

Correlation between aggressive behavior and sociodemographic characteristics in patients with schizophrenia at a psychiatry outpatient clinic

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Background

Schizophrenia is associated with an increased risk for violence in the community, which persists with increasing age, and is found in both the male and the female population.

Objectives

The present study aimed to assess the correlation between aggressive behavior and sociodemographic characteristics in a sample of patients with schizophrenia at a psychiatry outpatients' clinic and compare the results with those of normal controls.

Patients and methods

The Arabic version of the Modified Overt Aggression Scale was used to assess aggression in 30 patients with schizophrenia who attended the psychiatric outpatient clinic in Suez Canal University Hospital and in 30 patients who served as a control group.

Results

All patients showed variable degrees of aggression, and there was a negative correlation between age and aggression. Women were more aggressive than men. Aggression is more common in unmarried patients and directly correlated to educational level and adherence to treatment.

Conclusion

All patients showed variable degrees of aggression. There were many factors related to this aggression, including the patient age, sex, marital status, educational level, and adherence to treatment.

Keywords:

aggression, schizophrenia, sociodemographic characteristics

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Introduction

Schizophrenia is a brain disorder that affects how people think, feel, and perceive the world. It is among the most disabling and economically catastrophic medical disorders. It causes significant social and vocational dysfunction [1].

Human aggression is any behavior directed toward another individual that is carried out with the proximate (immediate) intent to cause harm. In addition, the perpetrator must believe that the behavior will harm the target, and that the target is motivated to avoid the behavior. Violence is aggression that has extreme harm as its goal [2].

It is now thought that there is an association between violence and schizophrenia and other psychoses [3].

Hence, there is good evidence from epidemiological studies that the diagnosis of schizophrenia is associated with an increased risk for violence in the community, which persists with increasing age, is found in both the male and the female population, and is strongly

associated with comorbid substance abuse. This poses a serious burden for relatives, staff, and society as a whole and, last but not the least, to patients with psychoses themselves because of the subsequent stigmatization. In hospital settings, violent behavior of patients with psychoses is associated with involuntary treatment, lack of insight into their illness and treatment, cognitive distortion, disorganization, and positive symptoms [4].

Aim

This study is designed to assess the correlation between aggressive behavior and sociodemographic characteristics in a sample of patients with schizophrenia at a psychiatry outpatient clinic in comparison with normal controls.

Patients and methods

The study was carried out as a comparative case-control study in the psychiatry outpatient clinic in Suez Canal University Hospital.

The sample consisted of 30 patients who were diagnosed with schizophrenia according to *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed., text revision (DSM-IV TR) criteria. They were either in acute relapse or on maintenance antipsychotic treatment and attending follow-up. All patients were aged 18–45 years.

The study excluded patients with comorbidity with other psychiatric disorders, substance abuse, or comorbidity with medical conditions.

An equal number (30 patients) were enrolled as a control group whose age, sex, and social class matched that of the general population. These controls attended the blood bank in Suez Canal University Hospital and were not suffering from any psychiatric disorders at the time of assessment.

Sample size

The sample size was calculated using this equation:

$$n=c+\frac{P_1Q_1+P_2Q_2}{d^2}+\frac{2}{d}+2,$$

where *c* is a constant equalling 10.51 with a power of 90% and α error of 0.05; *P*₁ is the prevalence of aggressive behavior among patients with chronic schizophrenia (12.5); *Q*₁ = 1–*P*₁; *P*₂ is the prevalence of aggressive behavior in the normal population (10.5); *Q*₂ = 1–*P*₂; and *d*: 10% added as expected dropout. A figure of *n* = 30 patients for each group (a total of 60) was derived.

Data collection

The clinical data of both cases and control were collected by the researcher in a semistructured psychiatric sheet of Suez Canal University Hospital.

