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The Effect of "Drug Compliance Therapy" on Compliance, Attitude toward Medication, and Insight among Hospitalized Patients with Psychotic Disorders

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Abstract: **Patient's attitude toward medication and insight into illness are the main predictors of compliance. An innovative multi-component approach thought to be advantageous in addressing and possibly improving the above mentioned factors is "drug compliance therapy". Objective: To examine the effect of "drug compliance therapy" on compliance, attitude toward medication, and insight among hospitalized patients with psychotic disorders. Setting: The study was conducted at El-Maamoura Hospital for Psychiatric Medicine in Alexandria, Egypt. Subjects: Comprised 80 noncompliant patients. They were divided into two equal groups; a study group and a control one (40 patients each). Tools: Four tools were used; Psychotic Patients' Socio-demographic and Clinical Data Structured Interview Schedule, Clinician Rating of Compliance Scale (CRCS), Drug Attitude Inventory (DAI-30) and Schedule for Assessment of Insight-Expanded version (SAI-E). Results: Patients in the study group showed significant improvements in their mean scores of the CRCS, DAI-30, and SAI-E following the implementation of drug compliance therapy. Conclusion: Drug compliance therapy can bring significant improvements in the levels of compliance, attitudes, and insight among hospitalized patients with psychotic disorders. Recommendations: Drug compliance therapy should be incorporated into the routine psychiatric clinical practice, psychiatric nurses need to be trained to deliver it in the inpatient and outpatient settings, and further researches are needed to evaluate the effectiveness of this therapy over long-term follow-up periods.**

Keywords: **Medication Compliance; Attitude toward Medication; Insight; Compliance Therapy; Psychiatric Nurse.**

1. INTRODUCTION

Despite the introduction of new psychotropic medications with broader efficacy, evidences indicate that drug compliance among patients with psychotic disorders is poor[(1,2)]. Noncompliance with psychotropic drugs was associated with greater risks of relapse, hospitalizations, violence, suicides, and increased substance abuse problems[(3,4)].

Different interacting factors affect compliance with psychotropic drugs. Among the main predictors of compliance are the patient's attitude toward medication and his insight[(2)]. Consideration of these factors is the first stage of any intervention to enhance drug compliance. Accordingly, different therapeutic interventions have been suggested to improve compliance rates among patients with psychotic disorders[(5)]. Moreover, there are evidences suggesting that attitude and insight are dynamic factors which may be the most modifiable patient–related factors for enhancing patients' compliance[(6,7)].

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Psychosocial interventions as cognitive-behavioral, psycho-educational, and affective interventions have been tried to improve compliance[8]. However, it was suggested that the complexity of factors affecting compliance may support the pressing need for multi-component interventions[6]. The advantage of multi-component approaches is that they address multiple barriers to compliance on multiple levels[9,10]. An innovative multi-component approach developed by Kemp et al. (1996) and thought to improve compliance with recommended treatment regimen is the "drug compliance therapy"[11]. It is a brief, pragmatic and patient-centered intervention that could be practiced in individual or group settings. The therapy is based on a combination of motivational interviewing, cognitive-behavioral, affective, and psycho-educational strategies[12].

Compliance enhancing intervention borrows extensively from motivational interviewing which is a counseling method aiming to help people change their attitudes and behaviors. Modifications are added to the motivational interviewing approach to be used with patients with psychotic disorders, with a more active therapeutic stance, cognitive, and educational techniques[11-13].

Previous randomized controlled trials reported that compliance therapy could be advantageous in addressing and possibly improving attitudes toward psychotropic medications and, insight into mental illness[14-16]. Eliciting patients' beliefs and stance toward treatment, exploring ambivalence to treatment, and working through treatment maintenance are the focus of the therapy[17,18]. Patients are invited to review their medication use history, openly express their feelings and experiences related to medication taking, discuss common misgivings and misconceptions about psychotropic drugs, and consider the advantages and disadvantages of taking medications. Patients also are encouraged to ask questions to receive information about the illness and medication accordingly[11,12]. Through these therapeutic interventions, attitudes and insight are explored, tackled, and may be enhanced and thus increasing compliance rate[8,14,16].

Understanding the characteristics of the negative attitude and diminished insight among noncompliant patients, would help the nurse to better motivate and assist patients to change their hindering attitudes and recover insight enabling them to take an active role in medication management and compliance process[19].

Studies regarding compliance enhancing interventions have been mostly undertaken in Western and developed countries[11-15]. Therefore, there is a compelling need to examine whether "drug compliance therapy" effective in the Western world, is also effective with Egyptian patients. Additionally, Egyptian psychiatric nurses need to try and incorporate different and advanced approaches to improve compliance as part of advanced psychiatric nursing practice.

