**Abstract**

**Introduction:** A study to assess effect of schizophrenia on socio-cognitive ability. Schizophrenia is a disorder of the ‘social brain’. (1)

Social cognition can be defined as "the mental operations underlying social interactions, which includes the human ability to perceive the intentions and dispositions of others and the cognitive processes that sub serve behavior in response to others". Severe and persistent social disability is a key characteristic of schizophrenia that often plagues the lives of many individuals with the disorder. (2)

**Aim of study:** The aim is to assess the social functions of schizophrenic inpatients in the Maamoura mental hospital and to compare it with healthy matching controls. Moreover, a correlation between schizophrenia symptom profile and social cognitive functions was investigated.

Subjects and methods: This is a case control study where 55 schizophrenic inpatients were randomly selected and compared with 55 socially and physically matching controls for using scales to test social cognition (social skills inventory (SSI), emotional intelligence scale (EI), theory of mind (ToM)) and the positive and negative scale for schizophrenia (PANSS).

**Results:** On reviewing results, it was found that there was a negative significant correlation between the total and subtotal values of PANSS with the total values and most of the subtotal values of SSI, EI and ToM. Patients with chronic schizophrenia showed significant impairment in socio-cognitive ability in comparison to normal individuals.

**Conclusion:** The control group showed better social cognitive function than the schizophrenic inpatients. In addition, social cognition showed a negative correlation with the degree of severity of schizophrenia.

**Recommendations:** Social cognitive assessment should be put as a cornerstone...
assessment in schizophrenia and should be included in the management plans. Key words: schizophrenia, social cognition, social skills, emotional intelligence, theory of mind.

| Response to Reviewers: | I did these corrections already  
Thank you |
Chronic schizophrenia and its effect on social cognition
Full Title: Chronic schizophrenia and its effect on social cognition
Short Title: schizophrenia and social cognition
Article Type: Original Article
Corresponding Author: mohammed el gohary, mbbch
maamoura mental hospital
EGYPT
First Author: Hussein El Sheikh, professor of psychiatry
Order of Authors: Hussein El Sheikh, professor of psychiatry
Hesham Mohamed El Sayed, assistant professor of psychiatry
shewikare Tawfik El Bakry, assistant professor of psychiatry
Mohammed El Gohary

Abstract: Abstract
Introduction: A study to assess effect of schizophrenia on socio-cognitive ability.
Schizophrenia is a disorder of the 'social brain'. Social cognition can be defined as "the mental operations underlying social interactions, which includes the human ability to perceive the intentions and dispositions of others and the cognitive processes that sub serve behavior in response to others". Severe and persistent social disability is a key characteristic of schizophrenia that often plagues the lives of many individuals with the disorder.
Aim of study: The aim is to assess the social functions of schizophrenic inpatients in the Maamoura mental hospital and to compare it with healthy matching controls. Moreover, a correlation between schizophrenia symptom profile and social cognitive functions was investigated.
Subjects and methods: This is a case control study where 55 schizophrenic inpatients were randomly selected and compared with 55 socially and physically matching controls for using scales to test social cognition (social skills inventory (SSI), emotional intelligence scale (EI), theory of mind (ToM)) and the positive and negative scale for schizophrenia (PANSS).
Results: On reviewing results, it was found that there was a negative significant correlation between the total and subtotal values of PANSS with the total values and most of the subtotal values of SSI, EI and ToM. Patients with chronic schizophrenia showed significant impairment in socio-cognitive ability in comparison to normal individuals. 

Conclusion: The control group showed better social cognitive function than the schizophrenic inpatients. In addition, social cognition showed a negative correlation with the degree of severity of schizophrenia. 

Recommendations: Social cognitive assessment should be put as a cornerstone assessment in schizophrenia and should be included in the management plans.

Key words: schizophrenia, social cognition, social skills, emotional intelligence, theory of mind.
Chronic schizophrenia and its effect on social cognition

Full Title: Chronic schizophrenia and its effect on social cognition

Short Title: schizophrenia and social cognition

Article Type: Original Article

Corresponding Author: mohammed el gohary, mbbch
maamoura mental hospital
EGYPT

First Author: Hussein El Sheikh, professor of psychiatry

Order of Authors: Hussein El Sheikh, professor of psychiatry
Hesham Mohamed El Sayed, assistant professor of psychiatry
shewikare Tawfik El Bakry, assistant professor of psychiatry
Mohammed El Gohary

Abstract: Abstract

Introduction: A study to assess effect of schizophrenia on socio-cognitive ability.