Assessment of aggression was made using the Modified Overt Aggression Scale (MOAS). It consists of four categories: (i) verbal aggression; (ii) aggression against property; (iii) autoaggression; and (iv) physical aggression. Within each category, aggressive behavior is graded according to its severity in a range of 0–4 (0 being ‘none’ and 4 being ‘extreme’ violence). The most severe aggressive event within each category is multiplied by its designated weight factor and then summed to yield a total aggression score. Scores range from 0 to 40, with higher scores indicating more aggression [5].

The scale was applied for assessing recent episodes of aggressiveness – that is, within the week before the study visit.

The scale was translated into Arabic by Palmstierna and Wistedt [6].

Data management and statistical analysis

The gathered data were processed using SPSS, version 15 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as means ± SD and qualitative data were expressed as numbers and percentages. The Student *t*-test was used to test the significance of difference between two means, whereas the χ^2 -test was used to test the significance of difference among qualitative data. Multiple logistic regressions were used to assess the

frequency of different aggressive behaviors and correlate different risk factors to this behavior. A probability value (*P*-value) less than 0.05 was considered statistically significant.

Ethical consideration

(1) Approval from the Research Ethical Committee of the Faculty of Medicine at the Suez Canal University was granted before starting the field work.

Suicidal Risk Factors in Cancer Patients

- (1) Approval from the head of the oncology department was obtained before starting the field work.
- (2) The importance and aim of the study was explained to the patients and their relatives.
- (3) Participants understood they had the right to consent to or decline co-operation without giving any reasons.
- (4) Informed consent was obtained from the patients and, where appropriate, their relatives.
- (5) Data collection should be at a suitable time.
- (6) Participants understood that they had the right to remain anonymous.
- (7) All interviews were between the researcher and the participant only to confirm confidentiality.
- (8) Participants understood they had the right to withdraw at any time without giving reason and that this would not compromise their right to receive regular medical care.
- (9) Results will be not be used except for the purpose of the current research.
- (10) Feedback will be provided to all participants and any who were deemed at high risk of suicidality were offered psychiatric help.

Table 1 Age and sex distribution in both patients and controls (n=30)

	Frequency [n (%)]		P-value
	Patients	Controls	
Age (years)			
21–30	12 (40)	15 (50)	0.6 (NS)
31–40	12 (40)	15 (50)	
41–45	6 (20)	0 (0)	
Sex			
Male	18 (60)	12 (40)	0.5 (NS)
Female	12 (40)	18 (60)	

Table 2 Social characteristics of patients and controls (n=30)

	Frequency [n (%)]		P-value
	Patients' group	Control group	
Marital status			
Single	3 (10)	9 (30)	0.2 (NS)
Married	21 (70)	15 (50)	
Divorced	6 (20)	6 (20)	
Educational status			
Illiterate	4 (13.3)	3 (10)	0.02*
Basic education	5 (16.7)	6 (20)	
Secondary education	18 (60)	6 (20)	
Higher education	3 (10)	15 (50)	

*Statistically significant difference.

Table 3 Distribution of treatment regularity among patients (n = 30)

Treatments	Frequency [n (%)]
	Patients' group
Regular	6 (20)
Irregular	24 (80)

Results

Demography

A total of 30 schizophrenic patients along with 30 controls were recruited for this work. Patient and control groups were subdivided into three age groups (21–30, 31–40, and 41–45 years). However, a statistically nonsignificant difference was found between the two groups regarding age and sex distribution ($P = 0.6$ and 0.5 , respectively); Table 1.

Social characteristics

Marital and educational status of the patients and controls was studied. The participants were divided into three groups on the basis of their marital status (single, married, and divorced) with nonsignificant difference between the two groups ($P = 0.2$). They were divided into four groups on the basis of their educational status (illiterate, basic education, secondary education, and higher education), with statistically significant difference between the groups ($P = 0.02$); Table 2.

Treatment regularity

Regarding treatment regularity in the patient group, there was an increased number of noncompliant patients (Table 3).

