

Social determinants of health in male forensic patients admitted at a tertiary psychiatric hospital in South Africa.

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Abstract

Introduction

Social factors are increasingly being used to determine health outcomes. The concept of social determinants of health have been used to shape policies that address disparities. There is a paucity of such studies in the forensic setting. This study aimed to use social determinants of health to identify social factors that are associated with being a male forensic patient.

Methods

The study was a retrospective two-group (forensic and non-forensic) comparison clinical record review. Association was identified through independent and multivariate statistical analysis.

Results

The study sample comprised of 296 patients, 56.4% (n=167) of which were non-forensic. Majority of the sample was black African, 50 years and older, single, unemployed and had attended main-stream schooling. Race ($p<0.01$), employment status ($p<0.02$), not completing high school ($p<0.01$), previous imprisonment ($p<0.01$), drug use ($p<0.01$) and not being on medication prior to admission ($p<0.01$) were

significantly associated with being a forensic patient. Multivariate logistic regression analyses also confirmed these associations.

Conclusion

Social determinants of health ought to be targeted to improve health outcomes of psychiatric patients. Collaborations between mental health, public health, law & policy makers as well as non-/governmental agencies may lead to change. Human rights of individuals with mental illness may thus be enhanced in the long run.

Keywords

State patients, social determinants of health, social factors, social disparities, social injustice, Criminal Procedure Act, Mental Health Care Act

Introduction

Mental health care services are provided at three levels of care, namely, primary, secondary and tertiary levels (Lund et al., 2010). Forensic psychiatry, an interlink between psychiatry and the law, is one of the specialized services provided by tertiary level institutions (Kaliski, 2006). An example of such, is the forensic mental health unit of Weskoppies hospital. Forensic psychiatry professionals receive court orders to assess individuals awaiting trial as per Criminal Procedure Act 55 of 1977 (as amended) section 77 and 78 and provide the referring court with recommendations as per section 79 (Africa, 2008). Furthermore, the court issues orders for assessed individuals who commit major crimes and fulfil section 77 and/or section 78 to be admitted as forensic patient (Africa, 2008; Strydom, Pienaar, Dreyer, & et al., 2011). Admitted forensic patients receive care, treatment and rehabilitation until they are assessed to be stable enough for reintegration back into the community (Africa, 2008). The judges in chambers review and decides on discharge of said forensic patients (Africa, 2008; D. o. Health, 2004).

Beyond assessments and admission procedures as outlined above, other health outcomes related to forensic populations have been reviewed in literature (Marais & Subramaney, 2015; Prinsloo, Lippi, & Swanepoel, 2017; Sampson, Edworthy, Vollm, & Bulten, 2016). The outcomes include the average length of stay in hospital of forensic patients (Andreasson et al., 2014; Davoren et al., 2015; Hare Duke, Furtado, Guo, & Völlm, 2018; Huband et al., 2018). In the South African context, the prolonged average length of stay may be related to the fact that the CPA does not provide recommendations for how long a forensic patient needs to be admitted before review. Internationally, Netherlands is the only country with a legal definition of prolonged stay as being six or more years (Sampson et al., 2016). Prolonged institutionalization infringes on the human rights of patients with mental illness.

Collaboration between psychiatry and social sciences began in the late 1930s (Burns & Roos, 2016). Available research strongly suggests that in addition to having biological etiology, mental illnesses have been found to be socially determined as well (Lund et al., 2018). Studies have previously focused on biological and behavioural factors that may play a role in health outcomes of forensic mental health populations

(Andreasson et al., 2014; Davoren et al., 2015). Psychiatrists however, use George Engel's biopsychosocial model, which gives clinicians a holistic approach to simultaneously look at the patient's biological, psychological and social dimensions of illness (Borrell-Carrió, Suchman, & Epstein, 2004). When the model is considered, previous studies show that the focus on forensic patients has been more on the first two dimensions rather than the latter (Huband et al., 2018).

Poor social and economic circumstances are proven to have an effect on health outcomes throughout life (Lund et al., 2018). Concepts like social determinants of health have been created to identify such circumstances, with the aim of shaping policies and programs that address health disparities (Wilkinson et al., 2003). Social determinants of health are described by the World Health Organization (WHO) as "the conditions in which people are born, grow, live, work and age" (Scott, Sanders, Schaay, & Schneider, 2017; Wilkinson et al., 2003).

