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A Prospective Descriptive Prevalence Study of Catatonia in an Acute Mental Health Unit in Urban South Africa

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ABSTRACT

Introduction

Catatonia arises from serious mental, medical, neurological, or toxic conditions. The prevalence range is from 10 to 20 percent in other countries. South African prevalence rates are currently unknown. This is a quantitative descriptive study utilising the Bush Francis Catatonia Rating Scale as a screening tool with an information sheet for clinical information. The study will investigate: 1) prevalence of catatonia, 2) clinical and demographic correlates associated with catatonia, 3) predictors of catatonia, 4) response to treatment, and 5) subjective experience of catatonia.

Methods and analysis

The setting is an acute mental health unit (MHU) within a regional, general medical hospital

in Nelson Mandela Bay, South Africa. Participants will be recruited from inpatients in the MHU over a one-year period. Most are admitted involuntarily, under the Mental Health Care Act of 2002. Patient ages range from 13 to over 65 years. Participants who screen positive for catatonia will be followed up after discharge for three months to measure outcomes. Primary outcomes will include:

- the 12-month prevalence rate of catatonia.
- descriptive and other data on presentation and assessment of catatonia in the MHU.

Secondary outcomes will include:

- data on treatment response.
- subjective experience of catatonia.
- predictors of catatonia.

Descriptive statistics, multivariate binomial logistic regression, and univariate analyses will be conducted to evaluate associations between catatonia and clinical or demographic data which could be predictors of catatonia. Survival analysis will be used to examine the time to recovery after diagnosis and initiation of treatment. The 95% confidence interval will be used to demonstrate the precision of estimates. The level of significance will be $p \leq .05$.

Ethics and dissemination

The study has received ethical approval from the Research and Ethics Committees of the Eastern Cape Department of Health and Walter Sisulu University. The results will be disseminated as follows: at various presentations and feedback sessions; as part of a Ph.D. thesis in Psychology at Nelson Mandela University; and in a manuscript that will be submitted to a peer-reviewed journal.

Keywords: *Catatonia, assessment, screening tool, Bush Francis Catatonia Rating Scale, predictors*

Article Summary

Strengths and limitations of this study

- This is the first study to examine the prevalence of catatonia in South Africa and aims to address the lack of data on prevalence rates of catatonia, presentation, optimal management, predictors, and outcomes in this setting.
- The triangulation of information sources like the Bush Francis Catatonia Rating Scale, a validated catatonia screening tool, clinical notes, and subjective reports of catatonic episodes from the participants present a unique opportunity to investigate different aspects of catatonia.
- The descriptive nature of the study and the limited number of participants could limit the applicability of significant associations between variables regarding cause and effect and the generalisability of findings.

INTRODUCTION

In the 1880s, Kraepalin described the prevalence of catatonia as close to 20% in 500 cases.[1] Modern-day studies show a range from less than 10% to just over 20%.[1] Catatonia is often treated by psychiatrists, even though underlying causes may be other medical conditions such as neurological, infectious, endocrine, and substance-induced disorders.[1] Grover et al.[2] described close to 40% of 205 patients who had delirium and two or more catatonic symptoms on the Bush Francis Catatonia Rating Scale (BFCRS).

Luchini et al.[3] characterised catatonia as an autonomous syndrome, frequently associated with mood disorders but also observed in patients with other conditions including neurological, neurodevelopmental, physical, and toxic conditions. Current evidence has provided some answers about the categorisation of catatonia, clinical presentations, interventions, and response to treatment.[3, 4, 5, 6]

The current study will investigate the prevalence of catatonia in patients of the Dora Nginza Hospital (DNH) mental health unit (MHU) and collect data on associated risk factors and response to treatment. Due to the prominent role played by electroconvulsive therapy

(ECT) in the treatment of catatonia, the results from this study may have applicability in public mental health planning, should the prevalence of catatonia be significant enough to warrant recommendations regarding availability of ECT in public hospitals.[1]

Catatonia in South Africa

There are currently no studies describing the prevalence of catatonia in South Africa (SA), which leaves clinicians blind to the burden of the disease linked to this potentially fatal syndrome. Clinicians may, therefore, be unaware of the importance of the assessment and detection of catatonia, leading to missed opportunities to intervene in what is a highly treatable condition.

White and Robins[7] described 17 patients with catatonia in SA who received antipsychotic medication. There was a deterioration in their clinical presentation into neuroleptic malignant syndrome (NMS). The risk of precipitating NMS in this case series was linked to the administration of antipsychotics. This study also challenged the notion of NMS being viewed as a separate condition to catatonia. Since then, catatonia has not been widely studied in SA, despite the researchers' observation that it continues to present a significant and sometimes life-threatening challenge. Another study conducted in SA described the treatment of 42 catatonic patients with ECT.[8] The current study represents the first stages of aiming to fill the gap in the extant research with a prospective study on prevalence and predictive data.

Prevalence of catatonia in other parts of the world

Fink and Taylor [1] described a rate of catatonia of 10% in acutely ill psychiatric patients and Stuivenga and Morrens [9] a rate of 16.9% when applying the DSM-5 criteria. Conditions found in association with a catatonic presentation have included psychiatric diagnoses like bipolar disorder, delirious mania, psychotic depression, schizophrenia, and other medical conditions.[4, 9] In some instances, the cause leading to catatonia has been less well-defined. DSM-5 has captured the multiple possible associations that occur with catatonia by including it as a specifier for mood disorders and schizophrenia or as linked to another medical condition.[10] Catatonia also appears as an entity with undefined aetiology under 'catatonia not otherwise specified'.[6]

Choice of screening tool and rating scale

In 1996, Bush et al. designed the BFCRS, a 14-item scale for screening and a 23-item scale for diagnosis of catatonia.[11, 12] They demonstrated that the scale was a reliable and valid tool for diagnosis and evaluation of response to treatment. It has a dual utility of screening and measurement of the severity of catatonia. A systematic review of seven catatonia rating scales reported a similar finding when comparing the BFCRS with other tools to screen for catatonia.[13] They recommend the BFCRS for routine use because of ease of use, reliability, and validity. Wilson et al.[14] found 300 out of 339 patients with acute medical and psychiatric illness screened positive for catatonia when applying the BFCRS.

The BFCRS has been used successfully as a screening tool and rating scale for the past seven years in the MHU which is the site of the current study. Other reasons supporting the utility of the BFCRS in this study are: 1) the reported ease of use, 2) reliability, 3) validity as both a screening tool and a measure of severity, and 4) its use since 2011 in the study site has not yielded any issues with applicability or appropriateness when used in this clinical setting. Figure 1 reflects the assessment tools and process that will be applied to assess participant and collect data.

Management of catatonia

The biological treatment for catatonia has advanced over the last century, from insulin coma therapy of the early 1930s and Meduna's use of seizure-inducing camphor oil injections to Cerletti's first documented use of an electric shock procedure in 1938.[1] Available evidence on management of catatonia includes the published works from various researchers.[1, 4, 5, 7,14-19] Lorazepam and ECT are the current recommended treatments, irrespective of aetiology. They are effective in most cases.[1, 5, 7, 14, 17]

In both in the White and Robins[7] and Fricchione et al.[5] case series, intravenous administration of benzodiazepines (diazepam or lorazepam) was demonstrated as an efficacious treatment for catatonia. Response is seen relatively rapidly, i.e. within minutes of administration. Instead of a sedative effect that one observes with the administration of benzodiazepines in non-catatonic patients, those with catatonia tend to 'wake up' from stupor or normalise from a state of extreme excitement. In the White and Robins[7] study, two

patients who did not receive intravenous benzodiazepines died.

The dose range used at the study site tends to be higher and is given more frequently compared to the recommendation in the Rasmussen et al. paper.[19] This is mainly because patients at the site present at advanced stages of catatonia and tend to respond slowly or not at all when the lower or less frequent doses are employed.

The subjective experience of catatonia

Northoff et al.[20] conducted a retrospective study on 24 catatonic patients post-recovery after a catatonic episode. The patients reported intense emotions which could not be controlled and ambivalence with less focus on their altered movements. Other descriptions of catatonia have stated an extreme fear response characterized by freezing, likened to the defence seen in animals of tonic immobility or freezing in the face of danger.[21]

This study will investigate the subjective experience of catatonia as described by participants once discharged from the hospital, to shed light on the emotive and cognitive experience of catatonia in the study cohort. This may provide clues on the psychological drivers of the catatonic response and could pave the way for further research into the psychology of the catatonic response.

Aims

This study aims to expand the understanding of catatonia in the South African setting so that recognition and management of the syndrome can be enhanced. This will be achieved through investigating the prevalence of catatonia in the DNH MHU, describing the clinical and demographic correlates associated with catatonia and response to treatment, identifying risk factors, and describing the subjective experience of catatonia.

Objectives

The research objectives are:

1. Collection of data on and description of BFCRS scores of all consenting patients admitted to the DNH MHU over 12 months.
2. Identification of participants diagnosed with catatonia based on the BFCRS scores and clinical assessments performed by the admitting doctor.

3. Description of the demographic and clinical information, including response to treatment, in participants diagnosed with catatonia during the study period.
4. Identification of any significant clinical correlates and risk factors in participants with catatonia.
5. Follow-up of participants with catatonia once discharged from the unit at one month, two months, and three months intervals, to assess outcomes using the BFCRS and information about readmission for recurrence of any episode of mental illness.
6. Report on the experience of catatonia as described by participants once the catatonic episode has resolved.

Research design

This is a prospective, descriptive triangulation study utilising mixed quantitative and qualitative methods. An exploratory qualitative aspect will investigate the emotive and cognitive subjective experience of participants with catatonia to establish a direction for further research. This is because there is currently limited data available on the subjective experience of catatonia, with most research focusing on quantitative aspects.

The quantitative elements of the study will include data collected from participant files of BFCRS scores upon admission, with additional clinical and demographic information collected via a pre-designed datasheet. The qualitative element will describe the participant's reported experience of the catatonic episode, post-discharge.

METHODS AND ANALYSIS

The study will take a positivist paradigm approach to investigate the potential causal relationships between catatonia and different variables via correlational studies.[22] Creswell[23] described the positivist's approach as an attempt to identify causes, which influence outcomes, the aim being to formulate laws, thus yielding a basis for prediction and generalisation. In the current study, deductive reasoning will be applied to data collected through 1) direct observation and 2) quantitative and qualitative approaches, to identify associations with catatonia, causal relationships, and possibly, predictors of catatonia.[22]

The Bradford Hill method will be applied to examine associations and determine

potential causality.[24] Hill proposed nine criteria that may be examined to assess an association. These are: 1) the strength of association, 2) consistency, 3) specificity, 4) temporality, 5) biological gradient, 6) plausibility, 7) coherence, 8) experiment, and 9) analogy.[24]

Sources of information that will be utilised for triangulation include: the participants' BFCRS scores and clinical notes; field notes taken by the research team during direct observation and interviews; and participant and relative interviews focusing on response to treatment, food insecurity, and the subjective experience of catatonia. Additionally, the mixed methods nature of the study will enable the generation of both objective (as documented by treating and research teams) and subjective data regarding the experience of catatonia. This type of triangulation is an important tool for meeting the goals of this study while facilitating a holistic assessment of catatonia in this cohort.

The study process and outline

Two research assistants (RAs) with a background in health will be recruited to assist the researcher with fieldwork. A health background is necessary to understand the medical terminology that is utilised in the clinical notes and screening tools. A part-time administrative assistant will be contracted to assist with data capturing and collation. Fieldwork will include the recruitment of participants and collection of data by the researcher and RAs. There will be a limited follow-up component that extends to up to three months following discharge from the hospital.

