Demographic, clinical and social characteristics of forensic patients diagnosed with schizophrenia at the Free State Psychiatric Complex, Bloemfontein, South Africa

Nkomile Ntswaki Clourinah Setlaba, Nathaniel Lehlohonolo Mosotho & Gina Joubert

Published online: 13 Mar 2020.

Submit your article to this journal ⎘

Article views: 64

View related articles ⎘

View Crossmark data ⎘

Routledge
Taylor & Francis Group

Check for updates

Demographic, clinical and social characteristics of forensic patients diagnosed with schizophrenia at the Free State Psychiatric Complex, Bloemfontein, South Africa

Nkomile Ntswaki Clourinah Setlaba[a], Nathaniel Lehlohonolo Mosotho[a] [iD] and Gina Joubert[b]

[a]*Department of Psychiatry, University of the Free State, Bloemfontein, South Africa;* [b]*Department of Biostatistics, University of the Free State, Bloemfontein, South Africa*

Schizophrenia, prevalent in forensic mental health settings, is chronic and devastating, with a generally unfavourable course and prognosis. The aim of this study was to determine the demographic, clinical and social characteristics of forensic patients diagnosed with schizophrenia at the Free State Psychiatric Complex. A data collection form was used to gather information from the clinical records of patients diagnosed with schizophrenia between 1 January 2011 and 31 December 2015. The majority of the 110 participants were young male adults aged between 18 and 35 years with a low educational level. Cognitive impairment and positive symptoms were the most prominent clinical features. Aggressive and violent behaviour was notably prevalent. The majority of our sample had committed crimes against humans, while fewer had committed other types of crimes. It was concluded that causal factors included young adulthood, male gender, substance abuse, a poor social support system and lower educational level.

Key words: clinical; crime; demographic; forensic; law; schizophrenia; symptoms.

1. Introduction

Schizophrenia is one of the most commonly diagnosed mental disorders in forensic settings. This condition is chronic and devastating, with an undesirable course and prognosis. It is characterized by a variety of signs and symptoms, classified into positive and negative symptoms. The positive symptoms include delusions, hallucinations and disorganized speech, with negative symptoms being social withdrawal, anhedonia, blunted affect and decreased motivation (alogia; American Psychiatric Association, APA, 2013). Individuals suffering from schizophrenia also present with cognitive impairment, which includes impaired attention and concentration,

poor memory and impaired executive functions (Rich & Caldwell, 2015). Schizophrenia gradually affects an individual's general occupational and social functioning. Ten per cent of affected individuals can maintain full-time employment, with 33% working part-time, but most patients are unemployed within five years of diagnosis (Prikryl, Kholova, Kucerova, & Ceskova, 2013). Following the first episode of schizophrenia, 90% of patients can reach remission of the psychotic symptoms within the first year of the illness. The illness can be episodic, with periods of remission in between; however, the majority of affected individuals are chronically ill. Recovery entails the individual having no

Correspondence: Nathaniel Lehlohonolo Mosotho. Department of Psychiatry, University of the Free State, P.O. Box 339, Bloemfontein, 9300, South Africa E-mail: mosothol@fshealth.gov.za

schizophrenia symptoms and being able to function on a social and occupational level.

The evidence suggests that multiple factors play (or may play) a role in the development of schizophrenia, with many theories having been proposed; however, its causes remain largely unknown. Multiple genetic theories exist at the biological level. Exposure to adverse events during pregnancy and in very early life contributes to vulnerability to mental illness, including schizophrenia. Maternal infections, hunger, toxins and vitamin deficiencies are some of the contributory factors (Söderlund, Wicks, Jörgensen, & Dalman, 2015). The literature also suggests that other risk factors, such as oxygen deprivation during pregnancy, may contribute to the development of mental illness. Anderson et al. (2013) identified the early prenatal period as the highest risk period. One theory regarding how schizophrenia develops is the dopamine hypothesis, which states that both increased and decreased levels of dopamine in various brain circuits cause the illness. Another theory is that understimulation of N-methyl-D-aspartate (NMDA) receptors by the neurotransmitter glutamate causes schizophrenia. Recently, it was proposed that elevated levels of norepinephrine in certain brain circuits play a role in causing schizophrenia. This mechanism is believed to work directly via elevated levels of norepinephrine (NE) in the synapse of nerve cells or by increased sensitivity of the receptors to NE (Fitzgerald, 2014). This theory, however, does not state that elevated NE is the only cause of schizophrenia, only that it may play an important role. Rich and Caldwell (2015) mention other neurotransmitters and neuropeptides that are also theorized to play a causative role in schizophrenia, including gamma aminobutyric acid (GABA), acetylcholine, serotonin and oxytocin, which are believed to be involved in psychotic and cognitive deficits of schizophrenia to different degrees.