Correlation between aggression and sociodemographic data

Correlation between total aggression score and sociodemographic characteristics

In the current study, the Pearson's correlation coefficient between age and aggression was -0.58 , indicating that for schizophrenic patients older than 18 years age is negatively correlated with aggression: as age increases, aggression falls.

Aggression was noted more in female patients than in male patients ($r = 0.7$), whereas in the control sample (-0.21) aggression was more in men.

Also, aggression was more common in divorced and widowed patients ($r = 0.41$) but the correlation was weakly positive in comparison with the control group ($r = 0.13$).

Education proved to be directly related to aggression in schizophrenic patients, whereas in the control sample education was found to be inversely correlated to aggression.

Finally, with treatment, the cases proved to be less aggressive ($r = -0.06$) (Table 4).

Table 4 The correlation between total aggression score and sociodemographic characteristics in both patients and controls

	Total aggression score (r)	
	Cases	Controls
Age	-0.58	0.45
Sex	0.75	-0.21
Marital status	0.41	0.13
Education	0.04	-0.58
Treatment adherence	-0.06	NA

NA, not available; r , Pearson correlation coefficient.

Table 5 The correlation between verbal aggression and sociodemographic characteristics in both patients and controls

	Verbal aggression (r)			
	Cases		Controls	
Age	-0.02	Weak negative	0.50	Weak positive
Sex	0.45	Weak positive	-0.10	Weak negative
Marital status	0.08	Zero	0.07	Zero
Education	0.48	Weak positive	-0.69	Strong negative
Treatment	0.46	Weak positive		NA

NA, not available; r , Pearson correlation coefficient.

Table 6 The correlation between aggression against property and sociodemographic characteristics in both patients and controls

	Aggression against property (r)			
	Cases		Controls	
Age	-0.31	Moderate negative	0.36	Weak positive
Sex	0.19	Weak positive	-0.34	Moderate negative
Marital status	-0.21	Weak negative	0.17	Weak positive
Education	-0.04	Weak negative	-0.57	Moderate negative
Treatment	-0.27	Weak negative		NA

NA, not available; r , Pearson correlation coefficient.

Correlation between verbal aggression and sociodemographic characteristics of both patients and controls

In the current study, verbal aggression was found to have a weak positive correlation with female sex, educational level, and treatment nonadherence in comparison with the control group. But no correlation was found between aggression and marital status in cases or controls (Table 5).

Correlation between aggression against property and sociodemographic characteristics in both patients and controls

Aggression against property was found to have moderate negative correlation with age. This means that aggression against property increases with young age of cases, in contrast to the control group. Also, aggression was higher in single patients, in women, in those with lower educational level, and in patients with treatment nonadherence.

Regarding the control group, weak positive correlation was found between aggression against property and marital status as well as old age, but in a weak pattern (Table 6).

Correlation between autoaggression and sociodemographic characteristics of both patients and controls

There was strong negative correlation between autoaggression and age; this means that autoaggression was

Table 7 The correlation between autoaggression and sociodemographic characteristics in both patients and controls

	Autoaggression (<i>r</i>)			
	Cases		Controls	
Age	-0.71	Strong negative	-0.33	Moderate negative
Sex	0.71	Moderate positive	0.27	Weak positive
Marital status	0.31	Weak positive	-0.48	Moderate negative
Education	-0.20	Weak negative	0.26	Weak positive
Treatment	0.47	Weak positive		NA

NA, not available; *r*, Pearson correlation coefficient.

Table 8 The correlation between physical aggression and sociodemographic characteristics in both patients and controls

	Physical aggression (<i>r</i>)			
	Cases		Controls	
Age	-0.22	Weak negative	0.52	Weak positive
Sex	0.52	Weak positive	-0.26	Weak negative
Marital status	0.44	Weak positive	0.23	Weak positive
Education	0.19	Weak positive	-0.51	Moderate negative
Treatment	0.63	Moderate positive		NA

NA, not available; *r*, Pearson correlation coefficient.

more common in young aged schizophrenics than in controls.