The RAs will be trained by the researcher on:

1) application of the BFCRS to ensure they are knowledgeable about the screening tool, its application, and its interpretation, and

2) assessment of capacity to consent utilising the University of California, San Diego Brief Assessment of Capacity to Consent Questionnaire (UBACC).

The UBACC has been applied successfully in the Eastern and Western Cape in study cohorts recruited from inpatient mental health institutions.[25, 26]

The researcher and RAs will assess participants who meet the inclusion criteria for

capacity to consent, utilising the UBACC. All those with the capacity to consent will be requested to consider entering the study. For participants who may be assessed as lacking the capacity to consent, their closest relatives or guardians will be requested to consent on their behalf through proxy consent (proxy consent and its ethical application is further discussed in the section 'Ethics and dissemination' on pages 13-14). Additionally, in those assessed to lack capacity to consent, such capacity will be reviewed weekly to allow for further re-engagement on their consent to take part in the study, the ultimate aim being to change from proxy consent to personal consent as soon as potential participants have regained capacity. Data collected about any participant who chooses to withdraw from the study will be removed from the study data sets and destroyed.

The research team will collect data from the clinical files of consenting participants on BFCRS scores and additional descriptive and demographic information as guided by the study questionnaire and study protocol. The completed data capturing forms will be submitted to the administrative assistant for data collation and entry into a spreadsheet at the end of each week.

During the limited follow-up period, the researcher and RAs will repeat the BFCRS assessment and conduct face-to-face interviews with participants regarding their experience of catatonia at one month, two months, and three months post-discharge. Recurrence of symptoms or readmissions since the last discharge will be documented. The participant's willingness to continue with the study will be reviewed during every visit to ensure their consent remains valid throughout. Figure 2 is a summary of the study process that will be followed.

Setting

The setting will be a 35-bed MHU within DNH, a general hospital in the Eastern Cape Province in South Africa. The hospital is in Zwide, Port Elizabeth and serves a population of over one million within an urban area with a high morbidity of mental illness.[27] The MHU admits persons who present with acute mental illness requiring inpatient treatment.

Sampling

Convenience sampling of all patients admitted to the MHU over a twelve-month period will be undertaken. Contact details of all consenting participants who have screened positive for catatonia will be entered into a database to enable contact for future follow-up at the end of one month, two months, and three months post-discharge. This information will be password encrypted. Admission rates at the DNH MHU for the past three years have been 1200 to 1300 annually, with an average length of stay of approximately ten to fourteen days. Thus, a realistic estimation based on these previous unit statistics and assuming a conservative catatonia prevalence of 5% to 8% is that around 60-100 participants may be expected to present with catatonia during the study period.

Participants

Most people admitted to the DNH MHU are involuntary admissions under the Mental Health Care Act of 2002.[28] Age of admission ranges from 13 to over 65 years because there are no child, adolescent, or geriatric inpatient-specific services in the region.

Inclusion criteria

All patients admitted to the unit during the study period will be eligible for inclusion. Those who screen positive for two or more catatonic signs and symptoms on the BFCRS will be included during the follow-up period for the qualitative part of the study.

Exclusion criteria

Refusal to take part in the study, whether through the direct patient consent process or the proxy consent process, will result in the exclusion of the patient.

Methods of assessment and measurement

The BFCRS is a 14 or 23-item scale (see Appendix A) that is used to screen for catatonia.[11] It is used as a 14-item scale on initial assessment or the full 23-items are used to determine severity. Participants' responses to the standard interventions of intravenous lorazepam administration or ECT will be documented by the admitting doctor in the case notes. The research team will then capture this information on a predesigned data collection sheet. A 50% reduction in signs and symptoms in response to the treatment intervention represents a response while a 100% reduction is considered full resolution.

The data collection sheet will collect information on demographics, clinical data, and food insecurity, using the participants' case notes as a primary source of information as well as direct observation of the participants. Additional information will be sought from relatives if the participant is unable to respond adequately to information required on food security questions due to the severity of catatonic symptoms, or in those who are unable to provide the additional information for whatever other reason.

Regarding social determinants of mental health, current evidence indicates that those who are poor or disadvantaged suffer disproportionately from common mental disorders and their adverse consequences.[29] The strength of the association with poverty has at times varied depending on the type of poverty measure used. Food insecurity as a poverty measure is one of the factors with a consistent and strong association with common mental disorders.[30] In this study, the administration of a food security questionnaire will be utilised to assess the correlation of poverty to catatonia. Two food insecurity questions are drawn from the USDA's 18-question Household Food Security Scale.[31] They make up The Hunger Vital Sign Questionnaire, a validated two-question food insecurity screening tool used in the clinical setting. The questions are:

1. Within the past 12 months, we worried whether our food would run out before we got money to buy more.
2. Within the past 12 months, the food we bought just did not last and we did not have money to get more.

During the follow-up period, participants will be asked to describe their experience of the catatonic episode as well as their perception of recovery.

Expected outputs

- The 12-month prevalence rate of catatonia.
- Descriptive and other data on presentation and assessment of catatonia in the DNH unit.
- Data on treatment response, short-term outcomes, and subjective experience of catatonia.

- Predictors for catatonia based on clinical correlates and other descriptive data collected.
- Recommendations and guidelines for the management of catatonia and possible prevention strategies.

Data management and analysis

Quantitative data collected will be summarised using descriptive statistics. Categorical variables will be presented using frequency tables, percentages, and graphs. Two or more categorical variables will be compared using contingency tables (e.g. 2 X 2 Table) and the expected frequencies will be calculated to determine the type of test best suited to determine the extent of any identified relative associations. If the expected frequencies in all cells are ≥5 then the Chi-squared test will be used and if the expected frequencies are < 5 in any cells then the Fisher's exact test will be used.

Binomial logistic regression will also be conducted to determine the predictors of catatonia and to estimate the risk ratio. If the numerical data are not normally distributed, non-parametric statistics will be used (median and interquartile range). The best fitting model of multivariate analysis will be chosen through forward selection of model building. The model with the lowest Bayesian information criterion will be selected as the better model and the 95% confidence interval will be used to estimate the precision of estimates. Survival analysis will be used to determine the time to recovery and the hazard ratio (i.e. the total number and timing of each event indicating relapse in this study) will be reported for this purpose.

Qualitative data collated during the follow-up period will be analysed to elucidate the subjective experience of catatonia in this cohort. Aspects of the thematic analysis presented by Braun and Clarke[32] will be applied to identify themes. Themes will be identified through a framework approach identifying word repetition, local expressions, metaphors and similarities, differences, and keywords. A tentative hypothesis and theory regarding the experience of catatonia will be presented based on emergent themes. Data collected during the quantitative and qualitative segments of the study will be analysed separately but compared for congruency of reported information to enhance data integration.

In summary, data integration will be in the form of:

i. converting information gathered from the quantitative aspects of the study into numerical information that can be processed through application of statistical methods to test for correlations and associations.

ii. identifying common themes through field notes taken when interviewing participants during the outpatient stage of the study.

iii. Assessing congruency between common themes with regard to the subjective experience of catatonia as described by participants and commonly identified presenting symptoms as highlighted in case notes and listed in the data collection sheet. The advantage of this approach is that it strengthens the validity and reliability of the study.

ETHICS AND DISSEMINATION

Ethics clearance has been granted for the study by the Eastern Cape Department of Health Ethics Committee and the Walter Sisulu University Research and Ethics Committee. The protocol is also required to be submitted to the Nelson Mandela University Research Ethics Committee (Human) for approval. The study does not have any intervention arm.

All patients admitted to the unit will be presented with an information leaflet on the study in English or Xhosa. Consent for inclusion in the study will be obtained from all participants who have the capacity to consent, which will be determined through application of the UBACC. Proxy consent will be sought from a relative or guardian for all patients who lack the capacity to consent or are minors between the ages of 13 and 18 years of age. The use of proxy consent in mental health research is applicable for those who lack the capacity to consent and the nearest relative or guardian consents on their behalf. It is permissible within the mental health care setting due to the challenges with capacity to consent that may exist in patients with acute mental illness.[33] Proxy consent ensures that respondents' rights are guarded while making it possible to include individuals or groups who may potentially benefit from scientific advances gained from research. This approach is also supported by the Helsinki Declaration on ethical research which states that 'for a research subject who is legally incompetent, physically or mentally incapable of giving consent or is a legally incompetent minor, the investigator must obtain informed consent from the legally authorised representative in accordance with applicable law'.[34] The Department of Health Guidelines

on ethics in health research similarly state that persons should not be excluded unfairly based on discrimination or disability.[35]

The Mental Health Care Act (MHCA) of 2002 also makes a reference as to whom may be considered an associate of a patient admitted under the Mental Health Care Act: e.g. a spouse, next of kin, partner, associate, parent, or guardian.[28] A similar approach will be taken for this research. All data will be anonymised and stored under lock and key, with access granted to the research team only.

Dissemination of results

The results will be presented at feedback sessions with the Hospital Board, Eastern Cape Department of Health and at national and international congresses and may be used to compile guidelines on assessment and management of catatonia in the region. They will also be compiled as a thesis, which will be submitted for examination for a Ph.D. in Psychology at Nelson Mandela University. A research report based on the study results will be submitted to peer-reviewed journals to be considered for publication.

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AUTHOR CONTRIBUTIONS

Z Zingela conceived the idea and devised the project and its main conceptual ideas assisted by S van Wyk and M Fink. L Stroud and J Cronje supervised the development of this manuscript and provided editorial input.

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COMPETING INTERESTS STATEMENT

The authors have no competing interests to declare.

