Relation between Metacognitive Abilities and Motivation among Patients with Schizophrenia

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Abstract

Background: Difficulties with metacognitive abilities among patients with schizophrenia have serious effects on wellness, psychosocial challenges, recovery process and motivation. Some studies reported that higher levels of motivation do not emerge without a basic level of metacognition. **Aim:** To explore the relation between metacognitive abilities and motivation in patient with schizophrenia spectrum. **Subjects and Method: Design:** Descriptive correlational design. **Setting:** Inpatient psychiatric department of Tanta University Hospital and Psychiatry outpatient clinic. **Subjects:** A convenience sample of 100 patients with schizophrenia. **Tools:** Socio-demographic and Clinical characteristics, Motivational Traits Questionnaire and Metacognition Questionnaire-MCQ. **Results:** There was a highly statistical significant positive correlation between metacognition and motivation. **Conclusion:** It was concluded that motivation might be significantly improved when targeting the metacognitive abilities. **Recommendation:** This study recommended that metacognitive abilities should be assessed routinely for patients with schizophrenia. Psychotherapeutic intervention that could improve motivation in patients with schizophrenia should focus on stimulating metacognitive abilities.

Keywords: Motivation, Metacognitive abilities, Schizophrenia

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Introduction

The ability to think about one's own thinking is referred to as metacognition, or cognition about cognition [(1)]. It has been defined as “the study of patients' own cognitive processes or anything related to them” [(2)]. Metacognition has been defined as the process by which cognition, emotion, and embodied experiences are combined to provide a more comprehensive understanding of oneself and others. This broader understanding of oneself and others enables interpretation of unique experiences throughout their life and the identification of what is personally adaptive to them [(3)].

According to Semerari et al. (2003) [(1)], metacognition is a broad range of cognitive and affective skills that allow patients to recognize their mental state, reflect on it, and attribute it to both themselves and other people. These abilities assist patients in understanding the rationale behind their psychological responses in a predictable manner and in developing a lifetime sense of self. [(4)].

Metacognitive knowledge and metacognitive regulation are the two main parts of metacognition. The term "metacognitive knowledge" (also known

as "metacognitive awareness") describes what people know about themselves, about others, about various methods for learning and problem-solving, and about the requirements of a specific learning task. Metacognitive regulation, on the other hand, is the use of this knowledge to control one's own cognitive processes. It is application of this understanding to one's own cognitive processes. This includes strategies like goal-setting, tracking advancement, and making necessary adjustments if needed. Individuals can enhance their task performance and successfully accomplish their goals by altering their own cognitive processes [2,5].

Deficits in metacognitive skills might make it difficult to understand and respect others' opinions, such as the necessity for mental treatment [6]. These deficits may also make it more difficult for people to comprehend how their own mental states have changed or are changing as well as how those changes influence others. They may also make it more difficult for people to make day-to-day decisions, resolve interpersonal conflicts or problems, set a meaningful goal and achieving them which results in a fragmented view of life that includes the presentation of mental illness [3,4,6].

There is increased interest in the negative symptoms of schizophrenia and their neuronal and mechanistic bases, with special attention to the motivation process. This is because lack of motivation is increasingly recognized to be a fundamental impediment to good management of patients with schizophrenia [8]. Additionally, reduced motivation in schizophrenia could influence many aspects of behavior including; the ability to work toward goals, to engage in beneficial occupational activity, and to follow the treatment plan regularly. Moreover, it impedes daily life functioning and hinders the recovery process [9]. Therefore, it is one of the most crucial factors determining how well patients with schizophrenia perform in the community [11,12].

