Metacognitive Abilities within Personal Narratives of Inpatients with Schizophrenia: Associations with Clinical Insight and Drug Compliance

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Abstract

Psychiatric nurses face many challenges in providing effective care for patients with schizophrenia who have poor insight. The understanding of metacognitive functions in schizophrenia may form a richer idea of why some patients deny illness and decline treatment, and may allow for further consideration of effective psychiatric care. This study aimed to assess the metacognitive abilities within personal narratives among inpatients with schizophrenia and to investigate its relationship with clinical insight and drug compliance. The study followed a cross- sectional descriptive correlational research design. It was conducted on 65 male inpatients with schizophrenia, at El-Maamoura Hospital for Psychiatric Medicine in Alexandria, Egypt. Indiana Psychiatric Illness Interview was used to elicit a narrative of self and illness, the narratives of the study subjects were rated using the metacognitive assessment scale concurrently with the assessment of clinical insight and drug compliance. The results revealed a statistical significant positive correlation between metacognitive abilities, clinical insight and drug compliance. It was concluded that poor insight and drug non-compliance might be significantly improved when considering the metacognitive measures. Recommendations encompassed that metacognitive assessment should be integrated in psychiatric care of inpatients with schizophrenia. A form of integrative psychotherapeutic intervention that could promote insight and drug compliance through stimulating metacognitive abilities should be developed in patients with schizophrenia. Replication of the study is also required on more diverse and larger groups of patients.

Keywords: Metacognitive abilities, Narratives, Schizophrenia, Clinical Insight, Drug compliance.

1.   Introduction

Poor insight is a core feature of schizophrenia, it is a complex and controversial phenomenon that is highly prevalent, occurring in 57 to 98 percent of patients with schizophrenia (Lehrer& Lorenz 2014). Some patients may fluctuate over time in their awareness, being more aware when they are in remission but losing the awareness when they relapse (Vidović*et al*. 2016). Poor insight can impair a person's ability to accept the need for treatment even with the best of relationships among patients, families, and mental health professionals (Jacob 2016). It is not only a barrier to treatment adherence, but also a significant contributor to poor functional outcomes and prognosis in individuals with schizophrenia spectrum disorders (Novick *et al*. 2015).

Poor insight in schizophrenia is prevalent across cultures and phases of illness (Lysaker *et al.* 2018). A previous study reported that up to 80% of all psychotic patients do not take their medication as prescribed mainly because of poor insight, which consequently affecting their awareness about their own needs (García*et al*. 2016). By examining the relationship between insight and drug adherence over time, Zhou et al (2017) found that poor

insight was predictive of medication discontinuation at one-year follow-up (Zhou et al. 2017). Also, Czobor et al. (2015) postulated that poor insight predicted less adherence at 6 and 12 months follow-up in drug trials conducted in first-episode psychosis, while Abdel et al (2016) found that insight predicted levels of post-discharge adherence (Czobor *et al.* 2015 & Abdel Aziz *et al.* 2016).

Limited understanding of how poor insight develops acts as a primary barrier for developing methods to address insight that are consistent with a recovery-oriented approach (Reddy 2016). As the patient does not perceive the symptoms of schizophrenia and cannot distinguish what is real from what is not, making the nurse's role toward improving medication compliance a complex task and a constant challenge (Pinho *et al.*2017).

Insight is a phenomenon involving not only the acceptance of the facts associated with one's illness, but also the integration of a range of experiences into complex understanding of one's psychiatric challenges (Arango& Amador 2011). It is a dynamic and multidimensional construct situated within the context of a given patient's clinical presentation and cognitive style. It encompasses awareness of illness, relabeling symptoms, and recognizing the need for treatment (Czobor *et al.* 2015).The development of insight requires more than the acceptance of fact, it requires the development of a sense of changes in one's own and other's internal states that have occurred as a result of the onset of mental illness, the selection of pertinent historical events related to the illness, and judgments about the causal links between historical events (Arango& Amador 2011). Since then a wealth of self report and case studies have confirmed the recalcitrance of these deficits in schizophrenia and highlighted their profound impact on the recovery process (Smith *et al.* 2004).

The integrated model of insight in schizophrenia has suggested that poor insight may result from multiple factors which compromise persons' abilities to integrate streams of information into a personal awareness of psychiatric challenges, and make adaptive responses (Lysaker *et al*. 2018). This model hypothesized that the origins of poor insight in schizophrenia may result, in part, from deficits in metacognitive capacity, or difficulties forming a complex and integrated understanding of both one's own thinking as well as the thinking of others regardless of clinical profile (Lysaker *et al*. 2011).

