

https://dspace.org/

Length of stay and associated factors in patients with schizophrenia and schizoaffective disorder in a specialised psychiatric hospital

Goga, Ladawa Yasese

2021
https://hdl.handle.net/10539/33119

Downloaded from a DSpace repository. https://dspace.org/

LENGTH OF STAY AND ASSOCIATED FACTORS IN PATIENTS WITH SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER IN A SPECIALISED PSYCHIATRIC HOSPITAL

Dr Ladawa Yasese Goga

Supervisor: Dr Belinda Marais

A research report submitted in a submissible format to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Medicine in the branch of Psychiatry

Johannesburg, 2021

DECLARATION

I, Ladawa Yasese Goga, declare that this research report is my own work. It is being submitted in partial fulfilment of the requirements for the degree of Master of Medicine in the branch of Psychiatry. It has not been submitted before for any degree or examination at this or any other University.



_____

2nd August
_____ day of _____ 2021

AUTHORS' CONTRIBUTIONS

L.Y Goga was responsible for data collection and initial draft of the manuscript. B. Marais was the supervisor of the project and contributed to the study design and editing.



_____

2nd August
_____ day of _____2021



_____

2nd August
_____ day of _____2021

DEDICATION

Above all, I would like to dedicate this work to my heavenly Father, as it is by His grace that all things come to be.

To my dearest husband, Dr Everett Nana Kwame Asante, without your constant support and unfailing love, I would not have come this far. Thank you for always believing in me and inspiring me daily.

To my daughters, Adalia and Jamelia, may you grow to learn that anything is possible if you put your mind to it. Thank you for unknowingly renewing my strength when it was hard to keep going.

To my incredible mother Amanda, my biggest motivator and cheerleader, thank you for being my anchor in life. I am so blessed to be your daughter.

To all my amazing brothers and sisters, including those who are no longer with us, you are my village and I thank God for each one of you every day. Your love and support has carried me throughout this journey and I thank you from the bottom of my heart.

To my Papa in heaven, Alphonse GOGA LINGO WA DONDO, I know that you are still with me and my desire to make you proud still drives me. Thank you for the lessons. I miss you.

Ya Papy, this one is for you.

PRESENTATIONS

This work has never been presented at a congress or any academic programme.

AUTHOR GUIDELINES FOR THE SOUTH AFRICAN JOURNAL OF PSYCHIATRY

The guidelines for submission of original research articles to the South African Journal of Psychiatry are the following:

Word limit	3000-4000 words (excluding the structured abstract and references)
Structured abstract	250 words to include a Background, Aim, Setting, Methods, Results and Conclusion
References	60 or less
Tables/Figures	No more than 7 Tables/Figure
Ethical statement	Should be included in the manuscript
Compulsory supplementary file	Ethical clearance letter/certificate

ABSTRACT

Background: Patients with schizophrenia and schizoaffective disorder often require long admissions. There exists a progressive shortage of beds in South African psychiatric hospitals and investigating current length of stay (LOS) trends is necessary to better inform future health system planning.

Aim: To explore LOS and associated factors of patients with schizophrenia and schizoaffective disorder, at a public sector specialised psychiatric hospital, over a 4-year period.

Setting: The study was conducted at Tara Hospital, in Johannesburg, South Africa.

Methods: A retrospective record review of 367 adult schizophrenia and schizoaffective disorder patients was conducted. Average LOS was calculated and the proportion of short-stay (<30 days), medium-stay (31-90 days) and long-stay (>90 days) admissions determined. Further data was collected, from a randomly selected subset of patients in each LOS category, regarding sociodemographic, clinical and admission outcome factors.

Results: Mean LOS was 128 days (median 87, IQR 49-164, range 0-755 days). A significantly greater proportion of patients had long-stay admissions ($p<0.001$). Male gender ($p=0.018$), being unmarried ($p=0.006$), treatment resistant ($p<0.001$) and on clozapine ($p=0.009$) were factors found to have a significant association with long-stay admissions. Overall, rates of unemployment (>80%), comorbid substance use disorders (>40%), medical illnesses (>40%), antipsychotic polypharmacy (>40%) and readmissions (>80%) were high. Of those with treatment resistance, approximately half were discharged on clozapine. Most (>80%) were discharged home, despite psychiatric residential placement being recommended.

Conclusion: Long-stay admissions were frequently required for patients with schizophrenia and schizoaffective disorder admitted to Tara Hospital. More research is needed into whether increased and improved community-based services such as residential and day-care facilities could translate into shorter admissions, less frequent relapses and improved outcomes in this population.

Keywords: Schizophrenia, schizoaffective disorder, length of inpatient stay, readmission, substance use, placement, deinstitutionalisation

ACKNOWLEDGEMENTS

I am sincerely grateful to my supervisor, Dr Belinda Marais, for her invaluable input and contribution to this project. Thank you for the endless support as well guidance and supervision, without which this work would not be possible.

Thank you to the helpful staff of Tara Hospital and to Professor Neville Pillay for his assistance with the data analysis.

TABLE OF CONTENTS

DECLARATION ..... **ii**

AUTHORS' CONTRIBUTIONS ..... **iii**

DEDICATION ..... **iv**

PRESENTATIONS ..... **v**

AUTHOR GUIDELINES FOR THE SOUTH AFRICAN JOURNAL OF PSYCHIATRY ..... **vi**

ABSTRACT ..... **vii**

ACKNOWLEDGEMENTS..... **viii**

TABLE OF CONTENTS..... **ix**

LIST OF FIGURES ..... **x**

LIST OF TABLES ..... **xi**

LIST OF ABBREVIATIONS..... **xii**

SUBMISSIBLE PAPER **1**

INTRODUCTION 1

Aim and objectives..... 4

RESEARCH METHODS AND DESIGN..... 4

Study design and setting 4

Participants 5

Data collection 5

Statistical analysis..... 5

Ethical considerations..... 6

RESULTS 6

Objective 1..... 6

Objective 2..... 7

Objective 3……8
DISCUSSION……11
Objective 1……11
Objective 2……12
Objective 3……12
Strengths and limitations……15
Implications and recommendations……15
CONCLUSION……16
ACKNOWLEDGEMENTS……16
Competing interests……16
Authors' contributions……16
Funding information……17
Disclaimer……17
REFERENCES……18
APPENDICES……23
Appendix A: Approved Research Protocol……23
Appendix B: Ethics Clearance Certificate……43
Appendix C: Turnitin Report……44

LIST OF FIGURES

Figure 1 Proportion of short-, medium- and long-stay admissions of schizophrenia and schizoaffective disorder patients admitted to Tara Hospital in 2015 to 2018

Figure 2 LOS trend of schizophrenia and schizoaffective disorder patients admitted to Tara Hospital every 6 months from 2015 to 2018

Figure 3 Short-, medium- and long-stay admissions of schizophrenia and schizoaffective disorder patients at Tara Hospital every 6 months from 2015 to 2018

LIST OF TABLES

Table 1 Sociodemographic factors of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018

Table 2 Clinical factors of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018

Table 3 Admission outcomes of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018

LIST OF ABBREVIATIONS

ACT	Assertive community-based treatment
HIV	Human immunodeficiency virus
IQR.	Interquartile range
LOS	Length of stay
Q-Q plot	Quantile-quantile plot
SD	Standard deviation
SMI	Serious mental illness
WITS	University of the Witwatersrand

SUBMISSIBLE PAPER

LENGTH OF STAY AND ASSOCIATED FACTORS IN PATIENTS WITH SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER IN A SPECIALISED PSYCHIATRIC HOSPITAL

INTRODUCTION

Schizophrenia-spectrum disorders are serious mental illnesses (SMIs), often associated with significant morbidity and functional impairment.[1] Those with SMIs are more likely to get hospitalised than the general population, with these patients requiring a notable proportion of healthcare resources.[1] The economic burden of schizophrenia in particular has been found to be significant, with inpatient care comprising most of the direct healthcare costs.[2,3,4]

Schizophrenia accounts for the majority of inpatient psychiatric admissions and has been found to be the most common diagnosis when investigating the profile of long-stay psychiatric patients.[5,6,7] A Brazilian study which reviewed sociodemographic profiles of psychiatric inpatients in 2014 found that 65% had diagnoses of schizophrenia.[8] In a Nigerian study, 86% of long-stay patients had schizophrenia.[7] Fewer studies exist regarding schizoaffective disorder, and this has been attributed to the debate regarding classification of the disorder and its changing diagnostic criteria.[9,10] Nonetheless, schizoaffective disorder has also been associated with longer hospitalisations.[11]

Other factors found to be associated with increased length of stay (LOS) are male gender, ethnicity, unemployment, and accommodation status or homelessness.[5,12] Illness severity in patients with schizophrenia and schizoaffective disorder has been linked to longer hospital admissions, as well as more frequent relapses.[11,13] Treatment resistance is another important factor, as approximately 40% of patients with schizophrenia do not achieve complete remission and have residual positive symptoms.[14] A recent study of schizophrenic forensic inpatients found an association between treatment resistance, in particular persistent psychotic symptoms and

treatment with more than one antipsychotic, and prolonged LOS.[15] Higher antipsychotic doses and more complex drug treatments have also been associated with longer LOS.[11] Substance use has been shown to play a role in LOS, as well as the frequency of relapses and readmissions. A South African study by Botha et al. found that high-frequency mental care users are more likely to admit to lifetime substance use.[16] Cannabis use in particular has been found to predict increased number of subsequent admissions and lead to longer admissions.[17,18] However, a large retrospective record review of psychiatric hospitalisations in Israel found that patients with chronic psychotic disorders and comorbid substance use disorders had shorter average LOS per hospitalisation, as compared to the non-substance users, but a greater number of hospitalisations and total hospital days.[19] Ries et al. similarly found shorter LOS among acutely admitted patients with schizophrenia and comorbid substance use disorders, as opposed to those without, with one of their hypotheses being that substances may briefly intensify symptoms, which quickly resolve following hospitalisation when the substance is stopped.[20] Active medical comorbidity is another factor found to be associated with increased LOS in patients with schizophrenia.[21]

Regarding the trend in length of admission of those with SMI, this differs between developing and developed countries. Though there seems to be a gradual trend of increasing LOS of patients with mental illnesses in developing countries, the LOS for those with SMIs in developed countries has reduced significantly in the last three decades.[6,22] A study conducted in Switzerland found that inpatient time for patients with schizophrenia and schizoaffective disorder was reduced by approximately half between the years of 1977 to 2004, and this reduction was attributed to their much improved community-based care.[23]

Deinstitutionalisation refers to a change in psychiatric care setting from long-term treatment in specialised facilities back to treatment within the community. It first began in the developed world, motivated by various factors such as the poor conditions and human rights violations in some psychiatric institutions, increasing cost of admission and the introduction of effective psychiatric medication.[24] However, whilst deinstitutionalisation may reduce costs by reducing hospital stay, other costs must be considered, such as the cost of developing efficient community-based

services.[25,26] Failure to couple deinstitutionalisation with improved community care has been shown to lead to further problems, namely increased relapses and readmissions, incarcerations, homelessness, increased suicide and mortality rates.[25,27] In South Africa, deinstitutionalisation began in the mid-1990's and advanced quite rapidly, but without adequate development of community psychiatric services and psychosocial rehabilitation facilities.[28,29] This discrepancy was noted in the National Mental Health Policy Framework and Strategic Plan 2013 – 2020.[26] The Life Esidimeni Tragedy of 2016, where 144 mental health care users died as a result of the rapid transfer of patients from the structured environment of those facilities into inadequate non-governmental organisations in the communities, further demonstrated the consequences of a failed and poorly planned attempt at deinstitutionalisation.[29,30] The subsequent Health Ombud's report and recommendations noted that "for deinstitutionalisation to be undertaken properly ... community-based mental health care services must be focused upon, must be resourced and must be developed before the process is started".[29,30] Furthermore, mental health budget allocation deficiencies generally, as well as the disparity between funding of hospital psychiatric services versus community mental health care services have been highlighted as issues needing to be addressed and rectified.[26,28,29]

As LOS impacts on direct hospital costs, it must be considered for financial planning and is an important marker for hospital administrators, among others, as well as health providers.[5,31] Some interventions that may reduce LOS include placement, step-down facilities and transitional care facilities.[32] Community-based rehabilitation facilities, based at primary care level, have been shown to improve functional outcomes in patients with schizophrenia. Assertive community-based treatment (ACT) and modified assertive interventions initiated in in the Western Cape in response to pressure for inpatient beds and crisis (premature) discharge policies, which serve as community-based interventions to reduce length of hospitalisation and readmissions, have proven to be successful.[33]

Whilst community psychiatric services are lacking, there also exists a shortage of specialised psychiatric hospitals, with a reduction of bed numbers over the years. It is thus a necessity to investigate the current trends in LOS of patients with SMI, such

as with schizophrenia and schizoaffective disorder, in South African psychiatric hospitals, in order for effective financial planning and structuring of health systems to occur.

Aim and objectives

This study aimed to explore LOS and associated factors of adults diagnosed with schizophrenia and schizoaffective disorder, admitted to Tara H. Moross Hospital, a specialised psychiatric hospital, over a 4-year period.

The study objectives were:

1. To quantitate length of hospital stay over the study period of 2015 to 2018, and determine the proportion of short-stay (0-30 days), medium-stay (31-90 days) and long-stay (>90 days) admissions.

2. To determine the trend with regards to LOS over the study period.

3. In a subgroup of patients, to explore associated sociodemographic factors, clinical factors and admission outcomes, and determine whether any relationship exists between these factors and the three categories of LOS.

METHOD

Study design and setting

This was a retrospective record review conducted at Tara Hospital, one of only three public sector specialised psychiatric hospitals in Gauteng. Tara Hospital receives referrals from various surrounding acute hospitals in Johannesburg, and provides inpatient and outpatient services. It has both specialised wards (comprising eating disorder, adolescent, child and psychotherapy units) and biological wards (for treatment of adult patients with a primary diagnosis of a SMI requiring medium-term hospitalisation). There are three biological wards, consisting of 80 beds, at Tara Hospital. Referrals are placed on a waiting list for admission, with waiting times

being influenced by the number of referrals, bed pressures at the acute units, as well as inpatient turnaround times, i.e. LOS. Tara Hospital has no formalised policy for crisis (premature) discharges. No assertive community interventions are currently available for patients discharged from public sector hospitals in and around Johannesburg.

Participants

Adult patients diagnosed with schizophrenia or schizoaffective disorder and admitted to any of the biological wards at Tara Hospital during the 4-year study period of 01/01/2015 to 31/12/2018 were included in the study. Patients who were less than 18 years old, still admitted to Tara Hospital at the time of data collection, or where the primary diagnosis was unclear, were excluded.