Schizophrenia is a disorder of the 'social brain'. Social cognition can be defined as "the mental operations underlying social interactions, which includes the human ability to perceive the intentions and dispositions of others and the cognitive processes that sub serve behavior in response to others". Severe and persistent social disability is a key characteristic of schizophrenia that often plagues the lives of many individuals with the disorder.

Aim of study: The aim is to assess the social functions of schizophrenic inpatients in the Maamoura mental hospital and to compare it with healthy matching controls. Moreover, a correlation between schizophrenia symptom profile and social cognitive functions was investigated.

Subjects and methods: This is a case control study where 55 schizophrenic inpatients were randomly selected and compared with 55 socially and physically matching controls for using scales to test social cognition (social skills inventory (SSI), emotional intelligence scale (EI), theory of mind (ToM)) and the positive and negative scale for schizophrenia (PANSS).
Results: On reviewing results, it was found that there was a negative significant correlation between the total and subtotal values of PANSS with the total values and most of the subtotal values of SSI, EI and ToM. Patients with chronic schizophrenia showed significant impairment in socio-cognitive ability in comparison to normal individuals.

Conclusion: The control group showed better social cognitive function than the schizophrenic inpatients. In addition, social cognition showed a negative correlation with the degree of severity of schizophrenia.

Recommendations: Social cognitive assessment should be put as a cornerstone assessment in schizophrenia and should be included in the management plans.

Key words: schizophrenia, social cognition, social skills, emotional intelligence, theory of mind.
CHRONIC SCHIZOPHRENIA AND ITS EFFECT ON SOCIAL COGNITION

Abstract

Introduction: A study to assess effect of schizophrenia on socio-cognitive ability.

Schizophrenia is a disorder of the ‘social brain’.(1)

Social cognition can be defined as “the mental operations underlying social interactions, which includes the human ability to perceive the intentions and dispositions of others and the cognitive processes that sub serve behavior in response to others”.

Severe and persistent social disability is a key characteristic of schizophrenia that often plagues the lives of many individuals with the disorder.(2)

Aim of study: The aim is to assess the social functions of schizophrenic inpatients in the Maamoura mental hospital and to compare it with healthy matching controls. Moreover, a correlation between schizophrenia symptom profile and social cognitive functions was investigated.

Subjects and methods: This is a case control study where 55 schizophrenic inpatients were randomly selected and compared with 55 socially and physically matching controls for using scales to test social cognition (social skills inventory (SSI), emotional intelligence scale (EI), theory of mind (ToM)) and the positive and negative scale for schizophrenia (PANSS).

Results: On reviewing results, it was found that there was a negative significant correlation between the total and subtotal values of PANSS with the total values and most of the subtotal values of SSI, EI and ToM. Patients with chronic schizophrenia showed significant impairment in socio-cognitive ability in comparison to normal individuals.

Conclusion: The control group showed better social cognitive function than the schizophrenic inpatients. In addition, social cognition showed a negative correlation with the degree of severity of schizophrenia.

Recommendations: Social cognitive assessment should be put as a cornerstone assessment in schizophrenia and should be included in the management plans.

Key words: schizophrenia, social cognition, social skills, emotional intelligence, theory of mind.
Introduction

Severe and persistent social disability is a key characteristic of schizophrenia that often plagues the lives of many individuals with the disorder. Psychiatrists as early as Emile Kraepelin (1919) described schizophrenia as being characterized by social withdrawal and a progressive deterioration in social functioning. Today’s nosology of mental disorders considers the presence of significant social dysfunction to be a key and defining characteristic of all forms of schizophrenia.\(^{(2)}\)

While schizophrenia is noted for its psychotic symptoms and deficit features, cognitive impairments are important aspects of the illness as well. While these cognitive impairments are well known as predictors of different aspects of real-world functional outcomes, social disability in schizophrenia may have a number of additional determinants. One of the domains where impairments may contribute to social disability in schizophrenia is social cognition. This is an area that is receiving an increase in attention that parallels the increased interest in cognition in schizophrenia over the past 10 years.\(^{(3)}\)

On one hand, Negative symptoms could spring from a similar affective processing dysfunction as social cognitive impairments. For example, diminished social reward salience found in negative symptoms (e.g.: anhedonia and a motivation) may contribute to subtypes of social cognitive dysfunction. Alternatively, failed empathy or mental simulation of others’ cognitive-affect states (a putatively social cognitive phenomenon) may underlie theory of mind deficits and also foster the extinction of social reinforcement, leading to increased negative symptoms.\(^{(4)}\)