Other frequently mentioned risk factors for the development of schizophrenia include a family history of psychotic disorders, resulting in a genetic predisposition to the illness. Abuse of substances such as cannabis is also considered a risk factor for poor outcome and more frequent relapses (L. Mosotho, Louw, & Calitz, 2011). Demographic factors, such as age, gender, socio-economic status, migration status and ethnicity, are often mentioned as contributing factors to the development of psychopathology by various researchers in the field of psychiatry (Kirkbride et al., 2012). Nevertheless, study results have shown variation in terms of clinical presentation. In China, Yang et al. (2014) found that childhood trauma, cannabis abuse, and living and growing up in an urban area were contributing environmental factors for the development of schizophrenic illness. Sutterland, Dieleman, Storosum, and Voordouw (2013) reported a similar trend in Chicago, Illinois in the United States. Moreover, it has been pointed out that childhood adversity can have an impact on individuals' mental status in adulthood, which may be a possible risk factor for the emergence of mental disorders such as anxiety disorders and psychosis in general (Li et al., 2015). The age of illness onset is on average lower in people with childhood trauma, with suicidal and aggressive behaviours being more prevalent. Several studies have associated child abuse with the development of schizophrenia. In South Africa, Burns, Tomita, and Kapadia (2014) reported that socio-economic status has an impact on societies. People suffering from schizophrenia are also adversely affected by disparity in income levels. These economic variations reportedly have a negative impact on infant mortality, life expectancy, and the development and course of mental illness.

The prevalence of schizophrenia varies between studies, with an average estimate of approximately 1% of the world population (Esan, 2013). The illness is complex and has a heterogeneous presentation and clinical picture, which could contribute to the wide differences in prevalence found in different studies. Changes in the diagnostic criteria over time

and differences in study designs and geographic areas, among other factors, also contribute to the different prevalence and incidence rates. Differences in demographic factors may also yield contradictory results (Esan, 2013; Simeone, Ward, Rotella, Collins, & Windisch, 2015). There are marked gender differences in the peak of the incidence of schizophrenia, with peaks in the early twenties for men and in later years for women. Among younger people, males have a 1.5- to 2-fold greater risk of developing schizophrenia. This difference, however, declines after the mid-thirties (Jackson, Kirkbride, Croudace, Morgan, & Boydell, 2013).

The prognosis of schizophrenia is poor, especially if left untreated. There is a risk of early death in patients with schizophrenia, with life expectancy being shortened by 10–20 years. More than 50% of people suffering from schizophrenia cease their treatment, preventing successful management of the illness, and thus have a worse clinical outcome (Vancampfort et al., 2015). The sufferers are at an increased risk for other medical illnesses, such as metabolic syndrome, heart disease and respiratory diseases. Poor lifestyle habits associated with schizophrenia, in combination with antipsychotic medications used for the treatment of schizophrenia, increase the risk of developing co-morbid medical illnesses (Lambert, Velakoulis, & Pantelis, 2003).

The longitudinal association between the development of symptomatology and criminality in patients with schizophrenia is not well documented. However, violent behaviour has been reported more frequently in individuals suffering from schizophrenia than in the general population (Munkner, Haastrup, Joergensen, & Kramp, 2003, 2009). Additional risk factors for criminal behaviour among the sufferers include male gender, poor insight and judgement regarding the illness, being single, longer illness duration and associated substance abuse (Ghoreishi et al., 2015). Despite the strong association between schizophrenic illness and criminal behaviour

and the need for psychiatric evaluation, there is a dearth of clear guidelines for best methods with which to conduct such evaluations. Clinical opinions and special investigations seem to form a basis for these evaluations, although their accuracy and reliability are uncertain (Fazel, Langstrom, Hjern, Grann, & Lichtenstein, 2009). A history of violent behaviour remains the strongest predictive factor for future criminal behaviour.

