A retrospective audit comparing state patients with schizophrenia and bipolar mood disorder who have committed violent crime admitted to the male forensic unit at Valkenberg Hospital.

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Declaration

I, Avani Maharaj, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work, nor any part of it, has been, is being or will be submitted for another degree at this or any other university.

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Abstract

Background

There is a consensus that psychosis confers a modest risk toward violent offending. Most research to date has shown that a statistical relationship does exist between schizophrenia and bipolar disorder, and violence and aggressive behavior
In forensic mental health, state patients are rehabilitated in a general program regardless of diagnosis. It is not known whether different rehabilitation management strategies should be implemented on those with bipolar disorder as compared to those with schizophrenia. This study is an attempt to ascertain if there are differences between those diagnosed with schizophrenia and bipolar disorders, and if so, whether these have implications for their rehabilitation programs.

Objectives

The study aims to compare the demographic profiles and comorbidities (in terms of substance use and personality disorders) of state patients with bipolar disorder and schizophrenia who have offended violently.

Methods

This was a quantitative, cross sectional study. State patients who were diagnosed with schizophrenia and bipolar disorder and committed a violent crime were included in the study from the 1st January 2000 to 31st December 2014.
The study population comprised a total of 93 male state patients. Of these 46 patients had a diagnosis of bipolar disorder and 47 patients had a diagnosis of schizophrenia.

Results

The results show that in general the differences between the schizophrenia group and the bipolar disorder group are marginal.
A higher percentage of patients with schizophrenia committed murder at 17.02% and attempted murder at 12.77%.
The bipolar disorder group had a significantly higher number of patients diagnosed with co morbid personality disorder at 59.57% (p value of 0.01.)
Substance abuse was common in both groups.
The mean age at admission was 31,23 years in schizophrenia and 36,85 years in bipolar disorder. This demonstrates an earlier onset of criminality in the group with schizophrenia.
Patients with bipolar disorder were more likely to be married (13.04%), divorced (10.8%) or separated (2.17%).

Conclusion

There were no major differences elicited between the 2 groups of patients. Certain aspects such as therapeutic programs for personality disordered patients and social interventions in patients with poor social support would contribute to improving the quality of the rehabilitation programs currently used. The commonalities found in the 2 groups suggest that a common approach to rehabilitation would be adequate in this setting.

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1. Chapter 1: Introduction and review of the literature

Introduction

There is a consensus that psychosis confers a modest risk toward violent offending, where violence is defined as any use or threatened use of physical force. Most research has been conducted on those diagnosed with schizophrenia and it has not been established definitively whether those with bipolar disorder display an equivalent risk.

In forensic mental health, state patients are rehabilitated in a general program regardless of diagnosis. It is not known whether different management strategies should be implemented on those with bipolar disorder. This study is an attempt to ascertain if there are differences between those diagnosed with schizophrenia and those diagnosed with bipolar disorder, and if so, whether these have implications for their rehabilitation programs.

Aims and objectives

This is a quantitative cross-sectional study comparing the profiles of state patients with schizophrenia and state patients with bipolar disorder at Valkenberg hospital following a charge of serious violence.

The study aims to compare the demographic profiles and comorbidities (in terms of substance use and personality disorders) of state patients with bipolar disorder and state patients with schizophrenia who have offended violently.

Research Hypothesis

There are no differences in the profiles between the two groups and therefore the rehabilitation program does not have to take their diagnosis into account.

Literature search strategy

Medline, PubMed and Psych Info were used as search engines without any language or date restrictions. Search terms included 'Schizophrenia*', 'bipolar mood disorder*', 'violence*', 'criminality*', 'homicide*', and 'substances*'

Summary of the literature

Background

Crime is a major problem that is encountered on a daily basis with an estimated 10 million prisoners worldwide, of which 400 000 of these demonstrate psychotic symptoms (1)

In South Africa the courts can refer a defendant for assessment if there is concern about the defendant's mental state (or their behaviour), either at the present time or at the time of the offence, or both. The defendant is held in the forensic psychiatry unit for a period of thirty days or longer if required for observation.
The defendant then undergoes a psycholegal assessment by the multidisciplinary team which includes forensic psychiatrists, psychologists, social workers, occupational therapists and nurses whose mandate it is to determine whether a mental illness or defect, or other factor could impact a defendant's fitness to stand trial (refers to current mental competence), and criminal responsibility (the defendant's mental competence at the time of

the offence). If it is found that the defendant is not fit to stand trial and lacks criminal responsibility or capacity, they are then made a state patient and admitted into a forensic psychiatry unit. If a defendant is found fit to stand trial and has criminal capacity the defendant is then sent back to court to continue with the trial proceedings (2).

State patients regardless of their diagnosis undergo the same process of rehabilitation other than being treated with specific medication for their illness. It then becomes prudent to examine the way in which forensic mental health is practiced and dispensed. Social and family reintegration becomes a priority in terms of the long-term management of forensic mental health care users as currently it is not known if the 2 groups can be managed as if they are the same. In order to provide appropriate risk management and rehabilitation for these 2 groups of state patients, the differences between them need to be addressed.

A study performed over an 18-month period on inpatients showed that there was a significantly increased risk of aggression among patients with bipolar disorder and schizophrenia whilst other mental disorders such as depression conferred a significantly lower risk of aggression. The high-risk patients that were identified were those who were actively psychotic, less than 32 years of age and substance abusers (3)
Another significant study supporting the hypothesis that patients with schizophrenia and bipolar disorder are prone to violence was performed as a total population cohort study in Sweden of 24 297 patients which showed that 10.7% of men and 2.7% of women were convicted of violent offences (4).
Further support was provided by another large-scale Danish Birth Cohort study demonstrating that there was a significant positive relationship between major mental disorder and criminal violence (5)
It has been established that there is a link between violent behavior and mental illness albeit a weak association as shown by studies conducted as early as 1938 (6-9).