On the other hand, Studies examining the impact of positive symptoms (i.e., hallucinations, delusions, thought disorder) on social functioning in schizophrenia have yielded mixed results, with some investigators finding small to moderate relationships between hallucinations, delusions, and social disability, and others reporting no significant relationships.\(^{(5)}\)

Recent evidence indicates that one of the most likely contributors to social disability in schizophrenia is a range of deficits in emotion processing, including the ability to accurately perceive emotions, to use emotions to facilitate thinking and decision-making, and to understand and manage emotions in oneself and others.\(^{(6)}\)

Since social cognition and ToM belong to a special cognitive domain that directly reflects the interactions within a social environment, thus affecting quality of life, it can be hypothesized that these functions are compromised in the case of mental illnesses characterized by cognitive impairments or disabilities (e.g., schizophrenia and bipolar disorder).\(^{(7,8)}\)

Subjects

65 Patients were recruited to the study but 10 patients left the study thus 55 patients were included in the study. This study was done in the Maamoura mental hospital from the first of August till the end of October 2016.
Inclusion criteria:

1. Both genders will be chosen randomly.
2. Patients diagnosed as schizophrenia fulfilling the (DSM IV-TR) diagnostic criteria and assessed according to SCID I and after the confirmation of 2 of the hospital certified consultants.
3. Age: 25 –50 years old.
4. Education: Finished elementary education as minimal requirement.

Exclusion criteria:

1. Patients that were clinically not stable enough to complete the assessment scales.
2. Comorbid medical or psychiatric conditions
3. Patients that received electroconvulsive therapy in the last 6 months.
4. Patients were checked not to have any type of sensory impairment
5. Toxicological screening for substance and alcohol abuse was done and confirmed negative.

Methods

Tools applied for cases (schizophrenic patients):

All cases will be subjected to the following:

- all chosen subjects were reviewed and clinically assessed by 2 consultant psychiatrists and similarly diagnosed with schizophrenia

1) Psychiatric sheet of General Secretariat of Mental Health hospitals.

**Aim:** to fulfill personal data, past history, family history, duration of illness, and current medications or electroconvulsive therapy (ECT).

2) SCID I also aided in the diagnosis

3) Psychometric studies for patients:

   a) Positive and Negative Syndrome Scale (PANSS)\(^{(9)}\).

   **Aim:** to measure the severity of psychopathology in adult patients with psychotic disorders.

   **Description:** consists of 30 items rated along a seven point rating scale. Composed of The positive scale, the negative scale and the general psychopathological scale. The Arabic translated and adapted version was used in the study.\(^{(10)}\)

   b) The Arabic Version of Schutte Self-Report Emotional Intelligence Scale \(^{(11)}\). Translated by Dr. Faten Farouk Abdel Fattah Musa - College of Education - University Alzkaziq.

   **Aim:** measuring general Emotional Intelligence (EI).

   **Description:** emotion perception, utilizing emotions, managing self-relevant emotions, and managing others’ emotions.
c) The Arabic Version of the Social Skills Inventory (SSI) (12). Translated by Dr. El Sayed Ibrahim El Samadony - College of Education – Tanta University

**Aim:** It evaluates verbal and non-verbal communication skills.

**Description:** 94-item, measures the basic dimensions of social skills.

d) Computerized the Eyes Test (Revised, Adult) (13).

**Aim:** Test Theory of Mind (ToM).

**Description:** 36 pictures of the eye region, the participants choose one word that describes the mental state of the person in picture and scoring is by summing the total score of pictures identified correctly and it is done automatically online.

**Assessment tests applied for healthy control group:**

- Personal data including medical, social and past history were taken.
- The Arabic version of Schutte Self-Report Emotional Intelligence Scale.
- The Arabic Version of the Social Skills Inventory (SSI)
- Computerized the Eyes Test (Revised, Adult)

**Ethical consideration:**

- Both patients and control groups were given full information about the study protocol, nature, aim of the study and they had the opportunity to discuss the issues relevant to the study before giving their consent. Also, their desire to ensure confidentiality about mentioning the names was insured. And it was made clear that they could leave the study at anytime with no penalty appointed.