The Latin word "Movire," which means to move, is the source of the word "motivation. The psychological concept of motivation relates to the propensity to act and direct behavior in accordance with a goal [9]. Intrinsic motivation can result from the self-generated variables that affect behavior. Extrinsic motivation might come from outside sources. In contrast to extrinsic motivation, which occurs when things are done to or for individuals to drive them such as incentives, promotion, or compliments, intrinsic motivation develops when people believe that their work is essential and interesting [13]. Although some promising interventions have led to enhancements in motivation, patients often struggle with reduced motivation in early and late phases of psychosis [14,15]. Thus, it is important to examine the predisposing factors that reduce motivation in patients with schizophrenia. According to research, one of these factors is metacognition, or the capacity to create complex representations of oneself, others, and the outside world [16].

A patient's capacity to make sense of their lives, to identify the worth of a task or goal and to appropriately balance the costs and advantages of completing a task is supported by having an integrated understanding of oneself [15, 17]. Therefore, it's crucial to focus on metacognition in

psychosocial therapies for schizophrenia patients in order to promote motivation and ascertain the patients who might benefit mostly from this approach [16].

Significance of the study:

Metacognitive difficulties seriously impact psychological wellness since they make it difficult for people to identify and control their own psychosocial problems in order to proceed with their own healing process. According to certain studies, enhancing motivation does not happen without a minimal level of metacognition. [15,25]. Motivation is important factor for mental health recovery; therefore, the goal of this study was to investigate how motivation and metacognitive skills relate in patients with schizophrenia [26].

The study aim:

Explore the relation between metacognitive abilities and motivation among patients with schizophrenia.

Research question

Is there a relation between metacognitive abilities and motivation among patients with schizophrenia?

Subject and Method

Research design

Descriptive correlational design

Setting:

The study was carried out at Inpatient psychiatric department of Tanta University Hospital which has (31) beds divided into two wards for male (17beds) and two wards for female (14beds), it works 24hrs / day 7 days / week as well as in Psychiatry outpatient clinic, it works four days per week and serves 10-14 patients with schizophrenia per week. Both settings are under the supervision and direction of Tanta University.

Subjects:

A convenience sample of 100 patients with schizophrenia, the sample size was calculated using Epi-Info software. They selected based on the following inclusion criteria: both sexes, 18 years old or above, diagnosed according to DM-5 and able to communicate in a relevant manner. Exclusion criteria include; any medical disease, substance use disorders, mental retardation or other psychiatric comorbidity and acute stage of schizophrenia.

Tools of the study:

The data was collected by using three tools:

Tool I: Socio-demographic and Clinical Data Questionnaire.

a - Socio-demographic data such as age, sex, marital status, residence, educational level, income, cohabitation and order in the family

b - Clinical data: such as duration of illness, number of previous admissions, and mode of admission and time laps since last admission.

Tool II: Motivational Traits Questionnaire (short form)

This tool was adopted by Kanfer and Colleagues (2000) [18] to assess motivation level. It consists of 48 items divided into three major domains namely: **personal mastery** (16 items) assesses the need to succeed when learning new skills or expanding one's knowledge. **Competitive excellence** (14 items) measure how well the performance in comparison with others. **Motivation related to anxiety** (**worry and emotionality**) Worry (10 Items) measure worry associated with performing tasks. **Emotionality** (8 items) measure emotions associated with performance. Participants respond using a 6-point Likert-type scale ranging from 1 =

being very untrue of me and 6= being very true of me except items 6, 10, 11, 16, 17, 21, 22, 36, 38, 41 are reversed score. The total score of overall items will be summed and ranging from 48 to 288 with higher scores indicating higher level of motivation as follow: ≤ 96 indicating low motivation, 97 – 192 indicating moderate motivation and >192 indicating high motivation

Tool III: Metacognition Questionnaire-MCQ-30 (short form)

MCQ was developed by Wells and Cartwright-Hatton (2004) [19]. It aimed to measure beliefs people have about their thinking. It consists of 30 items divided into five subscales 6 items in each subscale namely: positive beliefs about worry (items 1, 7, 10, 19, 23 and 28) , cognitive self-consciousness (items 3, 5, 12, 16, 18 and 30), cognitive confidence (items , 8, 14, 17, 24, 26 and 29), negative beliefs about uncontrollability of thoughts and danger (items 2, 4, 9, 11, 15 and 21), and beliefs about the need to control thoughts (items 6, 13, 20, 22, 25 and 27). Participants respond on a 4-point Likert-type scale ranging from 1 = don't agree to 4= agree very much. The total score of overall items will be summed and ranging from 30 to 120 with higher scores indicating higher levels of unhelpful metacognitions as follow: ≤ 40 indicating low metacognition, 41 – 80 indicating moderate metacognition and >80 indicating high metacognition.