Further, it was more common in female patients than in female controls and less common in single and married patients in contrast with controls. Autoaggression was less common with higher educational level and treatment nonadherence (Table 7).

Correlation between physical aggression and sociodemographic characteristics in both patients and controls

Physical aggression was less common with treatment nonadherence, old age, male sex, single status, and higher education in patients in contrast to the control group (Table 8).

Discussion

There are marked differences between acute and maintenance cases in aggression.

Sociodemographic characteristics are considered a stable risk factor in all cases.

Characteristics of the sample

Age and sex

Our study consisted of 30 patients with an established diagnosis of schizophrenia according to DSM-IV TR criteria who presented at the psychiatry outpatient clinic in Suez Canal University Hospital, and an equal number of normal controls. Most of the patients were aged 18–40 years, whereas the entire control group was aged from 21 to 40 years.

Marital and educational status

Married patients constituted 60% of the study sample, divorced people constituted 20%, and single patients constituted 10%.

In our study, patients with secondary education were 60% and those with high education (diplomas, university degree, or institute diplomas) were 10% of the study sample. The relatively high level of education seen in our study sample can be explained by the nonpaid education in our country.

Adherence to medication

Nonadherence to antipsychotic medication treatment has been associated with symptom progression, including aggressive behavior. Treatment adherence in the patient group was studied and a higher number of noncompliant patients (80%) were seen compared with compliant ones (20%).

Bobes *et al.*[7] studied prevalence and factors associated with aggressive behavior among schizophrenic outpatients at their routine follow-up visit to Community-based Mental Health Services in Spain, within the National Public Health System. They studied a sample of 1060 patients and found that 15.5% were noncompliant.

Ascher-Svanum *et al.* [5] studied risk factors for nonadherence with antipsychotic medication in the treatment of schizophrenia among 1579 patients in a 3-year prospective study of schizophrenic patients and found that 71% were noncompliant and 29% were compliant.

The high prevalence of nonadherence to antipsychotic treatment of schizophrenia in our study as well as the mentioned studies is related to different factors, which include lack of illness awareness and insight into having a mental illness and negative attitudes toward medication.

Correlation between aggression and sociodemographic data

Correlation between aggression and age

Age was found to have a strong negative correlation with autoaggression, which means that it is more common in young aged cases ($r = -0.7$). The other types of aggression - verbal, physical, and aggression against property ($r = -0.02, -0.22,$ and $-0.31,$ respectively) - were found also to increase in young age but in variable degrees. This is in contrast to the results found in control subjects, except for autoaggression, which was found to be common in young age.

The highly significant correlation of different types of aggression with young age is consistent with the results of other studies such as the one by Palmstierna and Wistedt [6], who studied aggressive behavior among psychiatric patients in specific psychiatric units in Sweden, and those by Davis [8] and Anderson and colleagues [9], who studied associated factors of violence with psychiatric patients in the USA.

The higher prevalence of aggression in young aged schizophrenic may be related to early age of onset of schizophrenia in late adolescence. Moreover, such schizophrenic symptoms that emerge early may predict a higher risk for aggressive behavior [10]. Also aggression is related to stress, which is shown in many studies to be more prominent in adult age. Stress refers to a life event or series of events that disrupt a person’s psychological equilibrium and potentially serves as a catalyst for the development of a disorder and for violence [11].

Correlation between aggression and sex

In the current study, aggression was more in women than in men among patients, whereas in the control sample aggression was more in men, but the difference was less significant. In patients autoaggression was more common in women than verbal and physical aggression, in contrast to the control group, except for autoaggression, which was also common in women.

Fazel *et al.* [12] reviewed studies that reported on associations between violence and schizophrenia and other psychoses, and found that aggression was higher in female patients than in male patients. Other studies also showed that aggression is more prominent in women, as in the studies by Swanson *et al.* [13] and Soliman *et al.* [14]. This is in agreement with our results. Serper *et al.* [15] found that women were more verbally aggressive. In contrast, Jones *et al.* [16] showed that different types of aggression were more common in men.