Aim of the Study

The aim of this study is to examine the effect of "drug compliance therapy" on compliance, attitude toward medication, and insight among hospitalized patients with psychotic disorders.

Research Hypothesis

This study hypothesizes that "drug compliance therapy" enhances compliance, attitude toward medication, and insight among hospitalized patients with psychotic disorders.

2. MATERIALS AND METHOD

Materials

Design: A quasi – experimental design was followed in this study.

Setting: The study was conducted at El-Maamoura Hospital for Psychiatric Medicine in Alexandria, Egypt. The hospital is affiliated to the Ministry of health. It has a capacity of 860 beds and is composed of twelve wards; ten for patients with psychotic disorders and two for male patients with substance abuse disorders. The psychiatric wards are divided into five free wards (three for male and two for female patients), and five paid wards (three for male and two for female patients). The hospital serves three governorates; namely, Alexandria, El-Beheira and Matrouh. This study was conducted in the ten wards that manage patients with psychotic disorders.

Subjects: The subjects of the present study comprised 80 patients with psychotic disorders, who were considered as noncompliant to psychotropic medications. The subjects were divided into two equal groups:

The study group: It was composed of 40 drug noncompliant patients who were subjected to drug compliance therapy sessions.

The control group: It was composed of 40 drug noncompliant patients who matched the study group. Matching was considered as much as possible regarding patients' sex, age, marital status, educational level, diagnosis, duration of illness, number of previous admission, duration of current hospitalization, and type of ward (free or paid).

Tools: The following four tools were used to collect data for this study:

Tool I: Psychotic Patients' Socio-demographic and Clinical Data Structured Interview Schedule

The tool elicits data about the general socio-demographic characteristics of the subjects, (such as sex, age, marital status, educational level, occupation and residence). It also elicits clinical data (such as patient's diagnosis, duration of illness, previous psychiatric hospitalization, the length of current hospitalization, mode of admission, type of ward, and the presently prescribed psychotropic medications).

Tool II: Clinician Rating of Compliance Scale (CRCS)

This is an observation Likert rating scale developed by Kemp et al. (1996) to assess the degree of medication compliance among patients with psychotic disorders[(11)].

The patient's compliance to psychotropic medications was measured on seven points Likert scale. Scores were distributed as follow; 1for complete refusal of psychotropic medications, 2 for partial refusal, 3 for reluctant acceptance, 4 for occasional reluctance about treatment, 5 for passive acceptance (patients do not resist when asked to take medications), 6 for moderate participation in the treatment and show some interest in treatment, and 7 for active participation in the treatment and show some responsibility for the medication intake.

The patient was considered as a drug noncompliant if he/she met the rating criteria from 1 to 4. On the other hand, if a patient met the rating criteria from 5 to 7, he/she was considered as a drug compliant. The CRCS has been successfully used in previous researches[(12,14-16)].

Tool III: Drug Attitude Inventory (DAI-30)

It was originally constructed by Hogan et al. (1983)[(20)]. It comprises 30 true/false statements that aim to capture and predict patients' attitudes toward psychotropic medications. The DAI has 30 statements divided into; 15 "True" statements scored as plus one, and 15 "False" statements scored as minus one. Scoring was done by counting plus one for each "true" statement, and minus one for each "false" statement. The final score for each patient is the positive score minus the negative score. The total score was ranging from +15 to -15. A positive total score indicated a positive attitude, and a negative total score indicated a negative attitude.

The DAI-30 was translated into Arabic language and tested for its translation, content validity, and reliability on Egyptian subjects by Mousa (2006). The tool had demonstrated adequate validity and strong reliability (r=0.922)[(2)].

Tool IV: Schedule for Assessment of Insight-Expanded version (SAI-E)

This is an insight measure which was designed by Kemp and David (1996)[(21)]. It comprises 11 items; eight items are rated from 0 to 2, and three items are rated from 0 to 4. The full score of the SAI-E is 28, with the full SAI-E score that ranged from 0 to 14 indicating "poor insight", while the full SAI-E score that ranged from 15 to 28 indicating "better insight".

Method

- Official written permissions to conduct the study were obtained from the responsible authorities.

- Tool I was developed and tool IV was translated into Arabic language by the researcher.

- Tools II and IV were tested for their content validity by a group of 5 experts in the psychiatric nursing field. Slight modifications were done in tool IV.

- A pilot study was carried out on 12 patients. Results of this pilot study revealed that all tools were clear and applicable.