Metacognition broadly refers to the process of thinking about cognitive states, it can be thought of as a spectrum of mental activities ranging from discrete (recognition of thoughts, feelings, and basic judgment) to more synthetic capacities (Vohs *et al*. 2015). Accordingly, poor insight among patients with schizophrenia is related to being inaccessible to the knowledge that is plain in the mind of others about changes that have been observed in their mental states (Giersch& Mishara 2017). Deficits in the ability to link and synthesize complex ideas about oneself and others are the core of disturbances in schizophrenia in which the patients are profoundly unaware of their own affects and thoughts as well as the affects and thoughts of others (Dixon *et al*. 2016).

Metacognitive deficits might block the ability to perceive and trust the view of others that treatment is needed (Lysaker *et al*. 2018). These deficits might further limit persons' abilities to know how their own mental states have changed or are changing and to judge the impact of those changes on others (Pinho *et al.*2017). Moreover, they might lead to a lack of complex ideas about painful and confusing events. When these deficits are combined, it likely leads to a fragmented view of a life including experiences of mental illness (Lysaker *et al*. 2018).

The narrative research method is especially designed to study the sequence of events that are involved in a behavior. It is an appropriate method to study topics where processes, rather than simple single behaviors have to be assessed. Meanwhile, an important part of the psychiatric nurses' role in an inpatient setting is interviewing patients to assess and manage patients' symptoms (Sobekwa& Arunachallam 2015). By utilizing metacognitive interview assessment in clinical setting, the meaningful elements of the human condition in schizophrenia are understood (Lysaker *et al*. 2011). Personal narratives of patients' lives and experiences establish a rational mechanism that provides frameworks and schemes of necessary knowledge such as elaboration of the world's interpretation, reality, and one's identity framework (Moritz *et al*. 2018).

A better understanding of whether different aspects of metacognition are associated with insight and drug adherence may help mental health professionals form a richer idea of why some persons with schizophrenia deny illness and decline treatment. Therefore, it appears that there would be a clear benefit to investigate metacognitive ability in people with schizophrenia. This would be important not only to further develop mental health professionals knowledge and understanding of the metacognition capacity in schizophrenia, but also as it may contribute towards the development of targeted nursing interventions that could be matched to the pattern of metacognitive functioning evident in those with poor insight and drug non compliance. In addition, it could allow for further consideration of effective treatment and rehabilitation strategies for these patients. Up to the

researchers' knowledge, metacognition has not been investigated among patients with schizophrenia in Egypt, and its relationship with clinical insight and medication compliance has not been examined. Hence, the current study aimed to assess the metacognitive abilities within personal narratives among inpatients with schizophrenia and to investigate its association with clinical insight and drug compliance.

2. Aims of the Study:

This study aimed to assess metacognitive abilities within personal narratives of inpatients with schizophrenia and to investigate the relationship between metacognitive abilities, clinical insight and drug compliance among inpatients with schizophrenia.

3. Research Question:

What is the relationship between metacognitive abilities, clinical insight and drug compliance among inpatients with schizophrenia?

4. Methodology

4.1 Research Design:

A cross- sectional descriptive correlational research design was utilized in this study.

4.2 Setting:

The study was carried out in the inpatient units of El-Maamoura Hospital for Psychiatric Medicine in Alexandria. The hospital is affiliated to the Ministry of Health and Population. It serves three governorates namely; Alexandria, Matrouh, and El-Beheira. The number of patients with psychotic disorders attending inpatient units ranged from 750 to 800 based on official statistics from El- Maamoura hospital in 2016. Patients with schizophrenia constitute 350 of the total capacity of inpatients (150 males and 200 females). The services provided at the inpatient units include psychiatric examination, diagnosis and dispensing medications.

4.3 Subjects:

The subjects of this study included a random sample of 65 inpatients with schizophrenia. The program of Epi info 7 was used to estimate the subject size, the minimal sample size was estimated to be 60 patients based on the following; the population size was 150 patients, expected frequency 50%, acceptable error 10% and confidence co-efficient 95%.

The subjects of this study met the following inclusion criteria; diagnosed with schizophrenia with no co-morbidity, able to communicate coherently and relevantly, Male inpatients, and hospitalized for more than one week.

4.4 Data Collection Tools: Five tools were used to collect the study data, these included:

- **Tool I: Bio-sociodemographic and clinical data structured interview schedule:**

This tool was developed to elicit bio-sociodemgraphic data of inpatients with schizophrenia about age, marital status, occupation, and level of education. In addition, clinical data as duration of illness, method of hospital admission, frequency of hospitalization and duration of current hospitalization.