Method

1- The director of the psychiatry department and outpatient clinic of Tanta University Hospital was requested in a formal letter by the dean of the nursing faculty for his participation in data gathering.

2- Ethical consideration:

- The study was revised and authorized by the Faculty of Nursing's ethical committee under the code 229-3-2023.
- Written informed consent was acquired from the patient.
- There was no harm or pain for the patients.
- The patients were reassured about of the confidentiality and privacy of their gathered data.
- Patients have the right to withdraw at any moment during the data gathering.

3- Two tools were translated into Arabic language by the researcher and then back translated.

4- A jury composed of five experts in psychiatric nursing for examining the content validity of the study tools.

5- Metacognitive ability and motivation traits tools were tested for reliability by using alpha Cronbach and found to be (0.835 and 0.792 respectively).

6- To check the accuracy and applicability of the study measures, to gauge the approximate time needed to interview participants, and to note any issues or challenges found during data collection, a pilot study involving 10% of schizophrenia patients was carried out.

7- During actual study:

- The study participants were chosen by the researcher based on their inclusion criteria, and clinical data was then verified by looking over patient records.
- Each patient was interviewed by the researcher on individual basis, through interviewing technique and go through the study tools.
- Each interviewed lasted from 30 – 45 minutes according to patient's understanding.
- The data was gathered over a four-month period, beginning in November 2021 and

ending in March 2022. The researcher visited both settings 2-3 days /week for data collection.

Statistical Analysis:

Statistical presentation and analysis of the present study was conducted, using the mean, standard deviation, chi-square test was used to compare between groups in qualitative, ANOVA test was used for comparison among different times in the same group in quantitative data, linear correlation coefficient was used for detection of correlation between two quantitative variables in one group and regression analysis model used to detect the influence of one or more independent variables on a dependent variable.

Results

Table (1) shows the distribution of the studied patients according to their socio-demographic and clinical characteristics. Regarding the age, 25% of the studied patients their age was less than 30 years old, more than half of them 53% ranged between 30 to 40 years old, 22% of them their age more than 40 years old with mean ±SD 33.41 ± 8.24

In relation to sex; more than half of the studied patients 59% are male and 41% of them are female. Regarding their marital status, 41 % of them are married, 32% are single, 20% are divorced, and 7% are widow. In relation to the residence; more than two thirds of the studied patients 77are living in rural while only 23% of them living in urban area. Regarding to their levels of education, it can be noticed that less than half of studied patient 46% had secondary education, while quarter of them 24% had university education, 20% had primary level, 8% of them had reading and writing and the minority of them had post-graduate 2%. Concerning their occupation; more than two thirds of studied patients 68% were not working and one third 32% of them were working. Also it can be noticed that 56% of them had not enough income and 44% had enough income. Most of studied patients 88% live with their family while only 12% live alone. Also it can be noticed 71% of the patients their duration of illness less than 10 years and only 7% their duration of illness more than 19 years with Mean ±SD 7.5±6.3. Also, it can be noticed that around half of the studied patients 46% are admitted to the hospital two times before while 36% of them admitted for the first time with mean ±SD 1.9±0.9. All of the studied patients are admitted to hospital involuntary and nearly half of the studied patient 49% their last admission to hospital since 2 to 4 years with mean±SD1.8±1.7.

