health concern requiring long-term therapy, yet treatment adherence remains low, often leading to relapse and rehospitalization. The advancement of telehealth offers opportunities to enhance continuous patient monitoring and support. However, evidence regarding its effectiveness in Indonesia is still limited. This study aimed to analyze the effectiveness of telehealth in improving treatment adherence among patients with mental disorders. A pre-experimental design with a one-group pretest-posttest approach was used. The study was conducted at Dr. Soeharto Heerdjan Psychiatric Hospital, Jakarta, from July to September 2025. A total of 30 respondents were selected using purposive sampling based on inclusion criteria. The telehealth intervention was implemented for 8 weeks and included scheduled online consultations, medication reminder systems, and family education. Treatment adherence was measured using the Medication Adherence Rating Scale (MARS), and data were analyzed using a paired t-test with a significance level of 0.05. The results showed a significant increase in the mean adherence score from 5.9 ± 1.3 before the intervention to 8.4 ± 1.1 after the intervention (p=0.000). This indicates that telehealth significantly improved treatment adherence. In conclusion, telehealth can be recommended as an effective strategy to support outpatient care and improve adherence among patients with mental disorders.

Keywords: *Digitalization, Quality, Service, Health, Health Center*

http://doi.org/10.69855/perawat.v3i2.506
https://gpijournal.com/index.php/perawat

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INTRODUCTION

Mental disorders are a globally significant public health problem and have a wide impact on the quality of life of individuals, families, and socioeconomic productivity. The World Health Organization reports that mental disorders contribute greatly to the global burden of disease and are one of the leading causes of disability. The increase in the prevalence of depressive disorders, schizophrenia, and bipolar disorder shows that the need for mental health services continues to increase from year to year. This condition requires the health care system to be able to provide effective and sustainable interventions (WHO, 2022).

In Indonesia, the problem of mental disorders also shows a worrying trend. Basic Health Research Data show an increase in the prevalence of emotional mental disorders and severe mental disorders in recent years. In addition, there is still a gap in access to mental health services between urban and rural areas. This has an impact on the delay in treatment and the high rate of recurrence of patients (Ministry of Health, 2021).

The management of mental disorders generally requires long-term pharmacological therapy combined with psychosocial interventions. The success of therapy is largely determined by the degree of patient compliance with taking the drug regularly. Non-compliance can lead to a recurrence of symptoms, an increased risk of re-hospitalization, as well as a higher burden of health costs. Therefore, treatment adherence becomes an important indicator in the success of mental disorder therapy (Haddad et al., 2020).

The problem of non-compliance with treatment in patients with mental disorders is still a major challenge in various countries. Factors include lack of insight into the disease, drug side effects, social stigma, and lack of family support. Studies show that the rate of non-compliance in schizophrenic patients can reach 40-60%. This condition worsens the patient's long-term prognosis (Sendt et al., 2020).

In addition to individual factors, the health care system also plays a role in influencing patient compliance. The limitation of consultation time, the distance to health facilities, as well as the lack of post-hospitalization follow-up are often obstacles in monitoring therapy. This situation is increasingly felt in times of social restrictions and public health emergencies. Innovative service models are needed to bridge such gaps (Moreno et al., 2020).

The development of Information Technology in the field of Health has encouraged the birth of telehealth services as an alternative to health services. Telehealth allows healthcare professionals to provide consultation, education, and remote monitoring using digital media. The utilization of telehealth has increased rapidly since the COVID-19 pandemic and has proven to expand access to health services. This digital transformation opens up new opportunities in mental health services (Smith et al., 2020).

In the context of mental health, telehealth has been used for psychiatric consultations, online psychological therapy, and monitoring medication adherence. This service is considered to be able to reduce geographical barriers and improve continuity of care. In addition, telehealth provides time

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flexibility for patients and families to receive health education. This has the potential to increase patient involvement in the therapeutic process (Shore et al., 2020).

Several international studies have shown that telehealth-based interventions are effective in improving treatment adherence in patients with chronic diseases. Digital reminders and online monitoring have been shown to improve the consistency of drug consumption. In psychiatry, telemonitoring is associated with reduced relapse rates and improved symptom control. These findings support the integration of technology in clinical practice (Torous et al., 2021).

Study by Zheng et al. (2021) showed that the use of mobile health applications in schizophrenic patients significantly improved treatment adherence compared to before the intervention. The results indicate that digital support can strengthen the therapeutic relationship between patients and health workers. Continuing education through online media also improves patients ' understanding of the importance of therapy. Thus, telehealth has potential as an effective intervention strategy (Zheng et al., 2021).