- **Tool II: Compliance Rating Scale (CRS):**

It was adapted from Kemp et al. (1996) and rated based on information from patient's interview and from nurse's observation, it has 7 point rating scale ranged from 1 to 7 to quantify the assessment of the level of adherence with medication, where 1 indicates "complete refusal" and 7 denotes "active participation". Patients, whose CRS scores above the five cut-off point reflect good adherence, while less than five points indicating insufficient adherence (Kemp *et al.*1996). The Compliance Rating Scale (CRS) was shown to be reliable, Cronbach's alpha coefficient (α) was 0.77 (Kemp *et al.*1998).

- **Tool III: The Indiana Psychiatric Illness Interview (IPII):**

The Indiana Psychiatric Illness Interview (IPII) was developed by Lysaker et al. (2002).The IPII is a semi-structured interview which developed to assess illness narratives. The interview consists of six open-ended questions. Firstly, rapport is established and participants are asked to tell their lives' stories as they can. Secondly, patients are asked if they think they have a mental illness and how they understand it. Thirdly, a question about what has and has not been affected by their condition in terms of interpersonal and psychological life. In the fourth question, patients asked about how their condition controls their life and how they control their condition. In the fifth question, patients are asked whether their illness was affected by others and how much others have been affected by their illness. Finally, the subjects are asked what they expect to stay the same and what will be different in the future, in terms of interpersonal and psychological function. The IPII thus results in a narrative of self and psychiatric challenges that can be analyzed in terms of metacognition (Lysaker *et al.*2002).

- **Tool IV: Metacognition Assessment Scale (MAS 28):**

It was developed by Semerari et al (2003) to assess metacognitive abilities as manifest in an individual's verbalizations (Semerari *et al*. 2003). The MAS contains four subscales with 28 items. These subscales include "Self reflectivity " or the ability to think about one's own mental states (with a range of 0-9); "Understanding of Others' Minds," or the ability to think about others' mental states(with a range of 0-8); "Decentration" or seeing the world as existing with others having independent motives(with a range of 0-3); and "Mastery" or the ability to implement effective strategies in order to cope with problems(with a range of 0-8). Each subscale consists of a series of capacities which are arranged in hierarchical order, such that once a capacity is rated (0) as not attained, no higher capacities should be possible.

- Each level of MAS subscales may receive one score to each level attained and 0.5 score can be assigned when levels are partially obtained, while   zero score received if the level was unattained. Higher sum values relating to a subscale or the total scale indicated higher metacognitive capacities. The obtained scores are summed to provide a score for total and each subscale.

-The studied patients were rated on an a priori basis as having basic self-reflectivity, understanding of others mind and mastery capacity if they obtained score"4" or more, where as obtaining less than "4" score reflects not having these capacities. A score of "2" or higher on the MAS decentration scale indicates having achieved decentration and if they achieved scores of less than "2"indicates not having achieved decentration. For the total scale, patients who scored above 14 cut-off point reflect having metacognitive abilities, while less than 14 points indicating lack of metacognitive abilities.

- The MAS and its subscales demonstrated acceptable levels of factorial validity, inter-rater agreement, internal validity and test–retest stability. The rating of metacognitive abilities has shown good overall inter-rater reliability (ICC = 0.89) and its subscales ranging from 0.83 to 0.89 in patients with schizophrenia (Lysaker *et al.* 2005; Lysaker *et al*. 2010& Carcione *et al*. 2008).

- **Tool V: Birchwood Insight Scale (BIS):**

The Birchwood insight scale was developed by Birchwood et al. (1994).The BIS scale consists of 8 items self-report, to measure the three dimensions of clinical insight (ability to re-label symptoms, awareness of mental illness, and recognition of a need for treatment).The first two subscales include two items each, while the third subscale includes four items, with all items being statements (e.g., "I am mentally well," "My doctor is right in prescribing medication for me"). It has a three point likert type scale ranged from 0 to 2 where zero indicates disagree, one denotes unsure, and 2 reflects agree. The total scores of the items were summed-up; it is ranged between 0 to 16. A total score of 9 or more indicates good insight, while scoring less than 9 reflects poor insight. For all of these subscales, the higher the score, the greater the level of the measured construct. The BIS scale demonstrated high validity and reliability. It has a high internal consistency (Cronbach's alpha = 0.75) and high test-retest reliabilities (0.90). (Compton *et al.*2011).

4.5 Method of Data Collection:

- Written permission was granted from the director of EL-Maamoura Hospital for Psychiatric Medicine in Alexandria.

- The researchers were trained for applying the study tools under supervision of experts in the field of psychiatric nursing. This was done for one month before embarking on the study.

- Tool I was developed by the researchers.

-Tools II,III, IV and V were translated into Arabic language.