Figure (1) shows the distribution of the studied patients according to their level of motivational traits. Regarding to total motivational trait levels, it can be noticed that nearly half of the studied patients 45% have low level of total motivational traits, 37% hade moderate level and only 18% of them had high level. Concerning motivational Traits subscales; 50% of the studied patients had low level in competitive excellence followed by Motivation related to anxiety subscale 45%, then emotionality subscale 44% and personal mastery 39%. On the other side it was found that only 21% of them had high level in personal mastery subscale followed by emotionality 20%, then Motivation related to anxiety 17% and only 15% in Competitive excellence subscale.

Figure (2) reveals distribution of studied patients according to their level of

Metacognition (MCQ) . Regarding to total metacognition levels it can be noticed that more than half of the studied patients 52% have low level of total metacognition, 34% hade moderate level and only 14% of them had high level. Concerning metacognition subscales; 59% of the studied patients had low level in need to control thoughts followed by positive beliefs about worry 58%, then lack of cognitive confidence 52% then Negative Beliefs about Uncontrollability and danger 49%, and Cognitive Self-Consciousness 40%. On the other side it was found that only 18% of them had high level in cognitive self- consciousness subscale followed by Negative Beliefs about Uncontrollability and danger 16%, then lack of cognitive confidence 15%, then positive beliefs about worry 12% and only 10% in need to control thoughts subscale.

Table (2) reveals a comparison between Motivational Traits subscales among studied patients. There was a highly statistical significant difference between all motivational subscales. It can be noticed that personal mastery subscale had the highest mean score followed by competitive excellence, then Motivation related to anxiety and emotionality (51.32±10.08, 41.42±9.15, 32.30±5.24, and 20.80±5.27 respectively). Higher mean score indicating a better subscale.

Table (3) shows a comparison between metacognitive abilities subscales among studied patients. It can be noticed that negative beliefs about Uncontrollability and danger subscale had the highest mean score followed by lack of cognitive confidence, then cognitive self-consciousness, then positive beliefs about worry and need to control thoughts (13.73±2.15, 12.98±2.28, 12.78±2.41, 12.21±2.63 and 9.98±2.47 respectively). Higher mean score indicating a better subscale.

Table (4) shows Correlation between metacognition and motivational traits among studied patients. There was a highly statistically significant positive correlation between all subscales of metacognition namely; Positive Beliefs about Worry, Cognitive Confidence, Cognitive Self-Consciousness, Negative Beliefs about Uncontrollability and Danger, need to Control Thoughts, total metacognition and motivational traits (r= 0.538 p= <0.001*, r= 0.252 p= 0.011*, r= 0.356 p=<0.001*, r= 0.518 p= <0.001*, r= 0.412 p= <0.001*, and r= 0.523 p=<0.001* respectively). This means improving metacognition leads to improving motivation.

Table (5) reveals the role of metacognition in the prediction of motivational traits. It was found that all metacognition subscales namely; Cognitive Confidence, Cognitive Self-Consciousness, and need to control thoughts had a significant effect and act as a predictor to motivational traits among patients with schizophrenia (t=2.183 p= 0.032 , t= 2.134 p=0.035 , t=2.563 p= 0.012 respectively) , while Positive Beliefs about Worry and Negative Beliefs about Uncontrollability and Danger subscales had a highly significant effect and act as a strong predictors on the prediction of motivation among patients with schizophrenia (t= 6.537 p= <0.001* , t=5.148 p= <0.001* respectively)

Table (1): Distribution of the studied patients according to their socio-demographic and clinical characteristics

Socio-demographic and clinical characteristics.	N (100)	%
Age (in years)		
<30	25	25
30 – 40	53	53
> 40	22	22
Range 20-54		
Mean ± SD	**33.41 ± 8.24**	
Sex		
Male	59	59
Female	41	41
Marital status		
Married	41	41
Single	32	32
Widow	7	7
Divorced	20	20
Residence		
Urban	23	23
Rural	77	77
Educational level		
illiterate/ read &write	8	8
Primary	20	20
Secondary/ preparatory	46	46
University	24	24
Master degree	2	2
Occupation		
Employed	32	32
Unemployed	68	68
Income		
Enough	44	44
Not enough	56	56
Cohabitation		
Alone	12	12
With family	88	88
Order in the family		
First	27	27
Second	36	36
Third	25	25
Fourth	10	10
Fifth	2	2