**Results**

**Regarding the demographic data:**

There was no significant difference in gender selection between cases and controls in fact controls had more female subjects. The mean age of the cases was 38.39±5.02 and controls were 33.49 ± 4.98.most of the cases and the control subjects were from an urban background. Concerning marital status, more than half the case group was either single widowed or divorced while the control groups were nearly equal. Shedding the light on educational level, more than half the cases have completed higher education, while the control group less percentage have completed only elementary education. In respect to employment, most of the cases were unemployed while most of the controls were employed.

**Regarding the description of the studied patients:**

Concerning the past history, the mean age of onset was 23.04 and the mean number of previous hospitalizations was approximately three times. Most cases showed negative consanguinity and negative family history of the disease. The average duration of illness was around 12 years and most of the patients were on atypical antipsychotics. It was noticed that most of the cases have not taken electroconvulsive therapy before.
Regarding the positive and negative syndrome scale (PANSS):

It was found that the average score of the positive syndrome was 28.64 where the negative syndrome average score was 27.07 and the general psychopathology average score was 60.31.

Regarding the social skill inventory assessment:

There was a significant difference between the cases and controls in the emotional sensitivity, social sensitivity, social control subscales and the total scale scores. But no significant difference was found in the score of emotional expressivity, emotional control and social expressivity subscales.

Regarding the results of the emotional intelligence assessment:

There was a significant difference between the mean scores of cases and controls regarding appraisal and expression subscale score, and the total scale score. While there was no significant difference concerning both the regulation and utilization of emotions subscales.

Regarding the theory of mind assessment:

There was a significant difference between the cases and controls scores of this test.

On comparing the different subscales of the PANSS and the total scores of the SSI, EI and ToM tests:

There was a negative significant correlation between all the PANSS subscale scores and the totals of the other scales of the cases except for the correlation between the positive syndrome scale and the theory of mind total score.
Tables of results

Table (1): Comparison between the two groups according to demographic data

<table>
<thead>
<tr>
<th></th>
<th>Cases (n = 55)</th>
<th>Control (n = 55)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24(43.6%)</td>
<td>17(30.9%)</td>
<td>0.167</td>
</tr>
<tr>
<td>Female</td>
<td>31(56.4%)</td>
<td>38(69.1%)</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>25.0-50.0</td>
<td>25.0-45.0</td>
<td>0.249</td>
</tr>
<tr>
<td></td>
<td>38.39±5.02</td>
<td>33.49 ± 4.98</td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>44(80.0%)</td>
<td>53(96.4%)</td>
<td>0.008*</td>
</tr>
<tr>
<td>Rural</td>
<td>11(20.0%)</td>
<td>2(3.6%)</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>34(61.8%)</td>
<td>26(47.3%)</td>
<td>0.126</td>
</tr>
<tr>
<td>Married</td>
<td>21(38.2%)</td>
<td>29(52.7%)</td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary education</td>
<td>23(41.8%)</td>
<td>39(70.9%)</td>
<td>0.002*</td>
</tr>
<tr>
<td>H (higher)</td>
<td>32(58.2%)</td>
<td>16(29.1%)</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>49(89.1%)</td>
<td>8(14.5%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Employed</td>
<td>6(10.9%)</td>
<td>47(85.5%)</td>
<td></td>
</tr>
</tbody>
</table>

Qualitative data were described using number and percent and was compared using Chi square. Normally quantitative data was expressed as Mean ± SD and compared using student t-test.

*: Statistically significant at p ≤ 0.05
Table (2): Distribution of the studied cases according to history in cases group (n = 55)

<table>
<thead>
<tr>
<th>Past history</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of onset of Schizophrenia</td>
<td>23.04 ± 4.08</td>
</tr>
<tr>
<td>Number of Hospitalizations</td>
<td>2.96 ± 1.28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family History</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Consanguinity</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>45 (81.8%)</td>
</tr>
<tr>
<td>Positive</td>
<td>10 (18.2%)</td>
</tr>
<tr>
<td>Family history of psychiatric illness</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>45 (81.8%)</td>
</tr>
<tr>
<td>Positive</td>
<td>10 (18.2%)</td>
</tr>
</tbody>
</table>

| Duration of illness           | 12.29 ± 7.12     |

<table>
<thead>
<tr>
<th>Currant Medications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A (atypical)</td>
<td>40 (72.7%)</td>
</tr>
<tr>
<td>T (typical)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>A and T</td>
<td>15 (27.3%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electroconvulsive Therapy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>43 (78.2%)</td>
</tr>
<tr>
<td>Positive</td>
<td>12 (21.8%)</td>
</tr>
</tbody>
</table>