- Tools II and IV were tested for reliability by applying them on 20 patients using a test-retest technique. Both tools proved to be reliable (r.=0.881 and 0.897, respectively).

- **The actual study was conducted in three stages:**

- ***Stage One:***

Before implementation of the therapy, recruiting patients who were considered as noncompliant with psychotropic medications was done through the following steps:

- Selection of the hospital wards was done using simple randomization to identify priority sequence of the ten wards that serve patients with psychotic disorders.

- In each selected ward, all patients were observed for two days during the distribution of the morning and noon medication doses using tool II in order to determine and detect noncompliant patients. If the number of detected noncompliant patients was not enough to constitute two matched groups, the observation was repeated again for another two days until the number is completed.

- Based on the observation, the detected noncompliant patients in the selected ward were classified randomly into two groups; a study group for drug compliance therapy and a control group left to undergo the usual hospital routine care without any intervention from the researcher.

- Matching was considered as much as possible through reviewing patients' medical charts, and patients' data collected using tool I.

- Patients were interviewed individually once, or twice to establish rapport.

- Tool I was applied again to complete and confirm the patient's socio-demographic and clinical characteristics with those obtained from the medical chart, and tools III and IV were applied in order to elicit attitude toward medication, and to assess insight (pre-implementation). This was done for the two groups before any intervention.

- ***Stage Two:***

- This stage is directed toward the implementation of drug compliance therapy after reviewing the compliance manual developed by Kemp et al. (1997)[22], and the concordance skills manual developed by Gray and Robson (2005)[23].

- The total number of the study group (40 patients) was divided into 9 subgroups composed of 4 or 5 patients each.

- Each group attended six intervention sessions; each session lasted for 60–90 minutes. Sessions were conducted 3 times a week, day after day.

- The researcher provided the patients of the study group with detailed explanation of therapy and its implementation. The ground rules of the group as for example honesty, confidentiality, were discussed.

- ***Stage Three:***

- This stage is concerned with the evaluation of the effectiveness of drug compliance therapy. Patients of the study and control groups were through observed immediately after completion of the therapy for two days during the distribution of the morning and noon medication doses using tool II. Then, reapplication of tools III and IV was done for the second time.

- Collection of data was done during the period from July 20th, 2008 to January 22nd, 2009.

Ethical considerations:

- Informed oral consent for voluntary participation in the study was obtained from the recruited patients after explaining the aim of the study.

- Subjects' privacy and anonymity were assured and respected.

- Data confidentiality was considered and respected.

Statistical Analysis

- The SPSS (Statistical Package for Social Science) program, version 13.0 was utilized for both data presentation and statistical analysis of the results.

- The following statistical measures were used:

A. Descriptive measures included frequency, percentage, minimum, maximum, arithmetic mean, and standard deviation.

B. Statistical tests included:

- Chi square test* was used to test the association between variables in qualitative data.
- t-test* was used to compare between two independent means.
- Paired t-test* was used to compare paired means (two dependent means within one group).
- Mean percent change was used to calculate the changes between the study and control groups before and after conducting the intervention.

- Levels of significance selected for this study were p equal to or less than 0.05 and 0.001.

3. RESULTS

Table (1) presents the socio-demographic characteristics of the studied patients` groups. The results indicated that 70% of patients in both the study group and control group were males, with a mean age of 34.5±10.11 years and 35.25±10.50 years respectively.

Regarding marital status, those who were single represent 72.5% for the study group and 75.0% for the control group. In relation to educational level, 30.0% of the study group and 45.0% of the control group had primary and preparatory level of education. Those with secondary level constituted 40.0% and 22.5% respectively. It was found that 45.0% and 47.5% respectively were unemployed. Table (1) also shows that 85.0% and 90.0% of the study and control groups respectively were living in urban areas.

Results revealed that no statistically significant differences were detected between the study and control groups, i.e., the patients in both groups were matched for their socio-demographic characteristics ($p>0.05$).

Table (2) shows the clinical characteristics of the studied groups of patients. The table illustrates that nearly two thirds of patients in both groups had schizophrenia (65.0%), followed by those having mood disorders (25.0%). Their mean duration of illness was equal to 13.0±7.75 years and 12.25±7.68 years for the study and control groups respectively.

Previously hospitalized patients constituted 95.0% of each group. The mean number of previous hospital admission(s) was equal to 2.85±3.03 times and 2.7±3.02 times for both groups respectively, with 47.5% and 45.0% of the study and control groups respectively being admitted four times and more.

