

Suicide in Schizophrenia Spectrum Disorders: A Review of Sociodemographic and Clinical Correlates

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ABSTRACT

Suicide is the most common cause of mortality among patients with schizophrenia. Literature shows that about 20 to 40% of schizophrenic patients make suicide attempts. Studies show that a history of past suicide attempts is a strong predictor of future suicide and increases the risk of future suicide. Suicide rates among patients with schizophrenia spectrum disorders (SSDs) range between 5 and 13%. There are various associated risk factors for suicide risk assessment, such as genetic vulnerability, gender, hopelessness, depression, underlying substance use, early phase of illness, and duration of untreated psychosis (DUP). However, the role of psychotic symptoms is also equally important while assessing for suicide risk. Hence, future research is required from appropriate risk assessment and suicide prevention among patients with SSD.

Keywords: Psychotic symptoms, Schizophrenia spectrum disorders, Suicide, Suicide attempt, Suicide prevention.

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INTRODUCTION

Suicide is the major cause of morbidity and mortality in schizophrenia¹ and the most common cause of premature death in schizophrenia.² Suicide rates among schizophrenic patients are alarmingly high,³ with one out of four persons with schizophrenia committing suicide.¹ Estimates for suicide rates among schizophrenics fall in the broad range of 5 to 13%.³ While some studies have reported high suicide rates of 10,⁴ 12,⁵ and between 10 and 13%,⁶ others have reported lower rates of 6.8,⁷ 4.9,⁸ or even lower at 4%.⁹ According to some investigators, the lifetime suicide risk was nearly 10%,³ though there are others who disagree with this view.¹⁰

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Individuals with schizophrenia have a shortened life expectancy.¹¹ Estimates are that 9 to 24% of schizophrenic patients will die by their own hand.^{12,13} Several studies have reported increasing risk of suicide in schizophrenia over time.¹⁴⁻¹⁶

Although data on suicide among schizophrenics are not available for many countries, however, the number of suicides among Danish patients with schizophrenia had reduced.¹⁷

SUICIDE ATTEMPTS IN SSDS

Suicide attempts are common among patients with schizophrenia and a significant risk factor for future suicide.^{1,13,18} In fact, it may be the most prominent predictor of suicide.¹⁹ About 20 to 40% of schizophrenic patients make suicide attempts, which they often complete at a later date,²⁰⁻²³ 1 to 2% of the patients manage to complete their attempt in the next 12 months.²⁴

A study by Harkavy-Friedman and Nelson et al.²⁵ among individuals with schizophrenia and schizoaffective disorder found that 34% of the 86 patients reported a history of suicide attempts.

A history of suicide attempts was common among schizophrenic patients¹ who had completed suicide.^{12,18,19} A history of past suicide attempts is a strong predictor of future suicide.¹⁹ Kelly et al.²⁶ in their study of schizophrenic patients who had committed suicide found that 93% of these individuals had past suicidal behaviors as compared with 23% of the patients who died by other means. A study by Heila et al.²⁷ reports that 71% of Finnish schizophrenics who committed suicide had a history of suicide attempts.

SOCIODEMOGRAPHIC CORRELATES OF SUICIDE

Age

The mean age of death among schizophrenics is 33.4 years.²⁸ In comparison to young people with affective disorders, young patients with schizophrenia are at a greater risk of suicide.²⁹

Young adulthood to midlife is the age range of greatest risk of suicide among persons with schizophrenia.¹ In fact, the suicide risk for adolescents or young adults with

schizophrenia is three times greater than that for adult schizophrenic patients.³

The age at suicide varies by gender among persons with schizophrenia, with the mean age at death among men being approximately 10 to 12 years younger than among women.^{19,30} This difference could be on account of the earlier mean age of onset of schizophrenia in men.²⁷ Among women, suicide attempts were more common in those with early age at onset and lack of children.³¹

It is observed that the effect of age disappears when other variables including duration of illness are taken into account. This implies that while young age is a prominent risk factor among schizophrenics, the phenomena is more complex and needs to consider other factors, such as stage and severity of illness.³²

Gender

Age at suicide varies by gender among persons with schizophrenia.¹

The ratio of men to women who commit suicide in the general population is approximately 4:1.³³ However, this ratio appears to be somewhat narrower among schizophrenic patients.^{7,19} Yet other studies report that suicide rates among schizophrenic men are slightly higher as compared with schizophrenic women.³⁴

Research indicates that the association between suicide attempts and completed suicide is particularly strong among women.^{35,36} A Danish register-based study found that nearly 57% of women who committed suicide visited a psychiatry hospital for admission.³⁷

