Prevalence of depression in schizophrenic patients evaluated by the Calgary Depression Scale in Shebin El-Kom, Menoufiya
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Background
Psychiatric comorbidities are commumal among patients with schizophrenia. A significant percentage of patients with schizophrenia show depressive symptoms during the development of their illness.

Objectives
The aim of this study was to evaluate the prevalence of depression using the Calgary Depression Scale for Schizophrenia (CDSS) in a sample of Egyptian patients (Shebin El-Kom, Menoufiya) with schizophrenia and without a diagnosis of depression.

Participants
In this cross-sectional study, we included outpatients from Menoufiya University Hospital and Shebin El-Kom Educational Hospital, 20–50 years old, with a diagnosis of schizophrenia or schizophreniform disorder that had not been diagnosed with depression.

Methodology
We administered the CDSS and the Positive and Negative Syndrome Scale (PANSS) to the schizophrenia patient sample. Also, schizophrenia patients were studied according to the Diagnostic and Statistical Manual of Mental Disorders, 4th ed. criteria.

Results
A total of 120 patients were recruited and included in the statistical analysis (72 men and 48 women). Sixty-three patients had a total score of 5 or more points on the CDSS, making the prevalence of depression 30%. The prevalence of depression in men (n = 24) was 33% versus 25% in women (n = 12). There was no significant difference between men and women in terms of the prevalence of depression. The CDSS had a higher correlation with the depressive factor of the PANSS and a moderate correlation with the general psychopathology subscale of the PANSS. Nonetheless, the correlation of the CDSS total score with the PANSS-negative was low. There was no correlation between depressive symptoms and positive symptoms.

Conclusion
Our results suggest that patients with schizophrenia who have not been diagnosed with depression frequently have clinically symptoms of depression, with the possible exception of a contribution from negative symptoms. CDSS is a more specific instrument to measure depressive symptoms in schizophrenia.

Keywords:
Calgary Depression Scale, depression, prevalence, schizophrenia

Introduction
Recently, there has been an increased prevalence of anxiety, depression, and substance abuse disorders in patients with schizophrenia, leading to distortion of its clinical representation [1,2]. A wealth of evidence underscores the comorbidity of depression and schizophrenia [3–6]. Furthermore, a considerable proportion of patients with schizophrenia show depressive symptoms during the course of their illness [6]. It was therefore hypothesized that depressive symptoms are an essential part of schizophrenia [2,7,8]. The reported prevalence of comorbidity of depression among schizophrenic patients is 7–75%, with a modal rate of 25% [2,6,8,9]. Nonetheless, it is important to note that such depressive symptoms may be secondary to other comorbid medical disorders, neuroleptics side effects, or a psychological reaction to the illness [5,6]. From a clinical perspective, depression may be a prodromal of a psychotic relapse or a postpsychotic episode [7,8]. Several studies [2,9,10] have explored the prevalence of depressive symptoms in the long-term treatment of schizophrenic patients. This affliction includes recurrent hospitalization [11], worse functional mutilation [12,13], cognitive deficits [14–19], and poor social abilities [20–22]. It is especially notable that the most frequently used instruments in psychiatry,
the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV) and the 10th revision of the International Statistical Classification of Diseases and Related Health Problem [23], differ in their approach to measurement of depressive symptoms in patients with schizophrenia [24–26]. Not surprisingly, therefore, the presence of specific diagnostic criteria for depression in schizophrenia is called post-schizophrenic depression in the ICD-10 manual [23,27]. Nonetheless, DSM-IV does not recognize depressive episodes in the majority of clinically stable schizophrenic patients [28,29]. In addition, DSM-VI encourages measurement of psychopathology in terms of quantitative dimensions, instead of merely as discontinuous categories [30].

**Aim**

The present investigation estimates the prevalence of depression in a sample of patients in Shebin El-Kom, Menoufiya with schizophrenia using a specific and validated tool, the Calgary Depression Scale for Schizophrenia (CDSS).

**Methodology**

**Study type**

This is a cross-sectional study.