Schizophrenia and violence

A general population birth cohort study showed that men with a major mental disorder, particularly schizophrenia were 2.6 times more likely than men with no disorder to have been convicted of a criminal offence and 4 times more likely to commit a violent crime (10)
A Meta-analysis of 20 studies reporting data from 18,423 individuals with schizophrenia and other psychoses compared to the general population found that in men, the odds ratio (OR) for the comparison of violence in those with schizophrenia and other psychoses with those without mental disorders varied from 1 – 7 with significant heterogeneity (11).
A recent systematic review of 110 studies reporting on 45 533 individuals with psychosis of which 8,439 were violent, showed 87.8% were diagnosed with schizophrenia. Risk factors identified in the review included non-adherence to psychological therapy ($p<0.001$), high poor impulse control scores, substance and alcohol misuse ($p<0.01$), and non-adherence to medication ($p<0.05$) (12).
In a local study done on forensic state patients at Sterkfontein hospital it was found that the diagnosis of schizophrenia was the most common in those patients who had committed violent crime (13). In other local studies more than half the forensic inpatients who committed violent crime were diagnosed with schizophrenia (55.5%) (14).

Violent behaviour in schizophrenia is heterogeneous in origin, i.e. other factors seem to be more important than the diagnosis alone, and violence may be as a result of psychotic symptoms (usually positive) such as paranoid delusions or a specific combination of "threat/override" symptoms (15, 16). Nevertheless, some violent behaviour displayed is not

directly attributable to psychotic symptoms. Co-morbid disorders may add to risk of violent behaviour namely, substance abuse and personality disorders (17).

Bipolar mood disorder and violence

In patients with bipolar mood disorder the prevalence of violence is at least as high as that of patients with schizophrenia (18).
A recent meta-analysis found that people with bipolar disorder had significantly more violent behaviors than healthy controls [OR: 4.1, 95% Confidence interval (CI): 2.9 – 5.8] (19).
Aggressive behavior was reported by 12.2% of individuals with a diagnosis of bipolar disorder, 8.2% of individuals with alcohol abuse, 10.9% of individuals with drug abuse and 1.9% of individuals with no disorder in a study done on a sample representing the population of the United States of America for the National comorbidity survey (NCS) between 1990 and 1992 (20)

Studies have shown that aggression in bipolar disorder is associated with paranoia and irritability as well as lack of insight (21).
Co- morbid substance use also plays a significant role in the prevalence of aggression in bipolar disorder in particular.
Alcohol abuse ranged between 31.9% and 47.3%, and illicit drug abuse ranged between 15.1 – 34.2% (22). Other studies showed ranges of 17 – 64% for co morbid substance abuse in individuals with bipolar mood disorder (11).
In general, there are higher levels of impulsivity and aggression in those with co morbid substance abuse as compared to those with stand-alone bipolar mood disorders (19, 23)

Gender differences need to be considered as well. In the evaluation of aggressive behavior, studies have shown that women with bipolar disorder were 4 times more likely to have been arrested than women in the general population, and men with bipolar disorder are 6 times more likely than women to be incarcerated for violent aggressive behavior (24).
Therefore early identification and treatment of people with bipolar disorder is important to help manage their aggressive impulses and any potential co morbid substance abuse and personality disorders to avoid aggressive behavior in the future (25)

Co Morbid substance abuse and violence

Fazel et al concluded that the risk of violent crime was increased in schizophrenia and other psychoses and that comorbidity with substance use substantially increased that risk.
Fazel et al also concluded that the increased risk for violence in schizophrenia and other psychoses with co morbid substance abuse was not different than the risk for violence in individuals with diagnosis of substance use disorders alone (26, 27).
Some of the substances involved included alcohol, cannabis and methamphetamines.
Other studies have confirmed that substance abusers exhibit a 12 – 16 times greater risk of exhibiting violent behavior than non-abusers (28).

Another large study was conducted where data on mental disorders and violence were collected as part of a national epidemiologic survey on alcohol and related conditions (NESARC). It was conducted in 2 waves from 2001 – 2003 and 2004 – 2005 respectively. A total of 34 653 subjects was collected and showed that the incidence of violence was higher in severe mental illness but only significantly so for those with co-occurring substance abuse (29).

Nevertheless there are studies that indicate that co morbid substance abuse does exacerbate symptoms such as command hallucinations (30-32), delusions(33, 34) and poor insight (35).

Other factors contributing to violence in severe mental illness

There are many factors that are associated with violence and aggression in patients with schizophrenia and bipolar disorder. Personality disorders may be a contributing factor toward violence and aggression.

Moran et al. did a study evaluating 708 patients with psychosis over a 2-year period, and it was found that co-morbid personality disorder was significantly associated with violent behavior. This association was independent for other risk factors for violence (36).
Personality disorder may precede the emergence of psychotic symptoms in violent patients with schizophrenia and bipolar disorder.
Antisocial personality disorder in schizophrenia is significantly associated with violence (37).
There is a high prevalence of comorbidity between borderline personality disorder and bipolar disorder. It is noted that the impulsivity trait found in borderline personality disorder may lead to a lack of premeditation and may lead to difficulties thinking and reflecting on the consequences of specific acts before participating in the act. Greater trait hostility was found among subjects with bipolar disorder with co-morbid personality disorder (borderline personality disorder in particular), than with bipolar disorder alone (38).
Some other attributes that were associated with a significantly raised incidence of aggression include, lack of insight, refusing to take treatment, being involved in substance abuse and experiencing a longer duration of illness (39, 40).

Conclusion

The etiology of human aggression is multifactorial and only a small proportion of societal violence should be attributed to mental illness (41).
There is a possibility though, that the prevalence of violence at the hands of the mentally ill may still be underestimated owing to underreporting by overburdened and threatened family members (42).
Nevertheless, most research to date has shown that a statistical relationship does exist between schizophrenia and bipolar disorder and violence and aggressive behavior.
The legal system and forensic psychiatry units are significantly overwhelmed, resulting in significant cost and burden to the state. If we are to become more efficient in dealing with these cases then more efficient treatment regimens need to be developed as there is a still a lack of clarity as to whether there are differences between patients with schizophrenia and bipolar disorders and their associations with violence (43, 44).

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Chapter 2: Publication-ready Manuscript

Title

A retrospective audit comparing state patients with schizophrenia and bipolar mood disorder who have committed violent crime admitted to the male forensic unit at Valkenberg Hospital.