In light of the unanswered questions revealed by the above literature review, the researchers decided to conduct a study in forensic patients diagnosed with schizophrenia and examine several variables. Another reason for the study is that patients diagnosed with schizophrenia occupy a large quantity of beds in mental health institutions worldwide. The designated mental health institutions/hospitals in South Africa are also affected by this global trend. However, it is important to note that schizophrenia and crime are not synonymous. Finally, the principal researcher works as a psychiatry registrar at the Free State Psychiatric Complex. It is always recommended that researchers and scientists focus on their geographical areas to meet local needs. Accordingly, scientific research and results should influence the decision-making, policies, planning and implementation of adequate and appropriate mental health care services in the surrounding communities.

The aim of the study was to investigate the demographic, clinical and social characteristics of forensic patients diagnosed with schizophrenia at the Free State Psychiatric Complex. Permission to conduct this study was obtained from the Free State Psychiatric Complex and the Free State Department of Health. The participants' confidential information was used only for the purpose of the study, and informed written consent was not necessary, as there was no direct contact with the participants. Final ethical approval was obtained from the Health Sciences Research Ethics Committee, University of The Free State (UFS).

2. Method

2.1. Study design, sampling and data collection

This was a descriptive, exploratory and retrospective study. A descriptive study investigates and analyses the magnitude of the problem in question (Ehrlich & Joubert, 2014). Given (2008) describes exploratory studies as involving a methodology mainly used in social and behavioural sciences that encompasses systematic data collection that is intentional and wide-ranging. It is specifically designed to maximize the generalizability of the results. This study was also retrospective in design, which entailed the collection of data on events that had already occurred (Neale & Liebert, 1986). The data consisted of the clinical files and other records of 110 participants. The assessment of the records of the participants who were diagnosed with schizophrenia between 1 January 2011 and 31 December 2015 was included in this cross-sectional study. These participants were initially referred to forensic units at the Free State Psychiatric Complex, Bloemfontein, South Africa, by various courts of law for a comprehensive forensic evaluation to determine their criminal responsibility and competency to stand trial. Forensic mental health experts were ordered to provide a full diagnostic report on the alleged offenders' mental states. These court orders were issued in accordance with Sections 77, 78 and 79 of the Criminal Procedure Act 1977 (SA) (Department of Justice and Constitutional Development, 1997). Subsequently, the participants were admitted under Section 42 of the Mental Health Care Act 2002 (SA) (National Department of Health, 2002) as forensic patients. The researchers used consecutive sampling because this technique was more purposeful and strategic for this type of research. Moreover, in consecutive sampling, every potential participant has a 100% chance of being included, which may reduce the systematic biasness associated with other methods of sampling (Yusen & Littenburg, 2005).

A data collection form was used to gather information from the clinical files of the participants, including participants' demographic data, clinical diagnoses, symptomatology, type of crimes, social information and the findings by the professional team. The principal researcher conducted a pilot study using 10 participants' files to investigate and determine the practical feasibility of the research in terms of testing the validity and reliability of the data collection form. These cases were included in the main study.

2.2. Data analysis

The descriptive analyses of demographic, clinical and social characteristics were performed by the Department of Biostatistics, UFS. The results are presented as frequencies and percentages (categorical variables).

3. Results

The results of the study are presented below. Demographic characteristics of the sample are presented in Table 1.

The majority of the participants were aged between 18 and 35 years. In the present study, male participants represented over 98% of the sample. The results also show that the majority of the participants were never married, with the largest number being black Africans. The largest percentage of the study participants lived in Thabo Mofutsanyana District, followed by Lejweleputswa. The highest level of education of the participants showed a wide variation, with the largest percentage having reached grades 9 to 11 only. Unemployment was found in 60% of the research sample, followed by informal employment (20%).