Figure 1

Assessment Tools

Figure 2

The Study Process

Figure 1: Assessment Tools

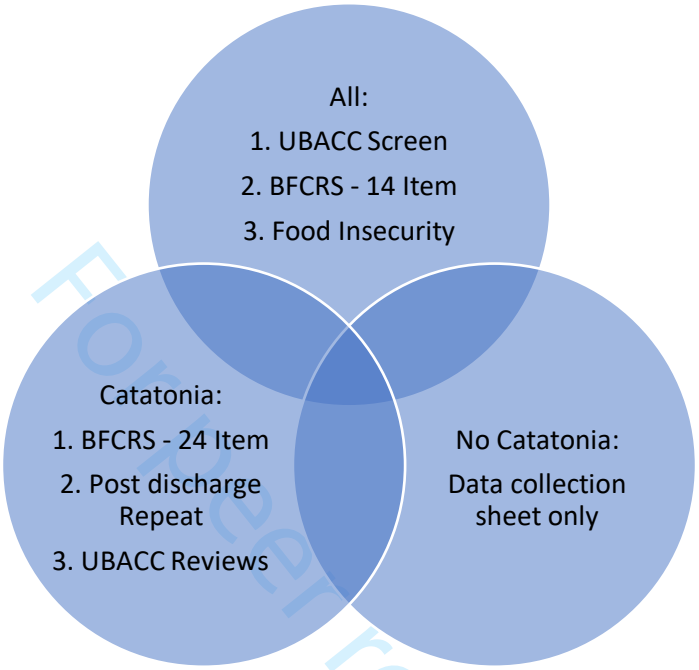
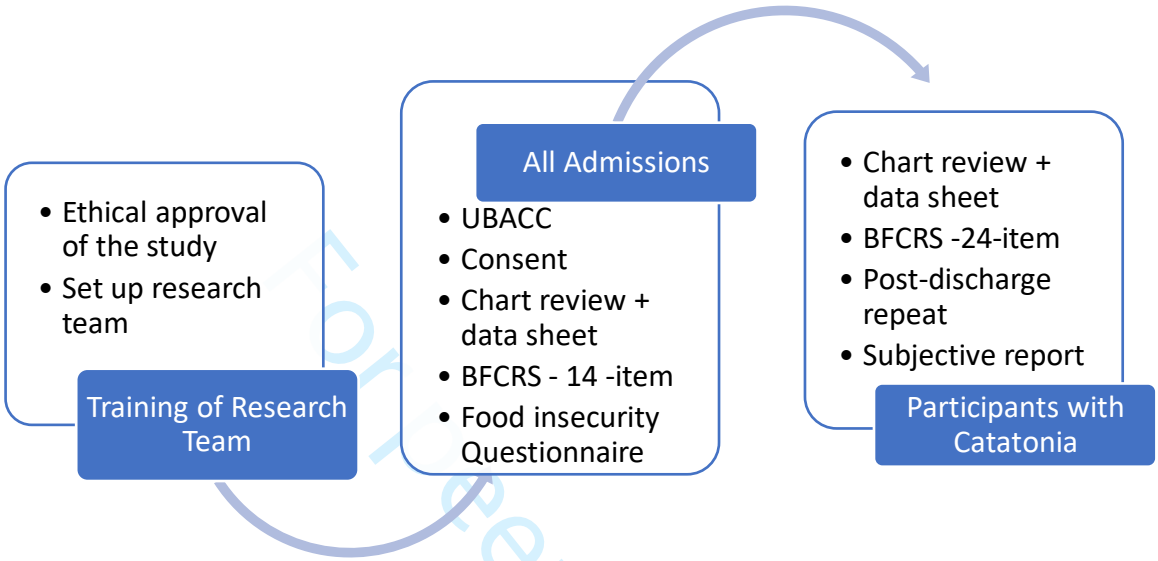


Figure 2: Study Process



APPENDICES

APPENDIX 1: DATA COLLECTION SHEET

DATA COLLECTION SHEET

Enrolment No:			**Tick applicable box or insert answer in area shaded in white**									
Unit			**Catatonic now?**									
B	M	72 hr	**No –fill in ONLY Sections A,G,H,I,J**						**Yes –fill in the whole data sheet Attach an anonymised copy of the BFCRS**			
A. Age			**Sex**		**Ethnicity**				**1st admission**	**Catatonic symptoms before?**	**Provisional DSM -5 Psychiatric diagnosis in file**	**Susbtance Use?**	**Another medical condition?**
< 16	6 - 35	36 - 65 > 65	F (0)	M (1)	B	C	I	W	Yes	Yes	Yes	Yes	Yes
									No - No of previous admissions =	No	No	No	No
									Not known	Not known	Not known	Not know	Not known
\B. BFCR Scale Score			**BZD or LR Rx:**		**Blood Pressure**				**Pulse**	**Body Temperature**	**Respiratory Rate/ O2 Sats**	**Other additional clinical**	

		No of dose/s administered					**parameters**
Initial Score		Nil					
At 15 minutes		1 2 3					
At 30 minutes		1 2 3					
At 45 minutes		1 2 3					
At 60 minutes		1 2 3					
	1 5 min		**Length of time from presentation to ECT**			**Degree of improvement**	

C. Length of time to response i.e. 50 % reduction in scale	0 min		On admission	4-6 days	11-13 days	Mild = Less than 25% reduction in No. of symptoms	
	5 min		1-3 days	7 -10 days	≥14 days	Moderate = 25% to 50% reduction in No. of symptoms	
	0 min		Reason ECT delayed for more than 3 days (from clinical notes) ……			Good = Response of more than 50% reduction in No. of symptoms	
D. ECT	Yes		Number of Sessions	Response		Maintenance ECT prescribed or required?	
	No			Time to 50% improvement	Time to full Resolution	Yes? If so No. of sessions?	No
E. Duration of Catatonia prior to admission if known No t Known	Hours to 3 days	Duration of Catatonia Prior to admission NOT known	Any other additional information				
	4 days To 2 weeks						
	3 to 4 weeks						
	More than 4 weeks						
F. Gradual	Hours to 3	Fluctuating	Type of onset	Any additional information			

vs. Rapid type if on set of catatonic symptoms	days		Unknown				
	4 days to 2 weeks	Gradual worsening					
	3 to 4 weeks	Mostly excited form					
	More than 4 weeks	Mostly slowed Form					
G. Food Insecurity	1.Within the past 12 months, we worried whether our food would run out before we got money to buy more.						
	Often true	sometimes true /refused	never true	don't know/ refused	Any additional information		
	2.Within the past 12 months, the food we bought just didn't last and we didn't have money to get more.						
	Often true	sometimes true /refused	never true	don't know/ refused	Any additional information		
H. Substances		YES	NO	Alcohol	Cannabis	Amphet	Heroin	Metamphet
				Cocaine	Opiods	Nicotine	Other (Specify)	

I.Medical Illness	No	Yes	If Yes, chose from the following if on history only		If Yes, choose from the following if co-morbid		If HIV	
			HPT	DM	HPT	DM	On HAART?	No
			Epilepsy	HIV	Epilepsy	HIV	If HIV on HAART, Regime?	If HIV, CD4?
			Head Trauma	TB	Head Trauma	TB	If HIV Viral Load?	Other (specify)
			SLE or Auto/I	Other (specify)		Other (specify)		
J. Investigations Done	**CK (u/l)**		CK≤200	**Fe µmol/l**	Fe 9 to 30	**VitB12 pmol/l**	B12 ≤ 107	**Auto/I Screen**
	CK 201 -1000		CK ≥1000	Fe ≤ 9	Fe ≥ 30	B12 108 - 221	B12 ≥ 221	F NF NA SR
	Endocrine		**TSH miu/l** **Normal TSH** 038 to 5.33	≤0.38	≥5.33	**Cortisol** **Normal (AM)** 185 to 617	≤184	≥618
			T4 pmol/l **Normal T4** 7.2 to 16.4	≤7.2	≥16.4	**Cortisol (PM)** ≤ 276	≤ 276 (pm)	≥276
END OF INPATIENT DATA CAPTURING SECTIONS								

J. Follow-up Period ONLY	**1 month**	**2 months**	**3months**	**Other**
Please tick the applicable box	Recurrence of Catatonia?	Recurrence of Catatonia?	Recurrence of Catatonia?	Other?
	Re-Admission?	Re-Admission?	Re-Admission?	Other?
Please describe (in your own words) your experience/ how you felt during the catatonic episode	Uyacelwa uchaze (ngawakho amazwi) ngamava akho ngexesha ubune catatonia ukuba ingaba ubuziva njani.	**PARTICIPANT RESPONSE RECORDED VERBATUM (USE AUDIO RECORDER)**		

APPENDIX 2: INFORMED CONSENT FORM INFORMED CONSENT – ENGLISH

INFORMED CONSENT FOR A STUDY ON CATATONIA

Dear Participant or Relative

We are requesting your consent to enroll you in a study on catatonia and how the symptoms respond to the treatment you are going to be given.

YES, I AGREE TO BE ENROLLED

I …….....
agree in **voluntarily** taking part in the study as explained to me by the doctor/ nurse

OR

(In cases where the patient is incapable of giving consent but is not opposed to taking part in the study, then a relative or custodian may provide informed consent by also signing below)

I …… being the .....of …… **willingly** agree that he/she may take part in the study which has been explained to us by the doctor/ nurse

Signature of participant/relative/ custodian: ……..

Signed by …… at.....on the …… of.....2019

NO, I DO NOT AGREE TO BE ENROLLED

I

…….....

do not agree in taking part in the study as explained to me by the doctor/ nurse OR

I …… being the .....of …… do not agree that he/she may take part in the study which has been explained to us by the doctor/ nurse

Signature of participant/relative/ custodian:

……

FOR OFFICE USE ONLY: ASSESSMENT OF CAPACITY TO CONSENT BASED ON UBACC

Does the patient….	***Yes***	***No***
1. Understand the information relevant to the decision?	……	…
2. Retain the information long enough to consider it?	……	…
3. Weigh the information as part of the decision-making process?	……	…
4. Communicate their decision in some way?	……	…

Please Note: Should there be a no answer to any of the 4 questions above then the patient lacks capacity to consent and a relative or custodian may then be requested to provide informed consent.

INFORMED CONSENT - ISIXHOSA

IPHEPHA-MVUME LOPHANDO NGESIGULO SE-CATATONIA

Mthathi-nxaxheba obekekileyo okanye Mzali okanye sizalwane esibekekileyo

Sicela imvume yakho yokuphanda nzulu ngeempawu zesi sigulo i-catatonia, nokuba unyango ozakulufumana luzakusebenezela njani na.

Ndiye ndanikwa iphepha elichaza ngolu phando kwaye ndiluchazelwe ngu ……

EWE NDIYAVUMA

Mna (faka igama lakho apha) ……. ndiyazikhethela ukulungenela olu phando ndiluchazelwe ngugqirha okanye umongikazi, kwaye andinyanzeliswanga.

OKANYE

Ukuba umntu akakwazi ukunika imvume ngasizathu sithile, kodwa abe engali ukulungenela uphando, kungatyikitya umzali okanye isizalwane

Isayinwe ngu…… e…….. ngomhla we…….. kwinyanga ye .....ku 2019

HAYI NDIKHETHA UKUNGALUNGENELI OLU PHANDO

Mna (faka igama lakho apha) ……. ndikhetha ukuba ndingalungeni olu phando ndiluchazelwe ngugqirha okanye umongikazi

Mna ndingu…….(Chaza uhlobene njani nomthathi-nxaxheba)
ka……(igama lomthathi nxaxheba)

Isaynwe e…… ngomhla we…….. kwinyanga ye.....ku 2019

Utyikitya apha wena okanye umzali okanye isizalwane ……

FOR OFFICE USE ONLY: ASSESSMENT OF CAPACITY TO CONSENT BASED ON UBACC

Does the patient….	***Yes***	***No***
1. Understand the information relevant to the decision?	……	……..
2. Retain the information long enough to consider it?	……	……..
3. Weigh the information as part of the decision-making process?	……	……..
4. Communicate their decision in some way?	……	……..

Please Note: Should there be a no answer to any of the 4 questions above then the patient lacks capacity to consent and a relative or custodian may then be requested to provide informed consent.

APPENDIX 3: INFORMATION LEAFLETS IN ENGLISH AND XHOSA

3.1 - INFORMATION LEAFLET (XHOSA)

Iphepha lokwazisa umthathi-nxaxheba kuphando lwesigulo i-Catatonia

Mthathi-nxaxheba obekekileyo *okanye* Mzali okanye sizalwane esibekekileyo

Ngale ncwadi sikwazisa malunga ngophando nzulu oluqhutywa ziinzululwazi ezifuna ukufunda nzulu ngesigulo ekuthiwa yi-catatonia kweli ziko lempilo. Unyango obuhleli uzakulufumna alusayi kutshintsha okanye luphazamiseke wakuthatha inxaxheba kolu phando.

Yintoni i-*catatonia*?