-The study tools were tested for content validity by a jury of three experts in the field of psychiatric nursing in Alexandria University.

- Twenty patients were selected randomly to assess the reliability of the study tools. It was found that, the study tools were proved to be highly reliable as Cronbach's α been 0.80 for CRS, 0.77 for BIS and 0.88 for total MAS. These patients were excluded from the actual study subjects.

- A pilot study was carried out on 7 patients with schizophrenia, they were chosen randomly from inpatient ward to ensure the clarity of the study tools and to identify any obstacles and problems that may hinder data collection. Modifications were done accordingly.

- For the actual study, male wards were ranked by simple randomization by picking their names up from a pool. The first selected ward was recruited, then the process was repeated till the required number obtained.

- All patients' medical charts were reviewed to identify those who met the inclusion criteria

- Each recruited patient in the study was interviewed individually to establish rapport and explain the aim of the study.

- The patient was encouraged to speak freely, and was given time for reflection and recollection. The interview was directed through questions and comments. The interview started with a detailed psychosocial history, which creates the departure points for the MAS specific probing. All relevant responses from the patient were examined in depth.

- Metacognitive abilities were assessed through a semi-structured interview using IPII, divided into two sessions and typically each session lasted between 45 and 60 minutes. The data were collected during period started from November 2016 to February 2017.

-To assess narratives by using the MAS, two raters have scored each evidence for the display of a given MAS capacity which was identified.

4.6 Ethical considerations:

- Study procedure was revised and approved by the Ethical Committee of the Faculty of Nursing, Alexandria University and by Human Rights Protection Committee of the General Secretariat of Mental Health in Cairo.

- Informed oral consent was obtained from each patient participated in the study.

- Data confidentiality was assured.

- Patient's privacy and anonymity were maintained and respected.

4.7 Statistical Analysis:

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0 (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, and standard deviation. Significance of the obtained results was judged at the 5% level.

The used tests were:

1- Student t-test for normally distributed quantitative variables, to compare between two studied groups

2 - F-test (ANOVA) for normally distributed quantitative variables, to compare between more than two groups

3 - Pearson coefficient was to correlate between two normally distributed quantitative variables

4- The Intra-class Correlation Coefficient (ICC) was to measure of the inter- rater reliability of measurements or ratings.

The followings are guidelines for the interpretation of ICC measures; below 0.50 is poor, between 0.50 and 0.75 is moderate, between 0.75 and 0.90 is good and above 0.90is excellent.

5. Results

Table (I) shows the mean percent scores of clinical insight of inpatients with schizophrenia. The displayed table showed that more than two thirds of the studied patients (67.7%) had poor insight. The mean scores of re-labeling symptoms, awareness of illness, and need for treatment were 1.83 ± 1.76, 1.32 ± 1.56, and 2.98 ± 3.06, respectively. Recognizing the need for treatment had the least mean percent score among the studied patients (8.27 ± 9.95).

Table (I): The mean percent scores of clinical insight of inpatients with schizophrenia (n = 65)

Clinical insight subscales	Total score	Percent score
Re-labeling symptoms		
Min. – Max.	0.0 – 4.0	0.0 – 100.0
Mean ± SD.	1.83 ± 1.76	45.77±43.88
Awareness of illness		
Min. – Max.	0.0 – 4.0	0.0 – 100.0
Mean ± SD.	1.32±1.56	33.08±39.06
Need for treatment		
Min. – Max.	0.0 – 8.0	0.0 – 25.0
Mean ± SD.	2.98±3.06	8.27±9.95
Overall insight		
Min. – Max.	0.0 – 16.0	0.0 – 100.0
Mean ± SD.	6.14±5.86	38.37±36.61
	No.	%
Poor insight	44	67.7
Good insight	21	32.3

Table (II) reveals the mean scores and inter-rater reliability of metacognitive assessment subscales and the total scale. The mean scores of self-reflectivity, understanding of others' minds, decentration, and mastery were 2.42 ± 1.10, 1.86 ± 1.03, 1.01 ± 0.27 and 1.64 ± 1.20; respectively with the total mean score of 7.12 ± 3.70. These reflect that the studied subjects have deficits in metacognitive abilities. As for Inter-rater reliabilities (IRRS) , the Intra- Class Coefficient (ICC) were good for the self –reflectivity , understanding of others' mind, mastery subscales and the total MAS scales (ICC=0.84, 0.77, 0.80 and   0.88 respectively). Whereas, decentration subscale has moderate IRRS (ICC=0.71).

Table (II) Mean scores and inter-rater reliability of metacognitive assessment subscales and the total scale (n = 65).