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Abstract

Background

There is a consensus that psychosis confers a modest risk toward violent offending. Most research to date has shown that a statistical relationship does exist between schizophrenia and bipolar disorder and violence and aggressive behavior
In forensic mental health, state patients are rehabilitated in a general program regardless of diagnosis. It is not known whether different rehabilitation management strategies should be implemented on those with bipolar disorder as compared to those with schizophrenia. This study is an attempt to ascertain if there are differences between those diagnosed with schizophrenia and bipolar disorders, and if so, whether these have implications for their rehabilitation programs.

Objectives

The study aims to compare the demographic profiles and comorbidities (in terms of substance use and personality disorders) of state patients with bipolar disorder and schizophrenia who have offended violently.

Methods

This was a quantitative, cross sectional study. State patients who were diagnosed with schizophrenia and bipolar disorder and committed a violent crime were included in the study from the 1st January 2000 to 31st December 2014.
The study population comprised a total of 93 male state patients. Of these 46 patients had a diagnosis of bipolar disorder and 47 patients had a diagnosis of schizophrenia.

Results

The results show that in general the differences between the schizophrenia group and the bipolar disorder group are marginal.
A higher percentage of patients with schizophrenia committed murder at 17.02% and attempted murder at 12.77%.
The bipolar disorder group had a significantly higher number of patients diagnosed with co morbid personality disorder at 59.57% (p value of 0.01.)
Substance abuse was common in both groups.
The mean age at admission was at 31,23 years in schizophrenia and 36,85 years in bipolar disorder which demonstrates an earlier onset of criminality in the group with schizophrenia.
Patients with bipolar disorder were more likely to be married (13.04%), divorced (10.8%) or separated (2.17%).

Conclusion

There were no major differences elicited between the 2 groups of patients. Certain aspects such as therapeutic programs for personality disordered patients and social interventions in patients with poor social support would contribute to improving the quality of the rehabilitation programs currently used. The commonalities found in the 2 groups suggest that in general a common approach to rehabilitation would be adequate in this setting.

Introduction

Crime is a major problem that is encountered on a daily basis, with an estimated 10 million prisoners worldwide of which 400 000 of these demonstrate psychotic symptoms (1). South Africa has a prison population of approximately 162 000 prisoners (0.29% of the total population), with the total population in 2017 estimated to be approximately 56 million people (2).

In South Africa the courts can refer a defendant for assessment if there is concern about the defendant's mental state (or their behaviour), either at the present time or at the time of the offence, or both. The defendant is held in the forensic psychiatry unit for a period of thirty days or longer if required for observation.
The defendant then undergoes a psycholegal assessment by the multidisciplinary team which includes forensic psychiatrists, psychologists, social workers, occupational therapists and nurses whose mandate it is to determine whether a mental illness or defect, or other factor could impact a defendant's fitness to stand trial (refers to current mental competence), and criminal responsibility (the defendants mental competence at the time of the offence.). If it is found that the defendant is not fit to stand trial and lacks criminal responsibility or capacity, the defendant is made a state patient and admitted into a forensic psychiatry unit.
If a defendant is found fit to stand trial and has criminal capacity the defendant is then sent back to court to continue with the trial proceedings (3).

The idea of dangerousness, mental illness, violence and criminality can incur 'social costs' which include but are not limited to, disruption of families and social networks, stigma, discrimination, loss of future opportunities, marginalization and decreased quality of life (4).

State patients regardless of their diagnosis undergo the same process of rehabilitation other than being treated with specific medication for their illness. It then becomes prudent to look at ways in which to optimize the way in which forensic mental health is practiced and dispensed and that social and family reintegration becomes a priority in terms of the long-term management of forensic mental health care users. One would assume that this could be achieved or at least partially achieved by looking at the common and differentiating traits. In this review an analysis of state patients with schizophrenia and bipolar disorder who have committed violent crime was undertaken and included profiling the types of crime committed by these two groups of patients as well as any difference in demographics and co morbidities.
When the question is asked as to what is common and what is different among these patients one can then set about forming more structured, tailored treatment plans and regimens potentially fast tracking these mental health care users onto the road to better mental health, rehabilitation and potential social and occupational rehabilitation.

Schizophrenia

Initial studies conducted as early as 1938, demonstrated that there was no difference in the arrest rate, or that there were fewer arrests made of patients with mental illness than in normal subjects in the general population (5, 6).
Since then however, it has been firmly established that there is a link between violent behaviour and schizophrenia with a prevalence of 8.4% compared with 2.4% in people without mental illness (7). Further studies showed that patients with schizophrenia were 5 times more likely to have been convicted of violent crime, 2.5 times more likely to have

been convicted of destruction of property and 3 times more likely to have violated drug laws (8).

Bipolar mood disorder

In patients with bipolar disorder the prevalence of violence is at least as high as that of patients with schizophrenia (9).
A Meta-analysis found that people with bipolar disorder had significantly more violent behaviors than healthy controls [OR: 4.1, 95% Confidence interval (CI): 2.9 – 5.8] (10). Aggressive behavior was reported by 12.2% of individuals with a diagnosis of bipolar disorder, 8.2% in those with alcohol abuse, 10.9% in those with drug abuse and 1.9% in those with no disorder in a study done on a sample representing the population of the United States of America for the National comorbidity survey (NCS) between 1990 and 1992 (11).

The etiology of human aggression is multifactorial and only a small proportion of societal violence should be attributed to mental illness (12).

Nevertheless, most research to date has shown that a statistical relationship does exist between schizophrenia, bipolar disorder and violence and aggressive behaviour.

This study aims to determine if there are there differences between the 2 groups i.e. patients with schizophrenia and patients with bipolar mood disorder who have committed violent crime, and if there are differences, what are they and what could the potential implications be for rehabilitation and management.

Methods

This is quantitative, cross sectional study.
Inclusion criteria included:

- State patients diagnosed with schizophrenia and bipolar disorder
- State patients who committed a violent crime
- State patients who were admitted from the 1st January 2000 to 31st December 2014.