Individuals at the bottom of a social ladder usually have poor health outcomes when compared with their counterparts (Wilkinson et al., 2003). The overall burden that comes with the poor outcome is unlikely to be relieved by improving access to mental health treatment alone (Lund et al., 2018). Initiatives such as the United States of America's Healthy People 2020 program have used social determinants of health to improve the country's health and to reduce its health disparities (healthy people gov). Despite the available evidence there is a lack of research on possible associations between social factors and variable outcomes in forensic psychiatry (Huband et al., 2018) including being a forensic patient.

The aim of the study was to use the public health concept of social determinants of health to identify social factors that are associated with being a male forensic patient at Weskoppies hospital. The objectives of the study were to identify and compare the social determinants of health found in male forensic patients and male non-forensic patients. The aim was motivated by two factors. First, the greater need to preserve the legal and human rights of the mentally ill. Secondly, the possibility of identifying interventions aimed at the prevention or interception of social factors that eventually predispose individuals to become forensic patients.

Materials and Methods

The study was conducted at Weskoppies hospital, a tertiary hospital with a dedicated forensic mental health unit as well as a general adult psychiatry unit, affiliated with the Department of Psychiatry, University of Pretoria. The study method was a retrospective two-group comparison clinical record review. Using the hospital's information technology department's data, systematic sampling was used to create a sample of two groups of patients – forensic and non-forensic group from the two units. The forensic and non-forensic groups comprised of patients admitted to the hospital under Chapters VI and V of the MHCA 17 of 2002 respectively. Inclusion criteria to both groups included being a male inpatient, 18 years and older with any psychiatric diagnosis. Patients who were at the time of the study on leave of absence or had been conditionally discharged were excluded from the study.

The study protocol was reviewed and granted ethics approval (ref 279/2019) by the University of Pretoria's Faculty of Health Sciences Research Ethics Committee and received waiver of consent to retrospectively review clinical files by the hospital's chief executive officer. Data was collected from the sample's clinical files using a data collecting tool created by the investigators. The tool was adapted from the key determinants set out by the Healthy People 2020 program. Key determinants were economic stability, education, social & community context, health & health care and neighbourhood & built environment. Variables removed from the tool included – food security, housing stability, language & literacy, civic participation, discrimination, social cohesion, health literacy and access to food. The measured variables were defined as used in Statistic South Africa's publications.

To determine if there was significant association between identified social determinants of health with being a male forensic patient, Chi-Square test was used. Where necessary, Fisher's exact test was undertaken. Frequency counts together with their corresponding percentages were given for categorical variables. Furthermore, logistic regression was employed to identify factors associated with being a male forensic patient compared to being a non-forensic patient. Statistical analysis was

undertaken using STATA 15 and all the variables were evaluated at 5% level of significance.

Results

1. Demographics

Table 1 presents demographic characteristics of the study population. From the total of 296 patients, 56.4% (n=167) were non-forensic (NFP) while 43.6% (n=129) were forensic (FP) patients. Patients 50 years and above (FP 31.0% n=40, NFP 38.9% n=65) made up the majority of the study population in both forensic and non-forensic groups, while patients between age 19-29 had the least percentages (FP 17.8% n=23, NFP 18.5% n=31). Overall the study population predominantly comprised of black African patients, who were single, unemployed and had attended mainstream schooling. Over 90% (n=118) of the forensic patients were black Africans, over 85% (n=114) were single and about 90% (n=116) of them were unemployed prior to being admitted as compared to 74.8%, 89.8% and 96.4% respectively for non-forensic patients. Race ($p<0.01$) and employment status ($p<0.02$) were statistically significantly associated with being admitted at Weskoppies hospital.

2. Economic stability and education

In the study, 89.9% (n=116) and 96.4% (n=161) of forensic and non-forensic patients respectively, were unemployed ($p<0.02$). Only a minority of patients from both groups were employed at the time of their admission to Weskoppies hospital (FP 10.1% n=13, NFP 3.6% n=6).