The prominent psychiatric signs and symptoms among the participants are shown in Tables 2 and 3. This symptomatology is divided into two groups – namely, primary and secondary symptoms. The symptoms with a prevalence of 10% or more are referred to as primary. The primary signs and symptoms are displayed in Table 2, while the secondary

Table 1.   Demographic characteristics.

Characteristics	% of sample
Age (years)	
18–25	5.5
26–35	53.6
36–50	30
51–65	10.9
Gender	
Male	98.2
Female	1.8
Marital status	
Single	90.8
Married	6.4
Divorced	0.9
Widowed	1.8
Race	
Black	96.4
Caucasian	1.8
Coloured	0.9
Asian	0.9
District	
Fezile Dabi	12.2
Lejweleputswa	28
Mangaung Metro	19.6
Thabo Mofutsanyana	32.7
Xhariep	7.5
Education	
None	5
Grades 1–8	31
Grades 9–11	41
Grade 12	23
Employment	
Unemployed, looking for a job	0.9
Unemployed, not looking for a job	64.6
Formally employed	3.6
Informally employed	20.9
Self-employed	3.6
Disability grant	5.5
Pension	0.9

symptoms (less than 10% prevalence) are listed in Table 3.

Cognitive impairment was found to be the most prominent clinical feature among the participants, with the majority displaying poor insight and judgement regarding their illness and the alleged crimes. They were easily distracted and were poorly orientated to time and place. Memory impairment was also present, with long- and short-term memory being the most affected domains. Regarding hypothalamic functioning, participants mainly complained of a diminished libido and insomnia. There were other noted signs and symptoms expressed by the participants, which were clinical manifestations that are not contained in either table because of their low prevalence in the sample. These other signs and symptoms included aggression, mutism, clouded consciousness, incoherence, perseveration, flight of ideas, thought blocking, somatic delusions, illusions, and somatic and tactile hallucinations. Additionally, some participants presented with agitation, feelings of shame and guilt. For the clinical management of the disorder, several psychotropic medications were prescribed, including antipsychotics, mood stabilizers, anticonvulsants, antidepressants and sedative hypnotics, and some patients were also treated with additional medications for other medical conditions, such as diabetes mellitus, HIV and hypertension.

The alleged crimes committed by the participants are shown in Table 4.

More participants committed human contact crimes than property and public order crimes. The most common crimes were rape and assault. Finally, it was noted that approximately 6% of this research sample had previous criminal convictions.

4. Discussion

The findings of this study are in accordance with the international literature, which indicates that schizophrenia is generally a disease with onset in adolescence and young adulthood (van Nimwegen, de Haan, van Beveren, van den Brink, & Linszen, 2005). Although the onset of schizophrenia can be earlier, the incidence reaches its peak in the early twenties in men and the thirties in women (Jackson et al., 2013; Sutterland et al., 2013). Although

Table 2. Primary symptoms.

Clinical signs & symptoms	% of sample	Clinical signs & symptoms	% of sample
Poor insight	91.8	Tangentiability	10
Poor judgement	91.8	Irrelevant answers	10
Distractible attention	23.6	Auditory hallucinations	57.4
Disorientated to time	34.6	Visual hallucinations	15.7
Disorientated to place	22.4	Grandiose delusions	31.8
Poor long-term memory	29.4	Persecutory delusions	29.1
Poor short-term memory	22.8	Bizarre delusions	12.7
Fair short-term memory	13.9	Inappropriate affect	20
Poor recent memory	15.5	Restricted affect	18.2
Concrete mode of thinking	44	Flat affect	17.3
Derailment	34.6	Diminished libido	31.1
Poverty of speech	19.1	Insomnia	29.5

Table 3. Secondary symptoms.