Exclusion criteria included:

- Female patients as there are no female state patients admitted to Valkenberg forensic unit.
- Patients with co-morbid neurocognitive disorders
- Patients with intellectual disability
- Patients with serious medical illnesses (potentially an independent contributor to violent behavior)

The study population consisted of 93 male state patients. Of these 46 patients had a diagnosis of bipolar disorder and 47 patients had a diagnosis of schizophrenia.
The diagnoses were made by forensic psychiatrists using the diagnostic and statistical manual of mental disorders (DSM) criteria for bipolar disorder and schizophrenia. (Appendix II)

Data Collection

A descriptive analysis was performed using a data-capturing sheet. (Appendix) Information and variables were extracted from clinical files, which included the following:

- Demographics
  - Age, Level of education, marital status
- Diagnosis
- Psychiatric history
  - Previous admissions,
  - Duration of illness,
  - co - Morbid personality disorders,
  - co - morbid conduct disorders.
- Co Morbid substance abuse
  - Including amphetamines,
  - Cannabis,
  - Hallucinogens and
  - Alcohol.
- Criminal History
  - History of violent or sexual offences.
  - Number of previous convictions

Data Management and statistical analysis

- Data was captured on password protected excel spreadsheets.
- Epi-info version 7 statistical software was used
- The data was analyzed in terms of descriptive statistics such as frequencies, means, standard deviations, proportions and percentages.
- The distribution of the sample was assumed to be non-parametric and therefore: The 2 independent groups, schizophrenia and bipolar disorder, were compared using the Mann-Whitney U test for continuous dependent variables and the Chi squared test for categorical dependent variables
- A p-value of <0.05 was regarded as significant

Ethical considerations

Ethics approval was attained from the University of Cape town, health sciences research committee (HREC) (Appendix IV). Hospital approval was granted by the CEO of Valkenberg Hospital (Appendix III).
As this was a retrospective audit, informed consent was not required from patients and confidentiality and patient anonymity were maintained using numbers.

RESULTS

Initially 99 cases were identified for inclusion, but 6 were excluded owing to insufficient information in their folders; 47 were diagnosed with schizophrenia and 46 with bipolar disorder. Their mean age was 34 years (range= 19-65, sd= 10.22); the highest level of education mean was 8.28 years (range= 0-16; sd=3.68). The comparisons of demographic

data are listed in table 1

Table 1: Comparison of demographic variables

	SCHIZOPHRENIA	BIPOLAR DISORDER	
Age at admission	Mean=31.23 (range=19-52; sd=8.2)	Mean=36.85 (range18-65; sd=11.4)	p=0.01
Years of education	Mean= 8.13(range=0-16; sd=3.72)	Mean=8.43 (range=0-16; sd= 3.71)	p=0.69
Marital status	Single = 45 (95.74%) Married= 2 (4.26%)	Single = 34 (73.91%) Married = 6 (13.04%) Divorced = 5 (10.87%) Separated=1 (2.17%)	

Those diagnosed with bipolar disorder were significantly older than those with schizophrenia. When marital status was collapsed into 2 categories, namely married or not, there were no significant differences between the groups (Chi sq=1.30; p=0.13)

Table 2: Comparison of the Index offences

	SCHIZOPHRENIA n(%)	BIPOLAR DISORDER n(%)	TOTAL n(%)
Murder	8 (17.02)	7 (15.22)	15 (16.13)
Murder, attempted murder	0	1 (2.17)	1 (1)
Attempted murder	6 (12.77)	3 (6.52)	9 (9.68)
Assault	23 (48.94)	22 (47.83)	45 (48.39)
Family violence	1 (2.17)	4 (8.68)	5 (5.38)
Sexual assault, including rape	9 (19.15)	9 (19.15)	18 (19.35)
Total	47(100)	46 (100)	93

Although it was not possible to perform univariate comparisons in table 2 both groups committed violent offences in roughly similar proportions.

Clinical variables

The mean duration of illness (at admission) for the sample was 3.82 years (range 1-20 years; sd=4.28). On admission all cases had already been diagnosed for a mean of 3.38 years (range=1-20 years; sd=3.91). Those diagnosed with schizophrenia had been ill for a mean of 2.72 years (range= 1-15; sd= 3.06), whereas those with bipolar disorder had been ill for a mean of 4.04 years (range = 1-20; sd=4.59). This difference was significant (Kruskal-Wallis H= 5.46; p=0.02). In other words, those with bipolar disorder were more likely to have been ill for twice as long as those with schizophrenia before being certified as a state patient following a violent offence.

Table 3: Clinical variables[1]

	SCHIZOPHRENIA n(%)	BIPOLAR DISORDER n(%)	
History of conduct disorder	13 (46.43)	15 (53.57)	Chi sq= 0.09; p=0.38
Previous admissions to a psychiatric hospital	28 (59.57)	19 (40.43)	Chi sq=1.55; p=0.19
Previous convictions for any offence	16 (34.04)	31 (65.96)	Chi sq=0.87; p=0.18
History of alcohol or substance use disorder	40 (85.11)	36 (76.26)	Chi sq= 0.34; p=0.28
Diagnosis of personality disorder[2]	19 (40.3)	28 (59.57)	Chi sq= 4.78; p=0.01

Even though there were no significant differences in the occurrences of conduct disorder, previous admissions to a psychiatric hospital, previous convictions and substance use disorders, those diagnosed with bipolar disorder were more likely to have been diagnosed with a personality disorder.

The variety of combinations of alcohol and substance misuse is reflected in Table 4.

[1]These are presented as dichotomous variables, namely the positive variable was used. It was not generally possible to establish precisely how many admissions or convictions etc had occurred
[2] The most common personality disorder diagnosis was antisocial personality disorder, but often the clinical notes just diagnosed personality disorder.