Despite 70% of both groups attending mainstream schooling (FP 79% n=95, NFP 73.9% n=105), 81% (n=61) of forensic patients did not complete grade 12 and only 42% (n=7) of those who completed grade 12 had access to tertiary education. 57% (n=61) of non-forensic patients dropped out of school before completing grade 12.

3. Social & community context

All forensic patients under investigation had previously been involved in criminal activities and been imprisoned before admission as compared to non-forensic patients

(n=58) (Table 1 and 2). Previous imprisonment was statistically significantly associated with being a forensic patient ($p<0.01$). Also, drug use ($p<0.01$) was statistically significantly associated with being a forensic patient. About 74% (n=95) of forensic patients used drugs prior to being admitted, whereas non-forensic patients had a lower percentage of drug use (47% n=77) prior to being admitted.

4. Health & health care

Clinical characteristics of male forensic and non-forensic patients admitted at Weskoppies hospital are presented in Table 2. Factors including prolonged stay ($p<0.01$) and receiving medication prior to admission to hospital ($p<0.01$) were statistically significantly associated with being a non-forensic patient. Patients who have been in hospital for prolonged period (>6 years) were fewer in both groups (FP n=10, NFP n=73) as compared to those who had been admitted for less than 6 years. More non-forensic patients were on psychiatric treatment (95.1% n=156) prior to admission to Weskoppies hospital as compared to forensic patients (77.3% n=99).

Over 50% of patients admitted at Weskoppies did not have recorded medical comorbidities. The majority (80% in both groups) had only one psychiatry diagnosis, while the remaining percentage of patients had two or three. Proportions of major psychiatric diagnosis are portrayed in figure 1, where the majority of patients in both groups have a diagnosis of schizophrenia (FP 65.89%, NFP 64.67%), followed by intellectual disability (FP 14%, NFP 9%). Cannabis induced psychotic disorder had the least percentage amongst non-forensic patients while for state patients; dissociative amnesic disorder, minor neurocognitive disorder and temporal lobe epilepsy had the least percentage for diagnosis.

5. Neighbourhood & built environment

Figure 2 presents the distribution of location in which patients resided prior to admission. Most of the non-forensic patients admitted at Weskoppies hospital were from the Gauteng province (68.9%), followed by a group of patients with unknown locations (19.2%) then Mpumalanga (6%). Majority of the forensic patients were from Mpumalanga (57.4%) followed by Gauteng (31%), with 7% from unknown location.

Table 3 describes the dwelling situations of the studied population. A quarter of the forensic population had no fixed abode as compared to a bigger percentage of non-forensic patients (FP 24.2%, NFP 41.6%). A notable proportion of patients in both groups did not have data available in their clinical files regarding access to clean drinking water (FP 31.8%, NFP 50.8%), safely managed sanitation services (FP 44.3%, NFP 51.6%) and electricity (FP 40.8% NFP 51.2%). Unavailability of access to safely managed sanitation was statistically significantly associated with being admitted at Weskoppies hospital ($p < 0.01$).

6. Proportions and logistic regressions

Table 4 denotes the factors associated with being a forensic patient using multivariate logistic regression. The odds of being a forensic patient was 1.38 times higher for age group 30-39 years, 2.98 higher for age group 40-49 years and 1.7 times higher for age group 50 and above compared to age group 19-29 years.

Patients who were Black African, who had not completed grade 12, were using drugs and were not on medication prior to being admitted were more likely to be forensic patients as compared to patients who were white (OR = 0.27, CI = .09 - .07) and coloured/Indian (OR = 0.17, CI .02-1.89), who completed grade 12 (OR = 0.30, CI = .14 - .66), never used drugs (OR = 0.15, CI = 1.17 – 5.30) and used medication prior to admission (OR = 0.09, CI = .02 - .35). Forensic patients were **not** statistically significantly associated with being admitted for a prolonged period (OR = 0.15, CI .06-.38).