Concerning the duration of current hospitalization, it ranged between 1.00–234.00 weeks for the study group and 1.00–156.00 weeks for the control group, with 47.5% of both groups being hospitalized for one week to less than one month. For this current hospitalization, all patients in the study and control groups were involuntarily admitted, and 47.5% and 52.5% of each group being admitted in free and paid wards respectively.

In general, no statistically significant differences were noted between the study and control groups, i.e., the patients in two groups were matched for their clinical characteristics ($p>0.05$).

Table (3) represents the distribution of the study and control groups of patients according to their compliance as measured by the Clinician Rating of Compliance Scale (CRCS) pre- and post-implementation of drug compliance therapy. It was observed that all patients in both groups were noncompliant to their prescribed medication regimens before implementing drug compliance therapy. After implementing the therapy, the majority of patients (90.0%) in the study group became compliant, while 97.5% of patients in the control group were still noncompliant. A statistically significant difference was proved between the study and control groups ($\chi^2=61.600$, $p=0.000$).

Table (4) presents the distribution of the study and control groups of patients according to their attitudes as measured by the DAI-30 pre- and post-implementation of drug compliance therapy. One can notice that all patients in both groups had a negative attitude toward medication regimens before implementing the drug compliance therapy. After implementation of the therapy, the majority of patients (90.0%) in the study group had a positive attitude toward medications, whereas all patients in the control group still had a negative attitude toward medications. A statistically significant difference was found between the study and control groups (χ^2=65.45, p=0.000).

Table (5) represents the distribution of the study and control groups of patients according to their insight as measured by the SAI-E pre- and post-implementation of drug compliance therapy. All patients in both groups had poor insight before implementing the intervention. After implementation of the therapy, 82.5% of the study group had better insight, while all patients in the control group still had poor insight. A statistically significant difference was noted between the two groups (χ^2=71.343, p=0.000).

Table (6) illustrates the mean scores and mean percent changes of compliance as measured by CRCS, attitudes toward medication as measured by DAI-30, and insight into illness as measured by SAI-E among the study and control groups pre- and post-implementation of drug compliance. It was observed that the mean score of CRCS among the study group was improved by 206.9±169.6 of the score before implementing the compliance therapy. In this respect, the mean score was 2.13±0.939 before the beginning of the intervention and increased to 5.23±1.05 after conducting the drug compliance therapy, with a statistically significant difference (paired t=14.892, p=0.000). On the same line, it was noted that the mean score of CRCS among the control group was slightly improved from 2.48±0.716 to 2.88±0.757 by 25.4±58.71 of the baseline value, with a statistically significant difference (paired t=3.369, p=0.001). Despite the improvement in the mean scores among the study and control groups, a statistically significant difference between the two groups was detected in the mean percent change (t=6.394, p=0.000).

Concerning the DAI-30, it was found that among the study group the mean score was improved by 268.7±211.7 post-implementation of the compliance therapy. The mean score significantly increased from - 4.95±3.707 to 6.70±4.631 (paired t=13.114, p=0.000). In contrast, there was a minimal reduction in the mean score of DAI-30 among the control group by 4.1±23.97. However, this change was not statistically significant (paired t=0.443, p=0.66). Comparing the mean percent changes, a statistically significant difference was proved between the study and control groups (t=7.789, p=0.000).

Regarding the SAI-E, there was a significant improvement in the mean score among the study group after the therapy by 1047.0±970.6 of the baseline value, being 6.9±3.18 and 20.3±6.33 before and after the drug compliance therapy respectively, with a statistically significant difference (paired t=18.01, p=0.000). On the other hand, the mean score of SAI-E among the control group was decreased from 7.40±2.56 to 7.20±2.42 by 116.8±110.8 of the baseline value, with no statistically significant difference (paired t=0.840, p=0.406). Comparing the mean percent changes, a statistically significant difference was noted between the study and control groups (t=5.794, p=0.000).

Comparing the mean percent changes between both groups, t-test results showed that the study group had significantly more improvements in the mean scores of compliance, attitude, and insight after participation in the compliance therapy sessions than the control group (p=0.000 for all respectively).

4. DISCUSSION

Drug compliance therapy is a multi-component intervention to improve barriers to successful treatment outcomes, namely; noncompliance, negative attitudes, and lack of insight[9,10]. Consequently, the current study was grounded on the hypothesis that this therapy enhances drug compliance, attitude toward medication, and insight among hospitalized patients with psychotic disorders. This was supported by the results of the present study as the majority of patients in the study group became more compliant, developed more positive attitudes toward medication and better insight into their mental illness after attending "drug compliance therapy". This was evident when comparing the study and control groups' total scores of compliance, attitudes, and insight scales. Generally, patients in the study group showed significant improvements in their mean scores of the Clinician Rating of Compliance Scale (CRCS), Drug Attitude Inventory-30 (DAI-30), and Schedule for Assessment of Insight-Expanded version (SAI-E) following the implementation of drug compliance therapy. These results go with the findings of previous studies which used these measurements to demonstrate that drug compliance therapy is effective in improving medication compliance, attitudes toward treatment, and insight into illness among patients with different psychiatric diagnoses[11,12,14].