Clinical signs & symptoms	% of sample	Clinical signs & symptoms	% of sample
Negativism	4.6	Neologisms	4.6
Disoriented to person	7.5	Delusion of reference	8.2
Fair recent memory	8.7	Delusions of control	4.6
Fair long-term memory	5.9	Dysphoric mood	7.3
Circumstantiality	7.3	Irritable mood	8.2
Pressure of speech	6.4	Depressed mood	4.6

the *Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition* (*DSM–5*; APA, 2013) indicates that the prevalence of schizophrenia is equal in both genders in the general population, the dominance of male participants in this study is explained by other research findings showing that criminal and violent behaviours are more prevalent in men than in women suffering from schizophrenia (Caqueo-Uŕízar, Fond, Urzúa, Boyer, & Williams, 2016). Ghoreishi et al. (2015) attribute factors such as male gender, substance abuse, non-compliance to treatment, lack of a social support system and duration of illness to complicating the course and outcome of schizophrenic illness. Thara and Kamath (2015) go further, arguing that women suffering from schizophrenia have a better disease course and outcome than men suffering from schizophrenia, which can largely be attributed to more favourable premorbid functioning, better social adjustment and better treatment compliance. Hence, there is a smaller representation of females in mental health forensic settings (Landgraf, Blumenauer, Osterheider, & Eisenbarth, 2013).

The finding that more than 90% of the sample were not married is a worrying factor, as marriage may serve an important function in providing social support and personal stability (N. L. Mosotho, Timile, & Joubert, 2017). The ethnic/racial distribution of the research sample is not surprising because black Africans constitute the majority of the population in the Free State province (Statistics South Africa, 2012). Regarding the

Table 4. Crimes.

Crimes	% of sample
Assault	38.2
Rape	23.6
Murder	10
Attempted murder	9.1
Malicious damage to property	8.2
Burglary	4.6
Arson	1.8
Alcohol-related	1.8
Robbery	0.9
Public violence	0.9
Others	14.6

administrative and geographical demarcations of the province, there are five districts in the Free State – namely, Mangaung Metro, Lejweleputswa, Thabo Mofutsanyana, Fezile Dabi and Xhariep. Regarding district of origin of the participants, the research findings did not correlate with the population distribution based on Statistics South Africa data, according to which Mangaung Metro is the most populated district. The reason for these unexpected findings may be the fact that Thabo Mofutsanyana District is the poorest and least resourced district. Authors such as Söderlund et al. (2015) explicitly point out that schizophrenia as a mental disorder has been linked to lower socio-economic status by various researchers over decades. The findings regarding the schooling history of the participants were expected, as the onset of schizophrenia occurs in adolescence and early adulthood and is characterized by a decline in functioning or failure to obtain expected functioning in personal, social and occupational settings (Brekke, Kohrt, & Green, 2001). The impaired occupational functioning associated with this illness was also evident in the unemployment rate of the study sample.

The findings of the present study on symptomatology are supported by those of Rich and Caldwell (2015), who described schizophrenia as an illness characterized by positive and negative symptoms as well as cognitive impairment. These symptoms include hallucinations, delusions, social withdrawal and disorganized speech and thinking. As part of the disorganized thinking, individuals suffering from schizophrenia reportedly display a concrete mode of thinking (Maurage et al., 2017), which was also prevalent in this study sample. Their disorganized speech was evident in how some of them would never keep to the topic at hand, a common thought form disorder known as derailment. The positive symptoms of schizophrenic illness were more common than negative symptoms among the participants. The majority of the participants complained of auditory hallucinations on admission to the hospital. There were participants who denied hearing voices but were nevertheless observed to behave as if they were hallucinating.

Grandiose, bizarre and persecutory delusions were also noted among the participants. These delusions were present even in the personal information that the participants provided about themselves. One of the participants reported being 181 years old and having over 100 children. Others reported having been married for more years than they had actually lived. Other prominent themes included having prophetic abilities, having healing abilities, and the residence of snakes inside the participants' bodies, with one participant reporting that the snake fed on his intestines and brain. Persecutory delusions were directed toward their neighbours, who were suspected of practising witchcraft and wishing harm on the sufferers. The authorities, including those in the departments of justice and psychiatry, were reported by some participants to have sent people to either insert microchips into their brains to make them mentally ill or have the participants killed. The inappropriate, blunted and/or restricted affect expressed by the study sample did not differ from the general manifestations of schizophrenic illness reported in the international literature. The presence of hypothalamic dysfunction among the participants is similar

to the results reported by other authors, who found that disturbances of libido and eating and sleep patterns are common among individuals suffering from schizophrenia (Baggaley, 2008; Kantrowitz, Citrome, & Javitt, 2009).