Metacognitive assessment subscales	Total scores	Min. – Max.	SD ± Mean	ICC/ IRR
Self-reflectivity	0-9	0.50 – 5.0	2.42±1.10	0.84
Understanding of others' minds	0-8	0.50 – 5.0	1.86±1.03	0.77
Decentration	0-3	0.0 – 2.0	1.01± 0.27	0.71
Mastery	0-8	1.0 – 4.0	1.64±1.20	0.80
Total scale	0-28	2.0 – 17.0	7.12 ± 3.70	0.88

Table (III) illustrates the distribution of the studied patients according to the levels of compliance with antipsychotic medication. The table revealed that 9.2% have complete drug refusal, 36.9% had partial refusal. Those who were very reluctant constituted 10.8%. Nearly one quarter of them (23.1%) have passive acceptance and 13.8% have moderate participation. Whereas, none of them (0.0%) has active participation.

Table (III) Distribution of the studied patients according to the levels of compliance with antipsychotic medication (n = 65).

Drug compliance scale	No.	%
Complete refusal	6	9.2
Partial refusal	24	36.9
Very reluctance	7	10.8
Occasional reluctance	4	6.1
Passive acceptance	15	23.2
Moderate acceptance	9	13.8
Active participation	0	0.0

Table (IV) shows the correlation between insight and metacognitive abilities of inpatients with schizophrenia (n = 65). It was found strong significant positive correlations between self-reflectivity and relabeling symptoms, awareness of illness and the need for treatment (r=0.45, P=0.001, r= 0.596, P= 0.001, and r= 0.36, P= 0.003 respectively). Also, the overall insight was significantly correlated with self-reflectivity (r=0.52, p=0.001).

In relation to the understanding of others' mind ability, it was positively and highly correlated with relabeling symptoms, awareness of illness and the need for treatment (r=0.28, P= 0.02, r=0.53, P=0.001 and r=0.27, P=0.02, respectively). Also, a strong significant correlation was found between understanding of others' mind and overall insight (r=0.27, P=0.02). Regarding the decentration ability, the table showed a high significant correlation between decentration and relabeling symptoms, awareness of illness, and the need for treatment (r=0.53, P= 0.001, r=0.72, P=0.001, and r=0.55, P= 0.001 respectively). Also, decentration was positively and strongly correlated with the overall insight (r=0.68, P=0.001).Speaking of the correlations between mastery and clinical insight subscales; relabeling symptoms, awareness of illness, the need for treatment and overall insight, the table showed strong and significant correlations (r=0.63, P= 0.001, r=0.59, P=0.001, r=0.499, P= 0.001, and r=0.62, P= 0.001, respectively).

Also, a strong significant correlation was found between the total metacognition score and all dimensions of insight (relabeling symptoms, awareness of illness, and need for treatment). (r=0.54, P=0.001, r= 0.68, P=0.001, and r=0.47, P=0.001, respectively). It can also be noticed that total metacognition score was positively and strongly correlated with overall insight (r= 0.47, P=0.001).

Table (IV) Correlation between insight and metacognitive abilities of inpatients with schizophrenia (n = 65).

MAS		Re-labeling symptom	Awareness of illness	Need for treatment	Overall insight
Self-reflectivity	R	0.450	0.596	0.362	0.522
	P	<0.001*	<0.001*	0.003*	<0.001*
Understanding of others' mind	R	0.286	0.531	0.277	0.277
	P	0.021*	<0.001*	0.026*	0.001*
Decentration	R	0.539	0.724	0.559	0.687
	P	<0.001*	<0.001*	<0.001*	<0.001*
Mastery	R	0.638	0.592	0.499	0.629
	P	<0.001*	<0.001*	<0.001*	<0.001*
Total MAS	R	0.547	0.687	0.478	0.478
	P	<0.001*	<0.001*	<0.001*	<0.001*

r: Pearson coefficient

*: Statistically significant at p ≤ 0.05

Table (V) reveals the relationship between socio-demographic characteristics, total insight and total rating MAS of inpatients with schizophrenia. It was found that the mean score of the total insight and total MAS score decreased as the age increased, being 7.53 ± 5.67 and 7.77 ± 4.22, respectively for those who their age ranged between 25 to less than 35 years and dropped to 4.67 ± 1.15 and 5.50 ± 1.73, respectively for those who aged more than 45years or more. However, no statistical significant difference was found in this respect (F=1.305, P=0.281 and F=0.704, P=0.553, respectively).