**Participants**

A total of 120 patients were selected from psychiatric outpatient clinics in Menoufiya University Hospital and Shebin El-Kom Educational Hospital during the period between October 2011 and November 2012. Written informed consent was obtained from all patients in Arabic. The inclusion criteria for all participants were an established diagnosis of schizophrenia, or schizophreniform disorder according to the Diagnostic and Statistical Manual of Mental Disorders, 4th ed., Text Revision (DSM-IV-TR) [24], and a score of 3 or less on the following items of the Positive and Negative Syndrome Scale (PANSS): delirium, conceptual disorganization, hallucinatory behavior, postural mannerism, and unusual thought content. The average age of the participants was 38.2 years (SD = 8.4) and 40% (n = 48) were women. There was no history of significant changes in antipsychotic treatment and/or mood stabilizers during the 3 months before the study. The demographic characteristics of the patients are presented in Table 1. Of note, the exclusion criteria were as follows: (a) other DSM-IV Axis I disorders including a major depressive episode, (b) an Axis II disorder, (c) treatment for 3 months before their participation with an antidepressant or more than one antipsychotic, and (d) unstable severe medical disease.

**Measures**

*Psychiatric diagnosis according to the DSM-IV-TR*

The following scales were used: the CDSS [31] and the PANSS [32]. We used the Arabic version of CDSS, which is based both on patient report and on clinician observations of depressive symptoms that minimize the poor self-report, especially in patients with cognitive malfunction. Scores of at least 5 [31,33] indicate clinically significant depression. The CDSS is very specific for psychoanalysis of patients with schizophrenia [33,34], and compared with the Hamilton Depression Rating Scale [35], the CDSS is more sensitive in assessment of depression in patients with schizophrenia [36]. We selected the PANSS as it was used to evaluate positive and negative symptoms and general psychopathology [32,37]. The PANSS has four subscales: a positive, negative, general, and a composite index [38].

**Data analysis**

Data were expressed as arithmetic mean and SD. Coded and revised data were introduced into an Excel database, and analyzed using SPSS, version 16.0. (SPSS Inc., Chicago, Illinois, USA). The means were compared using the t-test and analysis of variance; P-values less than or equal to 0.05 were considered statistically significant [39]. The correlation between the CDSS score and the different scales was calculated by the Spearman correlation coefficient.

**Ethical consideration**

The participation was entirely on a voluntary basis and patients had an option to quit at any point during the study. All patients were ensured of confidentiality. Menoufiya Medical School Research Ethics Committee approved the study.

**Results**

**Participants' characteristics**

The demographic characteristics of the selected sample are presented in Table 1. The table shows that a total of 125 patients were recruited; 120 of these patients were included in the statistical analysis after exclusion of five patients who did not fulfill the inclusion criteria. Three of these patients were not within the age range and we could not confirm the diagnosis for the remaining two patients. The mean age of the patients was 38.2 ± 8.4 years, ranging between 20 and 50 years, with men comprising 60% (n = 72) of the sample. At the time of testing, most of the patients had a diagnosis of

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**Table 1 Demographic characteristics**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number</td>
<td>120</td>
</tr>
<tr>
<td>Age (mean±SD) (years)</td>
<td>38.2 ± 8.4</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48 (40)</td>
</tr>
<tr>
<td>Male</td>
<td>72 (60)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>96 (80)</td>
</tr>
<tr>
<td>Schizophreniform disorder</td>
<td>24 (20)</td>
</tr>
<tr>
<td>Education (mean±SD) (years)</td>
<td>9.6 ± 2.9</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>25 (20.8)</td>
</tr>
<tr>
<td>Not married</td>
<td>95 (79.2)</td>
</tr>
<tr>
<td>Duration of illness (mean±SD) (years)</td>
<td>12.9 ± 10.3</td>
</tr>
<tr>
<td>Antipsychotic treatment</td>
<td></td>
</tr>
<tr>
<td>Typical neuroleptics</td>
<td>88 (73.3)</td>
</tr>
<tr>
<td>Atypical neuroleptics</td>
<td>32 (26.7)</td>
</tr>
</tbody>
</table>