Qualitative data were described using number and percent. Normally quantitative data was expressed as Mean ± SD.
Table (3): Comparison between the two groups according to different parameters

<table>
<thead>
<tr>
<th></th>
<th>Cases (n = 55)</th>
<th>Control (n = 55)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE</td>
<td>66.42 ± 21.99</td>
<td>67.95 ± 18.65</td>
<td>0.695</td>
</tr>
<tr>
<td>ES</td>
<td>84.25 ± 18.77</td>
<td>92.75 ± 18.17</td>
<td>0.018*</td>
</tr>
<tr>
<td>EC</td>
<td>71.64 ± 11.24</td>
<td>70.07 ± 17.27</td>
<td>0.575</td>
</tr>
<tr>
<td>SE</td>
<td>77.75 ± 15.66</td>
<td>80.04 ± 12.51</td>
<td>0.399</td>
</tr>
<tr>
<td>SS</td>
<td>81.11 ± 17.98</td>
<td>90.65 ± 18.62</td>
<td>0.007*</td>
</tr>
<tr>
<td>SC</td>
<td>81.65 ± 19.94</td>
<td>88.75 ± 16.42</td>
<td>0.044*</td>
</tr>
<tr>
<td>Total</td>
<td>462.71 ± 61.49</td>
<td>490.20 ± 42.0</td>
<td>0.007*</td>
</tr>
</tbody>
</table>

**Emotional intelligence scale**

<table>
<thead>
<tr>
<th></th>
<th>Cases (n = 55)</th>
<th>Control (n = 55)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appraisal and expression</td>
<td>25.24 ± 4.03</td>
<td>27.49 ± 4.24</td>
<td>0.005*</td>
</tr>
<tr>
<td>Regulation of emotion</td>
<td>25.44 ± 3.33</td>
<td>25.62 ± 4.04</td>
<td>0.797</td>
</tr>
<tr>
<td>Utilization of emotion</td>
<td>25.45 ± 4.59</td>
<td>26.98 ± 3.99</td>
<td>0.065</td>
</tr>
<tr>
<td>Total</td>
<td>76.15 ± 9.85</td>
<td>79.85 ± 8.46</td>
<td>0.036*</td>
</tr>
</tbody>
</table>

**Reading mind eyes**

<table>
<thead>
<tr>
<th></th>
<th>Cases (n = 55)</th>
<th>Control (n = 55)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE: emotional expressivity</td>
<td>19.93 ± 3.38</td>
<td>28.96 ± 1.89</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

Quantitative data was expressed as Mean ± SD and compared using student t-test.

*: Statistically significant at p ≤ 0.05

EE: emotional expressivity  ES: emotional sensitivity  EC: emotional control
SE: social expressivity    SS: social sensitivity  SC: social control
Table (4): Correlation between PANSS and different parameters in cases group (n = 55)

<table>
<thead>
<tr>
<th>PANSS</th>
<th>SSI (total)</th>
<th>Emotional intelligence (total)</th>
<th>Reading mind eyes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive syndrome score</td>
<td>r = 0.384 * , p = 0.004 *</td>
<td>-0.313 * , p = 0.020 *</td>
<td>-0.074 , p = 0.589</td>
</tr>
<tr>
<td>Negative syndrome score</td>
<td>r = -0.404 * , p = 0.002 *</td>
<td>-0.556 * , p &lt; 0.001 *</td>
<td>-0.289 * , p = 0.032 *</td>
</tr>
<tr>
<td>General psychopathology score</td>
<td>r = -0.525 * , p &lt; 0.001 *</td>
<td>-0.473 * , p &lt; 0.001 *</td>
<td>-0.310 * , p = 0.021 *</td>
</tr>
<tr>
<td>Total</td>
<td>r = -0.522 * , p &lt; 0.001 *</td>
<td>-0.556 * , p &lt; 0.001 *</td>
<td>-0.287 * , p = 0.034 *</td>
</tr>
</tbody>
</table>