In relation to the level of education, the highest mean score of total insight and total rating MAS were found among those who had university education (8.38 ± 7.82 and 9.81 ± 5.57 respectively), while those who read and write demonstrate the lowest mean score regarding the score of the total insight being 0.0 ± 0.0, and 5.17 ± 0.29 for the total rating of MAS, with no statistical significant difference was found (F=1.012, P= 0.419 and F=1.836, P= 0.120). Participants who were divorced have the highest mean score of total insight and MAS rating than those who were married and single (10.67 ± 9.24, 11.33 ± 4.62 respectively), with no statistical significant difference (F=1.028, P= 0.364 and F=3.118, P= 0.051). As regard the working status, the table revealed that the total insight and total rating MAS were higher in employed patients than those who were unemployed (6.31± 6.49, 7.89 ± 4.42 respectively), with no statistical significant difference was found (t= 0.234, p= 0.816and t= 1.676, p= 0.100, respectively). Those patients who lived in nuclear family had a tendency to demonstrate higher total insight than those who lived with extended family being 6.64 ± 6.14 and decreased to 5.63 ± 6.68, respectively. While the mean score of the total rating MAS remained nearly the same in both groups 7.64 ± 3.63 and 7.71 ± 4.29 respectively, with no statistical significant differences (F 0.240, P= 0.868 and F= 2.270, P= 0.089, respectively).

Table (V): Relation between socio-demographic characteristics, total insight and total rating MAS of inpatients with schizophrenia (n = 65).

Socio-demographics characteristics	Total insight	Total MAS ratings
Age (years)		
>25	7.25 ± 7.27	6.0 ± 1.87
25 –	7.53 ± 5.67	7.77 ± 4.22
35 –	4.64 ± 5.99	6.75 ± 3.40
≤45	4.67 ± 1.15	5.50 ± 1.73
F (p)	1.305(0.281)	0.704(0.553)
Educational level		
Illiterate	7.33 ± 5.68	4.33 ± 1.54
Read & write	0.0 ± 0.0	5.17 ± 0.29
Primary	4.86 ± 6.12	6.86 ± 3.34
Preparatory	6.27 ± 5.89	7.40 ± 2.95
Secondary	6.15 ± 5.38	7.06 ± 3.68
University	8.38 ± 7.82	9.81 ± 5.57
F (p)	1.012(0.419)	1.836(0.120)

Marital status		
Single	6.15 ± 5.35	6.45 ± 3.22
Married	5.50 ± 6.32	7.75 ± 4.07
Divorced	10.67 ± 9.24	11.33 ± 4.62
F (p)	1.028(0.364)	3.118(0.051)
Working status		
Working	6.31 ± 6.49	7.89 ± 4.42
Not working	5.97 ± 5.26	6.36 ± 2.69
t (p)	0.234(0.816)	1.676(0.100)
Living situation		
Alone	6.33 ± 5.22	6.56 ± 2.85
With extended family	5.63 ± 6.68	7.71 ± 4.29
With nuclear family	6.64 ± 6.14	7.64 ± 3.63
Others	4.0 ± 0.0	2.33 ± 0.58
F (p)	0.240(0.868)	2.270(0.089)

　　　Table (VI) reveals the relation between clinical data and total insight and total rating MAS of inpatients with schizophrenia. Comparing the mean scores of total insight, it appears that the mean score of total insight significantly increased among those who had gradual onset of illness compared to those who had sudden onset being 7.92 ± 6.05 and dropped to 3.79 ± 4.73 (t= 2.986, P= 0.004). Also, a statistically significant difference regarding the mean scores of the total rating MAS was found among those who had gradual onset of illness compared to those who had sudden onset being 8.09 ± 3.98 and decreased to 5.82 ± 2.87 (t= 2.675, P= 0.010). Inpatients with schizophrenia who are admitted to the psychiatric hospital with voluntary manner scored significantly higher mean score on both the total insight and total rating MAS, than those who were hospitalized involuntarily (t=5.333, P= 0.001 and t=10.968, P=0.001).

　　　The results also showed that the mean scores of both the total insight and total rating MAS of inpatients with schizophrenia did not show any statistical significant relation with patients' previous psychiatric hospitalization, type of treatment and type of drugs (t= 0.048, P= 0.96, t= 1.053, P= 0.29, and F= 0.771, P= 0.467, F= 0.376, P= 0.688, and F= 0.570, P= 0.568, and F= 0.046, P= 0.955, respectively).

Table (VI): Relation between clinical data, total insight and total rating MAS of inpatients with schizophrenia (n = 65).