Data collection

Data regarding LOS (objective 1 and 2) was obtained from the admissions registers (which record date of admission and discharge, and diagnosis) in each of the biological wards. Patients' clinical files (with discharge summaries and clinical notes) were retrieved from the hospital's registry department, to collect data regarding the patient's sociodemographic and clinical factors (objective 3).

Statistical analysis

Data was analysed descriptively using charts and tables. Statistical analyses were conducted in R software (version 3.5.1; www.R-project.org). The normal distribution of the data was checked using the Shapiro–Wilk test and examining Q-Q plots. All data were categorical and non-parametric analyses were conducted. Tests were two-tailed and model significance set at 0.05.

Objective 1: The mean LOS, standard deviation (SD), range, median and interquartile range (IQR) were calculated. Furthermore, the percentage of patients in the total study population that had short-stay, medium-stay and long-stay admissions was reported.

Objective 2: Median and IQR was calculated for every six months over the 4-year study period to determine the trend. Additionally, the proportion of patients that had short-stay, medium-stay, and long-stay admissions was calculated in each 6 month period, and analyzed using chi-squared contingency table analyses to assess whether the proportions of admissions deviated from chance.

Objective 3: Regarding the relationship between sociodemographic and clinical factors and LOS, simple random sampling was used to select an equal number of patients from each of the three LOS categories. Statistical significance was calculated and was expected with a minimum sample of 75 patients. Thus data was collected from a minimum of 25 patient files from each category (short, medium and long-stay). All data were categorical, and a Pearson chi-squared (χ^2) analyses was used to determine whether the distribution of patients in the three LOS groups deviated from chance.

Ethical consideration

Approval was obtained from the University of the Witwatersrand (WITS) Human Research Ethics Committee (clearance no M191192) and Tara Hospital's Research Committee and Chief Executive Officer. All participants were allocated a study number and data was anonymised, thereby ensuring privacy and confidentiality of all patients' personal information.

RESULTS

A total of 367 patients met the inclusion criteria and were included in the study.

Objective 1: Length of stay

The mean LOS was 128.24 days (SD=120.89; range 0-755). Median LOS was 87 days; IQR 45-164.5 days.

The proportion of short-stay, medium-stay and long-stay admissions is shown in Figure 1. A significantly greater percentage of patients had long-stay admissions, followed by medium-stay and then short-stay admissions ($\chi^2_2 = 71.04$, $p < 0.001$).

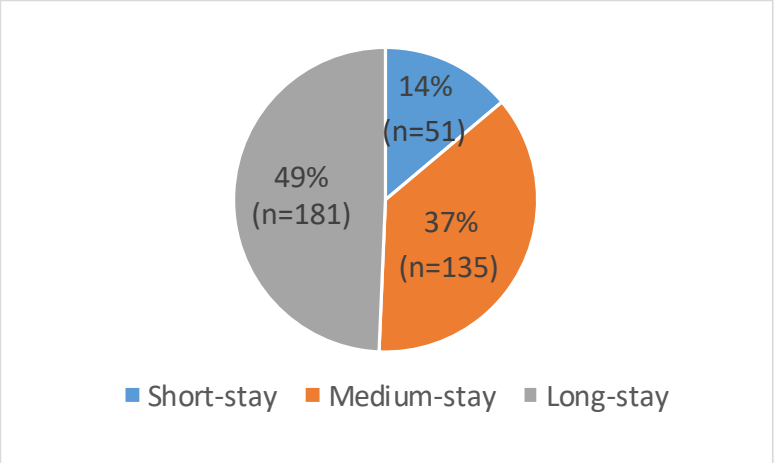


Figure 1. Proportion of short-, medium- and long-stay admissions of schizophrenia and schizoaffective disorder patients admitted to Tara Hospital in 2015 to 2018.

Objective 2: LOS trends

The trend with regards to LOS from 2015 to 2018 is shown in Figures 2. The shortest median stays were in 2015 and the longest median stay was in the second half of 2017. The range was also greatest in 2017. Figure 3 indicates the percentage of patients that had short, medium and long-stay admissions over the course of the study period. A significantly greater percentage had long-stay admissions, and the least had short-stay admissions ($\chi^2_{14} = 91.64$, $p < 0.001$).

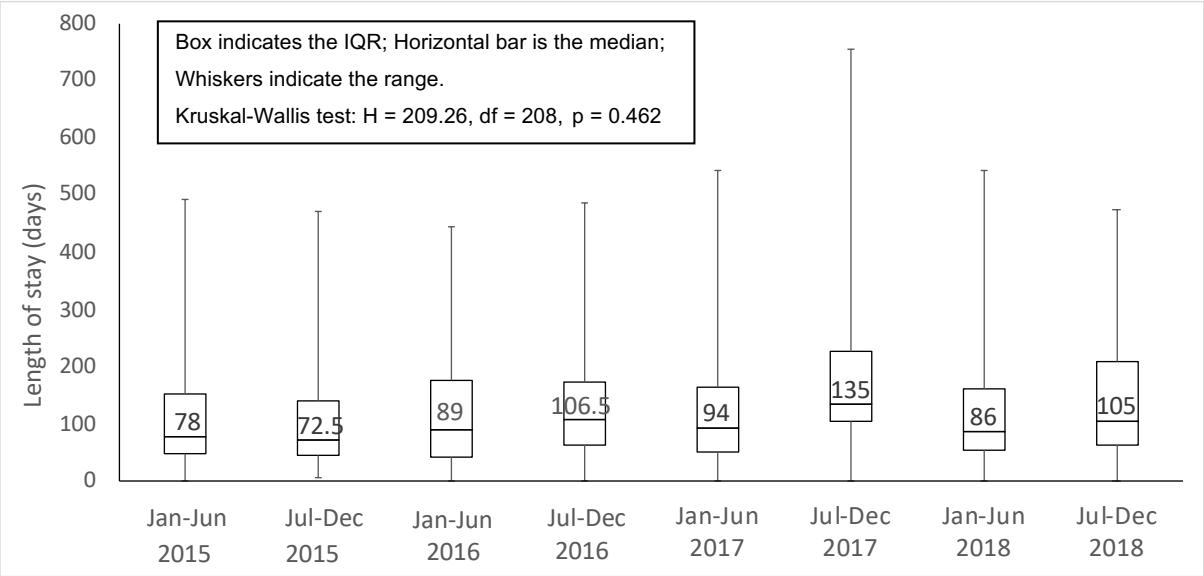


Figure 2. LOS trend of schizophrenia and schizoaffective disorder patients admitted to Tara Hospital every 6 months from 2015 to 2018.

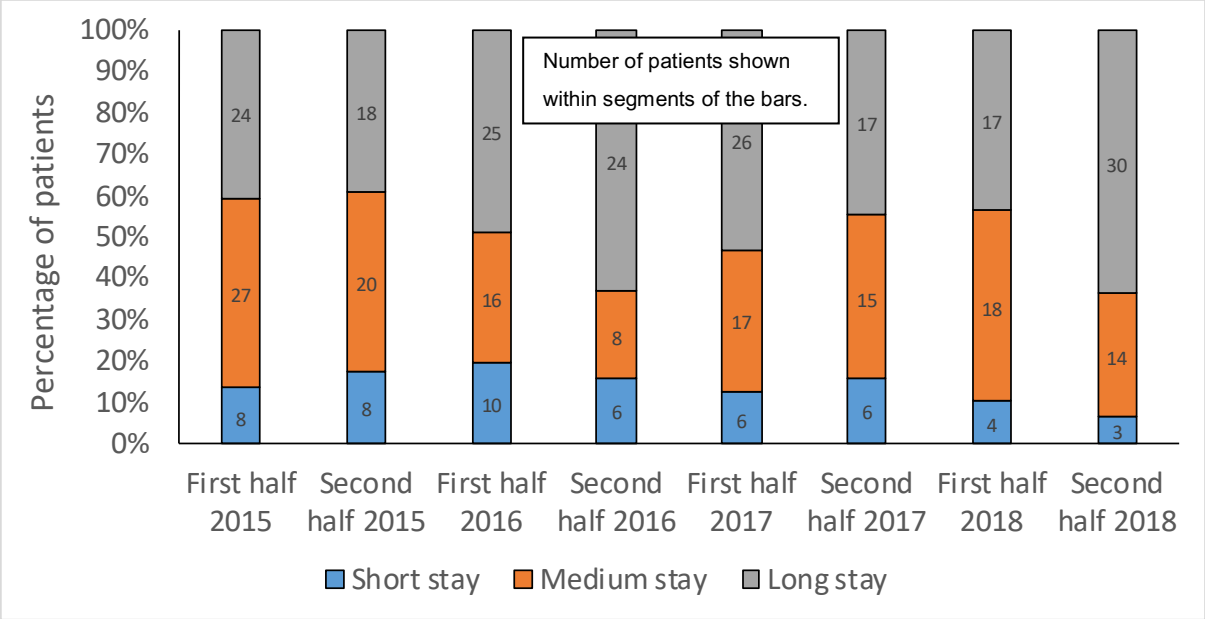


Figure 3. Short-, medium- and long-stay admissions of schizophrenia and schizoaffective disorder patients at Tara Hospital every 6 months from 2015 to 2018.

Objective 3: Socio-demographic and clinical data

Sociodemographic, clinical and admission outcome data was available for 25 short-stay, 26 medium-stay and 25 long-stay patients, and is shown in Tables 1, 2 and 3.

Table 1. Sociodemographic factors of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018.

Sociodemographic factors:		Short-stay (n=25)		Medium-stay (n=26)		Long-stay (n=25)		χ^2 value	p-value
		n	%	n	%	n	%		
Age (years)								χ^2_4 =6.08	0.193
	18-35	10	40	10	38.5	16	64		
	36-50	9	36	10	38.5	8	32		
	>50	6	24	6	23	1	4		
Gender								χ^2_2=8.05	**0.018**
	Male	8	32	14	53.8	18	72		
	Female	17	68	12	46.2	7	28		
Ethnicity								χ^2_6=3.58	0.734
	African	16	64	21	80.8	20	80		
	Caucasian	7	28	4	15.4	3	12		
	Coloured	1	4	1	3.8	1	4		
	Indian	1	4	0	0	1	4		
Nationality								χ^2_6=2.08	0.353
	South African	22	88	25	96.2	21	84		
	Non-South African	3	12	1	3.8	4	16		
Marital status								χ^2_4=14.50	**0.006**
	Married	8	32	2	7.7	0	0		
	Unmarried	16	64	22	84.6	25	100		
	Unknown	1	4	2	7.7	0	0		
Referral source								χ^2_2=1.01	0.604
	Public hospital	24	96	25	96.2	25	100		
	Private	1	4	1	3.8	0	0		
Highest level of education								χ^2_8=9.17	0.328
	No formal schooling	1	4	2	7.7	0	0		
	Primary	6	24	11	42.3	5	20		
	Secondary	11	44	10	38.5	16	64		
	Tertiary	4	16	1	3.8	3	12		
	Unknown	3	12	2	7.7	1	4		
Employment status								χ^2_4=2.48	0.648
	Employed	2	8	2	7.7	3	12		
	Unemployed	23	92	24	92.3	21	84		
	Unknown	0	0	0	0	1	4		

Table 2. Clinical factors of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018.

Clinical factors:		Short-stay (n=25)		Medium-stay (n=26)		Long-stay (n=25)		χ^2 value	p-value
		n	%	n	%	n	%		
Comorbidity:									
- Substance (including alcohol) use disorder								χ^2_2=0.49	0.784
	Yes	12	48	11	42.3	13	52		
	No	13	52	15	57.7	12	48		
- Other comorbid psychiatric disorder								χ^2_2=7.86	**0.020**
	Yes	8	32	11	42.3	2	8		
		3x personality disorders 2x neurocognitive disorders 2x trauma/stressor related 1x anxiety		2 x personality disorders 1 x mood disorder 4 x neurocognitive disorder 4 x other		2x personality disorders			
	No	17	68	15	57.7	23	92		
- Comorbid medical disorder								χ^2_2=1.31	0.5200
	Yes	10	40	13	50	14	56		
		1 x epilepsy; 3 x HIV; 1 x previous head injury; 5 x other medical disorder		1 x diabetes mellitus; 4 x HIV; 8 x hypertension;		4 x diabetes mellitus; 7 x hypertension; 2 x previous head injury; 1 x other medical disorder			
	No	15	60	13	50	11	44		
Illness severity:									
- Number of antipsychotic medications on discharge								χ^2_2=2.47	0.292
	One	13	52	13	50	8	32		
	Two or more	12	48	13	50	17	68		
- Antipsychotic treatment resistance *ie. failed ≥2 antipsychotic trials and/or on clozapine*								χ^2_2=22.09	**<0.001**
	Yes	4	16	9	34.6	20	80		
	No	21	84	17	65.4	5	20		
- Discharged on Clozapine (*)								χ^2_2=9,33	**0.009**
	Yes	2	8	4	15.4	12	48		
- Clozapine resistance *ie. of those on clozapine* (*), *documented residual psychosis on discharge*								χ^2_2=3.00	0.223
	Yes	2	*100*	1	*25*	6	*50*		
	No	0	*0*	3	*75*	6	*50*		
		figures in italics = % of those on clozapine, not of total study population							
- Previous psychiatric admissions (ie. readmission vs first / index admission)								χ^2_2=2.34	0.310
	Yes	21	84	21	80.8	24	96		
	No	4	16	5	19.2	1	4		
- Previously placement								χ^2_2=3.77	0.152
	Yes	0	0	1	3.8	3	12		
	No/Unknown	25	100	25	96.2	22	88		

Table 3. Admission outcomes of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018.

Admission outcomes:	Short-stay (n=25)		Medium-stay (n=26)		Long-stay (n=25)		χ^2 value	p-value
	n	%	n	%	n	%		
Discharged home	20	80	24	92.3	20	80	χ^2_2=1.95	0.337
- Placement however recommended during admission	5	*25*	8	*33*	9	*45*	χ^2_2=1.75	0.416
	figures in italics = % of those discharged home, not total study population							
Discharged to placement	2	8	2	7.7	4	16	χ^2_2=0.84	0.656
Other *ie. transferred to another facility (Sterkfontein Hospital), or discharged in absentia (absconded)*	3	12	0	0	1	4	χ^2_2=3.80	0.150

DISCUSSION

Objective 1

The LOS (median 87 days; IQR 49-164.5; mean 128.24; range 0-755) was increased compared to a previous study done at Tara Hospital, where the median LOS for schizophrenia patients in 2009 was 53 days (IQR 30-94).[5] Increased psychiatric patient numbers in Gauteng have been reported over the years between these two studies, which may have resulted in Tara biological ward referrals being reserved for more severely ill and treatment resistant patients compared to previous years, due to increased pressure for beds and more rapid patient turnaround times in the acute hospitals.[29] In another local study which reviewed the profile of patients, the majority of whom were diagnosed with a primary psychotic disorder, who absconded from Sterkfontein Hospital in 2008, the mean LOS of (non-forensic) patients was 100 days. However, 29% were not returned after absconding and therefore discharged in absentia, rather than due to being well and ready for discharge.[34] A Canadian study conducted between 2005 and 2015 found a mean LOS of 96 days for inpatients with schizophrenia.[17]

Target LOS for medium- to long-stay psychiatric hospitals in South Africa is 180 days according to the Department of Health Norms Manual for Severe Psychiatric Conditions, and as calculated by the World Health Organisation (WHO).[35]

The proportion of patients in this study with long-stay admissions was significantly higher ($p<0.001$) than the other categories of LOS, which was not an unexpected finding considering their clinical profile and also that patients are generally referred to Tara Hospital (as opposed to being discharged from the acute units) when it is anticipated that they will need longer admissions.