I-catatonia le sisigulo esiye sibangele ukuphazamiseka kwindlela umntu ashukuma ngayo apha emzimbeni. Kwabanye abantu sibangela ukuba umzimba lo ucothe kakhulu okanye ungakwazi kushuma, umntu azive eqinile, athi nokuba uyafuna ukushumisa umzimba wakhe njengesiqhelo angakwazi. Ide ibangele loo nto ngelinye ixesha ukuba umntu aphethe ehleli ndawoninye okanye emile ndawoninye de kugqithe imizuzu emininzi okanye iiyure zibe liqela. Iyakwazi nokubangela ukuba umntu angakwazi ukuphuma kwasebhedini, angakwazi kuzityisa, angakwazi kuzihlamba, asoloko elele ebhedini okanye ehleli esitulweni.

Kwelinye icala i-catatonia iyakwazi ukubangela ukuba umntu athi ngoku sele eqalile ukushukuma esithi wenza into ethile, suka umzimba lo uqine, aphethe amalungu omzimba afana neengalo, izandla, imilenze okanye iinyawo zilenga emoyeni angakwazi ukuyigqibezela laa nthsukumo ebeyiqalile. Intamo nentloko nazo ziyakwazi ukuphetha zikekele ngenxa yoku kuqina komzimba kuvela ngesiquphe.

Okokugqibela, i-catatonia iyakwazi ukuphinda ibangele intshukumo engaphaya kunesiqhelo, aphethe umntu eshuku-shukuma kakhulu, angahlali ndawonye okanye angazinzi. Abanye baye bazule ndawoninye, abanye baqhwabe izandla unomphelo okanye banqwale kungenjalo baninike intloko into engapheliyo. Iyakwazi nokuvela ngokuba omnye umntu abetha-bethe amanqindi emoyeni, omnye athi nokuba usebhedini kube ngathi unyomfa ibhaysikili into engapheliyo. Babakhona nabaphetha bethetha into enye, okanye benze isikhalo esiphindaphindwayo okanye nayiphina intsholo abaye bayiqhube imizuzu emininzi okanye iiyure zide zibe liqela. Bakhona ke nabanye abaye balinganise loo nto ithethwa ngumntu ophambi kwabo kungenjalo balinganisa loo nto bayibona isenziwa ngumntu ophambi kwabo.

Ibangelwa yintoni i-*catatonia*?

I-catatonia iyakwazi ukubangelwa zizigulo ezithile zengqondo kungenjalo nezinye izigulo zomzimba ziyakwazi ukuhamba ne-catatonia. Ingxaki esiye siyifumane thina boogqirha neenzululwazi kukungazi xa siqala ukumbona umntu onale catatonia ukuba ingaba eyakhe ibangelwa sisigulo sengqondo na okanye sesomzimba kusini na. Yiloo tno side sabona ukuba kungakuhle ukuba sinokuyiphonononga nzulu le ngxaki.

Luqulethe ntoni olu phando?

Sijonge ekubeni wonke umntu oze kulaliswa kweli candelo, ahlolwe, kukhangelwe ukuba akahlaselwanga ziimpawu ezithile zale-catatonia kusini na. Wothi uhlolwe ngugqirha wakho ebehleli ezakuhlola kakade. Ukuba zikhona iimpawu ezithile ugqirha acinga ukuba uziqaphele apha kuwe, usenakho ukubuza ngazo umzekelo mhlawumbi ukuba ziqale nini, njani, kwaye ingaba uyaqala ukuba nazo na njalonjalo. Uzakube phofu ebhala loo nto umxelela yona. Apha ekubhaleni kwakhe kodwa akazokulibhala igama lakho nokuba ungubani kwaye uhlala phi. Oku kuhlolwa nokubuzwa nge-catatonia kungathatha imizuzu emihlanu ukuya kweli shumi kuphela. Ulwazi esiluqokelelayo ngawe kukuba nje iimpawu zesi sigulo unazo na kwaye nale mibuzo sesiyikhakanyile kuphela.

Zimbini izinto esifuna ukuziqwalasela kolu phando nge-catatonia:

1. Ingaba bangaphi abantu abafunyanwa sesi sigulo kule ngingqi?
2. Ingaba zikhona izinto ezingunobangela wokuba abanye abantu bafunyanwe sesi sigulo abanye basinde, mhlawumbi njengobubudala bomntu, isini okanye ezinye izigulo zomzimba?

Nayiphi na into esinokuyifunda eyongezelela kulwazi esele sinalo ngesi-sigulo ingasinceda kakhulu ekubeni sikwazi ukusinyanga ngcono kwixa elizayo. Ngako oko ubukho bakho nokuthatha kwakho inxaxheba kolu phando kuya kunceda abantu abaninzi abanokuthi bafunyanwe sesi sigulo.

Alukho olunye uvavanyo oza kulwenza oludibene nolu phando. Naluphi na olunye uvavanyo okanye unyango ozakuthi ulufumane emva kokuba umongikazi okanye ugqirha egqibile ukukuhlola, lunyango lwesiqhelo obuhleli uzakulufumana kakade kugirha wakho.

Ukuba ndifunyaniswe ndinazo imipawu ze-*catatonia* loo nto ithetha ukuthini?

Ukuba ufunyaniswe unazo ezinye zezi mpawu ze-catatonia, ugqira wakho wokunika unyango lakho lwesiqhelo okanye enze uvavanyo ebehleli ezakulwenza kakade olunxulumene nempilo yakho.

Kuza kwenziwa ntoni ngeziphumo zolu phando?

Iziphumo zolu phando zizakudityaniswa zibhalwe kufndiswe abanye oogqirha neenzululwazi malunga nesi sigulo, kwiinkomfa zoogqirha neenzululwazi.

Ndithini ukuba ndinemibuzo?

Ukuba unemibuzo ngolu phando, cela ukuthetha nogqirha wakho okanye umongikazi ozakube encedisa kolu phando.

Siyabulela!

Sibulela kakhulu ngexesha lakho nokuzixhesha kwakho ngolu phando.

3.2 - INFORMATION LEAFLET (ENGLISH)

Information Leaflet about a Study of Catatonia

Dear Participant / Parent/ Relative

This leaflet is provided to inform you about a study being conducted by researchers who would like to investigate a condition called catatonia at his health facility. The usual care you were going to get will not be changed or disturbed through taking part in this study.

What is catatonia?

Catatonia is a condition that affects the way a person moves his whole body or body parts. In some people it slows down the body considerably to the point where some will stop moving completely, causing the person to feel very stiff such that they are unable to move even when they want to. This may lead to a person remaining in one position for a very long time (whether sitting or standing) to the point of many minutes or even hours. It can even cause some people to be bedridden, unable to feed themselves, or wash or attend to other daily needs.

Catatonia can also cause a person to appear frozen even after initiating a particular action, resulting in body

parts like legs, arms hands or feet being frozen in awkward or unusual looking positions. The head and or neck may also be tilted at awkward angles. The change in movement can often occur suddenly.

Lastly catatonia can also cause an abnormality of excessive movement which is more than normal. A person may show excessive movement that lasts up to many minutes or hours with a seeming inability to stay still. Some people may pace up and down, others may clap orwave for long periods lasting minutes to hours, while others may show head nodding, head shaking, grimacing, etc. Some people have been seen to do shadow boxing or cycling movements even when lying down. It may also appear as repetitive speech of the same phrase, a cry or shout or other odd sound that can last for hours. Others may repeat what they hear around them non- stop or they may mimic actions of those around them as well.

What causes catatonia?

Catatonia may be seen with a number of mental illnesses but it can also be associated with some other medical conditions. The problem we run into as doctors is when a person presents with the first time with this syndrome it may be difficult in the beginning to know what the underlying cause is i.e. whether the cause is a mental condition or another medical condition. This is why conducting research on catatonia is so important.

What does this research involve?

We are looking at ensuring that everybody who is admitted into this unit s examined and screened for symptoms and signs of catatonia. Your admitting doctor will examine you as usual, which will include an initial screen for catatonia through examination only. Following this, a trained research assistant who is a nurse will proceed to do a full screen using a rating scale, to ensure that no other signs of catatonia were missed. If theresearch assistant finds any additional signs of catatonia, they will tell your treating doctor. In addition, the nurse may ask you questions like when did the symptoms start and how fast did they appear etc. She or he will note down you answers but will not include details like your name or your address which can identify who you are. This further screening by the nurse not expected to take longer than 5 to 10 minutes. The information to be collected for the study about your condition is about the signs and symptoms and the few questions already mentioned to do with the illness, nothing more. There are two questions we would like to investigate about catatonia:

1. How many people experience this condition in this area?

2.Are there particular characteristics that make some people more prone to it and others less vulnerable to it like age, gender or other medical conditions?

Whatever we can learn about this condition, over and above what we know already will help us to come up with improved ways to diagnose it and to treat it in future. Taking part in this research will therefore help many people in future who may also get this illness.

There are no other tests you will be expected to take part in for this study. Whatever other tests or treatment interventions that follow will be those that your doctor would have undertaken anyway to help you manage your condition and get you better.

If I am found to show some of the symptoms or signs of catatonia what does that mean?

If you are found to have some signs and symptoms of catatonia, the research nurse will inform your treating doctor, so that your doctor can give you the appropriate and usual treatment for your condition. Your doctor may also decide to do more tests which would be what they would have done anyway even if you were not part of the study, in order to manage your condition.

What will be done with the results of the study?

The results of the study will be collected and put together to present to scientific congresses so that other doctors and scientists can learn from them.

What should I do if I have more questions?

If you have more questions, ask your treating doctor or the researcher, research assistant or nurse.

Thank you!

Thank you very much for your patience and for spending the few minutes on this study.

APPENDIX4: INSTITUTIONAL PERMISSIONS –DORA NGINZA HOSPITAL

Province of
EASTERN CAPE
HEALTH

DORA NGINZA REGIONAL HOSPITAL

DEPARTMENT OF PSYCHIATRY: BEHAVIOURAL HEALTH UNIT
Spondo Street · Zwide · Port Elizabeth · 6205
Private Bag X 11851 · Port Elizabeth · 6055
Telephone +27 41 406 4280 · Fax +27 41 4064687

DEPARTMENT OF PSYCHIATRY REQUEST FOR CEO APPROVAL OF DEPARTMENTAL RESEARCH

To	Mr P Tsibolane Chief Executive Officer Dora Nginza Hospital
From	Dr A Bronkhorst, Prof S van Wyk and Prof Z Zingela Department of Psychiatry
Subject	DEPARTMENT OF PSYCHIATRY REQUEST FOR CEO APPROVAL OF DEPARTMENTAL RESEARCH
Date	08 November 2018

Introduction
The Department of Psychiatry and Walter Sisulu University have identified research projects in catatonia as a priority for the Eastern Cape due to the severity of the illness and the potentially negative outcomes resulting from delay in recognition of the cognition

Requested support
CEO approval and support for the research project on Catatonia: *"Catatonia as a manifestation of serious mental illness: prevalence, presentation, management and outcomes in a mental health unit"*, is hereby requested on behalf of the investigators to initiate this study in the Department of Psychiatry in Dora Nginza Hospital.

Conclusion
This project is also expected to yield support for other ongoing and planned registrar research projects on Catatonia. Thank you for considering this request.

A Bronkhorst S van Wyk Z Zingela

The request for approval is hereby **granted** / **not granted** (please delete as appropriate)

Signature: ..... Designation: CEO Date: 20.11.07

Name: M.P.T. SIBOLANE

Dora Nginza Regional Hospital
Chief Executive Officer
Mr M.P. Tsibolane

Signature:.....

Date:.....