Researchers such as Ghoreishi et al. (2015) and Jakhar, Bhatia, Saha, and Deshpande (2015) explain that aggressive and violent behaviour is a common feature among individuals suffering from schizophrenia. However, this feature was reported in only 2% of this study sample.

Furthermore, there were psychosocial rehabilitation programmes conducted by a multi-professional team consisting of clinical psychologists, occupational therapists, social workers, psychiatric nurses and physiotherapists. The findings of this study on criminal behaviour are in agreement with those reported by other researchers – namely, that criminality, violence and aggressive behaviours are prevalent among individuals suffering from schizophrenia, especially males with co-morbid substance abuse (Krakowski, 2005; Munkner et al., 2003). Furthermore, as Kashiwagi et al. (2015) note, the crimes committed by these sufferers are of an extensive variety and severity.

5. Conclusion

Older studies suggest that there is a minimal association between mental illness and criminal behaviour. However, more recent studies have shown that people suffering from mental illness are more likely to commit criminal acts than the general population. In the present study, almost all the participants were young males, unmarried, less educated and unemployed. The majority of the participants presented with mainly positive symptoms and cognitive impairment. Crimes against humans were more prominent than property and public order crimes, probably due to episodes of aggressive and violent behaviours, with auditory hallucinations present among the study sample. The worrying factor was that the most common crimes were assault, rape and murder. Although this study provides valuable information on the socio-demographic, clinical and social characteristics of forensic patients diagnosed with schizophrenia, the generalization of the results and conclusions should be performed with caution because of the relatively small size of the sample and the restricted geographical area of the study. Nevertheless, this study will contribute to the international literature on the relationship between mental health and crime. Practically, it provides data and guidelines for mental health policy-makers in the country. The results of the study will hopefully assist in formulating adequate clinical and psychosocial rehabilitation programmes for offenders suffering from mental illness in general.

ORCID

Nathaniel Lehlohonolo Mosotho http://orcid.org/0000-0002-6069-6957

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th Ed.). Washington, DC: Author.

Anderson, G., Berk, M., Dodd, S., Bechter, K., Altamura, A. C., Dell'Osso, B., … Maes, M. (2013). Immuno-inflammatory, oxidative and nitrosative stress, and neuroprogressive pathways in the etiology, course and treatment of schizophrenia. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *42*, 1–4. doi:10.1016/j.pnpbp.2012.10.008

Baggaley, M. (2008). Sexual dysfunction in schizophrenia: focus on recent evidence. *Human Psychopharmacology*, *23*, 201–209. doi:10.1002/hup.924

Brekke, J. S., Kohrt, B., & Green, M. F. (2001). Neuropsychological functioning as a moderator of the relationship between psychosocial functioning and the subjective experience of self and life in schizophrenia. *Schizophrenia Bulletin*, *27*(4), 697–708. doi:10.1093/oxfordjournals.schbul.a006908

Burns, J. K., Tomita, A., & Kapadia, A. S. (2014). Income inequality and schizophrenia: Increased schizophrenia incidence in countries with high levels of income inequality. *International Journal of Social Psychiatry*, *60*(2), 185–196. doi:10.1177/0020764013481426

Caqueo-Urízar, A., Fond, G., Urzúa, A., Boyer, L., & William, D. R. (2016). Violent behaviour and aggression in schizophrenia: Prevalence and risk factors. A multicentric study from three Latin-America countries. *Schizophrenia Research*, *178*, 23–28. doi:10.1016/j.schres.2016.09.005

Department of Justice and Constitutional Development. (1997). Criminal Procedure Act 51 of 1977, Amendment 86 of 1996. Cape Town: Juta and Company Limited.

Ehrlich, R. & Joubert, G., (2014). *Epidemiology: A research manual for South Africa*. 3rd Ed. Cape Town: Oxford University Press.

Esan, O. (2013). Prevalence of schizophrenia: recent developments. *African Journal of Psychiatry*, *16*(2), 93.