Objective 2

Regarding the trend in LOS, the proportion of long-stay admissions was significantly greater ($p<0.001$) in all 4 years of the study. Additionally, LOS figures were lowest in 2015 and higher in subsequent years, though this was not statistically significant. Generally, patients may be suitable to go to placement facilities, where they would receive further psychosocial and functional rehabilitation, sooner than being considered ready for discharge home. Thus the closure of the various Life Esidimeni facilities (2016), which Tara Hospital relies on for placement transfers, may have been a contributing factor.[30] In a previous national situation analysis, according to existing service indicators, the bed/population ratio for medium/long-term psychiatric facilities was 35/100,000 including Life Esidimeni beds, as opposed to 16/100,000 if these beds were excluded.[36] In other words, following the closure of Life Esidimeni there was a significant reduction in available long-term psychiatric beds, placing an additional burden on a medium-term facility such as Tara Hospital.

Objective 3

In terms of sociodemographics, gender and marital status differed significantly between the three categories of LOS, with the long-stay group having the most male (72%; $p=0.018$) and unmarried (100%; $p=0.006$) patients. This is in keeping with a recent British study which examined LOS of psychiatric inpatients and found a positive association between male gender and increased LOS, but not between marital status and LOS.[12] Marital status is a good prognostic factor and associated

with increased social support, with married/cohabitating schizophrenia-spectrum disorder patients having been found to have better quality of life and be less likely to be living alone than single/separated/divorced/widowed patients.[37] Therefore it may be in this study that married patients were more likely to have shorter admissions due to better support and conversely with the unmarried patients. Age, ethnicity, nationality, level of education, employment and referring hospital did not differ significantly between the three categories of LOS in this study. The British study however found a positive association between unemployment and African ethnicity and increased LOS.[12] The lack of a significant association regarding employment status may be explained by the fact that majority of the patients included in this study were unemployed (more than 80% in all groups), which is partly a reflection of the unemployment rates in South Africa, as well as perhaps the severity of their illness. The majority of patients in all categories of LOS were also readmissions. Therefore, high rates of unemployment in all patients may have been expected.

There were high rates (over 40%) of comorbid substance use disorders, in all LOS groups, in keeping with literature which has shown that substance use is common in people with schizophrenia and other psychotic disorders.[38,39,40] Substance use disorders did not however predict a longer LOS in this study. Other psychiatric comorbidites also occur frequently in those with schizophrenia, and this comorbidity is often associated with a more severe illness and poorer outcomes.[40,41] This study's finding of significantly higher rates of other psychiatric comorbidities in the short and medium-stay groups as compared to the long-stay group was therefore unexpected. A possible explanation is that in the long-stay patients, due to greater illness severity and treatment resistance, comorbid psychiatric diagnoses may not have been as easily detected as with the other patients. Rates of personality disorders were similar though in the three groups, consistent with a recent review article which did not find convincing evidence that comorbid personality disorders worsened the course of illness in schizophrenia as opposed to that of other SMIs.[42] Medical comorbidities were common (40-56%) and occurred similarly in all three categories of LOS, with hypertension being most common, followed by HIV and diabetes mellitus. In the long-stay group, hypertension was often comorbid with diabetes. In these patients, this could possibly indicate metabolic syndrome, which can also be associated with dyslipidaemia, being overweight and an increased risk of heart disease. This group

also had the highest rates of treatment resistance (80%), thus were probably on other atypical antipsychotics as well as on clozapine (48%). Metabolic syndrome and other cardiovascular risk factors are highly prevalent in patients with schizophrenia, contributing to an increased risk for premature mortality. In addition to an unhealthy diet, sedentary lifestyle and smoking, atypical antipsychotics can also have a negative impact on cardiometabolic risk factors.[43] Regarding HIV, a large Danish study, of 2.6 million participants over 17 years, concluded that a diagnosis of HIV was associated with a significantly increased risk of developing schizophrenia or an episode of psychosis.[44] The impact of comorbid SMI and HIV, according to a recent review, is unclear, with limited evidence that it is associated with worse clinical outcomes.[45] In this study, HIV was the second most common medical comorbidity with similar distribution in the short and medium-stay groups, but none in the long-stay group. A possible explanation for this may be that the long-stay patients were less sexually active, as a result of having a more severe illness, with more severe negative symptoms and impairments in social functioning or they could possibly have sexual dysfunction secondary to psychotropics.

Regarding severity variables, the long-stay group had the highest percentage of patients on antipsychotic polypharmacy (68%), but the difference was not statistically significant. The rate of antipsychotic polypharmacy was in fact found to be high in all three groups. This is in keeping with a recent study in India which found a high rate (44%) of antipsychotic polypharmacy, with the most common reason being use of a depot with an oral antipsychotic.[46] The frequency of depot antipsychotic use was not however captured in the current study. Treatment resistance rates were significantly higher in the long-stay group (80%; $p<0.001$) as compared to the other categories of LOS. However only about half of the patients with treatment resistance, in all three groups, were discharged on clozapine. This underutilization of clozapine is in keeping with that described in the literature.[47] Nonetheless the proportion of patients discharged on clozapine was still significantly higher in the long-stay group (48%; $p=0.009$) compared to the other two groups. The difference between groups with regards to clozapine resistance however was not significant, and there were patients discharged with residual psychosis despite treatment with clozapine in all LOS groups. It is estimated in the literature that 40–70% of patients with treatment resistant schizophrenia do not respond to clozapine antipsychotic monotherapy.[48]

Most patients (over 80%) in all LOS groups were readmissions, with the highest rate (96%) in the long-stay group. Multiple relapses are frequent in patients with schizophrenia, and it has been suggested that psychosis may be neurotoxic and that relapses lead to disease progression and impairment of treatment response.[49]

Based on the patients' clinical profile, it is likely that many may have benefitted from referral to residential placement facilities, however the majority were discharged home, in all LOS groups, and not placed. Similarly, the proportion of patients who had previously been admitted to placement facilities was very low. This is indicative of the scarcity of community-based residential care beds in this setting.[36,50] Placement was recommended in 45% of the patients who were discharged home in the long-stay group, and even in the short and medium-stay groups it was recommended for 25% and 33% respectively. In these cases, patient and/or family refusal may have been the reason, but it may also have been due to long waiting lists for placement. To what extent though the shortage of beds at placement facilities, and certainly also the closure of Life Esidimeni, may have contributed to longer hospital admissions cannot be determined from this study.

Strengths and limitations

As with retrospective studies, limitations were related to recordkeeping. Missing information, such as unrecorded diagnoses or missing dates, in the admissions registers resulted in exclusion of patients who may have been eligible for inclusion in the study. Accuracy of the clinical information in patient records may also have been a limitation. Strengths of this study are that it has provided findings in an area where research has been limited.

Implications and recommendations

Ongoing efforts should be made to improve the management of patients with schizophrenia and schizoaffective disorder, including addressing substance use, preventing relapses and increased use of clozapine in treatment resistant patients. Improved community-based services is essential, as well as the need for more published data on step-down facilities in South Africa.[30,51] Such improvements may also provide cost-effective alternatives to admission in psychiatric hospitals, without

negatively impacting on patient outcomes.[52,53] The WHO Mental Health action plan also emphasises the need to provide comprehensive, integrated and responsive mental health and social care services in community-based settings and to strengthen research for mental health.[54]

CONCLUSION

The majority of patients with schizophrenia and schizoaffective disorder had long-stay admissions. Male gender, being unmarried, treatment resistant and on clozapine occurred most frequently in the long-stay group. Overall rates of unemployment, substance, other psychiatric and medical comorbidities, antipsychotic polypharmacy and readmissions were high, and clozapine remains underutilised. Most patients were discharged home, despite placement often being recommended. The shortage of psychiatric residential placement, step-down and transitional care facilities likely impacts on LOS. Further research in this area is required.

ACKNOWLEDGEMENTS

I am sincerely grateful to my supervisor, Dr Belinda Marais, for her invaluable input and contribution to this project. Thank you for the endless support as well guidance and supervision, without which this work would not be possible.

Thank you to the helpful staff of Tara Hospital and to Prof Neville Pillay for his assistance with the data analysis.

Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

L.Y Goga was responsible for data collection and initial draft of the manuscript. B. Marais was the supervisor of the project and contributed to the study design and editing.

Funding information

This research received no specific grant from any funding agency in the public, commercial or non-profit sectors.

Disclaimer

The views and opinions expressed in this article are those of the author(s) and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

REFERENCES

1. Jacobs R, Gutacker N, Mason A, Goddard M, Gravelle H, Kendrick T, et al. Determinants of hospital length of stay for people with serious mental illness in England and implications for payment systems: a regression analysis. BMC Health Serv Res. 2015; 15:439.
2. Kennedy J, Altar C, Taylor D, Degtiar I, Hornberger C. The social and economic burden of treatment-resistant schizophrenia: a systematic review. Int Clin Psychopharmacol. 2014 Mar; 29(2): 63-76.
3. Chong H, Teoh S, Chaiyakunapruk N. Global economic burden of schizophrenia: a systematic review. Neuropsychiatr Dis Treat. 2016; 12: 357-373.
4. Jo M, Kim HJ, Rim SJ, Lee MG, Kim CE. The cost-of-illness trend of schizophrenia in South Korea from 2006 to 2016. PloS ONE. 2020 Jul; 15(7): e0235736.
5. Otieno FA. 2010. Length of stay and the influence of specific factors at Tara the H Moross centre [research report]. Johannesburg: University of the Witwatersrand.
6. Addisu F, Wondafrash M, Chemali Z, Dejene T, Tesfaye M. Length of stay of psychiatric admissions in a general hospital in Ethiopia: A retrospective study. Int J Ment Healt. 2015; 9:13.
7. Taiwo H, Ladapo O, Aina OF, Lawal RA, Adebiyi OP, Olomu SO, et al. Long stay patients in a psychiatric hospital in Lagos, Nigeria. Afr J Psychiatry. 2008; 11:128-132.
8. Soria D, Marcellini PS. Sociodemographic profile of psychiatric inpatients at a center of mental health care in Brazil. Eur Psychiatry. 2014 Mar; 29(2): 63-76.
9. Singh R, Subramaney U. Schizoaffective Disorder in an acute psychiatric unit. S Afr J Psychiat. 2016; 22(1):a790.
10. Miller JN, Black DW. Schizoaffective disorder: A review. Ann Clin Psychiatry. 2019 Feb; 31(1):47-53.
11. Masters GA, Baldessarini RJ, Öngür D, Centorrino F. Factors associated with length of psychiatric hospitalization. Compr Psychiatry. 2014 Apr;55(3):681-7.
12. Newman L, Harris V, Evans L, Beck A. Factors associated with length of stay in psychiatric inpatient services in London, UK. Psychiatr Q. 2018 Apr 03; 89: 33-43.
13. Tulloch AD, Fearon P, David AS. The determinants and outcomes of long-stay psychiatric admissions. Soc Psychiat Epidemiol. 2008 Mar; 43, 569–574.
14. Sadock BJ, Sadock VA, Ruiz P. Synopsis of Psychiatry: Behavioral sciences/clinical psychiatry.11th ed. Philadelphia: Wolters Kluwer; 2015.

15. Gosek P, Kowska J, Rowinska-Garbien E, Dariusz B, Heitzman J. Treatment resistance and prolonged length of stay among schizophrenia inpatients in forensic institutions. Psychiatr Res. 2021 Apr; 298: 113771.
16. Botha UA, Koen L, Joska J, Parker JS, Horn N, Hering LM, Oosthuizen PP. The revolving door phenomenon in psychiatry: Comparing low-frequency and high-frequency users of psychiatric inpatient services in a developing country. Soc Psychiatry Psychiatr Epidemiol. 2009 Jun;45. 461-8.
17. Chen S, Collins A, Anderson K, Mckenzie K, Kidd S. Patient characteristics, length of stay, and functional improvement for schizophrenia spectrum disorders: a population study of inpatient care in Ontario 2005 to 2015. Can J Psychiatry. 2016 Dec; 62 (12): 854-863.
18. Patel R, Wilson R, Jackson R, Ball M, Shetty H, Broadbent M, et al. Association of cannabis use with hospital admission and antipsychotic treatment failure in first episode psychosis: An observational study. Br Med J.2016; 6:e009888.
19. Florentin S, Rosca P, Raskin S, Bdolah-Abram T, Neumark Y. Psychiatric Hospitalizations of Chronic Psychotic Disorder Patients With and Without Dual Diagnosis, Israel, 1963-2016. J Dual Diagn. 2019 Jul-Sep;15(3):130-139.
20. Ries RK, Russo J, Wingerson D, Snowden M, Comtois KA, Srebnik D, Roy-Byrne P. Shorter hospital stays and more rapid improvement among patients with schizophrenia and substance disorders. Psychiatr Serv. 2000 Feb;51(2):210-5.
21. Douzenis A, Seretis D, Nika S, Nikolaidou P, Papadopoulou A, Rizos EN, et al. Factors affecting hospital stay in psychiatric patients: The role of active comorbidity. BMC Health Serv Res. 2012;12:166.
22. Babalola O, Gomez V, Alwan NA, Johnstone P, Samson S. Length of hospitalisation for people with severe mental illness (Review). Cochrane Database Syst Rev. 2014; 1: art n CD000384.
23. Lay B, Nordt C, Rossler W. Trends in psychiatric hospitalisation of people with schizophrenia: A register based investigation over the last three decades. Schizophr Res. 2007; 97:68-78.
24. Salisbury TT, Killaspy H, King M. An international comparison of the deinstitutionalisation of mental healthcare: Development and findings of the Mental Health Services Deinstitutionalisation Measure (MENDit). BMC Psychiatry. 2016;16:54.
25. Sukeri K. Regional aspects of long-term public sector psychiatry in the Eastern Cape. S Afr J Psychiat. 2017; 23(0): a992.
26. South African Department of Health. National mental health policy framework and strategic plan 2013-2020. Pretoria: Government Printer. 2012. Available from:

https://www.health-e.org.za/wp-content/uploads/2014/10/National-Mental-Health-Policy-Framework-and-Strategic-plan-2013-2020.pdf. [accessed 05.03.2019]
27. Lazarus R. Managing de-institutionalisation in a context of change: The case of Gauteng, South Africa. S Afr Psychiatry Rev. 2005 May; 8:65-69.
28. Lund C, Peterson I, Kleintjies, Bhana A. Mental health services in South Africa: taking stock. Afr J Psychiatry. 2012 Nov;15: 402-405.
29. Robertson LJ, Janse van Rensburg B, Talatala M. Unpacking Recommendation 16 of the Health Ombud's report on the Life Esidimeni tragedy. S Afr med j. 2018 May; 108(5).
30. South Africa. 2017. Office of the Health Ombud. The report into the circumstances surrounding the deaths of mentally ill patients: Gauteng Province. Available: http://www.section27.org.za/wp-content/uploads/2016/04/Life-Esidimeni-FINALREPORT. pdf [accessed 07.08.2018]
31. Ithman MH, Gopalakrishna G, Beck NC, Das J, Petroski. Predictors of length of stay in an acute psychiatric hospital. J Biosafety Health Educ. 2014; 2:2.
32. Botha UA, Coetzee M, Koen L, Niehaus DJH. An attempt to stem the tide: Exploring the effect of a 90-day transitional care intervention on readmissions to an acute male psychiatric unit in South Africa. Arch Psychiatr Nurs. 2018;32:384-389.
33. Botha U, Koen L, Galal U, Jordaan E. The rise of assertive community interventions in South Africa: A randomised control trial assessing the impact of a modified assertive intervention on readmission rates: a three year follow-up. BMC Psychiatry. 2014 Feb;14(1): 56.
34. Arbee F. A retrospective record review of mental health care users who abscond from a psychiatric hospital [dissertation]. Johannesburg: University of the Witwatersrand; 2014.
35. South African Department of Health. Norms manual for severe psychiatric conditions. Pretoria: Government Printer. 2015. Available from: https://www.health.gov.za/index.php/shortcodes/2015-03-29-10-42-47/2015-04- 30-08-29-27/mentalhealth. [accessed 16. 06. 2018]
36. Lund C, Flisher AJ. Norms for mental health services in South Africa. Soc Psychiatry Psychiatr Epidemiol. 2006 Jul;41(7):587-94.
37. Nyer M. Kasckow J, Fellows I, Lawrence EC, Golshan S, Solorzano E et al. The relationship of marital status and clinical characteristics in middle-aged and older patients with schizophrenia and depressive symptoms. Ann Clin Psychiatry. 2010 Aug: 22 (3): 172-9.

38. Crockford D, Addington D. Canadian Schizophrenia Guidelines: Schizophrenia and Other Psychotic Disorders with Coexisting Substance Use Disorders. Can J Psychiatry. 2017 Sep; 62(9):624-634.
39. Tumenta T, Oladeji O, Gill M, Khan B, Olayinka O, Ojimba C, et al. Substance use patterns and schizophrenia spectrum disorders: a retrospective study of inpatients at a community teaching hospital. J Clin Med Res. 2020 Dec 18; 12(12): 803-808.
40. Buckley P, Miller B, David J. Psychiatric comorbidities and schizophrenia. Schizophr Bull. 2009 Mar; 35(2): 383-402.
41. Weber N, Cowan D, Milikan A, Niebuhr D. Psychiatric and general medical conditions comorbid with schizophrenia in the national hospital discharge survey. Psychiatr serv. 2009 Aug; 60 (8): 1059-1067.
42. Simonsen E, Newton-Howes G. Personality pathology and schizophrenia. Schizophr Bull. 2018 Nov; 44(6): 1180-1184.
43. DE Hert M, Schreurs V, Vancampfort D, VAN Winkel R. Metabolic syndrome in people with schizophrenia: a review. World Psychiatry. 2009 Feb; 8(1):15-22.
44. Hosein S [Internet]. Schizophrenia and HIV- study underscores serious issues associated with dual diagnosis. Canada: Canada's source for HIV and Hepatitis C information; [updated 2015 Jul 15; cited 2021 Apr 10]. Available from: https://www.catie.ca/en/catienews/2015-07-15/schizophrenia-and-hiv-study-underscores-serious-issues-associated-dual-diagnose.
45. Ebvenyi I, Taylor C, O'Flynn D, Prina A, Passchier R, Mayson R. The impact of comorbid severe mental illness and HIV upon mental and physical health and social outcomes: a systematic review. AIDS care. 2018 Aug; 30(12):1586-1594.
46. Shenoy S, Amrtavarshini R, Bhandary RP, Praharaj SK. Frequency, reasons and factors associated with antipsychotic polypharmacy in schizophrenia: A retrospective chart review in a tertiary hospital in India. Asian J Psychiatr. 2020 Jun;51(102022).
47. Guinart D, Correl C. Antipsychotic polypharmacy in schizophrenia: why not? J Clin Psychiatry. 2020 Jun; 81:3.
48. Lin C, Chan H, Hsu C, Chen F. Temporal trends in clozapine use at time of discharge among people with schizophrenia at two public psychiatric hospitals in Taiwan, 2006-2017. Sci Rep. 2020 Oct 22; 10, 17984(2020).
49. Emsley R. Chiliza B, Asmal L, Harvey B. The nature of relapse in schizophrenia. BMC Psychiatry. 2013 Feb 08; 13, 50(2013).
50. World Health Organisation. Mental health atlas 2017. Geneva: WHO. 2018.
51. Botha HF, Koen L, Niehaus DJH, Vava Y, Moxley K, Botha U. Demographic and clinical profile of patients utilising a transitional care intervention in the Western Cape, South Africa. S Afr J Psychiatr. 2020 Aug 26; 26:1523.

52. Docrat S, Besada D, Cleary S, Daviaud E, Lund C. Mental health system costs, resources and constraints in South Africa: a national survey. Health Policy plan. 2019 Sep; 34(9):706-719.
53. Kinchin I, Russel A, Tsey K, Jago J, Wintzloff T, Meurk C, et al. Psychiatric inpatient cost of care before and after admission at a residential subacute step-up/step-down mental health facility. J Med Econ. 2019 Feb; 22(5):491-498.
54. World Health Organisation. Mental Health action plan 2013. Geneva: WHO.2013.

Appendix A: Approved Research Protocol

LENGTH OF STAY AND ASSOCIATED FACTORS IN PATIENTS WITH SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER IN A SPECIALISED PSYCHIATRIC HOSPITAL

Dr Ladawa Yasese Goga

Student number: 1743050

Degree: Master of Medicine (MMED) in Psychiatry

Supervisor: Dr Belinda Marais

1. INTRODUCTION

Over the last few decades, many countries around the world have made attempts towards deinstitutionalisation. In the mid-20th century, many western European countries started to move the locus of psychiatric care away from psychiatric hospitals and more towards community-based care[1]. This move was motivated by various factors[1]. These included the public growing more aware and uncomfortable with the poor conditions and human rights violations that psychiatric inpatients faced in some institutions, the introduction of effective psychiatric medication and also the increasing cost of admission[1].

Although deinstitutionalisation may reduce costs by reducing hospital length of stay, there are other indirect costs, and thus other important factors for policy-makers to consider, such as the development of efficient community psychiatric care[2]. Failure to couple deinstitutionalisation with improved community care could lead to further problems, as was evident in Denmark where deinstitutionalisation led to increased suicide rates and more mentally ill persons being incarcerated[2]. Some researchers have also suggested a link between deinstitutionalisation and the phenomenon of transinstitutionalisation whereby psychiatric patients who have been moved from one kind of institution then move into another kind of institution[3]. Failure to ensure adequate community-based facilities may actually result in greater economic and societal costs due to increased relapses, readmissions and even mortality rates. In

2016, South Africa experienced the death of over ninety mental health care users as a result of rapid transfer of patients from the structured environment of Life Healthcare Esidimeni into inadequate non-governmental organisations in the communities[4]. These examples of challenges around deinstitutionalisation highlight the need for careful planning by policy-makers and other stakeholders, as well as the importance of admission-related data such as the one this study aims to produce.

Length of admission does impact on direct hospital costs, and thus is an important issue to consider for financial planning among other reasons[5]. Length of stay is usually investigated broadly across all psychiatric diagnoses, but this study will focus on schizophrenia and schizoaffective disorder.

Schizophrenia-spectrum disorders fall within the category of serious mental illnesses (SMIs), along with severe bipolar disorder and severe major depressive disorder[6]. SMIs include a range of chronic and often disabling conditions, which result in functional impairment and are associated with significant morbidity, as well as mortality[6]. Schizophrenia is one of two diseases that is estimated to constitute 1.5% of the total Disability Adjusted Life Year Burden of disease in the United Kingdom in 2010[6]. People suffering from a SMI are more likely to be hospitalised than the general population and this is due to various factors including their increased risk for physical co-morbidities[6]. Therefore, there exists an association between SMI and increased costs of treatment, as this particular patient group forms a notable proportion of the distribution of health care resources[6]. Schizoaffective disorder is another chronic primary psychotic disorder, which is also severely disabling and associated with functional impairments, though this is not a diagnostic criterion as it is with schizophrenia[7]. Poor diagnostic reliability and stability has also previously been reported with schizoaffective disorder, particularly with earlier versions of the Diagnostic and Statistical Manual of Mental Disorders (DSM), where the separation between schizophrenia with mood symptoms and schizoaffective disorder may not have been as clear as it is hoped it will now be with the DSM-5[7].

1.1 Aim

The aim of this study will be to conduct a clinical audit of adults diagnosed with schizophrenia and schizoaffective disorder, with regards to length of stay and

associated factors, who were admitted to Tara the H. Moross Hospital, a medium-term specialist psychiatric hospital located in Hurlingham, Johannesburg.

1.2 Hypothesis

My hypothesis is that the length of stay of patients with schizophrenia and schizoaffective disorder in a medium-term psychiatric hospital in increasing with time.

2. LITERATURE REVIEW

(i) Trends in length of admission of patients with schizophrenia and schizoaffective disorder in developing countries

Schizophrenia is a chronic mental illness whose natural course is frequently characterised by psychosis that usually leads to the patient being hospitalised at some point in their lives[8]. Schizoaffective disorder is a disorder that has features of both schizophrenia and mood disorders and patients with this disorder also often require hospitalisation as the clinical course is similar to schizophrenia[9].

The length of stay of patients in psychiatric hospitals has been a focus of attention for a long time. This has become even more relevant in recent years with the current economic climate and a growing realisation that health care costs need to be contained. Length of stay has a strong positive correlation with the cost of hospitalisation[10]. Therefore, it has become an important marker for hospital administrators, third party payers, patients, as well as community health providers[10].

A study conducted at Tara the H. Moross Hospital in 2010 determining the length of stay of all psychiatric patients concluded that the patients with the longest length of stay had a referral diagnosis of schizophrenia[5]. The median length of stay of patients with schizophrenia in this study was 53 days (interquartile range 30-94 days), with the maximum length of stay being 307 days[5]. This was the highest of all the diagnoses in the hospital at the time of the study.

There seems to be a gradual trend of increasing length of admission of patients with mental illness in third world countries[11]. A 10-year retrospective chart review conducted in a general hospital in Ethiopia concluded that patients with the diagnosis of schizophrenia and other psychotic disorders accounted for the longest admissions[11]. Schizophrenia and other psychotic disorders were the most common discharge diagnoses overall[11]. Some of the important factors that influenced the long length of stay were medication-induced extra-pyramidal side-effects, poor financial circumstances and the diagnosis of the patient[11]. This same study also highlighted the crucial need for future studies in this area, as there is a marked scarcity of such data that is collected in third-world countries, and especially in Africa.

In 2007, Taiwo et al. carried out a cross-sectional study at a psychiatric hospital in Lagos, Nigeria, investigating the clinical profiles of long-stay patients with a view of discharging them to relieve the heavy burden on strained hospital facilities and to create beds for new admissions[12]. They found that 86.3% of the subjects had the diagnosis of schizophrenia, which was similar to findings from previous studies[12]. There is a paucity of data in the literature on the length of stay trends of patients with schizoaffective disorder specifically.

Schizophrenia is known to have a strong association with poor clinical and social outcomes including a high unemployment rate, as well as remaining single or having poor marital adjustment[12]. Schizoaffective disorder is also associated with significant social and occupational dysfunction[13].

(ii) Trends in length of admission of patients with schizophrenia and schizoaffective disorder in developed countries

In high-income countries, over the last three decades, the length of hospital stay for people with serious mental illness has reduced significantly, although notable variation remains[14]. This variation may be larger in low-income countries[14]. Some argue that reduction in hospital stay may lead to ‘revolving door admissions’ and further deterioration in mental health outcomes despite cost savings, whilst others suggest longer admissions may be more damaging by institutionalising people[14].

A 1-year long longitudinal study conducted in Japan reported that of the psychiatric inpatients in Japan in 2014, 62% were patients with schizophrenia, and the majority of these were re-hospitalisations[15]. This illustrates that the heavy disease burden of schizophrenia is similar in both developed and developing countries.

In 2007, an epidemiological study conducted in Zurich, investigated the use of in-patient psychiatric services by people with schizophrenia, compared to that by people with other mental disorders during the period 1977-2004[16]. They concluded that overall, the length of stay in hospital declined from 45 days (median) in 1977 to 17 days in 2004[16]. For schizophrenia patients, as well as patients with other psychotic disorders, inpatient time was reduced approximately by half (schizophrenia: from 47 to 23 days; schizoaffective disorder: from 48 to 23 days)[16]. While the proportion of inpatient use by people with schizophrenia dropped from 40% to 20%, the proportion of inpatient use by patients with 'affective', 'substance use', and 'other disorders' increased[16]. The readmissions were mostly due to non-schizophrenia disorders and the researchers attributed this decreased need for inpatient care of patients with schizophrenia to much improved community based care targeted at patients with schizophrenia[16]. As was the case in other European countries, Switzerland had restructured its mental health and social services in order to prevent long-term hospitalisation and to encourage less restrictive community-based treatment[16].

A retrospective study published in 2016 revealed that Czech Republic psychiatric hospitals have excessively long average length of inpatient treatment for schizophrenia, schizotypal and delusional disorders, which was as high as 103 days in 2006 and 115 days in 2012[17]. Although the types of psychiatric hospitals were not specified in the study (acute, medium or long-term psychiatric hospitals), the reported average of 115 days in 2012 was more than double the 53 day average length of stay of patients with schizophrenia at Tara Hospital in 2010 as reported by Dr Otieno[5]. However there is a marked lack of studies conducted in developing or African countries that span over many years as the ones described above.