APPENDIX 5: INSTITUTIONAL PERMISSIONS

APPROVAL FROM EC HEALTH RESEARCH COMMITTEE

APPENDIX VI

Eastern Cape Department of Health

Enquiries: Madoda Xokwe
Tel No: 040 608 0710
Date: 19 December 2017
Fax No: 043 642 1409
e-mail address: madoda.xokwe@echealth.gov.za

Dear Prof. Z. Zingela

Re: Catatonia As A Presentation For Severe Mental Illness: Prevalence Of Catatonia In Two Mental Health Units In Urban And Rural South Africa (EC_201712_015)

The Department of Health would like to inform you that your application for conducting a research on the abovementioned topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Epidemiological Research & Surveillance Management. You may be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE

PGDP EASTERN CAPE 2004 - 2014
Ikamva eliqaqambileyo!

APPENDIX 6: CATATONIA RATING SCALE

APPENDIX VII

BUSH-FRANCIS CATATONIA RATING SCALE

Use presence or absence of items 1-14 for screening
Use the 0-3 scale for items 1-23 to rate severity

1. Excitement: Extreme hyperactivity, constant motor unrest which is apparently non-purposeful. Not to be attributed to akathisia or goal directed agitation 0 = Absent 1 = Excessive motion 2 = Constant motion, hyperkinetic without rest periods 3 = Full-blown catatonic excitement, endless frenzied motor activity	**2. Immobility/stupor:** Extreme hypoactivity, immobile, minimally responsive to stimuli 0 = Absent 1 = Sits abnormally still, may interact briefly 2 = Virtually no interaction with external world 3 = Stuporous, non-reactive to painful stimuli
3. Mutism: Verbally unresponsive or minimally responsive 0 = Absent 1 = Verbally unresponsive to majority of questions; incomprehensible whisper 2 = Speaks less than 20 words/ 5 min 3 = No speech	**4. Staring:** Fixed gaze, little or no visual scanning of environment, decreased blinking. 0 = Absent 1 = Poor eye contact, repeatedly gazes less than 20 seconds between shifting of attention; decreased blinking 2 = Gaze held longer than 20 seconds, occasionally shifts attention 3 = Fixed gaze, non-reactive
5. Posturing/catalepsy: Spontaneous maintenance of posture(s), including mundane (e.g. setting or standing for long periods without reacting). 0 = Absent 1 = Less than 1 minute 2 = Greater than one minute, less than 15 minutes 3 = Bizarre posture, or mundane maintained more than 15 minutes	**6. Grimacing:** Maintenance of odd facial expressions. 0 = Absent 1 = Less than 10 seconds 2 = Less than 1 minute 3 = Bizarre expression(s) or maintained more than 1 minute
7. Echopraxia/echolalia: Mimicking of examiner's movements/speech. 0 = Mimicking of examiner's movements/speech 1 = Occasional 2 = Frequent 3 = Constant	**8. Stereotypy:** Repetitive, non-goal-directed motor activity (e.g. finger-play; repeatedly touching, patting or rubbing self); abnormality not inherent in act but in frequency. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
9. Mannerisms: Odd, purposeful movements (hopping or walking tiptoe, saluting passers-by or exaggerated caricatures of mundane movements); abnormality inherent in act itself. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant	**10. Verbigeration:** Repetition of phrases or sentences (like a scratched record). 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
11. Rigidity: Maintenance of a rigid position despite efforts to be moved, exclude if cog-wheeling or tremor present. 0 = Absent 1 = Mild resistance 2 = Moderate 3 = Severe, cannot be repostured	**12. Negativism:** Apparently motiveless resistance to instructions or attempts to move/examine patient. Contrary behavior, does exact opposite of instruction 0 = Absent 1 = Mild resistance and/or occasionally contrary 2 = Moderate resistance and/or frequently contrary 3 = Severe resistance and/or continually contrary
13. Waxy Flexibility: During reposturing of patient, patient offers initial resistance before allowing himself to be repositioned, similar to that of a bending candle. 0 = Absent 3 = Present	**14. Withdrawal:** Refusal to eat, drink and/or make eye contact. 0 = Absent 1 = Minimal PO intake/interaction for less than 1 day 2 = Minimal PO intake/interaction for more than 1 day 3 = No PO intake/interaction for 1 day or more.

BUSH-FRANCIS CATATONIA RATING SCALE (CONT.)

15. Impulsivity: Patient suddenly engages in inappropriate behavior (e.g. runs down hallway, starts screaming or takes off clothes) without provocation. Afterwards can give no, or only a facile explanation. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant or not redirectable	**16. Automatic obedience:** Exaggerated cooperation with examiner's request or spontaneous continuation of movement requested. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
17. Mitgehen: "Anglepoise lamp" arm raising in response to light pressure of finger, despite instruction to the contrary. 0 = Absent 3 = Present	**18. Gegenhalten:** Resistance to passive movement which is proportional to strength of the stimulus, appears automatic rather than willful. 0 = Absent 3 = Present
19. Ambitendency: Patient appears motorically "stuck" in indecisive, hesitant movement. 0 = Absent 3 = Present	**20. Grasp reflex:** Per neurological exam 0 = Absent 3 = Present
21. Perseveration: Repeatedly returns to same topic or persists with movement. 0 = Absent 3 = Present	**22. Combativeness:** Usually in an undirected manner, with no, or only a facile explanation afterwards. 0 = Absent 1 = Occasionally strikes out, low potential for injury 2 = Frequently strikes out, moderate potential for injury 3 = Serious danger to others
23. Autonomic abnormality: Circle: temperature, BP, pulse, respiratory rate, diaphoresis. 0 = Absent 1 = Abnormality of one parameter [excluding pre-existing hypertension] 2 = Abnormality of two parameters 3 = Abnormality of three or more parameters	**TOTAL:**_____

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Walter Sisulu University

FACULTY OF HEALTH SCIENCES
POSTGRADUATE EDUCATION, TRAINING, RESEARCH AND ETHICS UNIT

HUMAN RESEARCH COMMITTEE
CLEARANCE CERTIFICATE

PROTOCOL NUMBER	: 067/2017
PROJECT	: PREVALENCE OF CATATONIA IN TWO MENTAL HEALTH UNITS IN URBAN AND RURAL SOUTH AFRICA
INVESTIGATOR(S)	: PROF Z ZINGELA
DEPARTMENT	: PSYCHIATRY & BEHAVIOURAL SCIENCES
DECISION OF THE COMMITTEE	: APPROVED
DATE OF APPROVAL	: 07 MAY 2020
DURATION	: 1 YEAR (07 MAY 2020 – 07 MAY 2021)
CONDITIONS	: NONE

N.B You are required to provide the committee with a progress or outcome report of the research after every 6 months. The committee expects a report on any changes in the protocol as well as any untoward events that may occur at any time during the study not later than 7 days of knowing as the investigator/s.

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.....
DR EJ NDEBIA
CHAIRPERSON

07.05.2020
DATE

DECLARATION OF INVESTIGATOR(S)

(To be completed in duplicate and one copy returned to the Research Officer at Office AB 02 GF 03 Administration Building, Sisson Street Campus, Fort Gale, Mthatha, WSU)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Research Ethics Committee. I/We agree to a completion of a 6-monthly/ yearly progress report. The committee reserves the right to withdraw approval in the event that there are serious ethical violations.

..... (Signature)

..... (Date)

N. B. Please quote the protocol number in all enquiries.

BMJ Open

A Protocol for a Prospective Descriptive Prevalence Study of Catatonia in an Acute Mental Health Unit in Urban South Africa

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A Protocol for a Prospective Descriptive Prevalence Study of Catatonia in an Acute Mental Health Unit in Urban South Africa

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ABSTRACT

Introduction

Catatonia arises from serious mental, medical, neurological, or toxic conditions. The prevalence range depends on the setting and the range is anything from 7% to 63% percent in other countries. South African prevalence rates are currently unknown. The proposed study is a quantitative descriptive study utilising the Bush Francis Catatonia Screening Instrument as a screening tool with a data capturing information sheet to extract clinical information from patient folders. The study will investigate: 1) prevalence of catatonia, 2) clinical and demographic correlates associated with catatonia, 3) predictors of catatonia, 4) response to treatment, and 5) subjective experience of catatonia.

Methods and analysis

The setting is an acute mental health unit (MHU) within a regional, general medical hospital in Nelson Mandela Bay, South Africa which accepts referrals from within the hospital and from outlying clinics. Participants will be recruited from inpatients in the MHU from beginning of September 2020 to end of August 2021. Most admissions are involuntarily, under the Mental Health Care Act of 2002 with an age range of 13 to over 65 years. Participants who screen positive for catatonia will be followed up after discharge for three months to measure outcomes. Primary outcomes will include the 12-month prevalence rate of catatonia, descriptive and other data on presentation and assessment of catatonia in the MHU.

Secondary outcomes will include data on treatment response, participants' report of their subjective experience of catatonia and predictors of catatonia.

Descriptive statistics, multivariate binomial logistic regression, and univariate analyses will be conducted to evaluate associations between catatonia and clinical or demographic data which could be predictors of catatonia. Survival analysis will be used to examine the time to recovery after diagnosis and initiation of treatment. The 95% confidence interval will be used to demonstrate the precision of estimates. The level of significance will be $p \leq .05$.

Ethics and dissemination

The study has received ethical approval from the Research and Ethics Committees of the Eastern Cape Department of Health, Walter Sisulu University and Nelson Mandela University. The results will be disseminated as follows: at various presentations and feedback sessions; as part of a Ph.D. thesis in Psychology at Nelson Mandela University; and in a manuscript that will be submitted to a peer-reviewed journal.

Keywords: *Catatonia, assessment, screening tool, Bush Francis Catatonia Rating Scale, predictors*

Article Summary

Strengths and limitations of this study

- This is the first study to examine the prevalence of catatonia in South Africa and aims to address the lack of data on prevalence rates of catatonia, presentation, optimal management, predictors, and outcomes in this setting.
- The triangulation of information sources like the Bush Francis Catatonia Rating Scale, a validated catatonia screening tool, clinical notes, and subjective reports of catatonic episodes from the participants present a unique opportunity to investigate different aspects of catatonia.
- The descriptive nature of the study and the limited number of participants could limit the applicability of significant associations between variables regarding cause and effect and the generalisability of findings. The heterogenous nature of catatonia and interrater reliability of catatonia screening instruments are another source of potential limitations of the study.

INTRODUCTION

In the 1880s, Kraepelin described the prevalence of catatonia as close to 20% in 500 cases.[1] Modern-day studies show a range from less than 10% to 63%.[1, 2, 3] Catatonia is often treated by psychiatrists, even though underlying causes may be other medical conditions such as neurological, infectious, endocrine, and substance-induced disorders.[1] Grover et al.[4] described close to 40% of 205 patients who had delirium and two or more catatonic symptoms on the Bush Francis Catatonia Rating Scale (BFCRS).

Luchini et al.[5] characterised catatonia as an autonomous syndrome, frequently associated with mood disorders but also observed in patients with other conditions including neurological, neurodevelopmental, physical, and toxic conditions. Current evidence has provided some answers about the categorisation of catatonia, clinical presentations, interventions, and response to treatment.[5, 6, 7, 8]

The current study will investigate the prevalence of catatonia in patients of the Dora Nginza Hospital (DNH) mental health unit (MHU), associated risk factors and response to treatment. Due to the prominent role played by electroconvulsive therapy (ECT) in the treatment of catatonia, the results from this study may have applicability in public mental health planning, and availability of ECT in public hospitals.[1]

Catatonia in South Africa

There are currently no studies describing the prevalence of catatonia in South Africa (SA), which leaves clinicians blind to the burden of the disease linked to this potentially fatal syndrome. Clinicians may, therefore, be unaware of the importance of the assessment and detection of catatonia, leading to missed opportunities to intervene in what is a highly treatable condition.