Family History of Suicide

Various studies have looked at the role of family history of suicide in suicide among patients with schizophrenia, but their findings are conflicting.³ A meta-analysis on the subject³⁸ reports that a family history of suicide was not a significant association (Odds ratio = 1.82). Yet other studies have found that a family history of suicide significantly increases the risk of an attempt at suicide in patients with widely varying diagnoses, including those with schizophrenia.³⁹

Other Sociodemographic Factors

Stressful life events, such as separation or divorce from a spouse, perceived or real abandonment by parents, broken relationship with a significant other, rehospitalization or discharge, change in therapists, or loss of a job have been found to precede depression and suicide in schizophrenic patients.¹⁹ Other factors are social isolation⁴⁰ and work impairment.⁴¹⁻⁴³ Being unemployed⁴⁰ and unmarried have also been found as risk factors,¹ though

marital status has not been found to be a consistent risk factor.⁴⁴

However, the role of various risk factors as above is difficult to quantify as all these factors are commonly found among all schizophrenics¹ and there is no difference between normal controls and schizophrenic suicide completers in the number of antecedent life events.⁴⁵ For example, the existence of social isolation might merely reflect progression of the disease.¹

Altamura et al.⁴⁶ in their investigation of transcultural differences, among SSD, comprising diagnostic and statistical manual of mental disorder IV schizophrenia or schizoaffective disorder patients, who did or did not attempt suicide found that variables related to suicide behavior were similar across the patients belonging to the five different geographical regions investigated, with differences only in the age at the first suicide attempt (earlier in the North America sample) and the number of lifetime suicide attempts (higher in the North America sample). The study concludes that with the influence of stable biological traits, other variables may vary across different geographical areas suggesting environmental influences.

Bhatia et al.⁴⁷ investigated the variations in the nature and effect of risk factors among patients with schizophrenia or schizoaffective disorder in India and the United States. However, none of these variables were significantly associated in the Indian sample. This study concluded the presence of difference in known risk factors of suicide attempters across ethnic groups among patients with schizophrenia.

There have been various risk factors which are schizophrenia-specific, such as the specific type of schizophrenia, the course of the illness, frequency of relapses,^{48,49} a severity of illness, a downward shift in social and vocational functioning,⁵⁰⁻⁵² and an insight into the deteriorative effect of schizophrenia.

CLINICAL CORRELATES OF SUICIDE

Depression

Postpsychotic depression has been reported to be particularly relevant for suicide risk.^{50,53} Also, depressed mood and hopelessness are correlated with current suicidal ideation.²⁵

Many studies have found high rates of major depressive disorder among individuals with schizophrenia.^{19,54-57} Depression can serve as a stressor or trigger for suicidal behavior among schizophrenics.^{25,58} Harkavy-Friedman et al.²⁵ found that major depression serves as a trigger for suicide attempts. A review of data from nine studies shows that nearly 60% of schizophrenics who

had completed suicide were depressed at the time of their deaths.⁵⁹

Drake et al.⁶⁰ found that secondary depression followed diminution of psychotic symptoms in 25% of schizophrenic patients. Also, 60% of the patients were reported to have suffered a major depressive episode at some point in their illness.⁶¹

Despite the fact that depression is known to be strongly associated with suicidal behavior, it is also found to be frequently under diagnosed, under treated, ignored, or untreated among individuals with schizophrenia, leading to increased risk for suicidal behavior.³ Also, depression can often be masked or confused with the negative symptoms or side effects of medication.^{62,63}

A comparative study of 15 schizophrenic inpatients who completed suicide subsequently, with schizophrenics who did not do so during a 3 to 7-year follow-up, found that those who completed suicide were more hopeless but not more depressed.⁶⁴

Schizophrenics with depressed mood are reported to have a probability of 0.22 of subsequently completing suicide, with the probability of subsequent completed suicide in case of a depressed mood alone (with or without hopelessness) being 0.07.⁶⁴

Gupta et al.⁶⁵ found that suicide attempts among schizophrenia patients were associated with the number of lifetime depressive episodes. For example, Roy⁴¹ found that significantly more of their sample of patients with schizophrenia who had attempted suicide had suffered from a major depressive episode at some time during their illness.

A study by Harkavy-Friedman et al.²⁵ found that nearly half of the patients with suicide attempts made their attempt during an episode of major depression. Similarly nearly half of the patients with depression never made a suicide attempt despite a long history of illness among patients with schizophrenia and schizoaffective disorders. It appears that even without a depressive episode, there is a significant risk for suicidal behavior among patients with schizophrenia.

Hopelessness

Hopelessness in case of schizophrenia is reported to be more important as a risk factor than the presence of clinical depression (also a significant risk factor for suicide).⁶⁶

As pointed out earlier, in schizophrenics, hopelessness appears to be a relatively more important factor than depression in predicting suicide.⁶⁴

Conwell et al.¹ suggest that there is a need to further study the role of hopelessness in schizophrenia.