Clinical data	Total insight	Total rating MAS
Previous psychiatric hospitalization		
Yes	6.15 ± 5.80	6.99 ± 3.65
No	6.0 ± 7.66	9.0 ± 4.56
t (p)	0.048(0.962)	1.053(0.296)
Onset of illness		
Sudden	3.79 ± 4.73	5.82 ± 2.87
Gradual	7.92 ± 6.05	8.09 ± 3.98
t (p)	2.986*(0.004*)	2.675*(0.010*)
Type of treatment		
Antipsychotic drugs	6.66 ± 5.87	7.45 ± 4.17
ECT	7.33 ± 5.99	6.42 ± 2.82
Both antipsychotics and ECT	4.86 ± 5.87	6.71 ± 3.01
F (p)	0.771(0.467)	0.376(0.688)
Type of drugs		
Typical	5.34 ± 5.42	7.19 ± 3.53
Atypical	5.0 ± 4.24	3.53 ± 4.60
Mixed	6.88 ± 6.31	7.01 ± 3.91
F (p)	0.570(0.568)	0.046(0.955)
Mode of admission		
Voluntary	10.38 ± 4.84	11.0 ± 2.71
Involuntary	3.66 ± 4.93	4.84 ± 1.81
t (p)	5.333*(<0.001*)	10.968*(<0.001*)

　　　Table (VII): shows the relationship between drug compliance, clinical insight and total rating of MAS of

inpatients with schizophrenia. It was noted that those who have passive acceptance and moderate participation in drug compliance demonstrate highest mean score on both the total insight and total rating MAS (10.40 ± 5.47, 10.33 ± 3.87 and 11.23 ± 3.07, 10.61 ± 2.09, respectively), with a statistical significant relation was found in this respect (F= 7.188, P= 0.001 and F= 317.00, P= 0.001).

Table (VII): The relationship between Drug compliance and clinical insight and total rating MAS of inpatients with schizophrenia (n = 65).

Drug compliance	Total insight	Total MAS
Complete refusal	5.67 ± 5.16	3.50 ± 1.84
Partial refusal	3.29 ± 5.14	4.98 ± 1.83
Reluctant acceptance	3.36 ± 4.52	5.27 ± 1.57
Passive acceptance	10.40 ± 5.47	11.23 ± 3.07
Moderate participation	10.33 ± 3.87	10.61 ± 2.09
F (p)	$7.188^*(<0.001^*)$	$31.007^*(<0.001^*)$

6. Discussion

Patients with schizophrenia experience poor insight, and as a result they are at high risk for non-adherence to medication which is the most challenging aspect of treating psychotic patients in clinical setting (Higashi et al. 2013). To understand the cognitive mechanisms of insight in patients with schizophrenia, attention should be drawn to the metacognitive abilities in their personal experience of mental illness. The development of insight requires an individual not only notices and reflects upon historical events related to one's own illness, but also makes sense of such experiences and develops a personally meaningful consensually valid narrative of the illness (Reddy 2016). Viewing insight in the light of metacognitive disturbances supports a more individualized approach to understanding the psychopathological features of schizophrenia (Lee et al. 2011). It may open a door for psychiatric nurses to think about the ways that could enhance patients' insight and treatment adherence in the clinical setting. Hence, the current study aimed at assessing the metacognitive abilities in personal narratives, and determining its association with clinical insight and drug compliance among inpatients with schizophrenia.

The results of the present study found that the majority of the studied patients were reluctant or non compliant with medication. This result could be attributed to the lack of insight among the studied patients, as shown in the present findings, more than two thirds of the studied patients had poor insight, and the need for treatment subscale had the least percent mean score. Additionally, there was a statistical significant relation between drug compliance and clinical insight among the studied inpatients. Similarly, several studies postulated that drug adherence and insight were associated significantly in patients with schizophrenia, those who are not compliant with medication did not think they have a mental illness, whereas those who are compliant perceived that they have a mental illness (Lee et al. 2011; Vohs et al. 2015& Chan 2016). Also, a meta-analysis study found that poor insight was a predictor of poor adherence in 20 of 26 studies reviewed (Paul et al. 2014).

Recent theories proposed that the metacognitive impairment is a determinant factor of poor insight among patients with schizophrenia. Developing insight would need to construct a coherent and integrated account of an individual's psychiatric state (Vohs& Lysaker 2014). This was confirmed by the results of the current study which revealed that the personal narratives of the studied inpatients with schizophrenia were impoverished in metacognitive abilities. The majority of the studied inpatients have a decrement in the total mean score of metacognitive abilities and its domains (self reflectivity, understanding of others' minds, decentration and mastery). The majority of them reported having the awareness that they are producing their own thoughts but are not able to identify their emotions and inner experiences. They perceived themselves as unable to control what is happening around them. Also, there's a little indication for recognizing others' emotional states and distinguishing others' mind operations within their personal narratives. In addition, they are not able to build elaborate descriptions of themselves and others, patients reported that they try to stay as healthy as they can, but were quite vague about identifying any problems.