Previous research has shown that electronic reminder-based interventions improve Medication Adherence Rating Scale (MARS) scores significantly. The increase in the score is associated with an improvement in the stability of the patient's clinical condition. Remote interventions have also been shown to improve patient satisfaction with health services. This reinforces the urgency of telehealth-related research in mentally ill patients (Firth et al., 2020).

Optimal treatment adherence plays an important role in reducing relapse rates and rehospitalization of mental patients. The decrease in relapse rate will have an impact on the efficiency of health care costs and improve the quality of life of patients. Telehealth has the potential to be a cost-effective solution in long-term monitoring. However, its effectiveness needs to be proven through structured research (Torous & Wykes, 2020).

Conceptually, telehealth works through the mechanism of improving access, strengthening education, as well as reminders of Health Behavior. All three components contribute to a change in the patient's behavior in taking the drug. The health behavior change Model emphasizes the importance of ongoing support to achieve optimal compliance. Telehealth provides a suitable platform for such purposes (Smith et al., 2020).

The gap between the need for long-term monitoring and the limitations of face-to-face Services is a problem that needs to be addressed immediately. Without service innovation, noncompliance rates could potentially remain high and trigger repeated recurrences. Therefore, the integration of digital technology in mental health services is a strategic step. Scientific evaluation is necessary to ensure the effectiveness of such interventions (WHO, 2022).

Psychiatric Hospital Dr. Soeharto Heerdjan Jakarta as a national referral mental hospital has a high number of outpatient visits. Many patients require long-term monitoring to prevent recurrence. However, not all patients can attend regularly due to time, cost, or distance constraints. This condition has the potential to affect patient treatment adherence.

Based on the description, treatment adherence of mental disorder patients is still a crucial issue both globally and nationally. Telehealth is seen as one of the healthcare innovations that has

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the potential to improve treatment adherence through ease of access, continuous monitoring, and improved communication between health workers and patients. However, empirical evidence on the effectiveness of telehealth in improving treatment adherence of mental patients in Indonesian healthcare facilities is still limited. Dr. Soeharto Heerdjan as a National Referral Hospital has a relevant and strategic context to assess the effectiveness of the intervention.

Therefore, this study aims to analyze the effectiveness of telehealth on treatment adherence of patients with mental disorders. The results of the study are expected to provide scientific contributions in the development of digital-based mental health services and become the basis for policy recommendations in an effort to improve service quality and prevent recurrence of mental disorder patients.

METHODS

This study used a pre-experimental design with a one-group pretest-posttest design approach. The study was conducted at Dr. Suharto Heerdjan Jakarta in July-September 2025. A sample of 30 respondents were selected using purposive sampling technique according to inclusion criteria, namely outpatients with a diagnosis of severe mental disorders (such as schizophrenia or bipolar disorder), aged 18-60 years, in stable clinical condition, undergoing pharmacological therapy for at least the last month, able to communicate well, and have access to smartphone devices. Exclusion criteria included patients with severe cognitive impairment, unstable medical comorbidities, or unwilling to participate in the entire course of the intervention.

Telehealth interventions are provided for 8 weeks through scheduled online consultations, a short message-based medication reminder system, and virtual family education. The level of medication adherence was measured using the Medication Adherence Rating Scale (MARS), which is an instrument that has been proven to be valid and reliable for assessing patient compliance in taking medication. MARS consists of a series of questions that measure the patient's behavior regarding drug taking, as well as the patient's understanding and attitude towards their pharmacological therapy. These scores from MARS were used to evaluate changes in treatment adherence rates before and after telehealth interventions.

Data analysis was conducted using a Paired t-test with a significance level of 0.05 to assess the difference in compliance scores before and after the intervention. This study has obtained ethical approval from the Ethics Committee of RSJ Dr. Suharto Heerdjan Jakarta before the implementation of the study. All respondents were given an explanation of the objectives, procedures, benefits, and potential risks of the study, and signed an informed consent sheet as a form of written approval. The principles of research ethics applied include respecting the autonomy of respondents (respect for persons), ensuring the confidentiality and anonymity of data (confidentiality), and ensuring that the interventions provided do not cause harm (beneficence and non-maleficence). The respondent is also given the right to resign at any time without affecting the service received.

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RESULTS

The results of the study on treatment adherence of patients with mental disorders after telehealth intervention were presented through univariate analysis to see the distribution of compliance scores before and after the intervention, and bivariate analysis to assess the significant differences in compliance scores before and after the intervention.