Awareness into illness increases the level of hopelessness and subsequently increases the risk of suicidal behavior among patients with schizophrenia. Study by

Drake and Cotton⁶⁴ found a relation between increased level of hopelessness and subsequent completed suicide in patients with chronic schizophrenia, which was attributed to illness awareness.

PSYCHOTIC SYMPTOMS AND SUICIDE

Various studies have found the role of psychotic symptoms in suicidal behavior among patients with SSDs. Many studies have found that delusions and presence of command hallucinations may also be risk factors for suicide, although the evidence is more equivocal.^{38,67,68} An Indian study by Singh et al.^{69,70} found that nearly 60% of SSD patients with current suicide attempt have attributed their reason for suicidal behavior for the presence of hallucinations and delusions. There are several mediating factors that are likely to be involved in the process of attempted suicide. Indian study shows more than 60% of patients with SSD attributed psychotic symptoms (i.e., auditory hallucinations, 34.3% of the patients; delusions, 31.4%) as a reason for wanting to commit suicide and that 58% of the patients with SSD, who attempted suicide on account of auditory hallucinations, did so because of command hallucinations, and a significant 42% of the patients with SSD did so because of distress associated with the negative content of the voices. This could be explained by the fact that the patients in our study were exclusively those who had attempted suicide. This study, therefore, highlights that among suicidal patients in case of both diagnostic groups, SSD and affective disorder, command hallucinations and distress associated with the negative content of voices are relevant clinical variables for patient management.^{69,70} This suggests that auditory hallucinations when present in suicidal patients cannot be ignored in the management of these patients. While not disregarding the role of hopelessness and depressive symptoms in patients with SSD, command hallucinations and distress associated with negative content of auditory hallucinations thus appear to be significant risk factors for suicide.

Though negative symptoms are also seen in patients with SSD, however, various studies have yielded varied finding to suggest that negative symptoms may actually protect against the risk of suicide,^{67,71,72} while other study found no relationship.³⁸

ILLNESS SUBTYPE

There is a strong correlation between affective disorders and suicide in patients with schizophrenia.^{19,59}

Data on suicide risk among specific subtypes of schizophrenia indicate that paranoid patients may be particularly vulnerable.^{67,73} Active paranoia may increase the risk of suicide, whereas negative symptoms may reduce the risk of self-harm in schizophrenia.¹

A follow-up study by Fenton and McGlashan,⁷⁴ which examined the association between suicide and diagnostic subtype among patients with SSDs, reports that during a follow-up period of 6 to 32 years, 10.2% committed suicide. Of the 112 patients with the paranoid subtype, 12% had completed suicides. This proportion was significantly greater than that of other subtypes of schizophrenics. In comparison to those who survived throughout the follow-up period, those who committed suicide had significantly lower global negative symptom severity ratings at admission, greater severity of delusions, and suspiciousness.

PHYSICAL ILLNESS

Schizophrenic individuals are at a greater risk of premature death from physical illnesses. Whether the presence of physical illnesses could further increase their already elevated risk for suicide is not clear. There is lack of research in this area.¹

Co-morbid Substance Use Disorders

Substance use disorders are frequently seen as comorbid with SSDs, which puts them at an increased risk of suicide.⁷⁵⁻⁸¹ The risk of suicidal behavior is much higher when this is associated with a diagnosis of schizophrenia.⁸²⁻⁸⁸ Schizophrenic patients have a higher incidence of alcoholism in comparison with the general population and its presence has shown to differentiate suicide commit-tees from schizophrenic controls in some studies.⁸⁹⁻⁹¹ Substance abuse further worsens the symptoms and prognosis of the disease condition and is associated with higher relapse rates.^{81,91}

Early age of onset of illness and exposure to substances also predispose to suicidal behavior. Youths who abuse drugs are at increased risk for committing suicide, and drug or alcohol abuse is identified in around 70% of children and adolescents who commit suicide.⁹² Studies of two American cohort researchers found significantly greater comorbid substance abuse among people with schizophrenia who were suicidal, predominantly among the younger patients.^{82,93,94}

However, studies examining the role of substance abuse among schizophrenics have produced inconsistent results. A comparison of schizophrenics who attempted suicide with those who had not attempted suicide showed that drug abuse did not differ between these groups.⁹⁵

Age at Onset and Duration of Illness

Several studies have reported increasing risk of suicide in schizophrenia over time.¹⁴⁻¹⁶