Although there is also a paucity of data on the length of stay of patients with schizoaffective disorder in developed countries, there is evidence that the prognosis

of schizoaffective disorder is slightly better than that of schizophrenia[18]. A 2014 Italian study conducted at the University of Cagliari compared the long-term outcome of patients with schizoaffective disorder and of those with schizophrenia. It was found that outcome measures were mildly better in the DSM-IV-TR schizoaffective group with clinical remission rates being 43.5% in the schizophrenia group and 54.5% in the schizoaffective group[18]. However, despite the better remission rates in the schizoaffective group, it was found that they had a more complicated course, with significantly more frequent hospitalisations and suicidality relative to the schizophrenia group[18]. The authors further noted the differences in previous literature with regards to the prognosis of schizoaffective disorder, and highlighted the challenge with regards to the lack of diagnostic stability and reliability of this disorder[18]. Nonetheless, despite the differences in the remission rates found in the above-mentioned Italian study, the results still indicate that both these illnesses have relatively poor prognosis.

(iii) Clinical factors associated with length of stay of patients with schizophrenia and schizoaffective disorder

Many of the studies conducted around the hospitalisation of patients with schizophrenia and schizoaffective disorder have identified some clinical factors that may play a role in extending the length of stay of these patients. It is important to note some of these factors in order to fully appreciate the different trends of hospitalisation of patients with schizophrenia and schizoaffective disorder in different settings.

In terms of demographic and socioeconomic factors, the 2010 study at Tara Hospital concluded that there was no significant association between age, as well as marital status, and average length of stay[5]. Ethnicity, employment status, referral source and referral diagnosis however showed significant relationships with average length of stay, with those who were African, unemployed, referred from public tertiary hospitals, and had a diagnosis of schizophrenia having the longest average length of stays[5]. This study divided the psychotic disorders into ‘schizophrenia’ and ‘psychosis’, the latter including all the other psychotic disorders that are not

schizophrenia. Schizoaffective disorder was not listed independently but was included in the 'psychosis' group, which had an median length of stay of 39 days[5].

The factors associated with the length of stay of patients with schizoaffective disorder have generally not been well documented. According to a South African study conducted at Helen Joseph Hospital in 2015 by R. Singh and U. Subramaney, which reviewed the profile of patients with schizoaffective disorder in an acute psychiatric unit, some of the reasons for this lack of epidemiological data were noted to be the poor diagnostic reliability and stability, as well as changing diagnostic criteria of schizoaffective disorder[19]. This study did however find that females predominated amongst those with schizoaffective disorder, which was in keeping with other studies[19]. Most of the patients were also unemployed, unmarried and on disability grants, which suggested social as well as occupational dysfunction[19]. It was however noted that the available literature was inconsistent in predicting outcomes in patients with schizoaffective disorder[19].

Factors such as medical co-morbidities and substance use may both play a role in length of stay of patients with schizophrenia and schizoaffective disorder. It has been reported that up to 50% of patients with schizophrenia have chronic medical illnesses such as diabetes, hypertension, obesity and hyperlipidaemia[20]. These medical problems have been linked with a higher burden on psychiatric patients leading to much poorer outcomes of their psychiatric condition, including worsened symptomatology and thus resulting in longer length of stay[20]. A naturalistic study conducted in Attikon General Hospital in Greece concluded that for patients with schizophrenia who had severe comorbid diseases, there was a significant linear positive association with length of stay[20]. A study conducted in England analysing data in a psychiatric hospital from 2006 to 2010 found that a comorbid diagnosis of substance use disorder was associated with a shorter length of stay in patients with a Serious Mental Illness[6]. However, a 2018 Italian study concluded that having a positive cannabis use history on early hospital admission for psychosis predicted an increased number of subsequent readmissions, as well as a longer length of stay in the subsequent 6 years[21].

A 2016 systematic review done by Prof E. Hughes et al. showed that there was a high prevalence of blood-borne infections, specifically HIV, hepatitis B and hepatitis C, in people with serious mental illness[22]. Furthermore, they also documented the paucity of data on this topic. They further emphasised the urgent need for further robust epidemiological research using representative samples of people with serious mental illness to assess the relationship between lifestyle behaviour and risk of infections in order to more fully understand the relationship between serious mental illness and viral infections[22].

Substance use and associated psychiatric disorders are important contributors to the global burden of disease[23]. Patients with schizophrenia and others who are psychosis-prone may be more likely to experience transient positive, negative, and cognitive symptoms following exposure to cannabinoids, and these effects may be greater in magnitude and duration relative to healthy individuals[24].Thus cannabis may act as a significant perpetuating factor and extender of hospital stay[25]. A 2015 observational study conducted in the United Kingdom found that patients who had a history of cannabis use were not only more likely to need compulsory admission to hospital, but were also more likely to have longer admissions[25]. This was attributed to a found association between cannabis and antipsychotic treatment failure[25].

A patient's individual response to treatment is also an important clinical factor. About 10-60% of patients with schizophrenia will achieve complete remission[9]. The other 40% will improve while still demonstrating some positive symptoms, and may be classed as "treatment resistant" (if failed 2 or more trials of antipsychotics)[9]. Therefore these patients may remain impaired and need long-term hospitalisations.

(iv) Norms and ideals for average length of stay in a South African specialised psychiatric hospital such as Tara Hospital

Tara Hospital is located in Johannesburg and is one of three public sector specialised psychiatric hospitals in Gauteng province. The hospital renders specialised medium-term inpatient and outpatient services to adults and children with serious mental illness[26].The World Health Organisation calculates a total period of 180 days as the average length of stay for patients with non-affective psychosis and

affective disorders in a medium-long-term psychiatric hospital[27]. In the 2010 study done at Tara Hospital, the overall median length of stay for all patients admitted to the hospital was 49 days, with the interquartile range (IQR) being 29-78 and the range 0-307[5]. Regarding length of stay in patients with non-affective psychosis and affective disorders specifically, the following was found in the 2010 Tara study: schizophrenia: median 53 days, IQR 30-94, range 0-307; “psychosis”: median 39 days, IQR 32-81, range 9-149; bipolar disorder: median 50 days, IQR 30-183, range 0-183; depression: median 45 days, IQR 29-65, range 0-163[5]. This was therefore mostly in keeping with the expectation of a medium-term psychiatric hospital, except for some patients with schizophrenia who had admissions of more than 180 days[5].

Currently, mental health service provision in South Africa is marked by a number of features. A situation analysis of the mental health system in South Africa was recently conducted and it revealed that mental health services continue to labour under the legacy of colonial and apartheid era mental health systems, with heavy reliance on psychiatric hospitals, as well as wide variation between provinces in the availability of service resources for mental health[28]. The analysis also revealed that deinstitutionalisation has progressed at a rapid rate in South Africa, without the necessary development of community-based services[28]. This has led to a high number of homeless mentally ill patients, people living with mental illness in prisons (an example of transinstitutionalisation), increased revolving door patterns, as well as the Life Esidimeni tragedies of 2016[4].

However, some efforts have been made to explore ways to improve the management of psychiatric patients in the community, to reduce the rate of relapses and readmissions and to attempt to address challenges faced by hospitals, such as inpatient bed shortages[28]. In the Western Cape, the newly established Assertive Community Treatment (ACT) teams have shown a reduction in inpatient admissions and length of stay among people with severe mental illness, as well as improved user, family, and staff satisfaction[28].

Some interventions that may reduce length of hospital stay include placement, step-down facilities and transitional care facilities[29]. Although a South African study assessing the effect of a transitional care service that included home visits, phone

calls and ongoing psychoeducation for the first 90 days post discharge, found no significant difference in readmission rates[29]. The transitional care service was offered to 60 male patients who were compared to a matched control group. Substance use was high and adherence dropped in both groups[29]. Some patients with serious mental illness may need long term care in a structured environment due to poor capacity of public sector mental health services to accommodate for these patients[2]. This then increases the need for long-term placement[2].

It is thus a necessity to investigate the current trends of length of stay of patients with schizophrenia and schizoaffective disorder in the South African setting, in order for effective financial planning and structuring of health systems to take place. This study will play an important role in the generation of necessary data that may facilitate informed decisions in future systematic and successful deinstitutionalisation in South Africa.

3. STUDY OBJECTIVES

In adults, 18 years and older, with the diagnosis of schizophrenia or schizoaffective disorder, who were admitted to Tara Hospital from 2015 to 2018, the objectives of the study are:

3.1. To quantitate the length of hospital stay over the 4-year study period.

3.2. To determine the trend with regards to length of stay over the 4-year study period (ie. whether remaining constant, increasing or decreasing).

3.3. To explore the sociodemographic and clinical factors, in a subgroup of these patients, and determine whether any relationship exists between these factors and their length of stay. The factors which will be captured will include: demographic, socioeconomic, comorbidity, severity variables, and admission outcomes. All these variables will then be compared between the various categories of admission: short stay (<30 days), medium stay (31-90 days) and long stay (> 90days).

4. METHODS

4.1 Study Design and Setting:

This will be a retrospective study, conducted at Tara Hospital is a public sector specialised psychiatric hospital, and one of only three such hospitals in Gauteng province. It receives referrals from various surrounding acute hospitals in Johannesburg.

Tara Hospital has 141 beds and renders both inpatient and outpatient care to adults and children with mental illness. The hospital consists of nine wards, of which 3 are biological wards consisting of 80 beds[25]. This study will include patients admitted to these biological wards. All of the wards are managed by specialist psychiatrists, with psychiatric registrars rotating through the wards throughout the year as part of their training. All the biological wards have multidisciplinary teams, including occupational therapists, psychologists and social workers.

4.2 Study Population:

Inclusion Criteria:

- All adult patients 18 years old and above admitted at Tara Hospital from 1 January 2015 to 31 December 2018 for any length of time.
- All patients admitted to any one of the biological wards (ward 6, 7, or 8) during the study period.
- All patients with the principal DSM-IV-TR or DSM-5 diagnosis of schizophrenia or schizoaffective disorder, as recorded in each of the biological wards' Admissions Registers.

Exclusion Criteria:

- Patients who may have been admitted to the biological wards during the study period who were under the age of 18 years old at the time of admission.
- Patients whose diagnosis is unclear, conflicting or incomplete as recorded in the Admissions Registers or patients' clinical files.
- Patients who were admitted during the study period, but have not yet been discharged and are still inpatients at Tara Hospital at the time of data collection.

- Adult patients diagnosed with schizophrenia or schizoaffective disorder who were admitted to any of the non-biological wards (for example, the psychotherapy or eating disorder wards) at Tara Hospital, as that would mean that the primary reason for that particular admission was due to a problem other than their diagnosis of schizophrenia or schizoaffective disorder.

5. DATA COLLECTION

The source of data regarding length of stay (ie. objective 1 and objective 2) will be the Admissions Registers in each of the biological wards. These registers record patients' date of admission and date of discharge, as well as their discharge diagnosis. For the objective 3 of the study, the patients' clinical files (with discharge summaries and clinical notes) will be the source of data regarding sociodemographic and clinical factors. The clinical files will be requested from the hospital's Registry Department.

The data for each patient will be collected by the researcher and recorded on a data collection sheet (Appendix 1). Each patient will be assigned a numerical identifying study number to ensure confidentiality. Patient name and hospital number will not be captured on the data collection sheet.

The study method will include three parts:

- The first part will include identifying all patients with the principle diagnosis of schizophrenia or schizoaffective disorder who were admitted to Tara Hospital between 1 January 2015 and 31 December 2018, who meet all of the other study inclusion criteria and none of the exclusion criteria. The admission dates and discharge dates of all these patients will be recorded. The length of stay will be calculated as the difference between the date of discharge and the date of admission. The length of stay of the total study population will be reported in terms of the median, interquartile range and the range. It will then further be reported in terms of categories: the proportion of admissions that were "short stay" (30 days or less), "medium stay" (between 31 and 90 days), and "long stay" (more than 90 days).

- The second part of the study will be to determine the trend with regards to length of stay over the 4-year study period. This will be done by calculating the

median length of stay of patients admitted over every 6 month period: ie. January 2015 to June 2015 (“T1”); July 2015 to December 2015 (“T2”); January 2016 to June 2016 (“T3”); and so on, until the end of the study period July 2018 to December 2018 (“T8”). This will provide eight points of comparison over the study period. Thereafter it may be determined whether a trend exists, and whether average length of hospital stay remained constant, increased or decreased with time over the study period.

- The third part of the study will be to explore the sociodemographic and clinical factors of a subgroup these patients, and determine whether any relationship exists between these factors and the three categories of length of stay, namely “short stay”, “medium stay” and “long stay”. The factors which will be captured will include both dependent variables (length of stay) and independent variables (demographic, socioeconomic, comorbidity, severity variables, and admission outcomes). Demographic data collected will be the patients’ age on admission, gender, ethnicity, nationality, marital status and referral source. Socioeconomic variables will include highest level of education and employment status. Comorbidity variables will include both psychiatric and non-psychiatric (ie. medical) comorbidities. Severity variables will capture whether the patient was discharged on more than one antipsychotic medication, treatment resistance (documentation of previous failed trials of two or more antipsychotics, and/or on clozapine), clozapine resistant (residual psychotic symptoms reported on discharge despite treatment with clozapine), number of episodes (index vs. readmission), and whether the patient was previously admitted to a placement facility. Admission outcome variables will include whether the patient was discharged or transferred to a placement facility, or if the patient was discharged home. Of the patents discharged home, it will also be determined whether at some point during the admission placement had been recommended and/or applied for, but then for some reason the patient was discharged home.

Sampling strategy for this part of the study (ie objective 3): Simple random sampling will be used. Statistical significance can be expected with a minimum sample of 75 patients, thus data will be collected from a minimum of 75 patient clinical files.

6. DATA ANALYSIS

The data will be analysed descriptively as follows: categorical data will be described with pie charts and continuous data with bar charts and scatterplots. Statistical analyses will be conducted in R software (version 3.5.1; www.R-project.org). The normal distribution of the data will be checked using the Shapiro–Wilk test and examining Q-Q plots.

Regarding the first objective of the study, which is to quantitate the length of hospital stay for patients with schizophrenia and schizoaffective disorder, the mean, standard deviation and range for the length of time will be calculated. In addition, median and interquartiles will be calculated for comparisons with other studies. Furthermore, length of stay data will also be reported according to the percentage of patients in the total study population that had “short stay” admissions (0-30 days), “medium stay” admissions (31-90 days) and “long stay” admissions (more than 90 days).

For the second objective of the study, determining the trend with regards to length of hospital stay. This will be done by calculating the median and interquartile ranges for the length of stay of patients admitted over every 6 month period: ie. January 2015 to June 2015 (“T1”); July 2015 to December 2015 (“T2”); January 2016 to June 2016 (“T3”); and so on, until the end of the study period July 2018 to December 2018 (“T8”). In addition, the proportion of patients that were short stay/ medium stay/ long stay will be calculated. These proportions will be analysed using chi-squared contingency table analyses to assess whether the proportions of admissions deviates from chance.