Table 4: Combinations of Alcohol and Substance use Disorders

	SCHIZOPHRENIA n(%)	BIPOLAR DISORDER n(%)
Dagga only	1 (2.1)	8 (17.6)
Alcohol only	3 (6.3)	2 (4.4)
Methamphetamine only	0	0
Dagga+Mandrax	7 (14.7)	7 (15.4)
Dagga + amphetamine	2 (4.2)	0
Dagga & alcohol	4 (8.4)	1 (2.2)
Dagga+Mandrax+alcohol	9 (18.9)	5 (11.0)
Dagga+amphetamine+alcohol	0	3 (6.6)
Dagga+mandrax+amphetamines	3 (6.3)	3 (6.6)
Dagga+mandrax+amphetamines+alcohol	11 (23.1)	7 (15.4)
No substance abuse	7 (14.7)	10 (22.0)
TOTAL	47	46

Discussion

The results show that in general the differences between the schizophrenia group and the bipolar disorder group are marginal.
A slightly higher percentage of patients with schizophrenia committed murder at 17.02% as compared to patients with bipolar disorder at 15.22%. However, a larger percentage (almost double) of patients with schizophrenia committed attempted murder at 12.77% vs. 6.52% for the bipolar disorder group. Family violence in the group with schizophrenia was noted to be 2.17% compared to the bipolar disorder group that was 8.68%. It was found that 1 person was convicted of murder, attempted murder and assault in the bipolar disorder group.

The other violent crimes that were noted (assault and sexual assault), showed fairly similar results when comparing both groups.

In general, murder, attempted murder and sexual assault made up the vast majority of violent crimes committed in both groups.

This is in keeping with previously published data as demonstrated by a recent systematic review where 87% of 8439 patients who were violent out of a total of 45 533 were diagnosed with schizophrenia (13). This is also supported by cohort studies performed in Sweden and Denmark that revealed data to support the hypothesis that there was a significant positive relationship between major mental illness and criminal violence (9, 14-16).
Although there is general consensus that both patients with schizophrenia and bipolar disorder confer increased risk for violence, some data has been shown to be divided on which group is more violent. In one study it was suggested that schizophrenia showed a stronger association with violence than did patients with bipolar disorder (17), whereas in another study the prevalence of violence in those patients with bipolar disorder was at least as high as that of patients with schizophrenia (9).

The bipolar disorder group had a significantly higher number of patients diagnosed with co morbid personality disorder at 59.57% vs. 40.43% for the schizophrenia group and this was found to be statistically significant with a p value of 0.01.

The bipolar disorder group also conferred a greater number of patients who were previously convicted, almost double that of patients with schizophrenia with 65.96% and 34,04% respectively.

Looking at these 2 findings it would suggest that patients with bipolar disorder are more likely to have comorbid personality disorder and prior convictions and are therefore more likely to commit violent crime and that in the absence of the co morbidities the number of violent crimes committed by patients with bipolar disorder would be less than those committed by patients with schizophrenia.

There have been many other studies done on co morbid personality disorders in schizophrenia and bipolar mood disorder and its association with violence. In these studies the occurrence of personality disorders in these 2 groups was fairly evenly matched although the types of personality disorders in the 2 groups did show some variability with borderline personality disorder occurring more frequently in the bipolar mood disorder group. It is noted however that this difference did not translate into any significant difference in violence rates between the 2 groups, which were fairly evenly matched in terms of violence or acts of aggression (18-20).

This is in contrast to this study, which showed a higher prevalence of co morbid personality disorder in the bipolar mood disorder group than in the group with schizophrenia.

Substance abuse was fairly common in both groups. Patients with schizophrenia had slightly higher rates of substance abuse at 85,11% when compared to the bipolar disorder group of patients at 76,26%. These findings are in keeping with previous research which showed that the risk of crime was substantially increased with co morbid substance use and some studies suggested that substance abusers represent a 12 – 16 times greater risk of exhibiting violent behaviour (21-24).
Substance abuse is a major problem and curbing the abuse of substances would seem to confer a drop in violent crime rates.
With regard to demographics the mean age at admission was at 31,23 years in schizophrenia and 36,85 years in bipolar disorder which demonstrates an earlier onset of criminality in the group with schizophrenia.
Patients with bipolar disorder were more likely to be married (13.04% vs. 4.26%), divorced (10.8% vs. 0%) or separated (2.17% vs. 0%) when compared to patients with schizophrenia. Being single or divorced (i.e. not in a long term stable relationship) was a factor that seemed to contribute toward an increase in violence (25, 26). The majority of participants in this study were single and this does agree with previous studies.

The results of this study are in keeping with previously published data that suggest that both patients with schizophrenia and bipolar disorder are prone to committing acts of violence and that patients who abuse substances did show a higher incidence of violence as well as those with co morbid personality disorders (21, 27).

Currently at the Valkenberg forensic unit generic rehabilitation programs are used in the treatment of both patients with schizophrenia and bipolar disorder. Any differences highlighted in this study can be aimed at tailoring rehabilitation programs aimed specifically at each particular group. For example, patients with bipolar disorder were more likely to be diagnosed with a personality disorder. Perhaps more psychotherapeutic interventions such as different behavioral therapies could be offered to this group of patients.
In addition, patients with bipolar disorder were more likely to be married indicating a degree

of social support. Therefore more social work intervention could be offered to patients with schizophrenia who were single with no or little support. However, this being said there were no other major differences between the 2 groups. Substance abuse was common to both indicating possible combined intervention for both groups in terms of psycho-education and rehabilitation for substance use.

It was noted that patients with bipolar disorder were ill for significantly much longer on average than patients with schizophrenia before being certified as state patients. This could be explained by the fact that patients with bipolar disorder present much more overtly than patients with schizophrenia.

Limitations of this study

Data collection was done retrospectively from patient folders and data collected was limited to what had been recorded in the folder.
It is unknown whether people with either disorder are more likely to be charged or diverted into the general psychiatric service, which may skew the numbers that become state patients.
It is currently not clear whether these results can be extrapolated to the general population.

Conclusion

Although there were no major differences elicited between the 2 groups of patients. Certain aspects such as therapeutic programs for personality disordered patients and social interventions in patients with poor social support would contribute to improving the quality of the rehabilitation programs currently used. The commonalities found in the 2 groups suggest that in general a common approach to rehabilitation would be adequate in this setting.

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Appendices

Appendix I – Author guidelines

South African Journal of Psychiatry Author Guidelines

Original Research Article full structure

Title: The article's full title should contain a maximum of 95 characters (including spaces).