Excess mortality among schizophrenics was found to be the highest in first episode or early illness phase

patients; this indicates a high rate of suicide early in the illness.⁵ For instance, Havaki-Kontaxaki et al.¹⁸ in their study report a mean duration of illness of 19.3 (\pm 8.8) years for suicide completers, as compared with a much lower figure of 13.5 (\pm 9.9) years for schizophrenic controls. For those who had a history of major depression with schizophrenia and schizoaffective disorder, suicidal behavior typically occurred 4.5 years after the onset of psychosis.²⁵

A Danish study proposes that the standard mortality ratios may be rising in first-episode schizophrenia in Denmark¹⁴ and falling in chronic schizophrenia.⁹⁷ It is suggested that a gradual onset of illness over time might also place schizophrenic patients at risk for suicide.⁹⁸

Currently studies have found risk of suicide is higher during early phase and also depends on DUP. Nearly 70% were suicidal during the period of untreated psychosis.⁹⁸ However, many studies have yielded inconsistent results. Some studies have found a positive association between longer DUP and suicide attempts,⁹⁹⁻¹⁰¹ while other studies have not found such association.^{102,103}

CONCLUSION

Suicide is a one of the major causes of mortality among the SSDs. Investigators have found the various associated risk factors of suicide in SSDs. While not disregarding the role of hopelessness and depressive symptoms in patients with SSDs, it might be clinically relevant to not entirely rely on these two measures while assessing suicidal intent. Among those with schizophrenia, the role of psychotic symptoms in suicide risk assessment is also equally considered and needs further research. Majority of studies have been done in Western population. However, there is lack of research in this context from developing countries. There is need for systematic research in developing world, so that appropriate interventions can be developed for specific ethnic group.

REFERENCES

1. Conwell Y, Cholette J, Duberstein PR. Suicide and schizophrenia: Identifying Risk Factors and Preventive Strategies. *Medscape Mental Health* 1998;3(3).
2. Sartorius N, Jablensky A, Korten A, Ernberg G, Anker M, Cooper JE, Day R. Early manifestations and first contact incidence of schizophrenia in different cultures. *Psychol Med* 1986 Nov;16(4):909-928.
3. Pompili M, Amador XF, Girardi P, Harkavy-Friedman J, Harrow M, Kaplan K, Krausz M, Lester D, Meltzer HY, Modestin J, et al. Suicide risk in schizophrenia: learning from the past to change the future. *Ann Gen Psychiatry* 2007;6:10.
4. Miles CP. Conditions predisposing to suicide: a review. *J Nerv Ment Dis* 1977 Apr;164(4):231-246.
5. Brown S. Excess mortality of schizophrenia. A meta-analysis. *Br J Psychiatry* 1997 Dec;171:502-508.