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schizophrenia \((n = 96, 80\%)\), followed by schizophreniform disorder \((n = 24, 20\%)\). Their average years of education were 9.6 ± 2.9, ranging between 0 and 16 years. The average duration of schizophrenia was 12.9 years (95% confidence Interval 13.1–15.2 years). Thirty-six patients had a total score of 5 or more points on the CDSS, making the prevalence of depression 30%. The prevalence of depression was 60% \((n = 24)\) in men and 40% in women \((n = 12)\).

Depressive symptoms

Table 2 shows a comparison between nondepressed patients and patients with depression; patients with depression had a significantly higher score on the PANSS-total, the general psychopathology subscale of the PANSS (PANSS-GP), and negative symptoms on the PANSS (PANSS-N) compared with nondepressed patients. Nonetheless, there was no significant difference between depressed and nondepressed patients in terms of positive symptoms. As shown in Table 3, the CDSS showed a high correlation with the depressive factor of the PANSS (PANSS-D) and a moderate correlation with the PANSS-GP. However, there was no correlation between depressive symptoms and positive symptoms \((r<0.3)\). Table 4 shows the CDSS scores out of the patients. The majority of patients \((n = 84)\) scored 4 or less, whereas 36 patients scored at least 5. Analysis of the individual items showed guilty ideas of reference to be the most common, followed by pathological guilt, depression, observed depression, self-deprecation, hopelessness, early waking, morning depression, and suicide.

Discussion

The aim of the present study was to examine the relationship between depression and schizophrenia. The incidence of depressive episodes is common in schizophrenia, with a common symptomatology. Consequently, the diagnosis of their comorbidity is challenging for both clinicians and researchers [40]. Within this context, the presence of comorbid depression negatively affects quality of life, underlies psychopathology and the brutality of associated medical conditions [10]. In addition, pharmacotherapy of schizophrenic patients with depression is different from that of patients with schizophrenia alone [40]. Keeping this in mind, the current study is very important in elucidating the prevalence of this comorbidity. Our findings suggest that depression is an important clinical phenomenon in schizophrenia. Depression appears to be associated with a greater severity of disease and may overlap with negative symptoms [40]. In terms of the prevalence of depression, we reported it to be 30%, which is in agreement with that reported by Siris and Bench [6] as well as that reported in an international survey of practicing psychiatrists [41]. It is noteworthy that the use of CDSS in our study was advantageous as it is estimated that about 1% of US psychiatrists reported the use of the CDSS [2,41]. Reine et al. [41] and Langon et al. [28] reported almost the same rate of depression in a sample of schizophrenic patients as our rate. It is noteworthy that we used the same CDSS for assessment of depression. Nonetheless, our prevalence rate of depression is not in agreement with that of Cardoso et al. [42], who reported the prevalence of depression to be 56%. This discrepancy could be explained by the fact that they may have included some patients in the acute phase. Also, in our study, we excluded patients with a diagnosis of depression or patients treated with antidepressants. The prevalence of depression is higher in the prodromal and acute phases compared with the stable phase of the disease [23]. Müller et al. [36] reported a higher rate of depression (70%) using the CDSS in a similar manner, but they included patients with acute schizophrenia, whereas we excluded, in our study, patients with positive symptoms and/or those who received two or more antipsychotics. Superficially, at least our observation was surprising in terms of the presence of depressive symptoms in a sample of patients with stable schizophrenia who were not diagnosed with depression and were not receiving antidepressants. Hence, on the basis of the present data, we suggest that depression in patients with schizophrenia is an under-recognized problem in our medical society. This is in agreement with Lako et al. [26] and D’Antonio and Serper [43]. The CDSS scale is unique in its ability to discriminate between depression and negative symptoms [41,44]. There is evidence that the relationship between depression symptoms measured by the CDSS and other symptoms of schizophrenia appears to differ during different stages of the illness. The CDSS has been validated in different languages (Brazilian, Danish, French, Arabic) [45–47]. When we studied the correlation between CDSS scores and other scales or subscales, the only high correlation was with the PANSS-D. This result is consistent with other studies [46,48] that have also found a good correlation between these two measurements, and it suggests that, with certain limitations (e.g., the PANSS-D does not evaluate important symptoms such as suicide), the PANSS-D provides a correct overall evaluation of depression in patients with schizophrenia [46,48]. Our results show a significant association between the presence of depression and the score of the