Discussion

As set out above, the motivation for the current study was to use social determinants of health to intercept social factors that predispose individuals to becoming forensic patients. Using a tool adapted from the Healthy People 2020 program led to findings of several social factors associated with being a male forensic patient in the current study. In terms of race, being black African was predominant in the forensic group while the non-forensic group almost mirrored the country's racial distribution. According to StatsSA, South Africa's racial distribution is currently 76.4%, 11.4% and 9.1% for black Africans, coloured & Asians, and whites respectively ("Statistics South

Africa," 2020). Despite the phased-out apartheid laws, previously disadvantaged South Africans (who were mostly black African) seem to continuously face social injustices and adversities (S. A. N. D. o. Health, 2013). The current study seems to concur with the notion that race is a contributing factor to the occurrence and the increase in prevalence of mental illness in marginalized racial groupings. This relationship has been found world-wide (Lund et al., 2018). Social injustices and adversities seem to predispose some individuals to poor health outcomes, and in the case of the current study, being a forensic patient.

Findings on education reveal poor education history in both population groups – similar to other South African studies conducted in psychiatric settings (Marais & Subramaney, 2015; Prinsloo et al., 2017; Strydom et al., 2011). In this study, majority of forensic patients were not formally educated, did not complete high school and did not have access to tertiary education as compared to the general public ("Statistics South Africa," 2020). The rate of high school completion in the forensic group seem to reflect that of the country which stands at 45.7% ("Statistics South Africa," 2020). Mental illness usually starts in late adolescent and early adulthood, making it a potential reason why the population cannot complete their education journey (Ennals, Fossey, Harvey, & Killackey, 2014). It has been shown that being well educated gives one the opportunity to gain access to services that are meant to assist in having favourable outcomes (Lund et al., 2018). Furthermore education is somewhat related to other social determinants like being employed (Draine, Salzer, Culhane, & Hadley, 2002).

With regards to the rate of unemployment, this study had similar findings to a study conducted at Sterkfontein hospital, South Africa (Marais & Subramaney, 2015). Both studies showed an unemployment rate that was three times that of the country (30%) ("Statistics South Africa," 2020). Despite the lack of research on the role of unemployment as a social determinant of mental illness (Eriksson, Agerbo, Mortensen, & Westergaard-Nielsen, 2010), the WHO states that unemployment puts one's health at risk, while being employed serves as a protective factor (Wilkinson et al., 2003). Patients with severe mental illness are less likely to be employed, as they may struggle with labour market stressors due to their poor social skills and diminishing cognitive abilities (Draine et al., 2002).

In terms of drug use, the WHO reports that there is a bidirectional interaction between drug use and poor social determinants of health (Wilkinson et al., 2003). First, individuals resort to drug use to dissociate from the harsh realities of their economic and social conditions. Secondly, drug use leads to and worsens the health outcomes (Wilkinson et al., 2003). More forensic patients used drugs when compared to non-forensic patients prior to being admitted. Moreover, literature has shown that drug use may lead to violence, criminality and imprisonment (Wilkinson et al., 2003). As expected the forensic group showed a majority involvement in criminality, as all forensic patients were involved in major or violent crimes, including the crime that led to their admission. Meanwhile only a minority of non-forensic patients were involved in criminal activity and had previously been imprisoned before being admitted at Weskoppies hospital.

Lastly, the majority of forensic patients admitted at Weskoppies hospital were diagnosed with schizophrenia, followed by intellectual disability, similar to previous studies conducted in other forensic mental health units (Houidi, Paruk, & Sartorius, 2018; Marais & Subramaney, 2015; Prinsloo et al., 2017; Strydom et al., 2011). A significant number of forensic patients were not on medication prior to their admission. Researchers have found that non-use of medication for psychiatric illnesses could contribute to the commission of crimes committed by psychiatric patients (Swartz et al., 1998). The risk of violence from not using medication in a background of mental illness, is even greater when coupled with drug use (Swartz et al., 1998).

Recommendations

Having identified the social factors associated with being a forensic patient, the study indicates that possible interventions that may ameliorate the likelihood of being admitted as one, are needed. Social determinants of health have been used by policy makers with the help of intersectoral collaborations to improve population health and health equity (Braveman & Gottlieb, 2014; Lund et al., 2018; Scott et al., 2017). Borrowing from the work implemented by assessing social determinants of health in different populations, the authors looked to alleviate the burden on the mental health care system by decreasing the number of potential forensic patients.