6. Caldwell CB, Gottesman II. Schizophrenia, a high-risk factor for suicides: clues to risk reduction. *Suicide Life Threat Behav* 1992 Winter;22(4):479-493.
7. Pompili M, Mancinelli I, Ruberto A, Kotzalidis GD, Girardi P, Tatarelli R. Where Schizophrenic Patients Commit Suicide: A review of Suicide Among Inpatients and former inpatients. *Int J Psychiatry Med* 2005;35(2):171-190.
8. Palmer BA, Pankratz VS, Bostwick JM. The Lifetime Risk of Suicide in Schizophrenia: A Reexamination. *Arch Gen Psychiatry* 2005 Mar;62(3):247-253.
9. Inskip HM, Harris EC, Barraclough B. Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. *Br J Psychiatry* 1998 Jan;172:35-37.
10. Meltzer HY. Suicidality in schizophrenia: pharmacologic treatment. *Clin Neuropsychiatry* 2005;2:76-83.
11. Tsuang MA, Woolson RF, Fleming JA. Premature deaths in schizophrenia and affective disorders: an analysis of survival curves and variables affecting the shortened survival. *Arch Gen Psychiatry* 1980 Sep;37(9):979-983.
12. Cheng KK, Leung CM, Lo WH, Lam TH. Risk factors of suicide among schizophrenics. *Acta Psychiatr Scand* 1990 Mar;81(3):220-224.
13. Siris SG, Mason SE, Shuwall MA. Histories of substance abuse, panic and suicidal ideation in schizophrenic patients with histories of post-psychotic depressions. *Prog Neuropsychopharmacol Biol Psychiatry* 1993;17:609-617.
14. Munk-Jorgensen P. Has deinstitutionalization gone too far? *Eur Arch Psychiatry Clin Neurosci* 1999;249(3):136-143.
15. Osby U, Correia N, Brandt L, Ekblom A, Sparen P. Mortality and causes of death in schizophrenia in Stockholm County, Sweden. *Schizophr Res* 2000 Sep;45(1-2):21-28.
16. Wolfersdorf M, Keller F, Schmidt-Michel PO, Weiskittel C, Vogel R, Hole G. Are hospital suicides on the increase? A survey of reports on hospital suicides in the psychiatric literature of the 19th and 20th century. *Soc Psychiatry Psychiatr Epidemiol* 1988 Dec;23(4):207-216.
17. Nordentoft M, Laursen TM, Agerbo E, Qin P, Hoyer EH, Mortensen PB. Change in suicide rates for patients with schizophrenia in Denmark, 1981-97: nested case-control study. *BMJ* 2004 Jul;329(7460):261.
18. Havaki-Kontaxaki BJ, Kontaxakis VP, Protopappa VA, Christodoulou GN. Suicides in a large psychiatric hospital: risk factors for schizophrenic patients. *Bibl Psychiatr* 1994;165:63-71.
19. Roy A. Suicide in schizophrenia. In Roy A, editor. *Suicide*. Baltimore, MD: Williams and Wilkins; 1986. pp. 97-112.
20. Landmark J, Cernovsky ZZ, Merskey H. Correlates of suicide attempts and ideation in schizophrenia. *Br J Psychiatry* 1987 Jul;151:18-20.
21. Planasky K, Johnston R. The occurrence and characteristics of suicidal preoccupation and acts in schizophrenia. *Acta Psychiatr Scand* 1971;47(4):473-483.
22. Drake RE. Suicide attempts and completed suicides among schizophrenia patients. In Tatarelli R, Pompili M, Girardi P, editors. *Suicide in schizophrenia*. New York, NY: Nova Science Publishers Inc.; 2006.
23. Meltzer HY, Fatemi H. Suicide in schizophrenia: the effect of clozapine. *Clin Neuropharmacol* 1995;18:S18-S24.
24. Meltzer HY, Okayli G. Reduction of suicidality during clozapine treatment of neuroleptic-resistant schizophrenia: impact on risk-benefit assessment. *Am J Psychiatry* 1995 Feb;152(2):183-190.
25. Harkavy-Friedman JM, Nelson EA, Venarde DF, Mann JJ. Suicidal behavior in schizophrenia and schizoaffective disorder: examining the role of depression. *Suicide Life Threat Behav* 2004 Spring;34(1):66-76.
26. Kelly DL, Shim JC, Feldman SM, Yu Y, Conley RR. Lifetime psychiatric symptoms in persons with schizophrenia who died by suicide compared to other means of death. *J Psychiatr Res* 2004 Sep-Oct;38(5):531-356.
27. Heila H, Isometsa ET, Henriksson MM, Heikkinen ME, Marttunen MJ, Lonnqvist JK. Suicide and schizophrenia: a nationwide psychological autopsy study on age- and sex-specific clinical characteristics of 92 suicide victims with schizophrenia. *Am J Psychiatry* 1997 Sep;154(9):1235-1242.
28. Waltzer H. Suicide in young schizophrenics. *Gen Hosp Psychiatry* 1984;6(3):219-225.
29. King E. Suicide in the mentally ill: an epidemiological sample and implications for clinicians. *Br J Psychiatry* 1994;165:658-663.
30. Black DW, Winokur G, Warrack G. Suicide in schizophrenia: the Iowa Record Linkage Study. *J Clin Psychiatry* 1985 Nov;46(11 Pt 2):14-17.
31. Muller DJ, Barkow K, Kovalenko S, Ohlraun S, Fangerau H, Kolsch H, Lemke MR, Held T, Nothen MM, Maier W, et al. Suicide attempts in schizophrenia and affective disorders with relation to some specific demographical and clinical characteristics. *Eur Psychiatry* 2005 Jan;20(1):65-69.
32. Rossau CD, Mortensen PB. Risk factors for suicide in patients with schizophrenia: nested case-control study. *Br J Psychiatry* 1997 Oct;171:355-359.
33. Centers for Disease Control and Prevention. Available from: http://www.cdc.gov/ViolencePrevention/pdf/Suicide_DataSheet-a.pdf
34. Allebeck P, Wistedt B. Mortality in schizophrenia: a ten-year follow-up based on the Stockholm County Inpatient Register. *Arch Gen Psychiatry* 1986 Jul;43(7):650-653.
35. Allebeck P. Schizophrenia: a life-shortening disease. *Schizophr Bull* 1989 Jan;15(1):81-89.
36. Allebeck P, Varla A, Kristjansson E, Wistedt B. Risk factors for suicide among patients with schizophrenia. *Acta Psychiatr Scand* 1987 Oct;76(4):414-419.
37. Qin P, Nordentoft M. Suicide risk in relation to psychiatric hospitalization: evidence based on longitudinal registers. *Arch Gen Psychiatry* 2005 Apr;62(4):427-432.
38. Hawton K, Sutton L, Haw C, Sinclair J, Deeks JJ. Schizophrenia and suicide: systematic review of risk factors. *Br J Psychiatry* 2005 Jul;187:9-20.
39. Roy A. Family history of suicide. *Arch Gen Psychiatry* 1983 Sep;40(9):971-974.
40. Drake RE, Gates C, Cotton PG, Whitaker A. Suicide among schizophrenics: who is at risk? *J Nerv Ment Dis* 1984 Oct;172(10):613-617.
41. Roy A. Suicide in chronic schizophrenia. *Br J Psychiatry* 1982;141(2):171-177.
42. Cotton PG, Drake RE, Gates C. Critical treatment issues in suicide among schizophrenics. *Hosp Community Psychiatry* 1985 May;36(5):534-536.
43. Nyman AK, Jonsson H. Pattern of self destructive behavior in schizophrenia. *Acta Psychiatr Scand* 1986 Mar;73(3):252-262.
44. Raymont V. Suicide in schizophrenia: how can research influence training and clinical practice? *Psychiatrist* 2001 Feb;25(2):46-50.