Regarding the third objective of the study, to determine, in a randomly selected subgroup of the patients, whether a relationship exists between the sociodemographic and clinical factors of study patients and the three length of stay categories (namely short stay, medium stay and long stay), the following will be done: The demographic, socioeconomic, comorbid and severity for schizophrenia and schizoaffective disorder patients will be analysed for the three length of stay categories (short, medium and long stay). For continuous data (eg. age), t-test analyses will be used (assuming normal data). For categorical data (eg. education),

Pearson chi-squared analyses will be used to assess whether the distribution of patients deviates from chance.

7. ETHICAL CONSIDERATIONS

Permission and ethical clearance to conduct the study will be obtained from the Tara Hospital Research Committee and hospital Chief Executive Officer (CEO), as well as from the University of the Witwatersrand (WITS) Human Research Ethics Committee, and the WITS Department of Health Sciences Postgraduate Assessor Group. This study will be is a retrospective record review and patients will not be actively involved in the study at all. Patients included in the study will all have been discharged from hospital at the time of data collection. Any patients who remain inpatients at the time of data collection will be excluded from the study. Consent will therefore not be required. All patient information will be kept confidential, as each patient will allocated a study number, and identifying data (patients' names and hospital numbers) will not be recorded. All raw patient data will be kept in locked cabinet.

8. LIMITATIONS

The anticipated limitations that have been identified for this study include:

- Reliance on the accuracy of the discharge diagnoses captured in the wards' Admissions Registers, as well as reliance on clinical notes and discharge summaries of patients, which may be problematic if unclear, illegible or incomplete. This being a retrospective study places a great deal of importance on the quality of the clinical records. Clinical notes will have been written by various doctors, with differing levels of experience and clinical skills. This may mean that incorrect diagnoses or inaccurate observations could have been made during the patients' admissions.
- Difficulty in accounting for patients who have had multiple admissions within the study period (2015 - 2018). Any patient who was readmitted within a short period of time since discharge but who had a relatively short length of stay with the subsequent admission may skew the study results.

- Difficulty in accounting for patients who are still admitted in Tara Hospital and have been already been admitted for a long period of time at the time the data is collected.

9. TIME FRAME

	Jan 2019 - Feb 2019	March 2019- April 2019	May 2019 - June 2019	July 2019 - Aug 2019	Sept 2019 - Oct 2019	Nov 2019 - Dec 2019	Jan 2020 - Feb 2020	March 2020 - April 2020	May 2020- June 2020	July 2020
Literature Review	X	X								
Protocol Development			X	X						
Protocol Assessment					X	X				
Ethics Clearance Application						X				
Data Collection							X			
Data Analysis							X			
Research Report Writing								X	X	
Submission										X

10. BUDGET AND FUNDING

Funding for this research study will be provided by the researcher.

Item Description	**Estimated cost:**
Data collection sheet photocopies	R600
Transport (petrol)	R2000
Statistician	Supplied by Wits University
Data Collector	Nil
Total Cost:	**R2600**

11. REFERENCES:

1. Salisbury TT, Killaspy H, King M. 2016. An international comparison of the deinstitutionalisation of mental healthcare: Development and findings of the Mental Health Services Deinstitutionalisation Measure (MENDit). *BMC* Psychiatry16:54.

2. Sukeri K. 2017. Regional aspects of long-term public sector psychiatry in the Eastern Cape. *S Afr J Psychiat* 23(0): a992.

3. Primea A, Bowers TG, Hamson MA, Xuxu. 2013. Deinstitutionalisation of the mentally ill: Evidence for transinstitutionalisation from psychiatric hospitals to penal institutions. *Comprehensive Psychology* 2:2.

4. South Africa. 2017. Office of the Health Ombud. The report into the circumstances surrounding the deaths of mentally ill patients: Gauteng Province. Available: http://www.section27.org.za/wp-content/uploads/2016/04/Life-Esidimeni-FINALREPORT. pdf [accessed 07.08.2018]

5. Otieno FA. 2010. Length of stay and the influence of specific factors at Tara the H Moross centre [research report]. Johannesburg: University of the Witwatersrand.

6. Jacobs R, Gutacker N, Mason A, Goddard M, Gravelle H, Kendrick T, *et al*. 2015. Determinants of hospital length of stay for people with serious mental illness in England and implications for payment systems: a regression analysis. *BMC* Health Serv Res 15:439.

7. Malaspina D, Owen MJ, Heckers S, Tandon R, Bustillo J, Schultz S, *et al*. 2013. Schizoaffective disorder in the DSM-5. *Schizophr Res* 150(1): 21-25.

8. Gorwood P. 2011. Factors associated with hospitalisation of patients with schizophrenia in four European countries. *Euro Psychiatry* 26:224-230.

9. Sadock BJ, Sadock VA, Ruiz P. Synopsis of Psychiatry: Behavioral sciences/clinical psychiatry.11th ed. Philadelphia: Wolters Kluwer; 2015.

10. Ithman MH, Gopalakrishna G, Beck NC, Das J, Petroski. 2014. Predictors of length of stay in an acute psychiatric hospital. *J Biosafety Health Educ* 2:2.

11. Addisu F, Wondafrash M, Chemali Z, Dejene T, Tesfaye M. 2015. Length of stay of psychiatric admissions in a general hospital in Ethiopia: A retrospective study. *Int J Meant Health Sys* 9:13.

12. Taiwo H, Ladapo O, Aina OF, Lawal RA, Adebiyi OP, Olomu SO, *et al*. 2008. Long stay patients in a psychiatric hospital in Lagos, Nigeria*. Afr J Psychiatry* 11:128-132.

13. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Washington DC: American Psychiatric Publishing; 2013.

14. Babalola O, Gomez V, Alwan NA, Johnstone P, Samson S. 2014. Length of hospitalisation for people with severe mental illness (Review). *Cochrane Database Syst Rev 1*: art n CD000384.

15. Shimada T, Nishi A, Yoshida T, Tanaka S, Kobayashi M. 2016. Factors influencing rehospitalisation of patients with schizophrenia in Japan: A 1-year longitudinal study. *Hong Kong J Occup* Th 28:7-14.

16. Lay B, Nordt C, Rossler W. 2007. Trends in psychiatric hospitalisation of people with schizophrenia: A register based investigation over the last three decades. *Schizophr Res* 97:68-78.

17. Winkler P, Mlada K, Krupchanka D, Agius M, Ray MK, Hoschl C. 2016. Long-term hospitalisations for schizophrenia in the Czech Republic 1998-2012. *Schizophr Res* 175:180-185.

18. Pinna F, Sanna L, Perra V, Randaccio RP, Diana E, Carpiniello B. 2014. Long-term outcome of schizoaffectve disorder.2014. Are they any differences with respect to schizophrenia? *Riv Psichiatr* 49(1):41-49.

19. Singh R, Subramaney U. 2016. Schizoaffective Disorder in an acute psychiatric unit. *S Afr J Psychiat* 22(1):a790.

20. Douzenis A, Seretis D, Nika S, Nikolaidou P, Papadopoulou A, Rizos EN, *et al*. 2012. Factors affecting hospital stay in psychiatric patients: The role of active comorbidity. *BMC Health Serv Res* 12:166.

21. Colizzi M, Burnett N, Costa R, De Agostini M, Griffin J, Bhattacharyya S. 2018. Longitudinal assessment of the effect of cannabis use on hospital readmission rates in early psychosis: a 6-year follow-up in an inpatient cohort. *Psychiatry Res* 268:381-387.

22. Hughes E, Bassi S, Gilbody S, Bland M, Martin F. 2016. Prevalence of HIV, hepatitis B and hepatitis C in people with severe mental illness: A systematic review and meta-analysis. *Lancet Psychiatry* 1;3:40-48.

23. Davis GP, Tomita A, Baumgartner JN, Mtshemla S, Nene S, King H. 2016. Substance use and duration of untreated psychosis in Kwazulu-Natal, South Africa. *S Afr J Psychiat* 22(1):a852.

24. D'Souza DC, Sewell RA, Ranganathan M. 2009. Cannabis and psychosis/schizophrenia: Human studies. *Eur Arch Psychiatry Clin Neurosci* 259(7):413-431.

25. Patel R, Wilson R, Jackson R, Ball M, Shetty H, Broadbent M*, et al*. 2016. Association of cannabis use with hospital admission and antipsychotic treatment failure in first episode psychosis: An observational study. *Br Med J* 6:e009888.

26. University of the Witwatersrand [internet]. Specialist Hospitals: Johannesburg; [cited 2019 June 14]. Available from: https://www.wits.ac.za/clinicalmed/departments/psychiatry/clinical-services/specialist-hospitals/. [accessed 21. 02. 2018]

27. South African Department of Health. Norms manual for severe psychiatric conditions. Pretoria: Government Printer. 2015. Available from: https://www.health.gov.za/index.php/shortcodes/2015-03-29-10-42-47/2015-04-30-08-29-27/mentalhealth. [accessed 16. 06. 2018]

28. South African Department of Health. National mental health policy framework and strategic plan 2013-2020. Pretoria: Government Printer. 2012. Available from: https://www.health-e.org.za/wp-content/uploads/2014/10/National-Mental-Health-Policy-Framework-and-Strategic-plan-2013-2020.pdf. [accessed 05.03.2019]

29. Botha UA, Coetzee M, Koen L, Niehaus DJH. 2018. An attempt to stem the tide: Exploring the affect of a 90-day transitional care intervention on readmissions to an acute male psychiatric unit in South Africa. *Arch Psychiatr Nurs* 32:384-389.

Appendix B: WITS Human Research Ethics Committee – Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG	HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research & Post Graduate Affairs)

TO: Dr LY Goga
School of Clinical Medicine
Department of Psychiatry
Medical School
Universitity

E-mail: ladawa111@gmail.com

CC: Supervisor: Dr B Marais <Belinda.Marais@Gauteng.gov.za>
and <HREC-Medical.ResearchOffice@wits.ac.za>

FROM: Iain Burns
Human Research Ethics Committee (Medical)
Tel: 011 717 1252

E-mail: Iain.Burns@wits.ac.za

DATE: 2020/01/16

REF: *R14/49*

PROTOCOL NO: **M191192** *(*This is your ethics application study reference number. Please quote this reference number in all correspondence relating to this study*)*

PROJECT TITLE: *Length of stay and associated factors in patients with schizophrenia and schizoaffective disorder in a specialised psychiatric hospital*

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to the Government funding of the University.

MSWorks2000/Iain0007/Clearscan.wps

Appendix C: Turnitin Report

1743050:Submissible_paper_with_corrections_23_July_2021.docx

by Ladawa Goga

Submission date: 25-Jul-2021 05:50PM (UTC+0200)
Submission ID: 1623767897
File name: 0246f819d36_Submissible_paper_with_corrections_23_July_2021.docx (192.86K)
Word count: 4506
Character count: 25292

SUBMISSIBLE PAPER

LENGTH OF STAY AND ASSOCIATED FACTORS IN PATIENTS WITH SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER IN A SPECIALISED PSYCHIATRIC HOSPITAL

INTRODUCTION

Schizophrenia-spectrum disorders are serious mental illnesses (SMIs), often associated with significant morbidity and functional impairment.[1] Those with SMIs are more likely to get hospitalised than the general population, with these patients requiring a notable proportion of healthcare resources.[1] The economic burden of schizophrenia in particular has been found to be significant, with inpatient care comprising most of the direct healthcare costs.[2,3,4]

Schizophrenia accounts for the majority of inpatient psychiatric admissions and has been found to be the most common diagnosis when investigating the profile of long-stay psychiatric patients.[5,6,7] A Brazilian study which reviewed sociodemographic profiles of psychiatric inpatients in 2014 found that 65% had diagnoses of schizophrenia.[8] In a Nigerian study, 86% of long-stay patients had schizophrenia.[7] Less studies exist regarding schizoaffective disorder, and this has been attributed to the debate regarding classification of the disorder and its changing diagnostic criteria.[9,10] Nonetheless, schizoaffective disorder has also been associated with longer hospitalisations.[11]

Other factors found to be associated with increased length of stay (LOS) are male gender, ethnicity, unemployment, and accommodation status or homelessness.[5,12] Illness severity in patients with schizophrenia and schizoaffective disorder has been linked to longer hospital admissions, as well as more frequent relapses.[11,13] Treatment resistance is another important factor, as approximately 40% of patients with schizophrenia do not achieve complete remission and have residual positive symptoms.[14] A recent study of schizophrenic forensic inpatients found an association between treatment resistance, in particular persistent psychotic symptoms and

treatment with more than one antipsychotic, and prolonged LOS.[15] Higher antipsychotic doses and more complex drug treatments have also been associated with longer LOS.[11] Substance use has been shown to play a role in LOS, and also the frequency of relapses and readmissions. A South African study by Botha et al. found that high-frequency mental care users are more likely to admit to lifetime substance use.[16] Cannabis use in particular has been found to predict increased number of subsequent admissions and lead to longer admissions.[17,18] However, a large retrospective record review of psychiatric hospitalisations in Israel found that patients with chronic psychotic disorders and comorbid substance use disorders had shorter average LOS per hospitalisation, as compared to the non-substance users, but a greater number of hospitalisations and total hospital days.[19] Ries et al. similarly found shorter LOS among acutely admitted patients with schizophrenia and comorbid substance use disorders, as opposed to those without, with one of their hypotheses being that substances may briefly intensify symptoms, which quickly resolve following hospitalisation when the substance is stopped.[20] Active medical comorbidity is another factor found to be associated with increased LOS in patients with schizophrenia.[21]

Regarding the trend in length of admission of those with SMI, this differs between developing and developed countries. Though there seems to be a gradual trend of increasing LOS of patients with mental illnesses in developing countries, the LOS for those with SMIs in developed countries has reduced significantly in the last three decades.[6,22] A study conducted in Switzerland found that inpatient time for patients with schizophrenia and schizoaffective disorder was reduced by approximately half between the years of 1977 to 2004, and this reduction was attributed to their much improved community-based care.[23]

Deinstitutionalisation refers to a change in psychiatric care setting from long-term treatment in specialised facilities back to treatment within the community. It first began in the developed world, motivated by various factors such as the poor conditions and human rights violations in some psychiatric institutions, increasing cost of admission and the introduction of effective psychiatric medication.[24] However, whilst deinstitutionalisation may reduce costs by reducing hospital stay, other costs must be considered, such as the cost of developing efficient community-based

services.[25,26] Failure to couple deinstitutionalisation with improved community care has been shown to lead to further problems, namely increased relapses and readmissions, incarcerations, homelessness, increased suicide and mortality rates.[25,27] In South Africa, deinstitutionalisation began in the mid-1990's and advanced quite rapidly, but without adequate development of community psychiatric services and psychosocial rehabilitation facilities.[28,29] This discrepancy was noted in the National Mental Health Policy Framework and Strategic Plan 2013 – 2020.[26] The Life Esidimeni Tragedy of 2016, where 144 mental health care users died as a result of the rapid transfer of patients from the structured environment of those facilities into inadequate non-governmental organisations in the communities, further demonstrated the consequences of a failed and poorly planned attempt at deinstitutionalisation.[29,30] The subsequent Health Ombud's report and recommendations noted that "for deinstitutionalisation to be undertaken properly ... community-based mental health care services must be focused upon, must be resourced and must be developed before the process is started".[29,30] Furthermore, mental health budget allocation deficiencies generally, as well as the disparity between funding of hospital psychiatric services versus community mental health care services have been highlighted as issues needing to be addressed and rectified.[26,28,29]

As LOS impacts on direct hospital costs, it must be considered for financial planning and is an important marker for hospital administrators, among others, as well as health providers.[5,31] Some interventions that may reduce LOS include placement, step-down facilities and transitional care facilities.[32] Community-based rehabilitation facilities, based at primary care level, have been shown to improve functional outcomes in patients with schizophrenia. Assertive community-based treatment (ACT) and modified assertive interventions initiated in in the Western Cape in response to pressure for inpatient beds and crisis (premature) discharge policies, which serve as community-based interventions to reduce length of hospitalisation and readmissions, have proven to be successful.[33]

Whilst community psychiatric services are lacking, there also exists a shortage of specialised psychiatric hospitals, with a reduction of bed numbers over the years. It is thus a necessity to investigate the current trends in LOS of patients with SMI, such

as with schizophrenia and schizoaffective disorder, in South African psychiatric hospitals, in order for effective financial planning and structuring of health systems to occur.