Continue: Table (1): Distribution of the studied patients according to their socio-demographic and clinical characteristics

Socio-demographic and clinical characteristics.	N (100)	%
Duration of illness (in years)		
<10	71	71%
10-19	22	22%
> 19	7	7%
Range 1-27		
Mean± SD 7.5±6.3		
Number of previous admissions		
1	36	36%
2	46	46%
3	18	18%
Range 1-3		
Mean± SD 1.9±0.9		
Mode of admission		
Involuntary	100	100%
Voluntary	0	0%
Time laps since last admission		
< 2	45	45%
2 – 4	49	49%
> 4	6	6%
Range 0-7		
Mean± SD1.8±1.7		

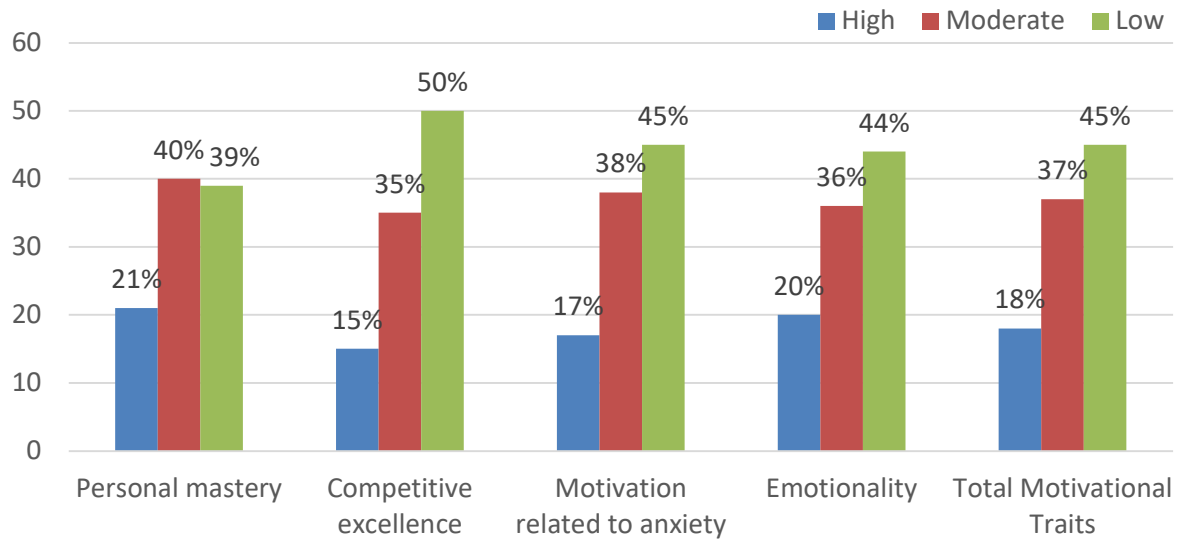

Figure (1) distribution of the studied patients according to their level of motivational traits

Table (2): Comparison between Motivational Traits subscales among studied patients

Subscale of Motivational Traits	**Mean ± SD**	**X^2** **P-value**
personal mastery	51.32±10.08	
Competitive excellence	41.42±9.15	
Motivation related to anxiety (worry & emotionality)	32.30±5.24	17.310 <0.001*
Emotionality	20.80±5.27	
Total Motivational Traits	145.84±25.97	