45. Modestin J, Zarro I, Waldvogel D. A study of suicide in schizophrenic in-patients. *Br J Psychiatry* 1992 Mar;160:398-401.
46. Altamura AC, Mundo E, Bassetti R, Green A, Lindenmayer JP, Alphas A, Meltzer, HY. Transcultural differences in suicide attempters: analysis on a high-risk population of patients with schizophrenia or schizoaffective disorder. *Schizophr Res* 2007 Jan;89(1-3):140-146.
47. Bhatia T, Thomas P, Semwal P, Thelma BK, Nimgaonkar VL, Deshpande SN. Differing correlates for suicide attempts among patients with schizophrenia or schizoaffective disorder in India and USA. *Schizophr Res* 2006 Sep;86(1-3):208-214.
48. Wolfersdorf M, Keller F, Schmidt-Michel PO, Weiskittel C, Vogel R, Hole G. Are hospital suicides on the increase? A survey of reports on hospital suicides in the psychiatric literature of the 19th and 20th century. *Soc Psychiatry Psychiatr Epidemiol* 1988 Oct;23(4):207-216.
49. De Hert M, McKenzie K, Peuskens J. Risk factors for suicide in young people suffering from schizophrenia: a long-term follow-up study. *Schizophr Res* 2001 Mar;47(2-3):127-134.
50. Fenton WS. Depression, suicide, and suicide prevention in schizophrenia. *Suicide Life Threat Behav* 2000 Spring;30(1):34-49.
51. Dingman CW, McGlashan TH. Discriminating characteristics of suicides. Chestnut Lodge follow-up sample including patients with affective disorder, schizophrenia and schizoaffective disorder. *Acta Psychiatr Scand* 1986 Jul;74(1):91-97.
52. Strauss JS, Carpenter WT Jr. The prediction of outcome in schizophrenia: I. characteristics of outcome. *Arch Gen Psychiatry* 1972 Dec;26:739-746.
53. Pompili M, Girardi P, Ruberto A, Tatarelli R. Toward a new prevention of suicide in schizophrenia. *World J Biol Psychiatry* 2004;5(4):201-210.
54. Drake RE, Gates C, Whitaker A, Cotton PG. Suicide among schizophrenics: a review. *Compr Psychiatry* 1985 Jan-Feb;26(1):90-100.
55. Harkavy-Friedman JM, Restifo K, Malaspina D, Kaufmann CA, Amador XF, Yale SA, Gorman JM. Suicidal behavior in schizophrenia: characteristics of individuals who had and had not attempted suicide. *Am J Psychiatry* 1999 Aug;156(8):1276-1278.
56. Guze SB, Robbins E. Suicide and primary affective disorders. *Br J Psychiatry* 1970 Oct;117(539):437-438.
57. Fawcett J, Scheftner W, Clark D, Hedeker D, Gibbons R, Coryell W. Clinical predictors of suicide of patients with major affective disorders: a controlled prospective study. *Am J Psychiatry* 1987 Jan;144(1):35-40.
58. Mann JJ, Waternaux C, Haas GL, Malone KM. Toward a clinical model of suicidal behavior in psychiatric patients. *Am J Psychiatry* 1999 Feb;156(2):181-189.
59. Roy A. Suicidal behavior in schizophrenics. In: Williams R, Dalby JT, editors. *Depression in schizophrenics*. New York, NY: Plenum Press; 1989. pp. 137-152.
60. Drake RE, Bartels SJ, Torrey WC. Suicide in schizophrenia: clinical approaches. In: Williams R, Dalby JT, editors. *Depression in schizophrenics*. New York, NY: Plenum Press; 1989. pp. 153-169.
61. Roy A, Mazonson A, Pickar D. Attempted suicide in chronic schizophrenia. *Br J Psychiatry* 1984 Mar;144(3):303-306.
62. Jones JS, Stein DJ, Stanley B, Guido JR, Winchel R, Stanley M. Negative and depressive symptoms in suicidal schizophrenics. *Acta Psychiatr Scand* 1994 Feb;89(2):81-87.