r: Pearson coefficient
*: Statistically significant at p ≤ 0.05

Table (5): Conclusion of correlations among the schizophrenic group

<table>
<thead>
<tr>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANSS (total) vs social skill inventory</td>
</tr>
<tr>
<td>PANSS (total) vs emotional intelligence</td>
</tr>
<tr>
<td>PANSS (total) vs reading mind eyes Median</td>
</tr>
<tr>
<td>SSI total vs emotional intelligence (total)</td>
</tr>
<tr>
<td>SSI (total) vs positive syndrome score</td>
</tr>
<tr>
<td>SSI (total) vs negative syndrome score</td>
</tr>
<tr>
<td>SSI (total) vs general psychopathology score</td>
</tr>
<tr>
<td>Emotional intelligence (total) vs positive syndrome score</td>
</tr>
<tr>
<td>Emotional intelligence (total) vs negative syndrome score</td>
</tr>
<tr>
<td>Emotional intelligence (total) vs general psychopathology score</td>
</tr>
<tr>
<td>Reading mind eyes vs positive syndrome score</td>
</tr>
<tr>
<td>Reading mind eyes vs negative syndrome score</td>
</tr>
<tr>
<td>Reading mind eyes vs general psychopathology score</td>
</tr>
</tbody>
</table>
Table (6): Correlation between SSI total and Emotional intelligence in cases group (n = 55)

<table>
<thead>
<tr>
<th>Emotional intelligence (total)</th>
<th>SSI total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
</tr>
<tr>
<td></td>
<td>0.384*</td>
</tr>
</tbody>
</table>

Figure (1): Correlation between SSI total and Emotional intelligence in cases group (n = 55)

Figure (2): Correlation between PANSS total and Social skill inventory in cases group (n = 55)
Figure (3): Correlation between PANSS total and Emotional intelligence in cases group (n = 55)

Figure (4): Correlation between PANSS total and Reading mind eyes Median in cases group (n = 55)
Discussion

The current research is a case control study, which was conducted on 55 patients with schizophrenia in-group A and 55 subjects of healthy volunteers in-group B to assess the effect of schizophrenia on social cognition.

Patients were selected from Al-Ma’amoura inpatient ward since the beginning of August of 2016 to the end of October 2016.

**Aim of the study:** is to assess social cognition functioning among a sample of inpatients diagnosed with schizophrenia and to correlate between symptom profile & disease severity of schizophrenia and social cognition.

**The current study attempted to answer the following questions:**

Most were from the urban areas which is most probably due to the geographical position of the hospital. Moreover, the urban population is more aware about the presence of psychiatric diseases that rural areas that may be more reluctant to seek treatment.

Also regarding educational level, it was noticed that a significant number of the patients have only finished core education. But the number of patients that have finished elementary education only is relatively high as well which may be due to the fact that the hospital from which the cases were taken is a public hospital and mostly for people of the lower socio-economic status. Another remark was that the educational level of the control group was found relatively and significantly different from the cases studied, and that was due to the availability of candidates that were working in the hospital and ready to attend the extensive assessment scales used. Moreover, patient relatives were excluded from the study selection due to the probability of being genetically predisposed or even having some personality disturbances making them more liable or inclined to becoming psychotic and that would alter the study results. Whereas for employment almost all the case subjects were found to be unemployed which may be due to the remitting and relapsing course of the disease and the progressive decline in the executive functions of the brain.

The patients had more than one hospitalization (mean approximately 3 times) and that is due to the chronicity of the condition and the fact that most patients were not well compliant due to either ignorance or poor incomes and lack of social and economic support.

So as for family history which was found negative in 81.8% of cases, although schizophrenia has a hereditary base (14),This result might be due to the ignorance and lack of knowledge of some patients about the different symptoms of mental illness and due to the lack of documentation in different mental hospitals.

The use of atypical antipsychotics is the current main trend worldwide and in the same as much as possible in Maamoura hospital (72% of cases)

In respect to electroconvulsive therapy(ECT) only 21% of patients have received previous ECT sessions, this could be due the false idea delivered by the media about use of ECT and may be also due to the complex and strict regulations applied by the hospital when considering treating patients with ECT.
The social cognition domains assessed using social skills inventory (SSI), schutte self-report emotional intelligence scale (SSREIS) and reading the mind in the eyes test (RMET). Also Symptoms severity was assessed using positive and negative syndrome scale (PANSS).

As regard performance based socio-emotional intelligence on patients with schizophrenia group showed significantly poorer performance than control in emotional sensitivity, social sensitivity, and social control) and total score of social skills inventory (SSI) but the results were found insignificant regarding the emotional expressivity, emotional control and social expressivity

(1) Regarding emotional expressivity score that reflects skill of sending/encoding nonverbal and emotional messages also nonverbal expression of attitudes, dominance, and interpersonal orientation. There were no significant relation between patients with schizophrenia and healthy control. Probably this could be attributed to the selected control cases who were mostly of lower level of education, poor job skills and that in our community usually denotes a lower intelligence level, which probably decreases social skills.