Public health policies and legislation changes may steer vulnerable racial groups to more advantaged paths by preventing discrimination at both individual and neighbourhood levels (Wilkinson et al., 2003). This has the potential to improve not only poverty levels of the individuals, but it may also improve other determinants. The WHO suggests that every citizen should be protected by minimum income guarantees and easy access to services (Wilkinson et al., 2003). The Department of Social Development through the South African Social Security Agency, has implemented social grants to selected disadvantaged individuals as an antipoverty strategy (Mashigo, 2019). The department may look at expanding the service to other poor citizens who currently do not meet the current criteria for said grants. Other strategies can include policies that strengthen household financial security like tax credits and subsidies, as well as improving employability by strengthening the educational background of the population (Wilkinson et al., 2003) .

Despite research highlighting the poor educational background of the psychiatric population, as above, no interventional studies have been made to ameliorate this. In general, high standards of education, starting in early life have been proven to equip individuals for work, which is associated with better outcomes (Centers for Disease, Prevention, National Center for Injury, & Control . Division of Violence, 2019). Studies that aimed at reducing childhood adverse events suggests that early learning opportunities may equip children with better skills that potentially reduce the need for special school services (Centers for Disease et al., 2019). With the aim of improving outcomes, it is recommended that the department of education should target individuals at the preschool-going level. Strategies may include increasing enrolment for preschool education and enforcing good quality curriculums at that level to better prepare individuals for mainstream schooling. In addition, the department may look into employing more educational psychologists and occupational therapists. Both will assist with earlier detection and treatment of possible learning disorders that may negatively impact education attainment. Furthermore, countries like the United States of America, have introduced mental health programs in their community school programs (Olubiyi, Futterer, & Kang-Yi, 2019). Mental health programs have been said to reduce school suspensions and improve grades and school completion (Olubiyi et al., 2019). Such programs may be adopted and introduced to the school curriculum so

as to aid those who may be affected by mental health problems during their schooling careers.

Unemployment in people with mental illness is a universal problem.(Draine et al., 2002) Studies have been conducted with aims of identifying and ameliorating factors associated with unemployability in people with mental illness (Bergai Parthasarathy, Tania, Vidya, & Pallerla, 2020; Carmona, Gómez-Benito, & Rojo-Rodes, 2019). There is a lack of such studies in South Africa, more so in a forensic psychiatry setting. Despite the paucity of data, it is believed that patients with schizophrenia might have improved employability as a result of skills development and having a supportive work environment (Carmona et al., 2019). Skills development programs may be beneficial in patients who have diminished cognitive abilities due to mental illness. In higher functioning patients who are employed already, providing services that promote better work environments may keep people with mental.

In a review article that matched social determinants of health with sustainable developmental goals, it was highlighted that targeting neighbourhood factors may alleviate drug use in communities (Lund et al., 2018). Suggested interventions included strengthening of mental health interventions at a community level (Lund et al., 2018). With drug use closely linked to criminality, such strategies may potentially assist with decreasing both. Other strategies suggested include regulating use through pricing, education targeted at a younger audience, as well as providing rehabilitation programs to individuals who already use drugs (Wilkinson et al., 2003).

Lastly, primary health care may play a role in identifying and addressing early psychiatric problems, as well as providing continued care to the already known psychiatric population (Centers for Disease et al., 2019). Recruitment of more health care providers such psychologists, social workers and community care workers dedicated to assist patients with mental illness might be advantageous in remote areas of the country.

Limitations

The authors identified a number of limitations. First, the sample of the study was made up of hospitalized patients. Forensic patients who were at the time of the study integrated with the community were not included. These resulted in a number of patients who have been in the forensic system for longer period being excluded. Secondly, patients' ages were recorded as age at the time of data collection. Provision for recording age at the time of being declared a state patient was not made. The finding would have given a better association of age with being a forensic patient. Providing the age group which needs to be targeted during intervention planning.

Thirdly, retrospective review of clinical files results in difficulties with the availability of data. Missing data of some variables may have influenced statistical significance of the results. Clerking/history taking style, circumstances surrounding admission including mental state of patients to provide information, availability of family members to provide collateral information and illegible handwriting may have negatively impacted on the quality of data. In other instances, there were information discrepancies where different members of the treating team recorded different information. Social work notes were used to verify such discrepancies as the social work department work closely with family members when collecting collateral information.