63. Pickar D, Roy A, Breier A, Doran A, Wolkowitz O, Colison J, Agren H. Suicide and aggression in schizophrenia. *Neurobiologic correlates*. *Ann N Y Acad Sci* 1986;487:189-196.
64. Drake RE, Cotton PG. Depression, hopelessness and suicide in chronic schizophrenia. *Br J Psychiatry* 1986 May;148(5):554-559.
65. Gupta S, Black DW, Arndt S, Hubbard WC, Andreasen NC. Factors associated with suicide attempts among patients with schizophrenia. *Psychiatr Serv* 1998 Oct;49(10):1353-1355.
66. Cohen LJ, Test MA, Brown RL. Suicide in schizophrenia: data from a prospective community treatment study. *Am J Psychiatry* 1990 May;147(5):602-607.
67. Fenton WS, McGlashan TH, Victor BJ, Blyler CR. Symptoms, subtype, and suicidality in patients with schizophrenia spectrum disorders. *Am J Psychiatry* 1997 Feb;154(2):199-204.
68. Harkavy-Friedman JM, Kimhy D, Nelson EA, Venarde DF, Malaspina D, Mann JJ. Suicide attempts in schizophrenia: the role of command auditory hallucinations for suicide. *J Clin Psychiatry* 2003 Aug;64(8):871-874.
69. Singh H, Reddi VSK, Chandra PS. Role of auditory hallucinations in suicide. *Indian J Private Psychiatry* 2015 Apr;9(1):42-51.
70. Singh H, Chandra PS, Reddi VSK. Clinical correlates of suicide in suicidal patients with schizophrenia spectrum disorders and affective disorders. *Indian J Psychol Med* 2016 Nov-Dec;38(6):517-523.
71. Schwartz-Stav O, Apter A, Zalsman G. Depression, suicidal behavior and insight in adolescents with schizophrenia. *Eur Child Adolesc Psychiatry* 2006 Sep;15(6):352-359.
72. Tarrier N, Gooding P, Gregg L, Johnson J, Drake R. Suicide schema in schizophrenia: the effect of emotional reactivity, negative symptoms and schema elaboration. *Behav Res Therapy* 2007 Sep;45(9):2090-2097.
73. Fenton WS, McGlashan TH. Natural history of schizophrenia subtypes, I: longitudinal course of paranoid, hebephrenic, and undifferentiated schizophrenia. *Arch Gen Psychiatry* 1991 Nov;48(11):969-977.
74. Fenton WS, McGlashan TH. Natural history of schizophrenia subtypes, II: positive and negative symptoms and long-term course. *Arch Gen Psychiatry* 1991 Nov;48(11):978-986.
75. Barbee JG, Clarck PD, Crapanzaro MS, Heintz GC, Kehoe CE. Alcohol and substance abuse among schizophrenic patients presenting to an emergency psychiatric service. *J Nerv Ment Dis* 1989 Jul;177(7):400-407.
76. Osher FC, Drake RE, Teague GB, Hurlbut SC, Beaudett MS, Paskus TS. Correlates of alcohol abuse among rural schizophrenic patients. *New Hampshire-Dartmouth: Psychiatric Research Center*; 1991. pp. 30-38.
77. Yesavage JA, Zarccone V. History of drug abuse and dangerous behavior in inpatient schizophrenics. *J Clin Psychiatry* 1983;44(7):259-261.
78. Safer DJ. Substance abuse by young adult chronic patients. *Hosp Community Psychiatry* 1987 May;38(5):511-514.
79. Drake RE, Wallach MA. Substance abuse among the chronic mentally ill. *Hosp Community Psychiatry* 1989 Oct;40(10):1041-1046.
80. Lindqvist P, Allebeck P. Schizophrenia and assaultive behaviour: the role of alcohol and drug abuse. *Acta Psychiatr Scand* 1990 Sep;82(3):191-195.
81. Pompili M, Tatarelli C, Kotzalidis GD, Tatarelli R. Suicide risk in substance abusers with schizophrenia. In: Tatarelli R, Pompili M, Girardi P, editors. *Suicide in schizophrenia*. New York, NY: Nova Science Publishers Inc; 2006.