Fazel, S., Langstrom, N., Hjern, A., Grann, M., & Lichtenstein, P. (2009). Schizophrenia, substance abuse, and violent crime. *The Journal of the American Medical Association*, *301*(19), 2016–2023.

Fitzgerald, P. J. (2014). Is elevated norepinerphrine an etiological factor in some cases of schizophrenia? *Psychiatry Research*, *215*, 497–504. doi:10.1016/j.psychres.2014.01.011

Ghoreishi, A., Kabootvand, S., Zangani, E., Bazargan-Hejazi, S., Ahmadi, A., & Khazaje, H. (2015). Prevalence and attributes of criminality in patients with schizophrenia. *Journal of Injury and Violence Research*, *7*(1), 7–12. doi:10.5249/jivr.v7i1.635

Given, L. M. (2008). *The SAGE Encyclopaedia of qualitative research methods*. Thousand Oaks, CA: Sage.

Jackson, D., Kirkbride, J., Croudace, T., Morgan, C., & Boydell, J. (2013). Meta-analytic approaches to determine gender differences in the age-incidence characteristics of schizophrenia and related psychoses. *International Journal of Methods in Psychiatric Research*, *22*(1), 36–45. doi:10.1002/mpr.1376

Jakhar, K., Bhatia, T., Saha, R., & Deshpande, S. N. (2015). A cross sectional study of prevalence and correlates of current and past risks in schizophrenia. *Asian Journal of Psychiatry*, *14*, 36–41. doi:10.1016/j.ajp.2015.01.005

Kantrowitz, J., Citrome, L., & Javitt, D. (2009). GABA$_B$ receptors, schizophrenia and sleep dysfunction. A review of the relationship and its potential clinical and therapeutic implications. *CNS Drugs*, *23*(8), 681–691. doi:10.2165/00023210-200923080-00005

Kashiwagi, H., Kuroki, N., Ikezawa, S., Matsushita, N., Ishikawa, M., Nakagome, K., Hirabayashi, N., & Ikeda, M. (2015). Neurocognitive features in male patients with schizophrenia exhibiting serious violence: a case control study. *Annals of General Psychiatry*, *14*(46), 1–6.

Kirkbride, J. B., Errazuriz, A., Croudace, T. J., Morgan, C., Jackson, D., Boydell J., Murray, R. M., & Jones, P. B. (2012). Incidence of schizophrenia and other psychoses in England, 1950-2009: A systemic review and meta-analyses. *PLos ONE*, *7*(3), e31660. doi:10.1371/journal.pone.0031660

Krakowski, M. (2005). Schizophrenia with aggressive and violent behaviours. *Psychiatric Annals*, *35*(1), 45–49.

Lambert, T. J. R., Velakoulis, D., & Pantelis, C. (2003). Medical comorbidity in schizophrenia. *The Medical Journal of Australia*, *178*(9), 67–70.

Landgraf, S., Blumenauer, K., Osterheider, M., & Eisenbarth, H. (2013). A clinical and demographic comparison between a forensic and a general sample of female patients with schizophrenia. *Psychiatry Research*, *210*, 1176–1183. doi:10.1016/j.psychres.2013.09.009

Li, X., Li, Q., Liu, J., Zhang, L., Tang, Y., & Wang, C. (2015). Childhood trauma associates with clinical features of schizophrenia in a sample of Chinese inpatients. *Psychiatry*

Research, *228*, 7–707. doi:10.1016/j.psychres.2015.06.001

Maurage, P., Philipott, P., Grynberg, D., Leleux, D., Delatte, B., Mangelinckx, C., Belge, J. B., & Constant, E. (2017). Imbalance between abstract and concrete repetitive thinking modes in schizophrenia. *Comprehensive Psychiatry*, *78*, 61–66. doi:10.1016/j.comppsych.2017.06.013

Mosotho, L., Louw, D., & Calitz, F. J. W. (2011). Schizophrenia among sesotho speakers in South Africa. *African Journal of Psychiatry*, *14*(1), 50–55.