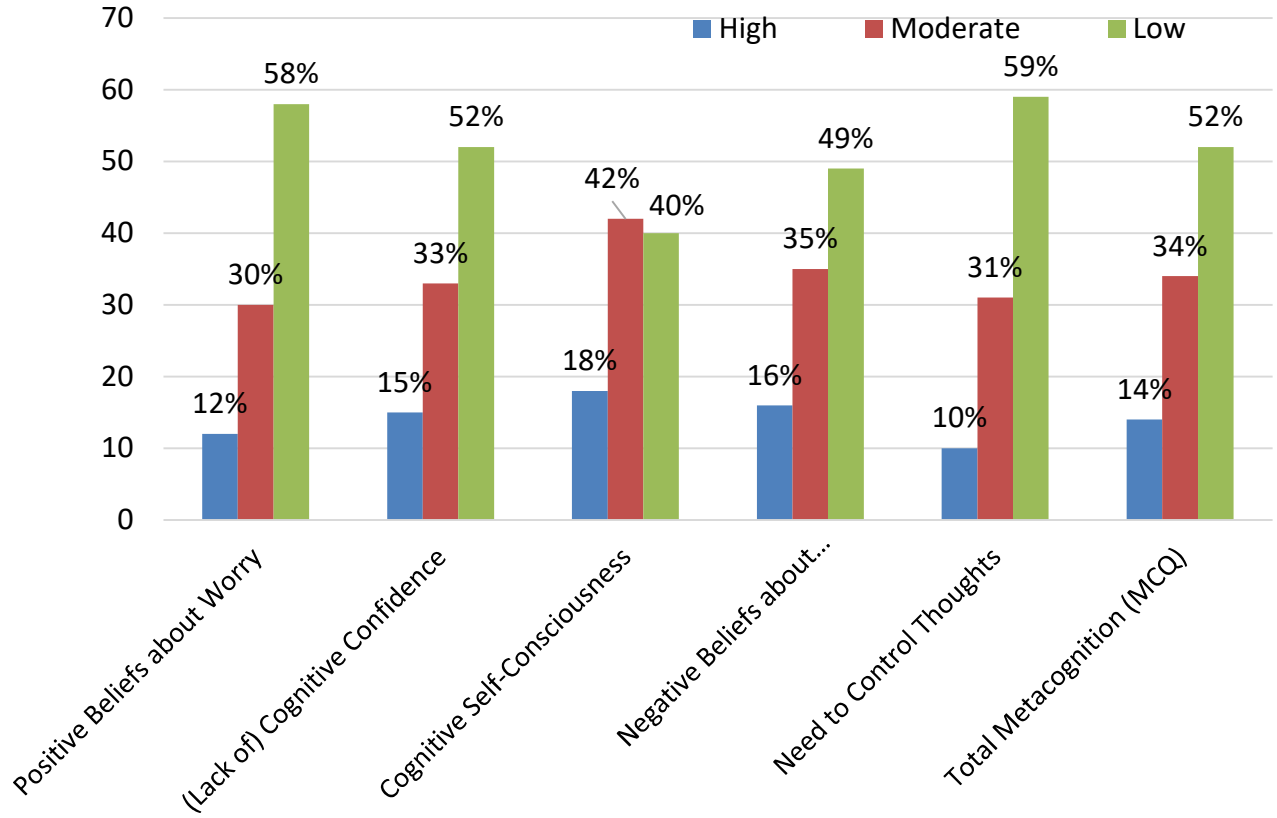

Figure (2): distribution of studied patients according to their level of Metacognition (MCQ-30

Table (3) Comparison between metacognitive abilities subscales among studied patients

Subscale of Metacognition	**Mean ±SD**	**X^2** **P-value**
Positive Beliefs about Worry	12.21±2.63	
Lack of Cognitive Confidence	12.98±2.28	
Cognitive Self-Consciousness	12.78±2.41	32.520
Negative Beliefs about Uncontrollability and Danger	13.73±2.21	<0.001*
Need to Control Thoughts	9.98±2.47	
Total Metacognition (MCQ) 61.68±8.15		

Table (4) Correlation between metacognition and motivational traits among studied patients