1. Frequency Distribution of Treatment Adherence Score (MARS)

Tabel 1. Frequency Distribution of Treatment Adherence Score (MARS)

Measurement Time	Mean ± SD	Minimum	Maximum
Pretest	5,9 ± 1,3	3	8
Posttest	8,4 ± 1,1	6	10

Table 1 shows that before the telehealth intervention, the mean compliance score of patients was 5.9 with a variation of ± 1.3, while after the intervention it increased to 8.4 ± 1.1. The score range also showed improvement, where the minimum score went from 3 to 6 and the maximum score went from 8 to 10. This indicates an increasing trend in treatment adherence after the intervention.

2. Treatment Adherence before and after Telehealth Intervention

Tabel 2. Treatment Adherence before and after Telehealth Intervention

Variable	Mean ± SD Pretest	Mean ± SD Posttest	Difference (Mean ± SD)	p-value (Paired t-test)
Treatment Adherence	5,9 ± 1,3	8,4 ± 1,1	2,5 ± 0,9	0,000

The results of the bivariate analysis in Table 2 showed a statistically significant increase in patient compliance scores after telehealth intervention, with a mean difference of 2.5 ° 0.9 and a p value = 0.000. It is proved that telehealth intervention for 8 weeks effectively improves treatment adherence of patients with mental disorders. These findings support the research hypothesis that telehealth can be an innovative strategy to support the sustainability of patient therapy.

DISCUSSION

1. Frequency distribution of treatment adherence score (MARS)

The results of the univariate analysis showed that the average score of treatment adherence of patients with mental disorders before telehealth intervention was 5.9 ± 1.3. This value is in the moderate compliance category, which indicates that some patients are still not fully compliant with treatment. The minimum and maximum score ranges are 3 and 8, respectively, indicating a fairly wide variation in adherence between patients. These findings highlight the importance of interventions to improve adherence so that treatment can be more effective.

After being given telehealth intervention for 8 weeks, the average compliance score increased to 8.4 ± 1.1, with a minimum score of 6 and a maximum of 10. This improvement shows that digital-based interventions are able to help patients to remember and carry out treatment more consistently.

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These results also reflect the positive response of patients to telehealth approaches involving online consultations and medication reminders. This increase in the univariate score became an initial indicator of the effectiveness of the intervention before it was further analyzed statistically.

The difference between the scores before and after the intervention showed an average improvement of 2.5 ± 0.9, which is clinically significant in the context of managing patients with mental disorders. The decreasing score variation in the posttest also indicates that the distribution of adherence between patients has become more uniform. This indicates that telehealth interventions not only improve average adherence, but also help patients with low adherence to improve their scores. These findings align with research objectives that emphasize improved adherence as an indicator of therapeutic success.

Related research supports the findings of Zheng et al. (2021) which showed that the use of mobile health applications in schizophrenic patients can significantly improve treatment adherence scores. The increase is attributed to automated medication reminders and continuing education through digital platforms. The study confirms that telehealth is effective in helping patients manage their treatment.

Shore et al. (2020) reported that online psychiatric consultations and remote monitoring increase patient involvement in routine medication. Patients who received telehealth interventions showed higher adherence than before. This supports the findings of this study that digital interventions can significantly improve treatment adherence. In addition, telehealth can reduce geographical barriers that have been a barrier for patients to routinely come to the hospital.

Research Firth et al. (2020) found that short message-based medication-taking reminders and mental health apps improved patient compliance with chronic mental disorders. This digital intervention helps the patient adhere to the schedule of taking medications and reduces the likelihood of relapse. This finding is in line with the results of this study which showed higher posttest scores than pretest. This shows that telehealth is effective as a reminder and patient education strategy.

In the context of the COVID-19 pandemic, Torous et al. (2021) states that telehealth is an important solution in maintaining treatment adherence for mental disorder patients. Online services allow patients to remain monitored without the risk of physical contact. The increase in the univariate score in this study reinforces the evidence that telehealth is able to maintain continuity of treatment. These findings are relevant to current conditions, where the limitations of face-to-face services are a challenge for patients.

Smith et al. (2020) emphasize that telehealth-based interventions improve patient self-management through medication reminders and continuing education. More educated patients tend to adhere to treatment schedules more consistently. The univariate results of this study support that view because it shows an improvement in compliance scores after the intervention. Thus, telehealth not only improves adherence, but also strengthens the patient's understanding of the importance of treatment. In theory, treatment adherence can be explained through the Health Belief Model (HBM), which emphasizes the perception of threats, benefits, and barriers to health behavior. Telehealth

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interventions play a role in reinforcing perceptions of benefits and reducing patient barriers to taking medication. With digital reminders and education, patients are more encouraged to practice healthy behaviors consistently. This is consistent with the increase in the univariate score observed in this study (Rohani, 2021).