Abstract: The abstract, written in English, should be no longer than 250 words and must be written in the past tense. The abstract should give a succinct account of the objectives, methods, results and significance of the matter. The structured abstract for an Original Research article should consist of six paragraphs labelled Background, Aim, Setting, Methods, Results and Conclusion.

- Background: Summarise the social value (importance, relevance) and scientific value (knowledge gap) that your study addresses.
- Aim: State the overall aim of the study.
- Setting: State the setting for the study.
- Methods: Clearly express the basic design of the study, and name or briefly describe the methods used without going into excessive detail.
- Results: State the main findings.
- Conclusion: State your conclusion and any key implications or recommendations.

Do not cite references and do not use abbreviations excessively in the abstract.

Introduction: The introduction must contain your argument for the social and scientific value of the study, as well as the aim and objectives:

- Social value: The first part of the introduction should make a clear and logical argument for the importance or relevance of the study. Your argument should be supported by use of evidence from the literature.
- Scientific value: The second part of the introduction should make a clear and logical argument for the originality of the study. This should include a summary of what is already known about the research question or specific topic, and should clarify the knowledge gap that this study will address. Your argument should be supported by use of evidence from the literature.
- Conceptual framework: In some research articles it will also be important to describe the underlying theoretical basis for the research and how these theories are linked together in a conceptual framework. The theoretical evidence used to construct the conceptual framework should be referenced from the literature.
- Aim and objectives: The introduction should conclude with a clear summary of the aim and objectives of this study.

Research methods and design: This must address the following:

- Study design: An outline of the type of study design.
- Setting: A description of the setting for the study; for example, the type of community from which the participants came or the nature of the health system and services in which the study is conducted.
- Study population and sampling strategy: Describe the study population and any inclusion or exclusion criteria. Describe the intended sample size and your sample size calculation or justification. Describe the sampling strategy used. Describe in practical terms how this was implemented.

- Intervention (if appropriate): If there were intervention and comparison groups, describe the intervention in detail and what happened to the comparison groups.
- Data collection: Define the data collection tools that were used and their validity. Describe in practical terms how data were collected and any key issues involved, e.g. language barriers.
- Data analysis: Describe how data were captured, checked and cleaned. Describe the analysis process, for example, the statistical tests used orsteps followed in qualitative data analysis.
- Ethical considerations: Approval must have been obtained for all studies from the author's institution or other relevant ethics committee and the institution's name and permit numbers should be stated here.

Results: Present the results of your study in a logical sequence that addresses the aim and objectives of your study. Use tables and figures as required to present your findings. Use quotations as required to establish your interpretation of qualitative data. All units should conform to the **SI convention** and be abbreviated accordingly. Metric units and their international symbols are used throughout, as is the decimal point (not the decimal comma).

Discussion: The discussion section should address the following four elements:

- Key findings: Summarise the key findings without reiterating details of the results.
- Discussion of key findings: Explain how the key findings relate to previous research or to existing knowledge, practice or policy.
- Strengths and limitations: Describe the strengths and limitations of your methods and what the reader should take into account when interpreting your results.
- Implications or recommendations: State the implications of your study or recommendations for future research (questions that remain unanswered), policy or practice. Make sure that the recommendations flow directly from your findings.

Conclusion: Provide a brief conclusion that summarises the results and their meaning or significance in relation to each objective of the study.

Acknowledgements: Those who contributed to the work but do not meet our authorship criteria should be listed in the Acknowledgments with a description of the contribution. Authors are responsible for ensuring that anyone named in the Acknowledgments agrees to be named.
Also provide the following, each under their own heading:

- Competing interests: This section should list specific competing interests associated with any of the authors. If authors declare that no competing interests exist, the article will include a statement to this effect: *The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.* Read our **policy on competing interests**.
- Author contributions: All authors must meet the criteria for authorship as outlined in the **authorship** policy and **author contribution** statement policies.
- Funding: Provide information on funding if relevant
- Disclaimer: A statement that the views expressed in the submitted article are his or her own and not an official position of the institution or funder.

References: Authors should provide direct references to original research sources whenever possible. References should not be used by authors, editors, or peer reviewers to promote self-interests. Refer to the journal referencing style downloadable on our *Formatting Requirements* page.

Appendix II

DSM criteria – Schizophrenia

A. Two (or more) of the following , each present for a significant portion of time during a 1-month period (or less if successfully treated).

At least one of these must be (1), (2), or (3):

1 . Delusions.
2. Hallucinations.
3. Disorganized speech (e. g . , frequent derailment or incoherence) .
4. Grossly disorganized or catatonic behavior.
5. Negative symptoms (i.e. , diminished emotional expression or avolition) .

B. For a significant portion of the time since the onset of the disturbance, level of functioning in one or more major areas, such as work, interpersonal relations, or self-care, is markedly below the level achieved prior to the onset (or when the onset is in childhood or adolescence, there is failure to achieve expected level of interpersonal, academic, or occupational functioning).

C. Continuous signs of the disturbance persist for at least 6 months. This 6-month period must include at least 1 month of symptoms (or less if successfully treated) that meet Criterion A (i.e., active-phase symptoms) and may include periods of prodromal or residual symptoms. During these prodromal or residual periods, the signs of the disturbance may be manifested by only negative symptoms or by two or more symptoms listed in Criterion A present in an attenuated form (e.g. odd beliefs, unusual perceptual experiences).

D. Schizoaffective disorder and depressive or bipolar disorder with psychotic features have been ruled out because either,

1) no major depressive or manic episodes have occurred concurrently with the active-phase symptoms, or
2) if mood episodes have occurred during active-phase symptoms, they have been present for a minority of the total duration of the active and residual periods of the illness.

E. The disturbance is not attributable to the physiological effects of a substance (e.g. a drug of abuse, a medication) or another medical condition.

F. If there is a history of autism spectrum disorder or a communication disorder of childhood onset, the additional diagnosis of schizophrenia is made only if prominent delusions or hallucinations, in addition to the other required symptoms of schizophrenia, are also present for at least 1 month (or less if successfully treated).

DSM criteria – Bipolar I disorder

For a diagnosis of bipolar I disorder, it is necessary to meet the following criteria for a manic episode. The manic episode may have been preceded by and may be followed by hypomanic or major depressive episodes.