Subscales of Metacognition (MCQ)	**Motivational Traits score**	
	r	P-value
Positive Beliefs about Worry	0.538	<0.001*
Cognitive Confidence	0.252	0.011*
Cognitive Self-Consciousness	0.356	<0.001*
Negative Beliefs about Uncontrollability and Danger	0.518	<0.001*
Need to Control Thoughts	0.412	<0.001*
Total Metacognition (MCQ)	0.523	<0.001*

Table (5) Regression analysis model (The role of metacognition in the prediction of motivational traits)

Regression	Unstandardized Coefficients		Standardized Coefficients	T	P-value	95% CI	
	B	SE	Beta			Lower	Upper
Positive Beliefs about Worry	2.823	0.432	0.345	6.537	<0.001*	1.965	3.680
Cognitive Confidence	1.220	0.559	0.118	2.183	0.032*	0.110	2.330
Cognitive Self-Consciousness	1.010	0.473	0.134	2.134	0.035*	0.070	1.950
Negative Beliefs about Uncontrollability and Danger	2.862	0.556	0.331	5.148	<0.001*	1.758	3.966
Need to Control Thoughts	1.264	0.493	0.150	2.563	0.012*	0.285	2.243
Dependent Variable: Total motivation							

Discussion

Metacognition is a central process that supports continuous introspection, adjustment, and collaboration with others throughout life. Metacognition is an umbrella term that describes a broad range of processes that enable individuals to perceive and reflect on what is happening as they perceived and react to events as they occur. It plays a role in how well people understand and respond to the social and psychological challenges posed by mental disorders**.** [(20)].

The result of the present study showed that more than half of the studied patients had low level of total metacognition. The literature has emphasized the need to better understand the potentially different causes of metacognitive dysfunction in schizophrenia. The biological basis of metacognitive impairment in patients with schizophrenia was found to be highly related

to atrophy in prefrontal and parietal cortex regions. [(21)]. Furthermore, metacognitive deficits may be associated with cognitive deficits in schizophrenic patients, which are thought to be a component of schizophrenia and influence disease development and maintenance**.** [(22,23)].

Another set of phenomena that may lead to impairment in metacognitive abilities in patients with schizophrenia is the attachment pattern. Without secure attachment pattern, there may be fewer or no persons to share ideas about the self and others, therefore these ideas might be unformed or distorted. [(22)] Further, if others are perceived as unpredictable or dangerous, persons may be unable to trust others which could affect their own sense of themselves and others. Supporting this

explanation, a study conducted by **Aydin et al (2016)** [24] found that people with schizophrenia had more deficits in metacognitive skills that associated with childhood emotional abuse. Anxious attachment patterns and caregiver overprotection were also specifically associated with metacognitive abilities. Another explanation for lowered level of metacognition is that, patients with schizophrenia might receive insufficient psych-education intervention to improve their metacognitive abilities. Evidence proposing that deficits in metacognitive abilities are mostly found in schizophrenia and considered an obstacle to the recovery process. This led to increasing attention to develop and integrate metacognitive-oriented treatments in psychiatric care of inpatients with schizophrenia.

In consistent, a study by **Lysaker et al. (2014)** [22] reported that the schizophrenia group had more limited metacognitive abilities than control group. Similarly , studies conducted by **Trauelsen et al (2016)** [25], **Bröcker et al. (2017)** [26] and **Lysaker et al. (2019)** [27] mentioned that deficit in metacognition are commonly present in schizophrenia. Additionally, According to **Vohs et al. (2014)** [28], both the early and late stages of schizophrenia have been associated with impairment in metacognition. Furthermore, **Hussein et al. (2019)** [29] concluded that studied subjects with schizophrenia have deficits in metacognitive abilities.