Lastly, variables developed for the data collecting tool were not comprehensive, as they were limited by the format of hospital records. The format was more suitable for identifying proximal social determinants, while the more distal factors were difficult to measure. A qualitative methodology might provide more extensive and overarching data as compared to the methodology used in this study.

Conclusion

The study identified social determinants of health in patients admitted at Weskoppies hospital using the modified key determinants as set out by the Healthy People 2020 program. It seems that being black, unemployed and being exposed to other adverse social factors leads to being a forensic patient. Empowerment of racially marginalized groups by providing good quality education and support to ensure completion of high

school, curbing drug use as well as providing high standards of mental health services may improve their health outcomes. Partnership between mental health, public health, law & policy makers as well as non-/governmental agencies may lead to change. Amelioration of some of the social determinants of health, as described in the current study, will most likely prevent psychiatric patients from becoming forensic patients. Human rights of individuals with mental illness will thus be enhanced.

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Table 1: Demographic characteristics of male forensic and non-forensic patients admitted at Weskoppies hospital

Characteristics	Patient group (N=296)		P-value
	Forensic [129 (43.6)] n (%)	Non-forensic [167 (56.4)] n (%)	
Age			0.33
19-29	23 (17.8)	31 (18.5)	
30-39	27 (21.0)	35 (21.0)	
40-49	39 (30.2)	36 (21.6)	
≥50	40 (31.0)	65 (38.9)	
Race			<0.01
Black African	118 (91.4)	125 (74.8)	
White	10 (7.8)	33 (19.8)	
Coloured/Indian	1 (0.8)	9 (5.4)	
Marital status			0.67
Single	114 (88.4)	150 (89.8)	
Married	10 (7.8)	9 (5.4)	
Divorced/widowed	5 (3.8)	8 (4.8)	
Employment status			0.02
Employed	13 (10.1)	6 (3.6)	
Unemployed	116 (89.9)	161 (96.4)	
Type of schooling			0.44
Special	10 (8.3)	11 (7.8)	
Mainstream	95 (79.2)	105 (73.9)	
Never schooled	15 (12.5)	26 (18.3)	
Completed grade12			<0.01
Yes	18 (18.8)	45 (42.4)	
No	61 (81.2)	61 (57.6)	
Tertiary Education			0.70
Yes	7 (41.2)	21 (46.7)	
No	10 (58.8)	24 (53.3)	
Previous imprisonment			<0.01
Yes	129 (100)	58 (44.6)	
No	0 (0)	72 (55.4)	

Table 2: Clinical characteristics of male forensic and non-forensic patients admitted at Weskoppies hospital

Characteristics	Patient group		P-value
	Forensic n (%)	Non-forensic n (%)	
Prolonged stay			
Yes	10 (7.8)	73 (43.7)	<0.01
No	119 (92.2)	94 (56.3)	
Number of Diagnosis			
1	111 (86.1)	141 (84.4)	0.66
2	18 (13.9)	24 (14.4)	
3	0 (0.0)	2 (1.2)	
Co-morbidities			
Yes	61 (47.3)	69 (41.3)	0.35
No	68 (52.7)	98 (58.7)	
Drug use			
Yes	95 (73.6)	77 (47.2)	<0.01
No	34 (26.4)	86 (52.8)	
Forensic history			
Yes	129 (100)	58 (34.7)	0.7
No	0	72 (43.1)	
Meds prior admission			
Yes	99 (77.3)	156 (95.1)	<0.01
No	29 (22.7)	8 (4.9)	

Table 3: Dwelling characteristics of male forensic and non-forensic patients admitted at Weskoppies hospital

Characteristics	Patient group		P-value
	Forensic n (%)	Non-forensic n (%)	
Fixed Adobe			
Yes	97 (75.8)	97 (58.4)	<0.01
No	31 (24.2)	69 (41.6)	
Access to drinking water			
Yes	51 (62.2)	65 (49.2)	0.06
n\	31 (37.8))	67 (50.8)	
a			
Access to Sanitation			
Yes	18 (25.7)	51 (39.2)	<0.01
No	21 (30.0)	12 (9.2)	
n\	31 (44.3)	67 (51.6)	
a			
Access to Electricity			
Yes	44 (57.9)	62 (47.3)	0.34
No	1 (1.3)	2 (1.5)	
n\	31 (40.8)	67 (51.2)	
a			