White and Robins[9] described 17 patients with catatonia in SA who received antipsychotic medication. There was a deterioration in their clinical presentation into neuroleptic malignant syndrome (NMS). The risk of precipitating NMS in this case series was linked to the administration of antipsychotics. This study also challenged the notion of

NMS being viewed as a separate condition to catatonia. Since then, catatonia has not been widely studied in SA, despite the researchers' observation that it continues to present a significant and sometimes life-threatening challenge. Another study conducted in SA described the treatment of 42 catatonic patients with ECT.[10] The current study represents the first stages of aiming to fill the gap in the extant research with a prospective study on prevalence and predictive data.

Prevalence of catatonia in other parts of the world

Fink and Taylor [1] described a rate of catatonia of 10% in acutely ill psychiatric patients and Stuivenga and Morrens 2] a rate of 16.9% when applying the DSM-5 criteria. Conditions found in association with a catatonic presentation have included psychiatric diagnoses like bipolar disorder, delirious mania, psychotic depression, schizophrenia, and other medical conditions.[6, 2] In some instances, the cause leading to catatonia has been less well-defined. DSM-5 has captured the multiple possible associations that occur with catatonia by including it as a specifier for mood disorders and schizophrenia or as linked to another medical condition.[11] Catatonia also appears as an entity with undefined aetiology under 'catatonia not otherwise specified'.[8]

Choice of screening tool and rating scale

In 1996, Bush et al. designed the Bush Francis Catatonia Screening Instrument (BFCSI) a 14-item scale for screening for catatonia and a 23-item scale for rating severity of catatonia.[3, 12] They demonstrated that the scales were reliable and valid tool for diagnosis and evaluation of response to treatment. The scales have a dual utility of screening and measurement of the severity of catatonia. A systematic review of seven catatonia rating scales

reported a similar finding when comparing the BFCRS with other tools to screen for catatonia.[13] They recommend the BFCRS for routine use because of ease of use, reliability, and validity. Wilson et al.[14] found 300 out of 339 patients with acute medical and psychiatric illness screened positive for catatonia when applying the BFCRS.

The BFCSI and BFCRS have been used successfully in the MHU as screening and rating scales for the past seven years in the MHU which is the site of the current study. Other reasons supporting the utility of the scales in this study are: 1) the reported ease of use, 2) reliability, 3) validity as both a screening tool and a measure of severity, and 4) its use since 2011 in the study site has not yielded any issues with applicability or appropriateness when used in this clinical setting. Figure 1 reflects the assessment tools and process that will be applied to assess participant and collect data.

Management of catatonia

The biological treatment for catatonia has advanced over the last century, from insulin coma therapy of the early 1930s and Meduna's use of seizure-inducing camphor oil injections to Cerletti's first documented use of an electric shock procedure in 1938.[1] Available evidence on management of catatonia includes the published works from various researchers.[1, 6, 7, 9,14-19] Lorazepam and ECT are the current recommended treatments, irrespective of aetiology. They are effective in most cases.[1, 7, 9, 14, 17]

In both in the White and Robins[9] and Fricchione et al.[7] case series, intravenous administration of benzodiazepines (diazepam or lorazepam) was demonstrated as an efficacious treatment for catatonia. Response is seen relatively rapidly, i.e. within minutes of administration. Instead of a sedative effect that one observes with the administration of

benzodiazepines in non-catatonic patients, those with catatonia tend to 'wake up' from stupor or normalise from a state of extreme excitement. In the White and Robins[9] study, two patients who did not receive intravenous benzodiazepines died.

The dose range used at the study site tends to be higher and is given more frequently compared to the recommendation in the Rasmussen et al. paper.[19] This is mainly because patients at the site present at advanced stages of catatonia and tend to respond slowly or not at all when the lower or less frequent doses are employed.

The subjective experience of catatonia

Northoff et al.[20] conducted a retrospective study on 24 catatonic patients post-recovery after a catatonic episode. The patients reported intense emotions which could not be controlled and ambivalence with less focus on their altered movements. Other descriptions of catatonia have stated an extreme fear response characterized by freezing, likened to the defence seen in animals of tonic immobility or freezing in the face of danger.[21]

This study will investigate the subjective experience of catatonia as described by participants once discharged from the hospital, to shed light on the emotive and cognitive experience of catatonia in the study cohort. This may provide clues on the psychological drivers of the catatonic response and could pave the way for further research into the psychology of the catatonic response.

Aims

This study aims to determine the prevalence of catatonia in an acute mental health

unit in urban South Africa and research its assessment and management in this setting.

Objectives

The two main research objectives are:

1. Screening of consenting participants admitted to the mental health unit in Dora Nginza Hospital using the BFCSI for catatonia, over a 12-month period from the 1st of September 2020 to the end of August 2021, to describe the prevalence of catatonia in this setting.
2. Description of demographic and clinical information, including response to treatment, in participants diagnosed with catatonia based on their BFCSI scores and clinical assessments performed by the admitting doctor.

In addition, significant clinical correlates and risk factors in participants with catatonia will be described, and participants with catatonia will be followed up once discharged at one month, two months, and three months intervals, to assess outcomes using the BFCSI and information about readmission or recurrence of any episode of mental illness. The association that will be looked at is between catatonia and demographic or clinical correlates such as age, gender, DSM 5 diagnosis, substance use, vitamin 12 deficiency and food insecurity and other co-occurring medical conditions. Participant's experience of catatonia once it has resolved will also be described.

Research design

This is a prospective, descriptive triangulation study utilising mixed quantitative and qualitative methods. An exploratory qualitative aspect will investigate the emotive and

cognitive subjective experience of participants with catatonia to establish a direction for further research. This is because there is currently limited data available on the subjective experience of catatonia, with most research focusing on quantitative aspects.

The quantitative elements of the study will include data collected from participant files of BFCSI scores upon admission, with additional clinical and demographic information collected via a pre-designed datasheet. The qualitative element will describe the participant's reported experience of the catatonic episode, post-discharge.

METHODS AND ANALYSIS

The study will take a positivist paradigm approach to investigate the potential causal relationships between catatonia and different variables via correlational studies.[22] Creswell[23] described the positivist's approach as an attempt to identify causes, which influence outcomes, the aim being to formulate laws, thus yielding a basis for prediction and generalisation. In the current study, deductive reasoning will be applied to data collected through 1) direct observation and 2) quantitative and qualitative approaches, to identify associations with catatonia, causal relationships, and possibly, predictors of catatonia.[22]

Sources of information that will be utilised for triangulation include: the participants' BFCSI/ BFCRS scores and clinical notes; field notes taken by the research team during direct observation and interviews; and participant and relative interviews focusing on response to treatment, food insecurity, and the subjective experience of catatonia. Additionally, the mixed methods nature of the study will enable the generation of both objective (as documented by

treating and research teams) and subjective data regarding the experience of catatonia. This type of triangulation is an important tool for meeting the goals of this study while facilitating a holistic assessment of catatonia in this cohort.

The study process and outline

Two research assistants (RAs) with a background in health will be recruited to assist the researcher with fieldwork. A health background is necessary to understand the medical terminology that is utilised in the clinical notes and screening tools. A part-time administrative assistant will be contracted to assist with data capturing and collation. Fieldwork will include the recruitment of participants and collection of data by the researcher and RAs. There will be a limited follow-up component that extends to up to three months following discharge from the hospital.

The RAs will be trained by the researcher on:

1) application of the BFCSI and BFCRS to ensure they are knowledgeable about the screening tool and its interpretation, and

2) assessment of capacity to consent utilising the University of California, San Diego Brief Assessment of Capacity to Consent Questionnaire (UBACC).

The UBACC has been applied successfully in the Eastern and Western Cape in study cohorts recruited from inpatient mental health institutions. [24, 25]

The inter-rater reliability (IRR) of the BFCRS was demonstrated to be good (α=0.779) in a study looking at four different instruments to assess for catatonia. [26] In the planned study, training that will be provided by the lead researcher to the RAs on the use of the BFCSI/BFCRS will be through:

- explaining the meaning of terms used in the BFCSI/BFCRS to describe clinical signs and symptoms of catatonia and
- providing a demonstration of how to elicit and document the 14-items and 23-items in the BFCSI/BFCRS, how to capture the relevant information accurately onto the data capturing form
- ensuring RAs start with practice participants initially under direct observation of the lead researcher, before starting the actual recruitment. An IRR in the range of (α=0.61 to 0.8) during the practice scoring will be deemed acceptable for RAs to proceed to the scoring of study participants.

Inter-rater reliability will also be addressed through ensuring that everyone has a similar understanding of all items to be rated in the screening tool and how these should be recorded.

The researcher and RAs will assess participants who meet the inclusion criteria for capacity to consent, utilising the UBACC. All those with intact capacity to consent will be requested to consider entering the study. For participants who may be assessed as lacking the capacity to consent, their closest relatives or guardians will be requested to consent on their behalf through proxy consent (proxy consent and its ethical application is further discussed in the section 'Ethics and dissemination' below). Additionally, in those assessed to lack capacity to consent, such capacity will be reviewed weekly to allow for further re-engagement on their consent to take part in the study, the ultimate aim being to change from proxy consent to personal consent as soon as potential participants have regained capacity. Data collected about any participant who chooses to withdraw from the study will be removed from the study data sets and destroyed.

The research team will collect data from the clinical files of consenting participants on BFCSI/BFCRS scores and additional descriptive and demographic information as guided by the study questionnaire and study protocol. The completed data capturing forms will be submitted to the administrative assistant for data collation and entry into a spreadsheet at the end of each week. The assessment of new admissions will be daily on weekdays with the expectation being to conduct daily screening or within the first 48-hours at least. Information on clinical presentation of patients admitted over weekends will be supplemented from the clinical folders. In cases where the Researcher or RAs identify possible missed catatonia, the treating doctor will be provided with any additional information picked up during the participants' assessment to allow for a review of the patient's clinical case and management.

During the limited follow-up period, the researcher and RAs will repeat the BFCSI assessment and conduct face-to-face interviews with participants regarding their experience of catatonia at one month, two months, and three months post-discharge. Recurrence of symptoms or readmissions since the last discharge will be documented. The participant's willingness to continue with the study will be reviewed during every visit to ensure their consent remains valid throughout. Figure 2 is a summary of the study process that will be followed.

Setting

The setting will be a 35-bed acute mental health unit in Dora Nginza Hospital, a general hospital in the Eastern Cape Province in South Africa. The hospital is in Zwide, in the iBhayi area of Port Elizabeth which has a population of over one million within an urban

area that has a high morbidity of mental illness.[27] Close to 70% of the population is comprised of working age adults between 15 and 64 years and the city has an unemployment rate of close to 30%. [27] Zwide itself has a population of 238 000. [28] Health services in the hospital include obstetrics and gynaecology, paediatrics, basic surgical, internal medicine, and family medicine. The MHU is an acute inpatient unit offering 24-hour care to persons who present with acute mental illness requiring inpatient treatment. It accepts referrals from all the other hospital departments including the Accident and Emergency Department, as well as referrals from primary care clinics and district hospitals in the nearby vicinity. The usual period of admission ranges anything from three days to a few weeks.

All cases of suspected catatonia, from any of the referring departments are discussed with the MHU team and prioritized for admission into the unit. Any treatment given thereafter is discussed with the MHU team and documented in the patient's folder.