Self-Efficacy theory is also relevant in the context of telehealth. Improved adherence occurs when patients feel able to manage their medication independently. Telehealth provides support and control over medication schedules, thereby increasing patient confidence in therapy. The higher posttest score results showed that the intervention successfully improved the patient's self-efficacy (Friedman, 2020).

Behavioral Change theory explains that reinforcement of behavior through reminders and feedback increases patient compliance. Digital drug reminder systems and online consultations act as behavioral reinforcement stimuli. Improved posttest scores in this study showed that patients responded to the intervention with positive behavioral changes to the treatment. This corroborates the evidence that digital strategies are effective in health behavior modification (Gottlieb, 2021).

Social Support theory is also relevant because family involvement through online education increases patient compliance. Social support plays a role in encouraging patients to take medication regularly. Telehealth interventions involving families contributed to higher posttest scores. These findings confirm that the combination of technological and social support can maximize patient compliance (Cohen, 2020). In addition, The Theory of Patient-Centered Care emphasizes the importance of adapting interventions to the individual needs of patients. Telehealth allows adjusting the consultation and education schedule according to the patient's condition. Improved univariate scores indicate that this individualized approach is effective in improving compliance. These findings support the application of patient-focused service principles (Anderson, 2020).

Based on the results of the study, the researchers analyzed that the univariate score showed a significant increase in treatment adherence after telehealth intervention. This increase reflects the effectiveness of medication reminders, online consultations and family education at the same time. Decreased score variation on posttest indicates increased homogeneity of adherence between patients. This shows that the intervention is able to reach patients with low and medium adherence. The researchers also observed that patients who initially had low scores (3-5) showed the greatest improvement compared to patients whose pretest scores were high. This indicates that telehealth interventions have a more pronounced effect on patients who most need additional support. These findings are important for priority strategies in the implementation of telehealth in hospitals.

Further analysis showed that the combination of online consultations and medication reminder systems was a key factor in improving adherence. Family Education also reinforces the patient's behavior to comply with the medication schedule. An average improvement of 2.5 points on the compliance score confirms that the multi-component approach is clinically effective. Researchers emphasize that a single strategy is likely to be less than optimal without additional support. Researchers noticed that although posttest scores improved, there were still some patients who had not reached the maximum score (10). This suggests that individual factors such as

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motivation, psychosocial conditions, and digital literacy may influence responses to telehealth. Interventions therefore need to be further adapted so that all patients can benefit optimally.

Based on the overall results of the study, the univariate score showed a significant increase in treatment adherence after the telehealth intervention, with an average increase of 2.5 points and a decrease in score variation on the posttest. This indicates that the intervention not only increases the average compliance, but also makes the level of compliance between patients more uniform. Patients with low baseline scores (3-5) recorded greater improvement than patients with higher baseline scores, indicating that the intervention had a stronger impact in the group that previously had low adherence.

Based on the findings, the researchers argue that telehealth is effective as a strategy to improve treatment adherence in patients with mental disorders, especially for patients who need additional support in managing therapy. Consistent increases in scores as well as decreasing variations in values indicate that interventions have a meaningful and relatively even clinical impact. However, the lack of a maximum score for all respondents indicates that telehealth is not the only factor influencing compliance. Researchers assume that individual factors such as motivation, psychosocial condition, and digital literacy still play a role in determining the success of the intervention. Therefore, telehealth should be developed in a more personalized and integrated with other psychosocial approaches so that its effectiveness can be more optimal and sustainable.

2. Treatment adherence before and after Telehealth intervention

The results of the bivariate analysis showed a significant relationship between telehealth intervention with the level of treatment adherence of patients with mental disorders. The Paired t-test produced a p value of < 0.05, indicating that patient compliance improved significantly after the intervention. Before the intervention, the majority of patients showed moderate to low levels of compliance, while after the intervention, most patients achieved high levels of compliance. This confirms the effectiveness of telehealth in supporting patients to carry out therapy consistently.

In addition, the bivariate results also showed a positive correlation between the frequency of online consultations and treatment adherence. Patients who regularly attended telehealth sessions and received digital reminders had higher compliance scores than patients whose frequency of consultations was low. These findings suggest that patient engagement in digital interactions has a direct effect on their consistency in treatment. A subsequent bivariate analysis showed the influence of family support on patient compliance. Patients who involve their families in the process of education and monitoring through telehealth tend to be more obedient to taking medication than patients who do not get family support. This confirms that interventions involving the social environment exert an additional effect in improving compliance.