Table 4: Factors associated with being Forensic patient using multivariate logistic regression

Characteristics	Odds Ratio (OR)	95% CI	P-value
Age Categories			
19-29	1.00		
30-39	1.38	.48 - 3.92	0.54
40-49	2.98	1.04 - 8.54	0.04
≥50	1.70	.61 - 4.70	0.31
prolonged stay			
no	1.00		
yes	0.15	.06 - .38	<0.01
Race			
Black African	1.00		
White	0.27	0.09 - .79	0.02
Coloured/Indian	0.17	0.02 - 1.89	0.15
Completed grd12			
no	1.00		
yes	0.30	.14 - .66	<0.01
Drug use			
no	1.00		
yes	2.49	1.17 - 5.30	0.02
Meds prior admission			
no	1.00		
yes	0.09	.02 - .35	<0.01

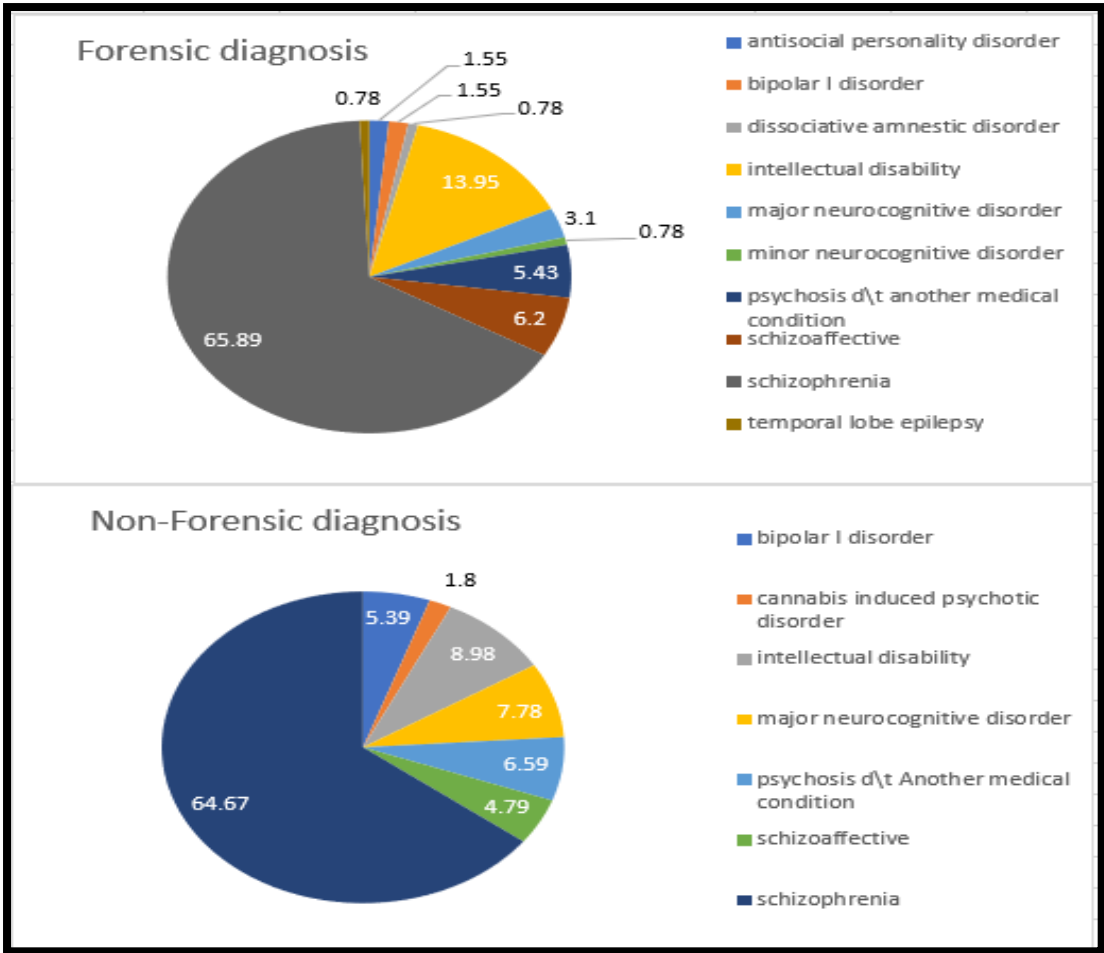


Figure 1: Major diagnosis distributed by patient group

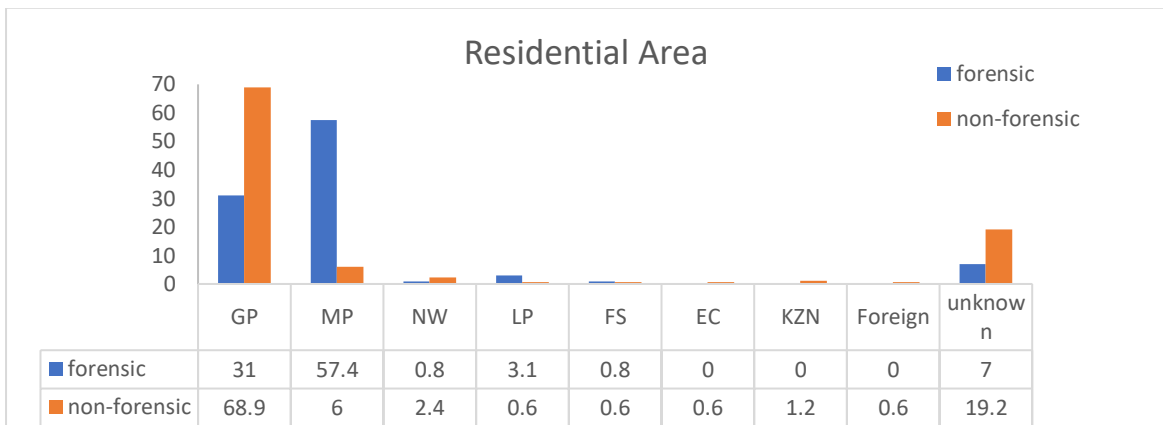


Figure 2: Area of residence.

EC Eastern Cape, FS Free State, GP Gauteng Province, LP Limpopo Province, MP Mpumalanga, NW North West, KZN Kwa-Zulu Natal

Not stated/unknown	0	<input type="checkbox"/>
Special	1	
Mainstream	2	
Never schooled	3	
2.3 Completion of primary, lower secondary and upper secondary education		
Not stated/unknown	0	<input type="checkbox"/>
Never schooled	1	