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Comparison between patients with and without depression according to PANSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation (mean ± SD) (95% CI)</td>
<td>Total sample ((N = 120))</td>
</tr>
<tr>
<td><strong>PANSS</strong></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30.8 ± 7.8</td>
</tr>
<tr>
<td>Positive</td>
<td>7.6 ± 2.8</td>
</tr>
<tr>
<td>Negative</td>
<td>12.9 ± 6.8</td>
</tr>
<tr>
<td>General psychopathology</td>
<td>21.7 ± 6.5</td>
</tr>
<tr>
<td>Depressive factor</td>
<td>7.4 ± 5.9</td>
</tr>
</tbody>
</table>

CI, confidence interval; PANSS, Positive and Negative Syndrome Scale.
Finally, Reine et al. did not find significant correlation in acute-phase patients with schizophrenia. However, Sarro et al. [46] did not report such an association. Our findings are consistent with the latter studies; however, the low correlation could be attributed to the low severity of positive symptoms in our study as a result of the selection criteria applied.

**Study limitations**

Therefore, our study has important methodological limitations including (a) the use of a relatively small sample size in relation to the objectives of the study, (b) the lack of use of HAMD as a comparable scale for measuring depression as they are effective with specific patterns of schizophrenia, (c) lack of reporting on the direction of the relationship between symptoms, as we have discussed for the association between depressive and negative symptoms, and (d) no evaluation of the progression of symptoms with time. The possible exclusion of patients who were receiving antidepressants could have led to an underestimation of the prevalence of depression in our study. Another caveat of this study stemmed from studying only one type of schizophrenia, that is, only in outpatients. Indeed, it would have improved our study if we had defined the level of chronicity of the illness with exact discrimination between different phases of schizophrenia.

**Clinical implications and recommendations**

The present study is among the first in our community to underscore the hypothesis that depression is an important clinical phenomenon in schizophrenia. The most striking finding of this study is that it alerts mental health professionals about the depressive symptoms in patients with schizophrenia. Depressive symptoms co-occur with several negative traits of the clinical upshot, including cognitive mutilation, worsening of psychosocial performance, longer hospitalization, lower response to medication, and increased suicide risk. Therefore, the core, underlying notion of our work is that schizophrenia should be defined properly in order to study its depressive features, that is duration rather than course of schizophrenia is a risk factor for depression. Our key recommendation to our fellow psychiatrists who treat patients with schizophrenia and depression is to perform a careful diagnostic assessment, which is essential to tailor suitable medications. From our results, we have a solid foundation that the CDRS showed higher sensitivity in detecting depression, especially among schizophrenic patients, thus helping clinicians to initiate proper psychosocial interventions and medications.

**Conclusion**

In conclusion, the present study suggests that patients with schizophrenia who have not been diagnosed with depression frequently have clinical symptoms of depression, with the possible exception of a contribution from negative symptoms. CDSS is a more specific instrument to measure depressive symptoms in schizophrenia and

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**Table 3** Correlation between the symptoms of depression (CDSS) and other clinical characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N</th>
<th>R</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANSS-T</td>
<td>120</td>
<td>0.43</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PANSS-P</td>
<td>120</td>
<td>0.22</td>
<td>0.049</td>
</tr>
<tr>
<td>PANNS-N</td>
<td>120</td>
<td>0.31</td>
<td>0.003</td>
</tr>
<tr>
<td>PANSS-GP</td>
<td>120</td>
<td>0.54</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PANSS-D</td>
<td>120</td>
<td>0.60</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

CDSS, Calgary Depression Scale for Schizophrenia; PANSS, Positive and Negative Syndrome Scale.