Consistent with the present study results a study by Kolet (15) uses the cue-modulated startle reflex to study emotional processes and emotional deficits in schizophrenia. Results indicated that there were no significant differences in the affective modulation of the startle response to the pictures between patients and control groups. These findings suggest that involuntary emotional reactions as well as subjective emotional experience are unimpaired in schizophrenia.

In contrast studies as (16) reported that schizophrenics display few facial expressions, minimal gaze and unusual gestures and postures. The difference may be due to smaller sample in these studies than the present study and different method of measuring emotional expressivity.

(2) Regarding Emotional Control which reflects the ability to regulate emotional and nonverbal displays of behavior and it involves the ability to mask felt emotional states and to deliberately portray particular emotions on cue. There were no significant difference between patients with schizophrenia and healthy control. May be because the cases that were subject of the study were more compliant on atypical antipsychotics and had some psychological and social skills training delivered to them in the hospital.

Consistently, a study by Henry et al. (17) Symptom severity and various aspects of cognitive and psychosocial functioning were also assessed. Relative to controls, individuals with schizophrenia did not differ with regard to their reported use of suppression and reappraisal. (15)

On the contrary a study by Kucharska-Pietura and Kopacz (18) Results revealed significantly greater impairment of emotional control in schizophrenics compared to healthy volunteers. Chronicity of the schizophrenic process seemed to intensify emotional control impairment. The difference may be due to different method of measuring social control.

(3) Regarding Social Expressivity, its skill in verbal expression and the ability to engage others in social interaction (i.e., skill in attaining, guiding, and maintaining
conversations). There were no significant relation between patients and healthy volunteers. And that could be explained by the unique remark during the study that the control patients themselves were found to have lower values where taking the tests, that may be denoting a change in the socio-economic standards of living on the overall affecting their social skills.

In contrast to Xu Jia Qi (19) Study consisted of a validation study for CAP (conversational analysis paradigm) and a cross-sectional study in investigating verbal information management in schizophrenia and healthy participants. Performance was compared between patients with schizophrenia spectrum disorders and matched healthy controls. Patients showed poorer performance in verbal information management under both cooperative and competitive conditions.

(4) Regarding Emotional sensitivity subscale results reflect impaired skill of receiving and interpreting the nonverbal messages as well as attentiveness to nonverbal cues in patients with schizophrenia. The patients mostly were unmarried with little social support, also had minimal education and mostly unemployed, with recurrent hospitalization history and the community lacks ways of social support and education.

Consistent with the present study results a study by Tseng et al., (20) schizophrenic patients and healthy participants performed and it was found that the emotion recognition ability of patients with schizophrenia was significantly worse than healthy participants in both facial and vocal modalities.

On the contrary Souto et al. (21) didn't find any significant statistical differences between both groups during emotional facial recognition, the performance of people with schizophrenia was slightly inferior. (17)

(5) Regarding Social Sensitivity; results reflect decreased ability in patients with schizophrenia to accurately decode/interpret others’ verbal communications, as well as knowledge of and sensitivity to the norms governing appropriate social behavior. It is related to a social “self-consciousness” that allows persons to monitor their own social behavior and realize its impact on others.

(6) Regarding Social Control subscale results reflect impaired skill in social role-playing and social self-presentation also decreased ability in guiding the direction and content of communication in social interaction.

Both may be explained by the fact that schizophrenia is a disease of progressive nature of socio-cognitive decline and so patients would gradually lose the ability and sensitivity to control their social behavior, moreover the longer the patients stay in the hospital, the less they are to deal with their relatives and other individuals in general. In addition, that would cause them gradually to lose some of their social abilities.

Consistent with the present study results a study by Vaskinn et al., (22) Social problem-solving was assessed with the Assessment of Interpersonal Problem Solving Skills (AIPSS) method. The schizophrenia group was outperformed by healthy controls on all Assessment of Interpersonal Problem Solving Skills (AIPSS) measures.

Total score of social skills inventory as a general indicator of global social competence results reflect impairment in patients with schizophrenia.
According to Perez. et al. (23) study using social skills inventory like the present study many social skill theorists argue that it is difficult to capture social skill deficits with a single score. Social skills are multidimensional and involve both verbal and nonverbal domains. Thus, one or more extreme social skills (either too high or too low) in relation to other social skill dimensions can be related to poor adjustment. This has important implications for social skills training, which is often a focus of treatment for psychiatric disorders.