These obvious improvements in the study group's levels of compliance, attitude, and insight after conducting the intervention can be explained by the aforementioned fact that drug compliance therapy utilizes various psychosocial compliance enhancing strategies at the same time. Each one of these strategies may be beneficial when employed alone; however, their combination may be more powerful in achieving the desired outcomes. Another explanation of the positive impact of compliance therapy could be that this type of intervention permits an open dialogue about mental illness and its treatment where patients frankly express and the psychiatric professional nurse empathetically listens. During different sessions, drug compliance therapy seeks to build and increase the patient's motivation for taking medications, changing negative attitudes toward pharmacotherapy, and develop insight into illness. This is achieved when patients are engaged in collaborative and non challenging conversations and discussions to help them express beliefs about illness, and concerns and attitudes toward medications, and review their past history with mental illness and psychotropic drugs. This in turn increases the patient's perception of susceptibility and awareness of the psychosocial consequences of the uncontrolled mental illness on self and others, and then those patients are guided in analyzing the benefits and risks of taking medication while emphasizing the advantages of regular medication taking[19,24]. Through this accepting non-blaming atmosphere, patients feel respected and listened to, and are confident, empowered, and autonomous to make right decisions about taking medicines. Moreover, improving compliance, attitudes, and insight often help patients to take an active role in managing their problems, understand their illness, recognize the value of available treatment protocols for their mental health, feel more empowered and successful at using medication regimens to achieve personal goals, and accepting medication as necessary for functioning in the community[13,14].

It is thought that the issues of compliance, attitudes, and insight will always be connected and integrated elements in the management of psychotic disorders[25,26]. Such a notion is supported by the findings of the present research which indicated that although the negative attitudes toward medication and lack of insight into illness were not inclusion criteria for the studied patients groups, it was noted that before implementing the intervention all noncompliant patients in both the study and control groups showed negative attitudes and poor insight, whereas after implementation of compliance therapy patients in the study group developed more positive attitudes toward medication, better insight into illness, and greater compliance with drug regimens. Given that lack of insight has adverse clinical implications in the form of unpleasant attitudes toward treatment, and medication noncompliance, it appears that patients who developed more insight were more likely to recognize the role of medications in their recovery, be motivated to continue taking medications, and develop favorable attitudes toward use of medications.

Akin to the findings of the current study, evidences from other studies confirmed that both the attitudes toward medication and insight into illness are important variables in predicting medication compliance and all are closely related[27,28]. Analysis of the compliance-attitude-insight triad has been confounded by the assumption that noncompliance is always associated with unfavorable attitudes toward treatment and denial of mental illness[29]. In the support of this assumption, the findings of prior studies reported that those patients with a greater insight and more favorable attitudes toward medications were more likely to comply with their prescribed medication regimens[13]. On the other hand, when individuals with psychotic disorders do not perceive themselves as ill, they are less inclined to enter or remain in treatment regimens. They also hold negative attitudes and underappreciate the benefits of medicines. They are often being coerced into treatment, and put themselves at higher risks of discontinuing medications, with a concomitant increase in the risk of relapse and hospitalization[19,30]. In the same direction, the present study revealed that both the study and control patients reported that they were involuntarily hospitalized. Needless to say that all those patients who are involuntarily admitted are lacking insight before conducting the intervention and because of this poor insight they do not see a necessity to take medications. Consequently, all patients in the study and control groups exhibited noncompliant behaviors which usually provoke coercive and compulsory measures and strict actions from the staff members in order to administer medications.