Sampling

Convenience sampling of all patients admitted to the MHU over a twelve-month period (September 2020 to August 2021) will be undertaken. Contact details of all consenting participants who have screened positive for catatonia will be entered into a database to enable contact for future follow-up at the end of one month, two months, and three months post-discharge. This information will be password encrypted.

The number of patients expected to be admitted during the study period is around 1000 based on previous unit stats over the last three years and adjusted down slightly to accommodate the effect of the COVID-19 outbreak on hospital admissions. The margin of error or confidence interval will be set at 95% and the standard deviation will be set at 0.05. To determine the total sample size required, the formula: $n=N/(1+Ne^2)$ will be utilized and

yields a minimum sample size of 286 subjects. A further 20% (57) will be added to account for data entry errors and non-responses. The appropriate sample size of participants to be screened for the prevalence of catatonia in the unit is 343.

Participants

Most people admitted to the DNH MHU are involuntary admissions under the Mental Health Care Act of 2002.[29] Age of admission ranges from 13 to over 65 years because there are no child, adolescent, or geriatric inpatient-specific services in the region.

Inclusion criteria

All patients admitted to the unit during the study period will be eligible for inclusion. Those who screen positive for two or more catatonic signs and symptoms on the BFCSI will be included during the follow-up period for the qualitative part of the study.

Exclusion criteria

Refusal to take part in the study, whether through the direct patient consent process or the proxy consent process, will result in the exclusion of the patient.

Methods of assessment and measurement

The BFCSI is a 14-item scale (see Appendix A) that is used to screen for catatonia and the BFCRS is a 21-item scale used to rate severity.[11] The BFCSI is used on initial assessment and the full BFCRS is used to determine severity. Participants' responses to the standard interventions of intravenous lorazepam administration or ECT will be documented by the admitting doctor in the case notes. The research team will then capture this information on a predesigned data collection sheet. A 50% reduction in signs and symptoms

in response to the treatment intervention represents a response while a 100% reduction is considered full resolution. When a patient presents with two or more positive items on the BFCSI, they are deemed catatonic and further management is guided by the unit protocol. A lorazepam infusion of 1mg or 2 mg is administered and a response of 50% or greater reduction in the scale score verifies the diagnosis although absence of verification does not exclude catatonia. The research team will capture information on participant's BFCSI/BFCRS scores and other clinical data this information on a predesigned data collection sheet. A 50% reduction in signs and symptoms in response to the treatment intervention represents a response while a 100% reduction is considered full resolution.

The clinical data collection that will be collected include current psychiatric diagnosis, co-occurring medical conditions, any other treatment administered, history of substance use, history of previous catatonic episodes, vital signs like temperature on admission, blood pressure, pulse, investigations like creatinine kinase, iron levels, thyroid function teste urea and electrolytes or any other relevant clinical investigations reflected in the file which are noted by the treating team to be of relevance to the current admission., and food insecurity. The participants' case notes will form a primary source of information as well as direct observation of the participants. Additional information will be sought from relatives if the participant is unable to respond adequately to information required on food security questions due to the severity of catatonic symptoms, or in those who are unable to provide the additional information for whatever other reason.

Regarding social determinants of mental health, current evidence indicates that those who are poor or disadvantaged suffer disproportionately from common mental disorders and their adverse consequences.[30] The strength of the association with poverty has at times

varied depending on the type of poverty measure used. Food insecurity as a poverty measure is one of the factors with a consistent and strong association with common mental disorders.[31] In this study, the administration of a food security questionnaire will be utilised to assess the correlation of poverty to catatonia. Two food insecurity questions are drawn from the USDA's 18-question Household Food Security Scale.[32] They make up The Hunger Vital Sign Questionnaire, a validated two-question food insecurity screening tool used in the clinical setting. The questions are:

1. Within the past 12 months, we worried whether our food would run out before we got money to buy more.
2. Within the past 12 months, the food we bought just did not last and we did not have money to get more.

During the follow-up period, participants will be asked to describe their experience of the catatonic episode as well as their perception of recovery.

Expected outputs

- The 12-month prevalence rate of catatonia.
- Descriptive and other data on presentation and assessment of catatonia in the DNH unit.
- Data on treatment response, short-term outcomes, and subjective experience of catatonia.
- Predictors for catatonia based on clinical correlates and other descriptive data collected.
- Recommendations and guidelines for the management of catatonia and possible

prevention strategies.

Data management and analysis

Quantitative data collected will be summarised using descriptive statistics. Categorical variables will be presented using frequency tables, percentages, and graphs. Two or more categorical variables will be compared using contingency tables (e.g. 2 X 2 Table) and the expected frequencies will be calculated to determine the type of test best suited to determine the extent of any identified relative associations. If the expected frequencies in all cells are ≥5 then the Chi-squared test will be used and if the expected frequencies are < 5 in any cells, then the Fisher's exact test will be used.

Binomial logistic regression will also be conducted to determine the predictors of catatonia and to estimate the risk ratio. If the numerical data are not normally distributed, non-parametric statistics will be used (median and interquartile range). The best fitting model of multivariate analysis will be chosen through forward selection of model building. The model with the lowest Bayesian information criterion will be selected as the better model and the 95% confidence interval will be used to estimate the precision of estimates. Survival analysis will be used to determine the time to recovery and the hazard ratio (i.e. the total number and timing of each event indicating relapse in this study) will be reported for this purpose.

Qualitative data collated during the follow-up period will be analysed to elucidate the subjective experience of catatonia in this cohort. Aspects of the thematic analysis presented by Braun and Clarke [32] will be applied to identify themes. Themes will be identified through a framework approach identifying word repetition, local expressions, metaphors and

similarities, differences, and keywords. A tentative hypothesis and theory regarding the experience of catatonia will be presented based on emergent themes. Data collected during the quantitative and qualitative segments of the study will be analysed separately but compared for congruency of reported information to enhance data integration.

In summary, data integration will be in the form of:

i. converting information gathered from the quantitative aspects of the study into numerical information that can be processed through application of statistical methods to test for correlations and associations.

ii. identifying common themes through field notes taken when interviewing participants during the outpatient stage of the study.

iii. Assessing congruency between common themes about the subjective experience of catatonia as described by participants and commonly identified presenting symptoms as highlighted in case notes and listed in the data collection sheet. The advantage of this approach is that it strengthens the validity and reliability of the study.

iv.

Patient and public involvement

No formal patient advisory committee was set up. The research was developed after the researchers noted mostly young patients in their mid-30's of less being admitted to the study site with catatonia. Some patients presenting with catatonia wanted to know why some people present with catatonia while others do not and whether there were risk factors that could indicate those who were susceptible. Patients who had recovered from catatonia also seemed to indicate varying experiences of the catatonic state. The observational descriptive nature of the sign was to ensure that data is collected in "real life" terms, such that if the

study reveals limitations in the resources for managing catatonia at the site, then the results could be used to motivate for proper resourcing of the heath facility to improve care of those with catatonia.

ETHICS AND DISSEMINATION

Ethics clearance has been granted for the study by the Eastern Cape Department of Health Ethics Committee, the Walter Sisulu University Research and Ethics Committee and the Nelson Mandela University Human Research Ethics Committee. The study does not have any intervention arm.

All patients admitted to the unit will be presented with an information leaflet on the study in English or Xhosa. Consent for inclusion in the study will be obtained from all participants who have the capacity to consent, which will be determined through application of the UBACC. Proxy consent will be sought from a relative or guardian for all patients who lack the capacity to consent or are minors between the ages of 13 and 18 years of age. The use of proxy consent in mental health research is applicable for those who lack the capacity to consent and the nearest relative or guardian consents on their behalf. It is permissible within the mental health care setting due to the challenges with capacity to consent that may exist in patients with acute mental illness.[33] Proxy consent ensures that respondents' rights are guarded while making it possible to include individuals or groups who may potentially benefit from scientific advances gained from research. This approach is also supported by the Helsinki Declaration on ethical research which states that 'for a research subject who is legally incompetent, physically or mentally incapable of giving consent or is a legally incompetent minor, the investigator must obtain informed consent from the legally authorised

representative in accordance with applicable law'.[34] The Department of Health Guidelines on ethics in health research similarly state that persons should not be excluded unfairly based on discrimination or disability.[35]

The Mental Health Care Act (MHCA) of 2002 also makes a reference as to whom may be considered an associate of a patient admitted under the Mental Health Care Act: e.g. a spouse, next of kin, partner, associate, parent, or guardian.[29] A similar approach will be taken for this research. All data will be anonymised and stored under lock and key, with access granted to the research team only.

Dissemination of results

The results will be presented at feedback sessions with the Hospital Board, Eastern Cape Department of Health and at national and international congresses and may be used to compile guidelines on assessment and management of catatonia in the region. They will also be compiled as a thesis, which will be submitted for examination for a Ph.D. in Psychology at Nelson Mandela University. A research report based on the study results will be submitted to peer-reviewed journals to be considered for publication.

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AUTHOR CONTRIBUTIONS

Z Zingela conceived the idea and devised the project and its main conceptual ideas assisted by S van Wyk and M Fink. L Stroud and J Cronje supervised the development of this manuscript and provided editorial input.

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COMPETING INTERESTS STATEMENT

The authors have no competing interests to declare.

Figure 1

Assessment Tools

Figure 2

The Study Process

Figure 1: Assessment Tools

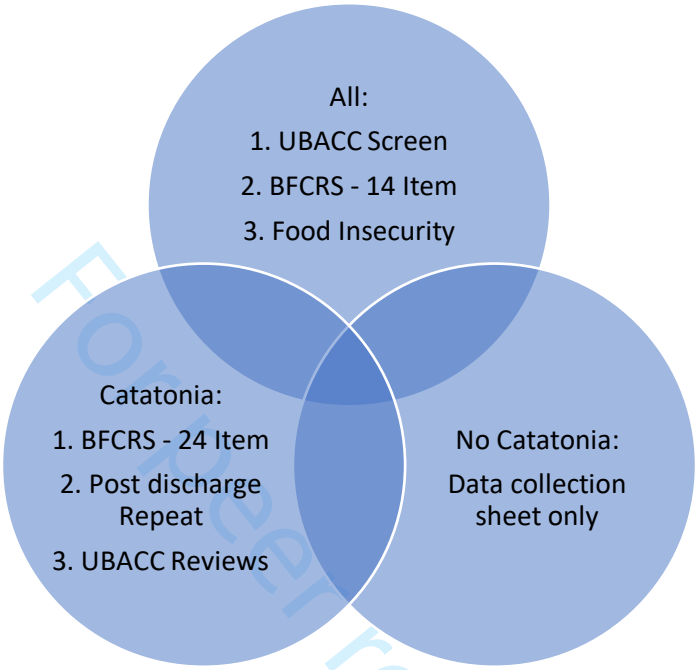
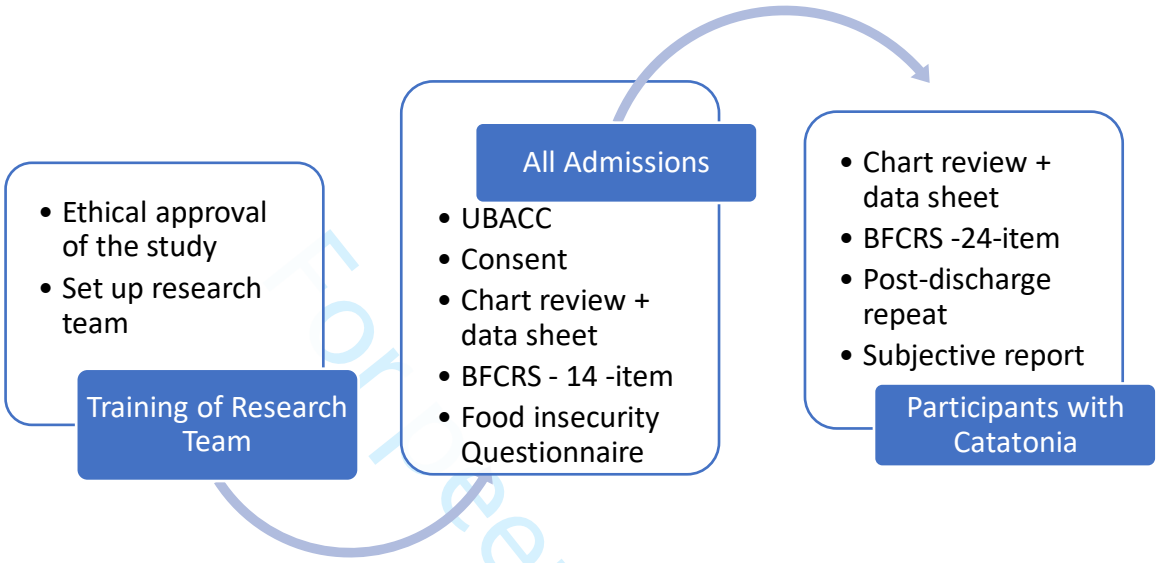