**Regarding the Emotional Intelligence scale:**

**Appraisal and expression** subscale results reflect *less* the ability of patients with schizophrenia to appraise and express the emotions of and to others through verbal or non-verbal information.

**Utilization of emotion** subscale results reflect *no impaired degree* of emotional utilization in problem solving in patients with schizophrenia. Emotions drive us to focus on more pressing needs (24) and positive emotions may affect cognitive organization and inclusively relate more materials to produce diverse ideas. (25)

**Total score results** of emotional intelligence reflect *decreased capacity* of patients with schizophrenia to reason with emotion and to use emotion to enhance thought.

This could be further explained that emotions are most probably under the control of the limbic system and basal ganglia depending mainly on dopamine and serotonin as neurotransmitters, and schizophrenic patients are believed to have impaired balances of such neurotransmitters in relation to their levels and relative levels to each other in the limbic system and other cortical and subcortical structures in the brain.

**Regarding theory of mind** there was *significant difference* between patients with schizophrenia and healthy control in reading the mind in the eyes test (RMET) that reflect impairment in patients’ mental state decoding of other individuals’ facial expressions (the ability to infer the emotions of others).

**Consistent** with the present study results a number of studies summarizing the schizophrenia research conducted were recently published. Three of the studies provided an overview of social cognition: (26, 27 and 28). Two broad meta-analyses of theory of mind (ToM) and schizophrenia conducted by Pickup (29) and Sprong et al. (30). Each of these studies explored the extent of mental impairment in patients with schizophrenia, and all found a *robust and serious impairment of theory of mind (ToM) abilities*. Sprong et al. (30) found that, on average, the theory of mind (ToM) performance of participants with schizophrenia was *more than one standard deviation below* that of healthy controls.

**On the contrary**, in De Achaval et al. (31) study Schizophrenia patients and healthy matches were recruited and conducted the theory of mind (ToM) assessment using the eyes test. Patients with schizophrenia showed *no impairment* in the Reading the Mind in the Eyes Test compared to controls (31).

One of the reasons that might have led to the poorer response with the patients was maybe that most of them might not have dealt with a computer device before and had significant anxiety when first dealing with it.
As regard Severity of illness, which rated the positive and negative syndrome scale (PANSS). There was a statistically significant negative correlation between positive and negative syndrome scale (PANSS) total score and total scores of Schutte Self-Report Emotional Intelligence Scale (SSREIS), social skills inventory (SSI) and reading the mind in the eyes test (RMET).

On relation to emotional sensitivity subscales of social skills inventory there was significantly negative correlation with scores of positive syndrome subscale and negative syndrome subscale of the positive and negative syndrome scale (PANSS). This comes in partial agreement with Tseng et al. (20). Riggio & Carney (32) found a trend of negative association between overall accuracy of nonverbal emotion recognition and negative symptom dimensions regarding different emotion categories across modalities, accuracy of happy emotion was negatively and modestly correlating with Delusion/Hallucination dimension and Hostility/Excitement dimension.

Similar to De Achaval et al. study, Theory of mind (ToM) assessed using the eyes test and symptoms severity assessed using positive and negative syndrome scale (PANSS), Abnormalities were independent of age, years of education, and general cognitive performance in patients and their relatives. There was no correlation between the eyes test and severity of symptoms.

In contrast with a previous study Kelemen et al., (33) which reported an inverse relationship between performance in the eyes test and negative symptom severity. This study investigated the relationship between theory of mind (ToM) deficits and visual perception in patients with schizophrenia. A reason could account for this difference is that patients in our sample were more symptomatic than those in the study by Kelemen et al. (33), in which almost a third of patients were in remission.

Conclusions

From the previous data we concluded that:

1. Patients with more severe symptoms showed poorer skill of receiving and interpreting the nonverbal messages as well as attentiveness to nonverbal cues.
2. Patients with schizophrenia have lower capacity to use emotion to enhance thought they also have poorer skill of receiving and interpreting both verbal and nonverbal communications also have deficit in guiding the direction and content of communication in social interaction with less ability to take another’s perspective.
3. The control group showed better social cognitive function than the schizophrenic inpatients. Also social cognition showed a negative correlation with the degree of severity of schizophrenia.

Area of conflict

* this paper was done with no conflict of interest and without any external funding from any organizations or persons.

REFERENCES


7. Couture SM, Granholm EL, Fish SC. A path model investigation of neurocognition, theory of mind, social competence, negative symptoms and real-world functioning in schizophrenia. Schizophr Res 2011; 125(2-3):152-60.