Thus, female sex could be a risk factor for aggression in schizophrenia, as the women in our sample were more likely than the men to live with their families (70% of our sample was married), thereby presumably having more opportunities for physical fights with members of their social network. This agreed with what was reported by Swanson *et al.* [13,17].

Correlation between aggression and marital status

In our study, aggression was more common in divorced and widowed patients but the correlation was weakly positive in comparison with that in the control group. Physical and autoaggression was more common in divorced and widowed patients but aggression against property was found to be common in single patients in contrast to the control group. No correlation was found between verbal aggression and marital status in cases and controls.

Other studies showed that unmarried status was one of the more reliable predictors of aggression, as seen in the studies by Ketelsen *et al.* [18] and Krakowski and Czobor [19].

In contrast, Tilman Steinert *et al.* [20] showed that marital status did not predict aggression against others in their study.

Correlation between aggression and educational level

In our study, aggression and educational level were found to be directly correlated in patients; the higher the education, the higher the level of aggression. However, in the control sample, education was found to be inversely correlated to aggression. Verbal and physical aggression was more prominent in well-educated patients than autoaggression and aggression against property; this is in contrast to the observations made in the control group, except for aggression against property.

Biancosino *et al.* [21] stated that the majority of aggressive patients were more likely to have scholastic education. Some also stated that suicide attempters were more likely to be literate, as in the study by Okasha *et al.* [22].

Educational level was high in the study sample, as 60% has completed secondary education; hence, aggression was expected to be well represented in the study sample.

Correlation between aggression and treatment adherence

In the current study, patients with adherence to treatment proved to be less aggressive, especially in aggression against property. Physical, verbal, and autoaggression was found to have a positive correlation with treatment nonadherence but in a weak pattern. This concurred with the results of Ascher-Svanum and colleagues, who reported that non-adherence to antipsychotic medication treatment was associated with symptom worsening, including aggressive behavior. Alia-Klein *et al.* [23], Swartz and colleagues [24], and Volavka and Citrome [25] found the same in their studies.

This could be due to the fact that nonadherence to medications is related to cognitive impairment or lack of illness insight, as well as intolerable side effects. Also nonadherence increases aggression prevalence in schizophrenic patients, suicide attempts, as well as relapse and has a negative impact on functioning and course of illness.

In addition, in our study, 80% of cases were nonadherent to treatment, and so aggression was well represented in this sample.

Limitations

A major limitation of the study was the small sample size. Also, violence was assessed irrespective of the timing of the diagnosis of schizophrenia (i.e. violence before and after diagnosis), which may have overestimated the effects of the illness.

The modified overt aggression scale has not been standardized for Egyptians.

The clinical data were collected by the researcher in a semistructured psychiatric sheet of Suez Canal University Hospital for both cases and controls. A standardized diagnostic tool for schizophrenia was not applied.

The lack of nationally documented studies on schizophrenia among Egyptian patients represented a difficulty in generalizing the findings of the study.

We had to rely on patients and families to assess patients' adherence without any objective measurement to assess it. This might have affected our assessment.

Conclusion

Aggression is a common complication in schizophrenic patients compared with normal individuals. In our study all patients showed variable degrees of various types of aggression.

Age is negatively correlated to aggression: as age increases, aggression falls.

In patients, aggression was noted more in women than in men. The reverse was noted in controls but it was less significant.

Aggression is more common in unmarried (divorced and widowed) individuals.

Aggression was directly correlated to educational level in patients; the reverse was seen in controls.

With treatment adherence, aggression against property tends to improve in schizophrenic patients.

Recommendations

- (1) Patient management programs, including stress management programs, should be implemented for patients with stressful life events.
- (2) Education of family members on psychological aspects should be ensured to decrease the burden on family caregivers.
- (3) High-risk individuals should be regularly followed up to prevent relapse.
- (4) Patients with aggressive behavior should be carefully followed up to prevent recurrent violent episodes.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

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