Aim and objectives

This study aimed to explore LOS and associated factors of adults diagnosed with schizophrenia and schizoaffective disorder, admitted to Tara H. Moross Hospital, a specialised psychiatric hospital, over a 4-year period.

The study objectives were:

1. To quantitate length of hospital stay over the study period of 2015 to 2018, and determine the proportion of short-stay (0-30 days), medium-stay (31-90 days) and long-stay (>90 days) admissions.

2. To determine the trend with regards to LOS over the study period.

3. In a subgroup of patients, to explore associated sociodemographic factors, clinical factors and admission outcomes, and determine whether any relationship exists between these factors and the three categories of LOS.

METHOD

Study design and setting

This was a retrospective record review conducted at Tara Hospital, one of only three public sector specialised psychiatric hospitals in Gauteng. Tara Hospital receives referrals from various surrounding acute hospitals in Johannesburg, and provides inpatient and outpatient services. It has both specialised wards (comprising eating disorder, adolescent, child and psychotherapy units) and biological wards (for treatment of adult patients with a primary diagnosis of a SMI requiring medium-term hospitalisation). There are three biological wards, consisting of 80 beds, at Tara

the total study population that had short-stay, medium-stay and long-stay admissions was reported.

Objective 2: Median and IQR was calculated for every six months over the 4-year study period to determine the trend. Additionally, the proportion of patients that had short-stay, medium-stay, and long-stay admissions was calculated in each 6 month period, and analyzed using chi-squared contingency table analyses to assess whether the proportions of admissions deviated from chance.

Objective 3: Regarding the relationship between sociodemographic and clinical factors and LOS, simple random sampling was used to select an equal number of patients from each of the three LOS categories. Statistical significance was calculated and was expected with a minimum sample of 75 patients. Thus data was collected from a minimum of 25 patient files from each category (short, medium and long-stay). All data were categorical, and a Pearson chi-squared (χ^2) analyses was used to determine whether the distribution of patients in the three LOS groups deviated from chance.

Ethical consideration

Approval was obtained from the University of the Witwatersrand (WITS) Human Research Ethics Committee (clearance no M191192) and Tara Hospital's Research Committee and Chief Executive Officer. All participants were allocated a study number and data was anonymised, thereby ensuring privacy and confidentiality of all patients' personal information.

RESULTS

A total of 367 patients met the inclusion criteria and were included in the study.

Objective 1

The mean LOS was 128.24 days (SD=120.89; range 0-755). Median LOS was 87 days; IQR 45-164.5 days.

Hospital. Referrals are placed on a waiting list for admission, with waiting times being influenced by the number of referrals, bed pressures at the acute units, as well as inpatient turnaround times, i.e. LOS. Tara Hospital has no formalised policy for crisis (premature) discharges. No assertive community interventions are currently available for patients discharged from public sector hospitals in and around Johannesburg.

Participants

Adult patients diagnosed with schizophrenia or schizoaffective disorder and admitted to any of the biological wards at Tara Hospital during the 4-year study period of 01/01/2015 to 31/12/2018 were included in the study. Patients who were less than 18 years old, still admitted to Tara Hospital at the time of data collection, or where the primary diagnosis was unclear, were excluded.

Data collection

Data regarding LOS (objective 1 and 2) was obtained from the admissions registers (which record date of admission and discharge, and diagnosis) in each of the biological wards. Patients' clinical files (with discharge summaries and clinical notes) were retrieved from the hospital's registry department, to collect data regarding the patient's sociodemographic and clinical factors (objective 3).

Statistical analysis

Data was analysed descriptively using charts and tables. Statistical analyses were conducted in R software (version 3.5.1; www.R-project.org). The normal distribution of the data was checked using the Shapiro–Wilk test and examining Q-Q plots. All data were categorical and non-parametric analyses were conducted. Tests were two-tailed and model significance set at 0.05.

Objective 1: The mean LOS, standard deviation (SD), range, median and interquartile range (IQR) were calculated. Furthermore, the percentage of patients in

the total study population that had short-stay, medium-stay and long-stay admissions was reported.

Objective 2: Median and IQR was calculated for every six months over the 4-year study period to determine the trend. Additionally, the proportion of patients that had short-stay, medium-stay, and long-stay admissions was calculated in each 6 month period, and analyzed using chi-squared contingency table analyses to assess whether the proportions of admissions deviated from chance.

Objective 3: Regarding the relationship between sociodemographic and clinical factors and LOS, simple random sampling was used to select an equal number of patients from each of the three LOS categories. Statistical significance was calculated and was expected with a minimum sample of 75 patients. Thus data was collected from a minimum of 25 patient files from each category (short, medium and long-stay). All data were categorical, and a Pearson chi-squared (χ^2) analyses was used to determine whether the distribution of patients in the three LOS groups deviated from chance.

Ethical consideration

Approval was obtained from the University of the Witwatersrand (WITS) Human Research Ethics Committee (clearance no M191192) and Tara Hospital's Research Committee and Chief Executive Officer. All participants were allocated a study number and data was anonymised, thereby ensuring privacy and confidentiality of all patients' personal information.

RESULTS

A total of 367 patients met the inclusion criteria and were included in the study.

Objective 1

The mean LOS was 128.24 days (SD=120.89; range 0-755). Median LOS was 87 days; IQR 45-164.5 days.

The proportion of short-stay, medium-stay and long-stay admissions is shown in Figure 1. A significantly greater percentage of patients had long-stay admissions, followed by medium-stay and then short-stay admissions ($\chi^2_2 = 71.04$, $p < 0.001$).

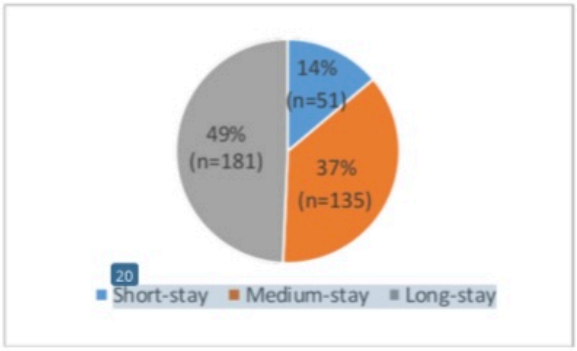


Figure 1. Proportion of short-, medium- and long-stay admissions of schizophrenia and schizoaffective disorder patients admitted to Tara Hospital in 2015 to 2018.

Objective 2

The trend with regards to LOS from 2015 to 2018 is shown in Figures 2. The shortest median stays were in 2015 and the longest median stay was in the second half of 2017. The range was also greatest in 2017. Figure 3 indicates the percentage of patients that had short, medium and long-stay admissions over the course of the study period. A significantly greater percentage had long-stay admissions, and the least had short-stay admissions ($\chi^2_{14} = 91.64$, $p < 0.001$).

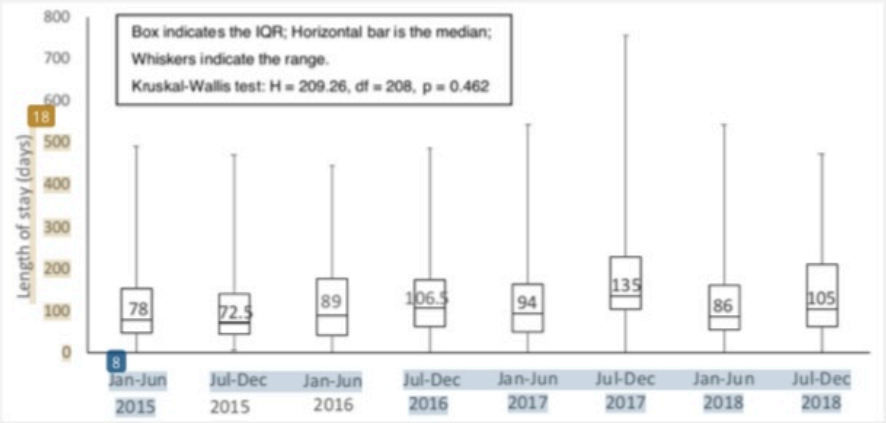


Figure 2. LOS trend of schizophrenia and schizoaffective disorder patients admitted to Tara Hospital every 6 months from 2015 to 2018.

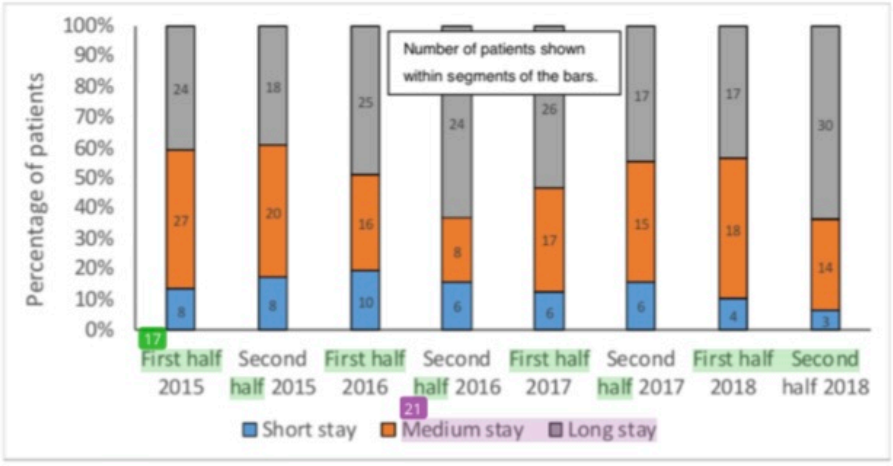


Figure 3. Short-, medium- and long-stay admissions of schizophrenia and schizoaffective disorder patients at Tara Hospital every 6 months from 2015 to 2018.

Objective 3

Sociodemographic, clinical and admission outcome data was available for 25 short-stay, 26 medium-stay and 25 long-stay patients, and is shown in Tables 1, 2 and 3.

Table 1. Sociodemographic factors of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018.

Sociodemographic factors:		Short-stay (n=25)		Medium-stay (n=26)		Long-stay (n=25)		χ^2 value	p-value
		n	%	n	%	n	%		
Age (years)								χ^2_4 =6.08	0.193
	18-35	10	40	10	38.5	16	64		
	36-50	9	36	10	38.5	8	32		
	>50	6	24	6	23	1	4		
Gender								χ^2_2=8.05	**0.018**
	Male	8	32	14	53.8	18	72		
	Female	17	68	12	46.2	7	28		
Ethnicity								χ^2_6=3.58	0.734
	African	16	64	21	80.8	20	80		
	Caucasian	7	28	4	15.4	3	12		
	Coloured	1	4	1	3.8	1	4		
	Indian	1	4	0	0	1	4		
Nationality								χ^2_2=2.08	0.353
	South African	22	88	25	96.2	21	84		
	Non-South African	3	12	1	3.8	4	16		
Marital status								χ^2_4=14.50	**0.006**
	Married	8	32	2	7.7	0	0		
	Unmarried	16	64	22	84.6	25	100		
	Unknown	1	4	2	7.7	0	0		
Referral source								χ^2_2=1.01	0.604
	Public hospital	24	96	25	96.2	25	100		
	Private	1	4	1	3.8	0	0		
Highest level of education								χ^2_8=9.17	0.328
	No formal schooling	1	4	2	7.7	0	0		
	Primary	6	24	11	42.3	5	20		
	Secondary	11	44	10	38.5	16	64		
	Tertiary	4	16	1	3.8	3	12		
	Unknown	3	12	2	7.7	1	4		
Employment status								χ^2_4=2.48	0.648
	Employed	2	8	2	7.7	3	12		
	Unemployed	23	92	24	92.3	21	84		
	Unknown	0	0	0	0	1	4		

Table 2. Clinical factors of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018.

Clinical factors:		Short-stay (n=25)		Medium-stay (n=26)		Long-stay (n=25)		χ^2 value	p-value
		n	%	n	%	n	%		
Comorbidity:									
- Substance (including alcohol) use disorder								χ^2_2=0.49	0.784
	Yes	12	48	11	42.3	13	52		
	No	13	52	15	57.7	12	48		
- Other comorbid psychiatric disorder								χ^2_2=7.86	**0.020**
	Yes	8	32	11	42.3	2	8		
		3x personality disorders 2x neurocognitive disorders 2x trauma/stressor related 1x anxiety		2 x personality disorders 1 x mood disorder 4 x neurocognitive disorder 4 x other		2x personality disorders			
	No	17	68	15	57.7	23	92		
- Comorbid medical disorder								χ^2_2=1.31	0.5200
	Yes	10	40	13	50	14	56		
		1 x epilepsy; 3 x HIV; 1 x previous head injury; 5 x other medical disorder		1 x diabetes mellitus; 4 x HIV; 8 x hypertension;		4 x diabetes mellitus; 7 x hypertension; 2 x previous head injury; 1 x other medical disorder			
	No	15	60	13	50	11	44		
Illness severity:									
- Number of antipsychotic medications on discharge								χ^2_2=2.47	0.292
	One	13	52	13	50	8	32		
	Two or more	12	48	13	50	17	68		
- Antipsychotic treatment resistance *ie. failed ≥2 antipsychotic trials and/or on clozapine*								χ^2_2=22.09	**<0.001**
	Yes	4	16	9	34.6	20	80		
	No	21	84	17	65.4	5	20		
- Discharged on Clozapine (*)								χ^2_2=9,33	**0.009**
	Yes	2	8	4	15.4	12	48		
- Clozapine resistance *ie. of those on clozapine* (*), *documented residual psychosis on discharge*								χ^2_2=3.00	0.223
	Yes	2	*100*	1	*25*	6	*50*		
	No	0	*0*	3	*75*	6	*50*		
		figures in italics = % of those on clozapine, not of total study population							
- Previous psychiatric admissions (ie. readmission vs first / index admission)								χ^2_2=2.34	0.310
	Yes	21	84	21	80.8	24	96		
	No	4	16	5	19.2	1	4		
- Previously placement								χ^2_2=3.77	0.152
	Yes	0	0	1	3.8	3	12		
	No/Unknown	25	100	25	96.2	22	88		

Table 3. Admission outcomes of short-, medium- and long-stay schizophrenia and schizoaffective disorder patients admitted to Tara Hospital from 2015 to 2018.