The metacognitive deficits among the studied patients could be attributed to the fact that the neural basis of metacognitive efficiency in human prefrontal and parietal cortex regions was found to be highly susceptible to

atrophy in patients with schizophrenia. Thus may affect the elaboration of linguistic verbal expressions and the evaluation strategies as metacognitive tasks in narrative process (Schultz *et al.* 2010). Moreover, Barra et al. (2018) investigated the analysis of the narration evaluative components of interviews of 25 individuals with psychiatric diagnosis of chronic schizophrenia and 25 of chronic affective psychosis. They found that there was a functional deterioration in the process of elaborating narrative structures especially in the articulation of the evaluative component in the patients with chronic schizophrenia while, superficial dysfunctions were manifested in the affective psychosis group (Barra *et al.* 2018).

Furthermore, the metacognitive deficits could be related to profound neurocognitive impairments in patients with schizophrenia which are considered as a constitutive part of the disease, that influence the onset and the maintenance of schizophrenia (Lysaker *et al.* 2014 & Dimaggio *et al.* 2012).

Consistent with these findings, Lysaker et al. (2012) found that metacognitive abilities scores of persons with first-episode and prolonged schizophrenia have been significantly lower than the scores of samples with prolonged non psychiatric medical conditions (Lysaker *et al.* 2012). Moreover, Vohs et al. (2014) postulated that deficits in metacognition have been found in both in earlier and later phases of the schizophrenic illness (Vohs *et al.* 2014). Lysaker et al. (2014) found that patients with schizophrenia have lesser metacognition capacities compared with participants with PTSD and substance abuse (Lysaker *et al.* 2014).

According to the present findings, clinical insight and drug compliance were significantly related to metacognitive abilities among the studied patients with schizophrenia. Those patients with metacognitive deficits experienced poor insight and drug non-compliance. This could be attributed to the metacognitive impairment, or the disability to form integrated representations of self and others which is a rising potential contributor to poor insight among patients with schizophrenia. Similarly, Vohs et al (2014) reported robust correlations between metacognitive capacity and multiple domains of clinical insight in first-episode psychosis (Vohs *et al.* 2014).

Although the current results revealed that all metacognitive abilities were correlated significantly with clinical insight and its dimensions, it has been postulated that patients who had difficulties in reflecting upon themselves will be more likely to have difficulty in gaining awareness of their illness, relabeling symptoms and the need for treatment (Lysaker *et al.* 2011). Lyskar et al. (2011) found that self reflectivity was significantly linked with awareness of symptoms and mastery with treatment need (Lysaker *et al.* 2011). Furthermore, an imaging study has suggested that insight is related to cortical regions and circuits that may support processes necessary for metacognition, including self-consciousness and self-referential processing (Chakraborty& Basu 2010).

In conclusion, the personal narratives of the studied inpatients with schizophrenia were impoverished in metacognitive abilities. The majority of the studied patients were reluctant or non compliant with medication and more than two thirds of them had poor insight. The metcognitive deficits among the studied patients were significantly associated with poor insight and drug non-compliance. The assessment of the clinical insight and drug compliance within the context of metacognitive abilities supports a more individualized approach to the understanding of impaired insight and drug non-compliance in patients with schizophrenia.

According to the results of this study, it can be recommended that metacognitive assessment and therapy should be integrated in the clinical settings and in rehabilitation programs for patients with schizophrenia. The individualized care plans based on metacognitive assessment should be developed for patients with schizophrenia. Techniques to promote patient's self reflectivity and mastery abilities should be incorporated into psychiatric care. Stimulating the metacognitive abilities of   patients with schizophrenia through applying a form of integrative psychotherapeutic intervention can promote insight and drug compliance. Psychiatric nurses can be trained to assess metacognitive abilities and to apply metacognitive therapeutic interventions for inpatients with schizophrenia through developing in-service training program for these nurses. Metacognitive functions should be integrated in the psychiatric nursing curriculum in nursing schools.

In addition, further comparative studies will be needed to investigate the differences in metacognitive abilities between patients in early and late phases of schizophrenia. Further studies are also needed to explore when and how metacognitive deficits develop. Longitudinal research is needed to understand the complex relationships between metacognitive abilities, clinical insight and drug compliance. The feasibility of metacognitive interventions should be investigated for different groups with schizophrenia.

Of note, there are several limitations to this study. It is cross-sectional rather than longitudinal in design. All inpatients were male, and generally many years had passed since the onset of their illness. Besides, the majority of them were in some form of refusing treatment. Therefore, replication of the study is required on more diverse

and larger groups including females, and patients in an earlier phase of illness and those patients with active treatment.

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