Manic Episode

A. A distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased goal-directed activity or energy, lasting at least 1 week and present most of the day, nearly every day (or any duration if hospitalization is necessary) .

B. During the period of mood disturbance and increased energy or activity, three (or more) of the following symptoms (four if the mood is only irritable) are present to a significant degree and represent a noticeable change from usual behavior:

1. Inflated self-esteem or grandiosity.
2. Decreased need for sleep (e. g . , feels rested after only 3 hours of sleep) .
3. More talkative than usual or pressure to keep talking.
4. Flight of ideas or subjective experience that thoughts are racing.
5. Distractibility (i.e. attention too easily drawn to unimportant or irrelevant external stimuli), as reported or observed.
6. Increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation (i . e . , purposeless non-goal-directed activity) .
7. Excessive involvement in activities that have a high potential for painful consequences (e.g. engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments) .

C. The mood disturbance is sufficiently severe to cause marked impairment in social or occupational functioning or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.

D. The episode is not attributable to the physiological effects of a substance (e.g. a drug of abuse, a medication, other treatment) or to another medical condition.

Note: A full manic episode that emerges during antidepressant treatment (e.g. medication, electroconvulsive therapy) but persists at a fully syndromal level beyond the physiological effect of that treatment is sufficient evidence for a manic episode and, therefore, a bipolar I diagnosis.

Note: Criteria A-D constitute a manic episode. At least one lifetime manic episode is required for the diagnosis of bipolar I disorder.

Hypomanic Episode

A. A distinct period of abnormally and persistently elevated , expansive, or irritable mood and abnormally and persistently increased activity or energy, lasting at least 4 consecutive days and present most of the day, nearly every day.

B. During the period of mood disturbance and increased energy and activity, three (or more) of the following symptoms (four if the mood is only irritable) have persisted, represent a noticeable change from usual behavior, and have been present to a significant degree:

1. Inflated self-esteem or grandiosity.
2. Decreased need for sleep (e.g. feels rested after only 3 hours of sleep) .
3. More talkative than usual or pressure to keep talking.
4. Flight of ideas or subjective experience that thoughts are racing.
5. Distractibility (i.e. attention too easily drawn to unimportant or irrelevant external stimuli), as reported or observed .
6. Increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation .
7. Excessive involvement in activities that have a high potential for painful consequences (e.g. engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments).

C. The episode is associated with an unequivocal change in functioning that is uncharacteristic of the

individual when not symptomatic.

D. The disturbance in mood and the change in functioning are observable by others.

E. The episode is not severe enough to cause marked impairment in social or occupational functioning or to necessitate hospitalization. If there are psychotic features, the episode is, by definition, manic.

F. The episode is not attributable to the physiological effects of a substance (e.g. a drug of abuse, a medication, other treatment).

Note:
A full hypomanic episode that emerges during antidepressant treatment (e.g. medication, electroconvulsive therapy) but persists at a fully syndromal level beyond the physiological effect of that treatment is sufficient evidence for a hypomanic episode diagnosis. However, caution is indicated so that one or two symptoms (particularly increased irritability, edginess, or agitation following antidepressant use) are not taken as sufficient for diagnosis of a hypomanic episode, nor necessarily indicative of a bipolar diathesis.

Note:
Criteria A-'F constitute a hypomanic episode. Hypomanic episodes are common in bipolar I disorder but are not required for the diagnosis of bipolar I disorder.

Major Depressive Episode

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.
Note: Do not include symptoms that are clearly attributable to another medical condition
.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g. feels sad , empty, or hopeless) or observation made by others (e.g. appears tearful). (Note: In children and adolescents, can be irritable mood.)
2. Markedly diminished interest or pleasure in all, or almost all, activities most o f the day, nearly every day (as indicated by either subjective account or observation).
3. Significant weight loss when not dieting or weight gain (e.g. a change of more than 5% of body weight in a month) , or decrease or increase in appetite nearly every day. (Note: In children, consider failure to make expected weight gain.)
4. Insomnia or hypersomnia nearly every day.
5. Psychomotor agitation or retardation nearly every day (observable by others; not merely subjective feelings of restlessness or being slowed down) .
6. Fatigue or loss of energy nearly every day.
7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick) .
8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others) .
9. Recurrent thoughts of death (not just fear of dying) , recurrent suicidal ideation without a specific plan , or a suicide attempt or a specific plan for committing suicide.