Mosotho, N. L., Timile, I., & Joubert, G. (2017). The use of computed tomography scans and Bender Gestalt Test in the assessment of competency to stand trial and criminal responsibility in the field of mental health law. *International Journal of Law and Psychiatry*, *50*, 68–75. doi:10.1016/j.ijlp.2016.05.009

Munkner, R., Haastrup, S., Joergensen, T., & Kramp, P. (2003). The temporal relationship between schizophrenia and crime. *Social Psychiatry Psychiatric Epidemiology*, *38*, 347–353. doi:10.1007/s00127-003-0650-3

Munkner, R., Haastrup, S., Joergensen, T., & Kramp, P. (2009). Registered criminality and sanctioning of schizophrenia patients. *Nordic Journal of Psychiatry*, *63*(6), 485–492. doi:10.3109/08039480903118174

National Department of Health. (2002). Mental Health Care Act, 17 of 2002. Cape Town: Government Gazette.

Neale, J. M., & Liebert, R. M. (1986). *Science and behaviour: An introduction to methods of research* (3rd Ed.). Ann Arbor, MI: Prentice-Hall.

Prikryl, R., Kholova, M., Kucerova, H. P., & Ceskova, E. (2013). Prevalence of remission and recovery in schizophrenia in the Czech Republic. *Comprehensive Psychiatry*, *54*(7), 1111– 1116. doi:10.1016/j.comppsych.2013.05.006

Rich, M. E., & Caldwell, H. K. (2015). A role for oxytocin in the etiology and treatment of schizophrenia. *Frontiers in Endocrinology*, *6*(90), 90–13. doi:10.3389/fendo.2015.00090

Simeone, J. C., Ward, A. J., Rotella, P., Collins, J., & Windisch, R. (2015). An evaluation of variation in published estimates of schizophrenia prevalence from 1990-2013: a systematic literature review. *BioMed Central Psychiatry*, *15*(193), 1–14.

Söderlund, J., Wicks, S., Jörgensen, L., & Dalman, C. (2015). Comparing cohort incidence of schizophrenia with that of bipolar disorder and affective psychosis in individuals born in Stockholm County 1955–1967. *Psychological Medicine*, *45*, 3433–3439. doi:10.1017/S0033291715001336

Statistics South Africa. (2012). *Census 2011 Municipal report free state*. Retrieved from http://census2011.adrrianfrith.com/place/345

Sutterland, A. L, Dieleman, J., Storosum, J. G., & Voordouw, B. A. C. (2013). Annual incidence rate of schizophrenia and schizophrenia spectrum disorders in a longitudinal population-based cohort study. *Social Psychiatry Psychiatric Epidemiology*, *48*, 1357–1365. doi:10.1007/s00127-013-0651-9

Thara, R., & Kamath, S. (2015). Women and schizophrenia. *Indian Journal of Psychiatry*, *57*(2), 246–251. doi:10.4103/0019-5545.161487

Vancampfort, D., Rosenbaum, S., Schuch, F. B., Ward, P. B., Probst, M., & Stubbs, B. (2015). Prevalance and predictors of treatment dropout from physical activity interventions in schizophrenia: a meta-analysis. *General Hospital Psychiatry*, *39*, 15–23. doi:10.1016/j.genhosppsych.2015.11.008

Van Nimwegen, L., de Haan, L., van Beveren, N., van den Brink, W., & Linszen, D. (2005). Adolescence, schizophrenia and drug abuse: a window of vulnerability. *Acta Psychiatrica Scandinavica*, *111*(427), 35–42. doi:10.1111/j.1600-0447.2005.00543.x

Yang, J., Kang, C. Y., Zeng, Y., Li, J. H., Li, P .K., Wan, W .P., … & Pauline, S. (2014). Prevalence and prognosis of schizophrenia in Jinuo people in China: A prospective 30-year follow-up study. *International Journal of Social Psychiatry*, *60*(5), 482–488. doi:10.1177/0020764013498987

Yusen, R. D., & Littenburg, B. (2005). Study eligibility and participant selection. In D. Schuster & W. J. Poweres (Eds.), *Translational and Experimental Clinical Research* (p.46). Philadelphia, PA: Lipincott, Williams & Wilkins.