This study also showed that nearly half of the patients had low overall motivational characteristics. In the same line a study by **Fervaha et al. (2015)** [30] they have documented that half of individuals with schizophrenia reported severe or clinically significant levels of amotivation. Additionally, Gagan **Fervaha (2018)** [31] referred that up to one-third of outpatients studied in stable sample experienced prominent impairments in motivation. Moreover, **Shanna Cooper et al. (2015)** [32] stated that, schizophrenic patients have deficits in autonomy when compared to persons without schizophrenia, less motivational autonomy and more impersonal, a motivated orientations were seen in schizophrenia patients. In contrast study carried by **Mendes et al. (2018)** [33] stated that, lack of motivation was moderate among the studied sample schizophrenia.

This result could be attributed to impaired metacognitive abilities in studied patients, as shown in the present finding that there was a highly statistically significant positive correlation between metacognition and motivational traits. This means improving metacognition leads to improving motivation. To recognize the cognitive mechanisms of motivation among patients with schizophrenia, attention should be given to the metacognitive abilities in their experience of mental illness. According to the cognitive model, patients with negative symptoms may exhibit decreased motivation because they have low expectations for successfully completing tasks [34]. Consequently, these dysfunctional attitudes (negative beliefs about their performance) cause negative symptoms to manifest, particularly a lack of goal-directed behavior.

The integrated model proposed that patients with schizophrenia experience low motivation as a result of deficits in metacognitive abilities [35]. This model was based on the description of metacognition as a continuum of processes spanning from awareness of different thoughts, feelings, and bodily experiences to the synthesis of those experiences into a more comprehensive understanding of oneself and other people as a unique one. Needless to say that, having a holistic understanding of oneself and others is crucial for motivating and sustaining goal-directed behaviour. Without this integration, it can be challenging to use one's understanding of oneself to develop worthwhile goals or strategies for accomplishing these goals [36]. Additionally, without metacognition, it may be hard to distinguish maladaptive thoughts about oneself, others, or the world that can impede goal directed-behavior. It is suggested low motivation may result from a person's inability to clearly understand their own or others' feelings, needs, and desires due to a weakness in metacognitive skills [37,38].

In the literature metacognition involves two main components: knowledge about cognition, and regulation of cognition. Knowledge of cognition: individuals who have a good understanding of their own cognitive processes may be more motivated to engage in activities that align with their strengths and interests. For example, someone who knows that they are good at math may be more motivated to pursue a career in engineering or finance. Regulation of cognition: The ability to regulate one's own thinking processes can also impact motivation. Individuals who are able to set goals, plan strategies, and monitor their progress may be more motivated to achieve those goals than those who lack these skills [39].

In the same line, **Brüne et al. (2011)** [40], **Kukla et al. (2013)** [41], **Luther et al. (2016)** [37] and Lysaker **et al. (2010)** [10] stated that impaired metacognitive abilities have been associated with negative social outcomes, low levels of intrinsic motivation and impaired subjective recovery. Similarly, study has suggested that, deficit in metacognitive function may also directly influence the path of illness by limiting persons' abilities to identify and respond to the challenges posed by psychiatric disorders. Therefore, limiting their ability to follow treatment plan and direct their own recovery process [42,43].

The present study also showed that whether there were specific metacognition domains that were highly significant than the others for motivation as in table 5. The domains of Positive Beliefs about Worry and Negative Beliefs about Uncontrollability and Danger act as strong predictors on the prediction of motivation among patients with schizophrenia than the other domains. In the same direction a study by **Luther et al. (2018)** [44]**,** suggested that not all domains of metacognition are necessary for high motivation to occur.

Conclusions

This study concluded that impairment in metacognitive abilities among the studied patients were significantly correlated with low level of motivation Additionally, the

metacognitive domains namely; Positive Beliefs about Worry and Negative Beliefs about Uncontrollability and Danger act as strong predictors on the prediction of motivation among patients with schizophrenia.

Recommendations

According to the results of this study the following recommendation was proposed:

- Metacognitive abilities should be assessed routinely for patients with schizophrenia.
- Psychotherapeutic intervention that could improve motivation in patients with schizophrenia should focus on stimulating metacognitive abilities.
- The study should be replicated on larger groups of patients.

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