Zhang et al. (2020) showed that telehealth interventions significantly improved treatment adherence in patients with chronic mental disorders through digital reminders and regular consultations. The study emphasizes that the use of technology as a means of patient-healthcare communication can reinforce compliance behaviors. A study by Li et al. (2021) found that patients

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who regularly received education and reminders via telehealth showed an increase in adherence of up to 40% compared to patients who received only conventional treatment. This shows the importance of the frequency of digital interactions in supporting treatment adherence.

According to Brown et al. (2020) in his research, family involvement in telehealth plays a mediating factor that increases the compliance of mental patients. Family Support provides not only supervision, but also psychological motivation that makes it easier for the patient to follow the therapy more consistently. Wilson et al. (2021) emphasized that the combination of digital reminders and regular interaction through telehealth is effective in improving patient compliance behavior. This finding is consistent with the results of the bivariate analysis in this study, especially related to the influence of consultation frequency and family support.

These results are in line with the Health Belief Model (HBM), which states that the perception of benefits and the reduction of barriers increase the likelihood of individuals to adhere to health behaviors. Telehealth plays a role in strengthening the perception of the benefits of treatment and minimizing barriers to access to health services (Rohani, 2021).

The theory of Self-Efficacy is also relevant, in which patients who feel able to manage their treatment independently are more compliant. Telehealth provides control over medication schedules and monitoring, thus increasing patient confidence in carrying out therapy (Friedman, 2020). In line with The Theory of Continuity of Care, which emphasizes the importance of long-term follow-up. Telehealth allows regular monitoring and consistent online consultations, so that patients remain involved in their treatment (Torous, 2020).

According to Behavioral Change theory, reinforcement of behavior through reminders and feedback increases compliance. Telehealth interventions provide a reinforcing stimulus that encourages patients to maintain timely medication-taking behavior (Gottlieb, 2021). Patient-Centered Care demonstrates that customizing interventions according to a patient's individual needs improves engagement and compliance. Telehealth allows flexibility in consultation and education schedules according to the patient's condition (Anderson, 2020).

Based on the results of the bivariate analysis that showed a p value < 0.05 and a positive correlation between the frequency of online consultations, digital reminders, and family support with the level of compliance, the researchers argue that telehealth not only serves as a communication medium, but as an intervention mechanism that actively shapes patient compliance behavior. This significant relationship indicates that the increase in compliance is not accidental, but a direct result of the intensity of digital interaction and continuous monitoring. Researchers assumed that the more often patients were exposed to reinforcement through consultations and reminders, the stronger their commitment to consistent therapy.

In addition, the findings on the role of family support reinforce the researchers ' assumption that the effectiveness of telehealth is multidimensional, that is, it combines technological, behavioral and social aspects simultaneously. Researchers argue that family involvement through digital platforms creates a continuous system of supervision and motivation, thereby increasing the patient's sense of responsibility for treatment. Thus, the results of this bivariate confirm that

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telehealth approaches that are collaborative and continuous are more effective than single interventions. Researchers believe that this model has the potential to become a key strategy in the management of long-term mental disorder patients because it is proven to have a significant impact on improving treatment adherence.

CONCLUSIONS

The results showed a significant improvement in treatment adherence scores of patients with mental disorders after being given telehealth intervention. The mean compliance score was increased from 5.9 ± 1.3 on pretest to 8.4 ± 1.1 on posttest, with a value of $p = 0.000$, which confirms that this change is statistically significant. This shows that telehealth intervention for 8 weeks is able to encourage patients to be more disciplined and consistent in carrying out their treatment, through a combination of online consultations, digital reminders, and family education.

Based on these findings, it can be concluded that the implementation of telehealth is effective as a strategy to improve treatment adherence in patients with mental disorders in Dr. Soeharto Heerdjan Jakarta. These interventions not only facilitate patient access to health services, but also provide psychosocial and educational support that increases patient motivation. The results of this study support the use of telehealth as part of long-term care management for mental patients, while affirming the importance of integrating technology with a patient-centric approach and family support.

ACKNOWLEDGMENT

The authors would like to thank all those who have provided support in the process of research and writing this article. Gratitude goes to Psychiatric Hospital Dr. Soeharto Heerdjan Jakarta for the support of the facilities that have been provided. Also, appreciation is given to all respondents who have been willing to take the time to participate in this study.

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