The results of the current study revealed a statistically significant effect of the carried out compliance therapy on the drug compliance as measured by the Clinician Rating of Compliance Scale (CRCS). This improvement may be due to the effect of the motivational-cognitive framework of compliance therapy which assumes that in attempting to get patients be compliant with medication regimens, psychiatric professionals must be sensitive to patients' concerns and feelings regarding illness and medication taking. They should employ such sensitivity in a way that is nonjudgmental when discussing the issue of noncompliance[31]. Therefore, instead of trying to convince patients that they are sick and need

treatment, patients who participated in compliance therapy are invited to join the psychiatric nurse in an open and accepting dialogue about the various perceived advantages and disadvantages of treatment, and they are encouraged to identify positive and negative consequences of compliance and/or noncompliance that might help and/or prevent them from achieving symptoms relief and illness control as well as attaining personal goals. Through this cognitive-motivational approach, patients weigh up pros and cons of their noncompliant behavior, while at the same time assume the responsibility for their decisions with assistance from the psychiatric professionals to view this benefit-risk profile realistically in order to make the appropriate decisions[11,12]. Similarly, previous researches demonstrate the improvement in the patients' level of compliance after participating in compliance enhancing interventions inspired by the concepts of motivational interviewing and cognitive techniques[32,33]. To the contrary, O'Donnell et al. (2003) and Gray et al. (2006) concluded that compliance therapy had no clear benefits in terms of treatment compliance[34,35].

Regarding the attitude toward medication, the results of the current study demonstrated that before the intervention all the study and control patients held negative attitudes toward psychotropic medications. This is contradictory to the findings of El-Emary and Aly (2009) who also used the DAI-30 to measure patients' attitudes toward psychotropics and reported that the majority of patients had positive attitudes toward their drug regimens knowing that those patients did not receive any kind of special psychosocial interventions to improve the attitude toward medication, and they only received the routine hospital care. The researchers attributed this result to that most of these patients were on atypical and novel medications and they have some knowledge about the therapeutic effects and side-effects of these medications[36]. This appears partly true knowing that patients' knowledge and information related to the illness and treatment could improve their attitudes and compliance with medication regimens[32,37].

However, it was found by other researchers that the didactic intervention such as psycho-education as a single compliance enhancing strategy focuses on knowledge alone proved to be insufficient in changing attitudes and improving compliance with treatment[5,38]. This is in harmony with the findings of an Egyptian study conducted by Hussein et al. (2006) who concluded that patients' attitudes and compliance could be improved when they receive a multimodal intervention which included not only psycho-education, but also counseling and cognitive treatments[39]. In parallel, drug compliance therapy as a multi-component psychosocial intervention, employing a combination of motivational interviewing, cognitive, psycho-educational, and affective approaches, seems beneficial than a single focus component intervention[32,40,41].

Previous researches advocated the advantage of compliance therapy on improving patients' attitudes toward psychopharmacological treatment regimens[11,12,14,16]. This can be confirmed by the results of the present study which revealed that after participation in drug compliance therapy sessions, patients in the study group reported more positive attitudes toward their medication than the control group did. This may be due to the fact that within an active and accepting therapeutic stance, patients are allowed to express their beliefs and attitudes toward their psychotropic medications, while the psychiatric professional exhibits a great degree of acceptance and understanding for the expected misconceptions and negative attitudes toward treatment[19,31].

As regards patients' insight, the results of the current research revealed a statistically significant positive effect of the carried out compliance therapy. The study group gained significantly more insight following participation in compliance therapy sessions than the control group. Such a result is supported by prior research evidences which indicate that compliance therapy has an advantageous effect on the insight of patients with various psychotic conditions[11,12,14].

Actually, the three etiological models of impaired insight explained the improvement in the level of insight among patients of the study group in the present study. First, the psychological model suggests that lack of insight is a defensive coping mechanism in the form of denial of mental illness to protect against the stigma and low self-esteem[42,43]. In other words, it is well known that the public attitudes toward people with mental illnesses have been described as stigmatized, uninformed, and fearful. Usually, patients are aware of the general public's tendency to stigmatize them as dangerous, irresponsible, and unlikely to improve. As a result, patients deny their illness as a defense against the negative feelings accompanying the stigma[44,45]. Drug compliance therapy considers these issues as it offers the opportunity to tackle the stigma of mental illness and helps patients share their stories, experiences, feelings, and concerns related to this problem in a nonjudgmental and accepting atmosphere. Additionally, unlike one-to-one therapies, compliance therapy which carried out on a group level invites patients to experience feelings of connectedness, togetherness, and mutual support, to exchange experiences, and to motivate and learn from each other how to combat the stigma. Drug compliance therapy

also provided the study group a therapeutic context where the experience of being mentally ill and taking medication was normalized and decatastrophized. Added to this, patients became aware of stressors as possible causes for psychotic conditions in the context of stress vulnerability model which enabled patients accepting their psychotic symptoms as conditions necessitating pharmacotherapeutic interventions[11,12,22].