primary (grade 7)	2	
Lower secondary (grade 9)	3	
Upper secondary (grade 12)	4	
Not applicable	5	
2.4 Dropped out of school before completing grade 12		
Not stated/unknown	0	<input type="checkbox"/>
Yes	1	
No	2	
Not applicable	3	
2.5 Acquired tertiary qualification		
Not stated/unknown	0	<input type="checkbox"/>
Yes	1	
No	2	
3 SOCIAL AND COMMUNITY CONTEXT		
3.1 Forensic history		
3.1.1 Previous forensic history		
Not stated/unknown/does not apply	0	<input type="checkbox"/>
Yes	1	
No	2	
3.1.2 Previous observation		
Not stated/unknown	0	<input type="checkbox"/>
Yes	1	
No	2	
3.1.3 Previous imprisonment		
Not stated/unknown	0	<input type="checkbox"/>
Yes	1	
No	2	
4 HEALTH AND HEALTH CARE		

4.1 Patient on psychiatric medication prior to admission

Yes	1
No	2

5 NEIGHBOURHOOD & BUILT ENVIRONMENT

5.1 Fixed abode

Yes	1
No	2

5.2 Quality of housing

5.2.1 availability of safely managed drinking water services

Not stated/unknown	0
Yes	1
No	2

5.2.2 availability of safely managed sanitation services

Not stated/unknown	0
Yes	1
No	2

5.2.3 access to electricity

Not stated/unknown	0
Yes	1
No	2