B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

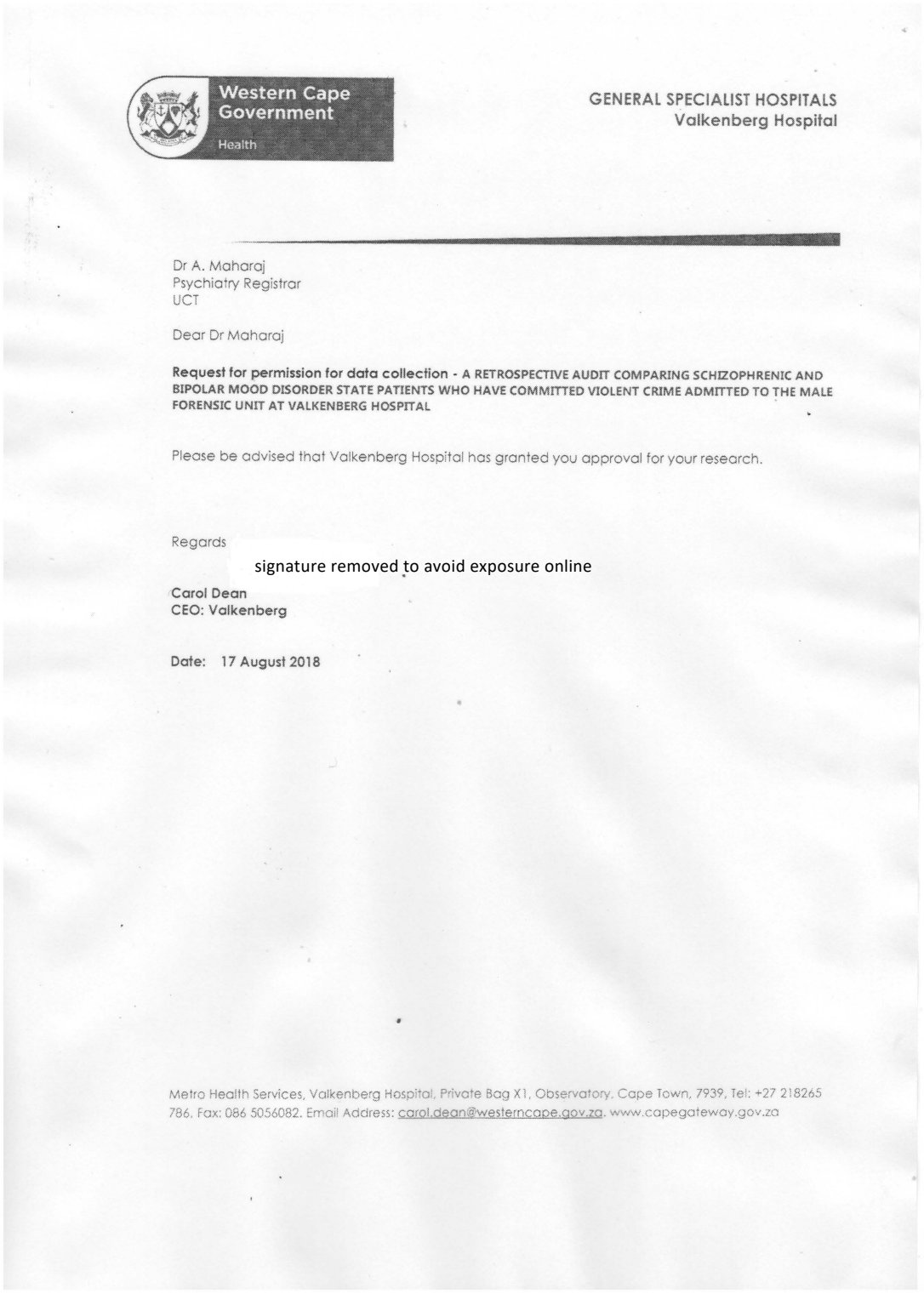
C. The episode is not attributable to the physiological effects of a substance or another medical condition.

Note:
Criteria A-C constitute a major depressive episode. Major depressive episodes are common in bipolar I disorder but are not required for the diagnosis of bipolar I disorder.

Note:
Responses to a significant loss (e.g. bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite, and weight loss noted in Criterion A, which may resemble a depressive

episode. Although such symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgment based on the individual's history and the cultural norms for the expression of distress in the context of loss.

Appendix III – Hospital approval letter



Western Cape Government
Health

GENERAL SPECIALIST HOSPITALS
Valkenberg Hospital

Dr A. Maharaj
Psychiatry Registrar
UCT

Dear Dr Maharaj

Request for permission for data collection - A RETROSPECTIVE AUDIT COMPARING SCHIZOPHRENIC AND BIPOLAR MOOD DISORDER STATE PATIENTS WHO HAVE COMMITTED VIOLENT CRIME ADMITTED TO THE MALE FORENSIC UNIT AT VALKENBERG HOSPITAL

Please be advised that Valkenberg Hospital has granted you approval for your research.

Regards

signature removed to avoid exposure online

Carol Dean
CEO: Valkenberg

Date: 17 August 2018

Metro Health Services, Valkenberg Hospital, Private Bag X1, Observatory, Cape Town, 7939, Tel: +27 218265 786, Fax: 086 5056082. Email Address: carol.dean@westerncape.gov.za. www.capegateway.gov.za

Appendix IV – HREC approval letter

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room E53-46 Old Main Buildir
Groote Schuur Hospit
Observatory 792
Telephone [021] 406 64
Email: sumayah.ariefdien@uct.ac.
Website: www.health.uct.ac.za/fhs/research/humanethics/forn

2 August 2016

IREC REF: 401/2016

rof S Kaliski
sychiatry, Training Centre
alkenberg Hospital
iesbeeck Parkway
bservatory

ear Prof Kaliski

ROJECT TITLE: A RETROSPECTIVE AUDIT COMPARING SCHIZOPHRENIC AND BIPOLAR OOD DISORDER STATE PATIENTS WHO HAVE COMMITTED VIOLENT CRIME ADMITTED TO HE MALE FORENSIC UNIT AT VALKENBERG HOSPITAL-(MMed-candidate-Dr A Maharaj)

hank you for your response letter dated 29 July 2016, addressing the issues raised by the Human esearch Ethics Committee (HREC).

t is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

pproval is granted for one year until the 30 August 2017.

he HREC note retrospective folder review from 2000 to 31 Dec 2014.

lease submit a progress form, using the standardised Annual Report Form if the study continue eyond the approval period. Please submit a Standard Closure form if the study is completed within th pproval period.
Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

lease quote the HREC REF in all your correspondence.

Ve acknowledge that the student, Dr A Maharaj will also be involved in this study.

lease note that the ongoing ethical conduct of the study remains the responsibility of the princip nvestigator.

lease note that for all studies approved by the HREC, the principal investigator **must** obtain appropriat nstitutional approval before the research may occur.

ours sincerely

signature removed to avoid exposure online

ROFESSOR M BLOCKMAN
HAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE

Appendix V – Data collection sheet

DATA SHEET
MMED

Patient Number	

1. Age (years)

<20	20 - 30	30 - 40	40 - 50	>50

2.Marital status

Single	Married	Divorced	Widower

3. Level of education

No Formal	Primary school	High school	Tertiary

4. Diagnosis

Current -
Previous -

5. Psychiatric history

previous admissions		Yes		No	
		If yes, How many -			
Duration of illness	< 1yr	1 - 10 yrs	10 - 20 yrs	> 20yrs	
Comorbid personality disorder		Yes		No	
Comorbid conduct disorder		Yes		No	

6. Co morbid substance abuse

Cannabis	Yes		No	
Amphetamines	Yes		No	
Alcohol	Yes		No	
Mandrax	Yes		No	

7. Crimial history

Crime commited				
Previous convictions	Yes		No	
	If Yes, How many -			