Second, the cognitive model which explains the insight as a set of attributes and beliefs about symptoms is used as a basis for providing the cognitive strategies during compliance therapy sessions[46]. These cognitive techniques focus on eliciting patients' cognitive representations and appraisal of illness and medication use[47]. The cognitive techniques often help patients examine their cognitive representations and explanations, and consider more flexible, alternative, and logical explanations for their mental illness which are more compatible with the use of medication[48]. This can be confirmed by the findings of the current study which indicated that before the therapy patients of the study group tended to project their problems and explained their conditions using psychotic symptoms such as persecutory and grandiosity beliefs. Yet, after the implementation of drug compliance therapy the level of insight significantly increased and the psychotic rationales were less reported or disappeared. On the contrary, after receiving the routine hospital care the control patients' impaired insight did not improve, so they tended to mention illogical psychotic symptoms as explanations for their mental conditions. This coincides with findings of other studies which demonstrated that lacking insight and holding negative attitudes toward treatment together contribute to irregular medication taking and may in turn lead to increased psychopathology. Patients in these studies had significantly higher ratings on psychotic symptoms[49-52]. In the psychiatric clinical practice, poor insight is easily recognized if the patient brings up the negative attitudes actively or discontinue the medication regimens[53].

A further advantage of compliance therapy sessions is the cognitive techniques used. One of these cognitive strategies is the guided association/discovery which aims to increase and promote insight through helping patients make associations, e.g., between drug compliance and symptoms reduction.

The third model explaining lack of insight is the neurophysiological model. Proponents of this model assumed that medications may promote brain functions and consequently insight into illness[54]. This assumption could be supported by the results of the present study knowing that after conducting compliance therapy the majority of the study group obtained high mean scores on both CRCS and SAI-E. In this regard, it is thought that compliance might be considered to be the behavioral-external side of the mental illness, whereas its subjective-internal perspective is insight[55].

5. CONCLUSION

In the light of the results of the current study, it could be concluded that drug compliance therapy as a multi-component and patient-centered approach can bring significant improvements in the levels of compliance, attitudes, and insight among hospitalized patients with different psychotic disorders.

6. RECOMMENDATIONS

The followings are the main recommendations yielded by this study:

- Drug compliance therapy should be integrated and incorporated into the routine psychiatric clinical practice.
- Psychiatric nurses need to be trained to deliver drug compliance therapy effectively in the inpatient settings and extended to the outpatient and community settings.
- Replicative studies are needed to examine the effectiveness of drug compliance therapy on outpatient and community subjects.
- Further researches are needed to evaluate the effectiveness of drug compliance therapy over long-term follow-up periods.

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Table (1): Socio-demographic characteristics of the studied groups of patients

Variables	Study group (n = 40)		Control group (n = 40)		Test of significance
	No.	%	No.	%	
Sex					
Male	28	70.0	28	70.0	$\chi^2 = 0.000$
Female	12	30.0	12	30.0	p = 1.000
Age (in years)					
20 –	17	42.5	16	40.0	
30 –	12	30.0	12	30.0	$\chi^2 = 0.141$
40 –	7	17.5	7	17.5	p = 0.986
50 +	4	10.0	5	12.5	
Min – Max	20.00 – 56.00		21.00 – 59.00		
Mean ± SD	34.5 ± 10.11		35.25 ± 10.50		t = 0.325 p = 0.746
Marital status					
Single	29	72.5	30	75.0	
Married	7	17.5	8	20.0	$\chi^2 = 0.750$
Divorced	4	10.0	2	5.0	p = 0.687
Educational level					
Illiterate / read & write	5	12.5	4	10.0	
Primary / preparatory education	12	30.0	18	45.0	$\chi^2 = 3.521$
Secondary education	16	40.0	9	22.5	p = 0.313
University education	7	17.5	9	22.5	
Occupation					
Employed	9	22.5	8	20.0	
Businessman	2	5.0	1	2.5	$\chi^2 = 0.463$
Housewife	11	27.5	12	30.0	p = 0.927
Unemployed	18	45.0	19	47.5	
Residence					
Urban	34	85.0	36	90.0	$\chi^2 = 0.457$
Rural	6	15.0	4	10.0	p = 0.499

Table (2): Clinical characteristics of the studied groups of patients

Variables	Study group (n = 40)		Control group (n = 40)		Test of significance
	No.	%	No.	%	
Diagnosis					
Schizophrenia	26	65.0	26	65.0	
Mood disorders	10	25.0	10	25.0	$\chi^2 = 0.000$
Schizoaffective	2	5.0	2	5.0	p = 1.000
Others	2	5.0	2	5.0	
Duration of illness (in years)					
< 5	7	17.5	9	22.5	
5 –	10	25.0	8	20.0	$\chi^2 = 0.826$
10 –	9	22.5	11	27.5	p = 0.843
15 +	14	35.0	12	30.0	
Min – Max	2.00 – 35.00		2.00 – 30.00		
Mean ± SD	13.0 ± 7.75		12.25 ± 7.68		t = 0.435 p = 0.665
Previous psychiatric admission					
Yes	38	95.0	38	95.0	$\chi^2 = 0.000$