82. Rich CL, Fowler RC, Fogarty LA, Young D. San Diego suicide study. III. Relationship between diagnosis and stressors. *Arch Gen Psychiatry* 1988 Jun;45(6):589-592.
83. Bowers MB Jr., Mazure CM, Nelson JC, Jatlow PI. Psychotogenic drug use and neuroleptic response. *Schizophr Bull* 1990;16(1):81-85.
84. Pompili M, Mancinelli I, Girardi P, Tatarelli R. Preventing suicide in young schizophrenics who are substance abusers. *Subst Use Misuse* 2004 Jul;39(9):1437-1441.
85. Berglund M. Suicide in alcoholism. A prospective study of 81 suicides. I. The multidimensional diagnosis at first admission. *Arch Gen Psychiatry* 1984 Sep;41(9):888-891.
86. Murphy GE, Robins E. Social factors in suicide. *JAMA* 1967 Jan;199(5):303-308.
87. Murphy GE, Amstrong JW, Herlene SL, Fischer JR, Clendenin WW. Suicide and alcoholism: interpersonal loss confirmed as a predictor. *Arch Gen Psychiatry* 1979 Jan;36(1):65-69.
88. Soyka M. Substance abuse, psychiatric disorders and violent and disturbed behaviour. *Br J Psychiatry* 2000 Apr;176(4):345-350.
89. Dassori AM, Mezzich JE, Keshavan M. Suicidal indicators in schizophrenia. *Acta Psychiatr Scand* 1990 May;81(5):409-413.
90. Earle KA, Forquer SL, Volo AM, McDonnell M. Characteristics of outpatient suicides. *Hosp Comm Psychiatry* 1994 Feb;45(2):123-126.
91. Cohen LJ, Test MA, Brown RL. Suicide in schizophrenia: data from a prospective community treatment study. *Am J Psychiatry* 1990 May;147(5):602-607.
92. Altamura AC, Mundo E, Bassetti R, Green A, Lindenmayer JP, Alphs A, Meltzer HY. Transcultural differences in suicide attempters: analysis on a high-risk population of patients with schizophrenia or schizoaffective disorder. *Schizophr Res* 2007 Jan;89(1-3):140-146.
93. Rich CL, Motooka MS, Fowler RC, Young D. Suicide by psychotics. *Biol Psychiatry* 1988;24:595-601.
94. Fowler RC, Rich CL, Young D. San Diego suicide study. II. Substance abuse in young cases. *Arch Gen Psychiatry* 1986 Oct;43(10):962-965.
95. Harkavy-Friedman JM, Restifo K, Malaspina D, Kaufmann CA, Amador XF, Yale SA, Gorman JM. Suicidal behavior in schizophrenia: characteristics of individuals who had and had not attempted suicide. *Am J Psychiatry* 1999 Aug;156(8):1276-1278.
96. Licht RW, Mortensen PB, Gouliaev GH, Lund J. Mortality in Danish psychiatric long-stay patients, 1972-82. *Acta Psychiatr Scand* 1993;87:336-341.
97. Westermeyer JF, Harrow M, Marengo J. Risk for suicide in schizophrenia and other psychotic and nonpsychotic disorders. *J Nerv Ment Dis* 1991 May;179(5):259-265.
98. Barrett EA, Sundet K, Faerden A, Nesvåg R, Agartz I, Fosse R, Mork E, Steen NE, Andreassen OA, Melle I. Suicidality before and in the early phases of first episode psychosis. *Schizophr Res* 2010 Jun;119(1-3):11-17.
99. Altamura AC, Bassetti R, Bignotti S, Pioli R, Mundo E. Clinical variables related to suicide attempts in schizophrenic patients: a retrospective study. *Schizophr Res* 2003 Mar;60(1):47-55.
100. Clarke M, Whitty P, Browne S, Mc TO, Kinsella A, Waddington JL, Larkin C, O'Callaghan E. Suicidality in first episode psychosis. *Schizophr Res* 2006 Sep;86(1-3):221-225.
101. Harvey SB, Dean K, Morgan C, Walsh E, Demjaha A, Dazzan P, Morgan K, Lloyd T, Fearon P, Jones PB, Murray RM. Self-harm in first episode psychosis. *Br J Psychiatry* 2008 Mar;192(3):178-184.
102. Foley S, Jackson D, McWilliams S, Renwick L, Sutton M, Turner N, Kinsella A, O'Callaghan E. Suicidality prior to presentation in first-episode psychosis. *Early Interv Psychiatry* 2008 Nov;2(4):242-246.
103. Nordentoft M, Jeppesen P, Abel M, Kasso P, Petersen L, Thorup A, Krarup G, Hemmingsen R, Jorgensen P. OPUS study: suicidal behaviour, suicidal ideation and hopelessness among patients with first episode psychosis. One-year follow-up of a randomised controlled trial. *Br J Psychiatry* 2002 Sep;(Suppl 43):s98-s106.