Admission outcomes:	Short-stay (n=25)		Medium-stay (n=26)		Long-stay (n=25)		χ^2 value	p-value
	n	%	n	%	n	%		
Discharged home	20	80	24	92.3	20	80	χ^2_2=1.95	0.337
- Placement however recommended during admission	5	*25*	8	*33*	9	*45*	χ^2_2=1.75	0.416
	figures in italics = % of those discharged home, not total study population							
Discharged to placement	2	8	2	7.7	4	16	χ^2_2=0.84	0.656
Other *ie. transferred to another facility (Sterkfontein Hospital), or discharged in absentia (absconded)*	3	12	0	0	1	4	χ^2_2=3.80	0.150

DISCUSSION

Objective 1

The LOS (median 87 days; IQR 49-164.5; mean 128.24; range 0-755) was increased compared to a previous study done at Tara Hospital, where the median LOS for schizophrenia patients in 2009 was 53 days (IQR 30-94).[5] Increased psychiatric patient numbers in Gauteng have been reported over the years between these two studies, which may have resulted in Tara biological ward referrals being reserved for more severely ill and treatment resistant patients compared to previous years, due to increased pressure for beds and more rapid patient turnaround times in the acute hospitals.[29] In another local study which reviewed the profile of patients, the majority of whom were diagnosed with a primary psychotic disorder, who absconded from Sterkfontein Hospital in 2008, the mean LOS of (non-forensic) patients was 100 days. However, 29% were not returned after absconding and therefore discharged in absentia, rather than due to being well and ready for discharge.[34] A Canadian study conducted between 2005 and 2015 found a mean LOS of 96 days for inpatients with schizophrenia.[17]

Target LOS for medium- to long-stay psychiatric hospitals in South Africa is 180 days according to the Department of Health Norms Manual for Severe Psychiatric Conditions, and as calculated by the World Health Organisation (WHO).[35]

The proportion of patients in this study with long-stay admissions was significantly higher ($p<0.001$) than the other categories of LOS, which was not an unexpected finding considering their clinical profile and also that patients are generally referred to Tara Hospital (as opposed to being discharged from the acute units) when it is anticipated that they will need longer admissions.

Objective 2

Regarding the trend in LOS, the proportion of long-stay admissions was significantly greater ($p<0.001$) in all 4 years of the study. Additionally, LOS figures were lowest in 2015 and higher in subsequent years, though this was not statistically significant. Generally, patients may be suitable to go to placement facilities, where they would receive further psychosocial and functional rehabilitation, sooner than they may be considered ready for discharge home. Thus the closure of the various Life Esidimeni facilities (2016), which Tara Hospital relies on for placement transfers, may have been a contributing factor.[30] In a previous national situation analysis, according to existing service indicators, the bed/population ratio for medium/long-term psychiatric facilities was 35/100,000 including Life Esidimeni beds, as opposed to 16/100,000 if these beds were excluded.[36] In other words, following the closure of Life Esidimeni there was a significant reduction in available long-term psychiatric beds, placing an additional burden on a medium-term facility such as Tara Hospital.

Objective 3

In terms of sociodemographics, gender and marital status differed significantly between the three categories of LOS, with the long-stay group having the most male (72%; $p=0.018$) and unmarried (100%; $p=0.006$) patients. This is in keeping with a recent British study which examined LOS of psychiatric inpatients and found a positive association between male gender and increased LOS, but not between marital status and LOS.[12] Marital status is a good prognostic factor and associated

with increased social support, with married/cohabitating schizophrenia-spectrum disorder patients having been found to have better quality of life and be less likely to be living alone than single/separated/divorced/widowed patients.[37] Therefore it may be in this study that married patients were more likely to have shorter admissions due to better support and conversely with the unmarried patients. Age, ethnicity, nationality, level of education, employment and referring hospital did not differ significantly between the three categories of LOS in this study. The British study however found a positive association between unemployment and African ethnicity and increased LOS.[12] The lack of a significant association regarding employment status may be explained by the fact that majority of the patients included in this study were unemployed (more than 80% in all groups), which is partly a reflection of the unemployment rates in South Africa, as well as perhaps the severity of their illness. The majority of patients in all categories of LOS were also readmissions. Therefore, high rates of unemployment in all patients may have been expected.

There were high rates (over 40%) of comorbid substance use disorders, in all LOS groups, in keeping with literature which has shown that substance use is common in people with schizophrenia and other psychotic disorders.[38,39,40] Substance use disorders did not however predict a longer LOS in this study. Other psychiatric comorbidites also occur frequently in those with schizophrenia, and this comorbidity is often associated with a more severe illness and poorer outcomes.[40,41] This study's finding of significantly higher rates of other psychiatric comorbidities in the short and medium-stay groups as compared to the long-stay group was therefore unexpected. A possible explanation is that in the long-stay patients, due greater illness severity and treatment resistance, comorbid psychiatric diagnoses may not have been as easily detected as with the other patients. Rates of personality disorders were similar though in the three groups, consistent with a recent review article which did not find convincing evidence that comorbid personality disorders worsened the course of illness in schizophrenia as opposed to that of other SMIs.[42] Medical comorbidities were common (40-56%) and occurred similarly in all three categories of LOS, with hypertension being most common, followed by HIV and diabetes mellitus. In the long-stay group, hypertension was often comorbid with diabetes. In these patients, this could possibly indicate metabolic syndrome, which can also be associated with

dyslipidaemia, being overweight and an increased risk of heart disease. This group also had the highest rates of treatment resistance (80%), thus probably on atypical antipsychotics, and being on clozapine (48%) Metabolic syndrome and other cardiovascular risk factors are highly prevalent in patients with schizophrenia, contributing to an increased risk for premature mortality. In addition to unhealthy diet, sedentary lifestyle and smoking, atypical antipsychotics can also have a negative impact on cardiometabolic risk factors.[43] Regarding HIV, a large Danish study, of 2.6 million participants over 17 years, concluded that a diagnosis of HIV was associated with a significantly increased risk of developing schizophrenia or an episode of psychosis.[44] The impact of comorbid SMI and HIV, according to a recent review, is unclear, with limited evidence that it is associated with worse clinical outcomes.[45] In this study, HIV was the second most common medical comorbidity with similar distribution in the short and medium-stay groups, but none in the long-stay group. A possible explanation for this may be that the long-stay patients were less sexually active, as a result of having a more severe illness, with more severe negative symptoms and impairments in social functioning, compared to the other patients.

Regarding severity variables, the long-stay group had the highest percentage of patients on antipsychotic polypharmacy (68%), but the difference was not statistically significant. The rate of antipsychotic polypharmacy was in fact found to be high in all three groups. This is in keeping with a recent study in India which found a high rate (44%) of antipsychotic polypharmacy, with the most common reason being use of a depot with an oral antipsychotic.[46] The frequency of depot antipsychotic use was not however captured in the current study. Treatment resistance rates were significantly higher in the long-stay group (80%; $p<0.001$) as compared to the other categories of LOS. However only about half of the patients with treatment resistance, in all three groups, were discharged on clozapine. This underutilization of clozapine is in keeping with that described in the literature.[47] Nonetheless the proportion of patients discharged on clozapine was still significantly higher in the long-stay group (48%; $p=0.009$) compared to the other two groups. The difference between groups with regards to clozapine resistance however was not significant, and there were patients discharged with residual psychosis despite treatment with clozapine in all LOS

groups. It is estimated in the literature that 40–70% of patients with treatment resistant schizophrenia do not respond to clozapine antipsychotic monotherapy.[48] Most patients (over 80%) in all LOS groups were readmissions, with the highest rate (96%) in the long-stay group. Multiple relapses are frequent in patients with schizophrenia, and it has been suggested that psychosis may be neurotoxic and that relapses lead to disease progression and impairment of treatment response.[49]

Based on the patients' clinical profile, it is likely that many may have benefitted from referral to residential placement facilities, however the majority were discharged home, in all LOS groups, and not placed. Similarly, the proportion of patients who had previously been admitted to placement facilities was very low. This is indicative of the scarcity of community-based residential care beds in this setting.[36,50] Placement was recommended in 45% of the patients who were discharged home in the long-stay group, and even in the short and medium-stay groups it was recommended for 25% and 33% respectively. In these cases, patient and/or family refusal may have been the reason, but it may also have been due to long waiting lists for placement. To what extent though the shortage of beds at placement facilities, and certainly also the closure of Life Esidimeni, may have contributed to longer hospital admissions cannot be determined from this study.

Strengths and limitations

As with retrospective studies, limitations were related to recordkeeping. Missing information, such as unrecorded diagnoses or missing dates, in the admissions registers resulted in exclusion of patients who may have been eligible for inclusion in the study. Accuracy of the clinical information in patient records may also have been a limitation. Strengths of this study were that it has provided findings in an area where research has been limited.

Implications and recommendations

Ongoing efforts should be made to improve the management of patients with schizophrenia and schizoaffective disorder, including addressing substance use, preventing relapses and increased use of clozapine in treatment resistant patients. Improved community-based services is essential, as well as the need for more

published data on step-down facilities in South Africa.[30,51] Such improvements may also provide cost-effective alternatives to admission in psychiatric hospitals, without negatively impacting on patient outcomes.[52,53] The WHO Mental Health action plan also emphasises the need to provide comprehensive, integrated and responsive mental health and social care services in community-based settings and to strengthen research for mental health.[54]

CONCLUSION

The majority of patients with schizophrenia and schizoaffective disorder had long-stay admissions. Male gender, being unmarried, treatment resistant and on clozapine occurred most frequently in the long-stay group. Overall rates of unemployment, substance, other psychiatric and medical comorbidities, antipsychotic polypharmacy and readmissions were high, and clozapine remains underutilised. Most patients were discharged home, despite placement often being recommended. The shortage of psychiatric residential placement, step-down and transitional care facilities likely impacts on LOS. Further research in this area is required.

ACKNOWLEDGEMENTS

I am sincerely grateful to my supervisor, Dr Belinda Marais, for her invaluable input and contribution to this project. Thank you for the endless support as well guidance and supervision, without which this work would not be possible.

Thank you to the helpful staff of Tara Hospital and to Prof Neville Pillay for his assistance with the data analysis.

Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

L.Y Goga was responsible for data collection and initial draft of the manuscript. B. Marais was the supervisor of the project and contributed to the study design and editing.

Funding information

This research received no specific grant from any funding agency in the public, commercial or non-profit sectors.

Disclaimer

The views and opinions expressed in this article are those of the author(s) and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

1743050:Submissible_paper_with_corrections_23_July_2021....

ORIGINALITY REPORT

9%	6%	6%	4%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	sajp.org.za Internet Source	1%
2	hts.org.za Internet Source	1%
3	www.scielo.org.za Internet Source	1%
4	Mark Fackrell. "Modelling healthcare systems with phase-type distributions", Health Care Management Science, 03/2009 Publication	1%
5	Hari Krishnan Kanthimathinathan, Adrian Plunkett, Barnaby R Scholefield, Gale A Pearson, Kevin P Morris. "Trends in long-stay admissions to a UK paediatric intensive care unit", Archives of Disease in Childhood, 2020 Publication	1%
6	Laura Cowling, Kylen Swartzberg, Anita Groenewald. "Knowledge retention and usefulness of simulation exercises for disaster medicine - what do specialty trainees know	1%

14	academic.oup.com Internet Source	<1 %
15	www.researchsquare.com Internet Source	<1 %
16	Submitted to Northern Kentucky University Student Paper	<1 %
17	www.greenandgoldrugby.com Internet Source	<1 %
18	icphusa.org Internet Source	<1 %
19	repository.up.ac.za Internet Source	<1 %
20	Nasser, Ramzi, Jacqueline Doumit, and James Carifio. "Well-being and belief in a just world among rest home residents", Social Behavior and Personality An International Journal, 2011. Publication	<1 %
21	Peter H. Millard. "A decision support system for bed-occupancy management and planning hospitals", Mathematical Medicine and Biology, 1995 Publication	<1 %
22	foodtech.uonbi.ac.ke Internet Source	<1 %

	and think?", African Journal of Emergency Medicine, 2021 Publication	
7	"13th European Congress of Clinical Microbiology and Infectious Diseases", Clinical Microbiology and Infection, 2003 Publication	<1 %
8	Submitted to Central Queensland University Student Paper	<1 %
9	Submitted to Nelson Mandela Metropolitan University Student Paper	<1 %
10	safpj.co.za Internet Source	<1 %
11	secure.um.edu.mt Internet Source	<1 %
12	www.thieme-connect.com Internet Source	<1 %
13	Bojana Vidović, Aleksandra Stefanović, Srđan Milovanović, Brižita Đorđević et al. "Associations of oxidative stress status parameters with traditional cardiovascular disease risk factors in patients with schizophrenia", Scandinavian Journal of Clinical and Laboratory Investigation, 2014 Publication	<1 %

14	academic.oup.com Internet Source	<1 %
15	www.researchsquare.com Internet Source	<1 %
16	Submitted to Northern Kentucky University Student Paper	<1 %
17	www.greenandgoldrugby.com Internet Source	<1 %
18	icphusa.org Internet Source	<1 %
19	repository.up.ac.za Internet Source	<1 %
20	Nasser, Ramzi, Jacqueline Doumit, and James Carifio. "Well-being and belief in a just world among rest home residents", Social Behavior and Personality An International Journal, 2011. Publication	<1 %
21	Peter H. Millard. "A decision support system for bed-occupancy management and planning hospitals", Mathematical Medicine and Biology, 1995 Publication	<1 %
22	foodtech.uonbi.ac.ke Internet Source	<1 %

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

Acknowledgement by supervisor: 

Date: 02 August 2021