No	2	5.0	2	5.0	p = 1.000
Number of previous admission(s)					
Once	5	12.5	9	22.5	
Twice	10	25.0	6	15.0	$\chi^2 = 2.281$
Triple	4	10.0	5	12.5	p = 0.684
Four times & more	19	47.5	18	45.0	
Min – Max	0.00 – 15.00		0.00 – 17.00		
Mean ± SD	2.85 ± 3.03		2.7 ± 3.02		t = 0.222 p = 0.825
Duration of current hospitalization					
1 week –	19	47.5	19	47.5	
1 month –	8	20.0	7	17.5	$\chi^2 = 1.135$
3 months – < 1 year	4	10.0	7	17.5	p = 0.769
1 year +	9	22.5	7	17.5	
Min – Max	1.00 – 234.00		1.00 – 156.00		
Mean ± SD	58.6 ± 96.1		49.1 ± 86.9		t = 0.625 p = 0.534
Mode of admission (as patient said)					
Involuntary	40	100.0	40	100.0	-
Ward					
Free	19	47.5	19	47.5	$\chi^2 = 0.000$
Paid	21	52.5	21	52.5	p = 1.000

Table (3): Distribution of the study and control groups according to their compliance pre- and post-implementation of drug compliance therapy

Group	Compliance (Pre-implementation)				Total		Compliance (Post-implementation)				Total		Test of significance χ^2(p)
	Compliant		Non-compliant				Compliant		Non-compliant				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Study (n = 40)	0	0.0	40	100.0	40	100.0	36	90.0	4	10.0	40	100.0	61.600** (0.000)
Control (n = 40)	0	0.0	40	100.0	40	100.0	1	2.5	39	97.5	40	100.0	

** Significant value at p <0.001*

Table (4): Distribution of the study and control groups according to their attitudes pre- and post-implementation of drug compliance therapy

Group	Attitude (Pre-implementation)				Total		Attitude (Post-implementation)				Total		Test of significance χ^2(p)
	Positive attitude		Negative attitude				Positive attitude		Negative attitude				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Study (n = 40)	0	0.0	40	100.0	40	100.0	36	90.0	4	10.0	40	100.0	65.45** (0.000)
Control (n = 40)	0	0.0	40	100.0	40	100.0	0	0.0	40	100.0	40	100.0	

** Significant value at p <0.001*

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Table (5): Distribution of the study and control groups according to their insight pre- and post-implementation of drug compliance therapy

Group	Insight (Pre-implementation)				Total		Insight (Post-implementation)				Total		Test of significance χ^2(p)
	Better Insight		Poor Insight				Better Insight		Poor Insight				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Study (n = 40)	0	0.0	40	100.0	40	100.0	33	82.5	7	17.5	40	100.0	71.343** (0.000)
Control (n = 40)	0	0.0	40	100.0	40	100.0	0	0.0	40	100.0	40	100.0	

** Significant value at p <0.001*

Table (6): Mean scores and mean percent changes of compliance, attitudes toward medication, and insight into illness among the study and control groups pre- and post-implementation of drug compliance

Variables	Study Group			Control Group			t-test (p)
	Pre- Mean ± SD	Post- Mean ± SD	Mean % Change ± SD	Pre- Mean ± SD	Post- Mean ± SD	Mean % Change ± SD	
Compliance as measured by CRCS	2.13 ± 0.939	5.23 ± 1.05	206.9 ± 169.6	2.48 ± 0.716	2.88 ± 0.757	25.4 ± 58.71	6.394** (0.000)
	Paired t=14.892** p=0.000			Paired t=3.369** p=0.001			
Attitude as measured by DAI-30	- 4.95 ± 3.707	6.70 ± 4.631	268.7 ± 211.7	- 6.20 ± 4.268	- 6.25 ± 4.056	4.1 ± 23.97	7.789** (0.000)
	Paired t=13.114** p=0.000			Paired t=0.443 p=0.66			
Insight as measured by SAI-E	6.9 ± 3.18	20.3 ± 6.33	1047.0 ± 970.6	7.40 ± 2.56	7.20 ± 2.42	116.8 ± 110.8	5.794** (0.000)
	Paired t=18.01** p=0.000			Paired t=0.840 p=0.406			

***Significant value at p <0.001*

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