**Table 4** CDSS scores and item scores of patients with schizophrenia (n = 120)

<table>
<thead>
<tr>
<th>CDSS scores</th>
<th>Number of patients</th>
<th>Proportion of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to ≤ 4</td>
<td>84</td>
<td>70</td>
</tr>
<tr>
<td>≥ 5</td>
<td>36</td>
<td>30</td>
</tr>
</tbody>
</table>

Item of CDSS

| Guilty ideas of reference | 48 | 40 |
| Pathological guilt        | 44 | 36.7 |
| Depression                | 40 | 33.3 |
| Observed depression       | 35 | 29.2 |
| Self-deprecation           | 32 | 26.7 |
| Hopelessness              | 25 | 20.8 |
| Early waking              | 17 | 14.2 |
| Morning depression         | 13 | 10.8 |
| Suicide                   | 11 | 9.2 |

CDSS, Calgary Depression Scale for Schizophrenia.
can distinguish well between depressive and negative symptoms. Thus, CDRS should be considered as an indispensable step in the assessment of schizophrenic patients to identify true positive depression early to provide a proper intervention. The comorbidity of schizophrenia should prove fruitful for future analytical rather than descriptive research.

Acknowledgements

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Conflicts of interest

There are no conflicts of interest.

References


الف وظائف البحث: يهدف البحث إلى دراسة ظاهرة الاكتئاب في مرضى الفصام في عينه من المرضى المترددين في العيادات الخارجية مستشفى جامعة المنوفية والمستشفى التعليمي بشبين الكوم باستخدام مقياس كالجري للاكتئاب.

طريقة البحث: تضمن هذا البحث دراسة 120 مريض بالفصام من المترددين على العيادات الخارجية للطب النفسي مستشفى جامعة المنوفية والمستشفى التعليمي بشبين الكوم بمحافظة المنوفية-جمهورية مصر العربية. تشمل 72 ذكر و48 أنثى. جميع المرضى المشتركين في البحث تم إخضاعهم ل عدة فحوصات وهي: المقايض السريرية المصممة للتشخيص (قسم الاكتئاب والفصام) حسب التصنيف العالمي الرابع ومقياس كالجري للاكتئاب، ومقياس الأعراض الإيجابية والسلبية للفصام.

نتائج البحث: أظهرت الفحوص أن نسبة الاكتئاب في مرضى الفصام 36% (36 مريض) يشمل 24 ذكر و12 أنثى. وقد أظهرت مقارنة نتائج مقياس كالجري للاكتئاب، ومقياس الأعراض الإيجابية والسلبية للفصام أنه هناك ارتباط بين جميع اعراض الفصام ماعدا الإعراض الإيجابية منها مع عامل الاكتئاب. كما وجد أنه هناك ارتباط قوي بين مقياس كالجري للاكتئاب وعامل الاكتئاب مقياس الأعراض الإيجابية والسلبية للفصام.

وقد وجد في نتائج مقياس كالجري للاكتئاب أكثر اعراض الاكتئاب حدوثا في مرضى الفصام وهي: "أفكار الذنب الشاذ" ثم "الشعور بالذنب المرضي" ثم "الاكتئاب" ثم "الاكتئاب الملاحظ" ثم "الاكتئاب المبكر" ثم "الاكتئاب الشاذ" ثم "الاكتئاب الصباحي" ثم "الانتحار".

الاستنتاج: خصص البحث إلى أن دراسة ظاهرة الاكتئاب في مرضى الفصام تحتاج إلى الاهتمام وذلك لزيادة نسبة حدوث ظاهرة الاكتئاب في مرضى الفصام وذلك في مرضى الفصام لم يتم تشخيص اكتئاب سابقا. وأن مقياس كالجري للاكتئاب لديه مصداقية في تشخيص الاكتئاب في مرضى الفصام.