Figure 2: Study Process



APPENDICES

APPENDIX 1: DATA COLLECTION SHEET

<table>
<tr><td colspan="5">Enrolment No:</td><td colspan="8">Tick applicable box or insert answer in area shaded in white</td></tr>
<tr><td colspan="5">Unit</td><td colspan="8">Is the Patient Catatonic now?
(Fill in the BFCRS item 1 to 14 to answer this question), 2 or more signs mean Yes, there is catatonia</td></tr>
<tr><td colspan="5">DNH</td><td colspan="4">If No then tick this box and fill in ONLY Sections A,G,H,I, and J</td><td colspan="4">If Yes then tick this box and fill in sections A, B, C, D, E, F, G, H, I, and J.</td></tr>
<tr><td colspan="4">A. Age</td><td>Sex</td><td colspan="4">Ethnicity</td><td>1st admission</td><td>Catatonic symptoms before?</td><td>Provisional DSM -5 Diagnosis in file?</td><td>Susbtance Use?</td><td>Another medical condition</td></tr>
<tr><td>< 16</td><td>6 - 35</td><td>36 - 65</td><td>> 65</td><td>F (0)</td><td>M (1)</td><td>B</td><td>C</td><td>I</td><td>W</td><td>Yes
No</td><td>Yes
No</td><td>Yes
Diagnosis ……
….
No</td><td>Yes
No</td><td>Yes
No</td></tr>
<tr><td colspan="9"></td><td>No of previous admissions</td><td>No of times had catatonia previously</td><td>No of previous diagnoses?</td><td></td><td>No of medical conditions?</td></tr>
<tr><td colspan="9"></td><td>Not known</td><td>Not known</td><td>Not known</td><td>Not known</td><td>Not known</td></tr>
<tr><td colspan="4">B.</td><td>BZD or</td><td colspan="4">Blood Pressure</td><td>Pulse</td><td>Body</td><td>Respiratory</td><td colspan="2">Name of BZD</td></tr>
</table>

BFCR Scale Score	**LRZ Dose:** 1-2mg 2-4 mg >4 mg **No of dose/s** 1 -2 3 - 4 5 or more	**Systolic:** <120 120 -139 140 – 180 181 – 220 >220	**Diastolic:** <70 80 -90 91-110 110-120 >120	<70 71-100 101-120 121-160 >160	**Temp** <35 35 -37 38 – 40 >40	**Rate/ O2 Sats** **<90%** **91 – 93** **94 – 96** **97 – 99** **100**	**given:** Lorazepam Clonazepam Diazepam Midazolam Dose……. Other Treatment? ……
Initial Score	1st dose	2nd dose		3rd dose		4th dose	5th dose
<6	<6	<6		<6		<6	<6
6-12	6-12	6-12		6-12		6-12	6-12
12-24	12-24	12-24		12-24		12-24	12-24
24-36	24-36	24-36		24-36		24-36	24-36
>36	>36	>36		>36		>36	>36

<table>
<tr><td rowspan="4">C. Length of time and degree of response to BZD</td><td colspan="2">1st hour after admission</td><td colspan="2">2-3 days</td><td>4-6 days</td><td>Degree of Response</td></tr>
<tr><td colspan="6">Mild = Less than 25% reduction in No. of symptoms</td></tr>
<tr><td colspan="2">2 to 6 hours after admission</td><td>7-10 days</td><td>11-14 days</td><td>>14 days</td><td>Moderate = 25% to 50% reduction in No. of symptoms</td></tr>
<tr><td colspan="2">7 to 47 hours after admission</td><td colspan="3">Reason ECT was not given after the 1st 3 days of admission (from clinical notes)
……</td><td>Good = Response of more than 50% reduction in No. of symptoms
Response to BZD not sustained</td></tr>
<tr><td rowspan="3">D. ECT and response</td><td colspan="2" rowspan="2">Yes</td><td>Number of Sessions</td><td colspan="2">Response</td><td>Response to ECT not sustained</td></tr>
<tr><td rowspan="2"><4
5-9
10-12
>12</td><td colspan="2">Nil
Remission of catatonia
Other (specify)……..</td><td colspan="2">Maintenance ECT prescribed or required?</td></tr>
<tr><td colspan="2">No</td><td>Time to 50% improvement
<3 days
4-7 days
>1 week</td><td>Time to full Resolution
<3 days
4-7 days
>1 week</td><td>Yes, prescribed? If so what is the No. of sessions?</td><td>No, not prescribed</td></tr>
<tr><td rowspan="4">E. Duration of Catatonia prior to admission if known

OR
Not Known</td><td>Hours to 3 days</td><td>Duration of Catatonia Prior to admission?</td><td colspan="4" rowspan="4">Any other additional information?</td></tr>
<tr><td>4 days to 2 weeks</td><td>NOT known
OR</td></tr>
<tr><td>3 to 4 weeks</td><td>< 3 days
4 to 7 days</td></tr>
<tr><td>More than 4 weeks</td><td>>7 days</td></tr>
<tr><td>F. Type of onset</td><td>Hours to days</td><td>Gradual</td><td>Fluctuating</td><td colspan="2">Mostly Excited Form?</td><td>Mostly Slowed Form?</td></tr>
</table>

				Excited/ Stereotypy/ Mannerism		Stupor/ Withdrawal/ Rigidity/ Mutism/ Staring		
G. Food Insecurity	1.Within the past 12 months, we worried whether our food would run out before we got money to buy more.							
	Often True	Sometimes true	Never true	Don't know	Other			
	2.Within the past 12 months, the food we bought just didn't last and we didn't have money to get more.							
	Often true	Sometimes true	Never true	Don't know	Other			
H. Substances		YES	NO	Alcohol	Cannabis	Amphet	Heroin	Metamphet
				Cocaine	Opiods	Nicotine	Other (Specify)	

I.Medical Illness	No	Yes	If Yes, chose from the following if on history only		If Yes, choose from the following if current		If HIV			
			HPT	DM	HPT	DM	On HAART?		No	
			Epilepsy	HIV	Epilepsy	HIV	If HIV on HAART, Regime?		If HIV, CD4?	
			Head Trauma	TB	Head Trauma	TB	If HIV, Viral Load?		Other (specify)	
			SLE or Auto/I	Other (specify)		Other (specify)				
J. Investigations:	**CK (u/l)**		CK≤200	**Fe µmol/l**	Fe 9 to 30	**VitB12 pmol/l**	B12 ≤ 107		**Auto/I Screen**	
1.CK – Creatinine Kinase **2.Fe – Iron** **3.B12 – Vitamin B12** **4.TSH – Thyroid Stimulating Hormone** **5.T4 – Thyroid Hormone** **6.ANF – Nuclear Factor Rheumatoid Factor**	CK 201 -1000		CK ≥1000	Fe ≤ 9	Fe ≥ 30	B12 108 - 221	B12 ≥ 221	RF < 14IU/ml OR >14IU/ml	ESR < 29 OR > 29	ANA Pos OR Neg
	Endocrine		**TSH miu/l** **Normal TSH** 038 to 5.33	≤0.38	≥5.33	**Cortisol** **Normal (AM)** 185 to 617	≤184		≥618	
			T4 pmol/l **Normal T4** 7.2 to 16.4	≤ 7.2	≥ 16.4	**Cortisol (PM)** ≤ 276	≤ 276 (pm)		≥ 276	
END OF INPATIENT DATA CAPTURING SECTIONS										

BEGINNING OF OUTPATIENT FOLLOW UP SECTION FIR PATIENTS WHO HAD CATATONIA					
K. Follow-up Period ONLY	**Date of Discharge**	**1 month**	**2 months**	**3months**	**Other**
Please tick the applicable box	Recurrence of Catatonia? Yes No	Recurrence of Catatonia? Yes No	Recurrence of Catatonia? Yes No	Other?	
	Re-Admission? Yes No	Re-Admission? Yes No	Re-Admission? Yes No	Other?	
Please describe (in your own words) your experience/ of the catatonic episode in terms of your thoughts, feelings and behaviour	Uyacelwa uchaze (ngawakho amazwi) ngamava akho ngexesha ubune catatonia ngokwengcinga a zakho, indlela obuziva ngayo nezinto obuzenza.	**PARTICIPANT RESPONSE RECORDED VERBATUM (USE AUDIO RECORDER)** **Thoughts** **Feelings** **Behaviour**			

APPENDIX 2: INFORMED CONSENT FORM INFORMED CONSENT – ENGLISH

INFORMED CONSENT FOR A STUDY ON CATATONIA

Dear Participant or Relative

We are requesting your consent to enroll you in a study on catatonia and how the symptoms respond to the treatment you are going to be given.

YES, I AGREE TO BE ENROLLED

I …….....

agree in **voluntarily** taking part in the study as explained to me by the doctor/ nurse

OR

(In cases where the patient is incapable of giving consent but is not opposed to taking part in the study, then a relative or custodian may provide informed consent by also signing below)

I …… being the..... of …… **willingly** agree that he/she may take part in the study which has been explained to us by the doctor/ nurse

Signature of participant/relative/ custodian: ……..

Signed by …… at.....on the …… of.....2019

NO, I DO NOT AGREE TO BE ENROLLED

I

…….....

do not agree in taking part in the study as explained to me by the doctor/ nurse OR

I …… being the..... of …… do not agree that he/she may take part in the study which has been explained to us by the doctor/ nurse

Signature of participant/relative/ custodian:

……

FOR OFFICE USE ONLY: ASSESSMENT OF CAPACITY TO CONSENT BASED ON UBACC

Does the patient….	***Yes***	***No***
1. Understand the information relevant to the decision?	**……**	**……...**
2. Retain the information long enough to consider it?	**……..**	**……...**
3. Weigh the information as part of the decision-making process?	**……...**	**……...**
4. Communicate their decision in some way?	**……...**	**……...**

Please Note: Should there be a no answer to any of the 4 questions above then the patient lacks capacity to consent and a relative or custodian may then be requested to provide informed consent.

INFORMED CONSENT - ISIXHOSA

IPHEPHA-MVUME LOPHANDO NGESIGULO SE-CATATONIA

Mthathi-nxaxheba obekekileyo okanye Mzali okanye sizalwane esibekekileyo

Sicela imvume yakho yokuphanda nzulu ngeempawu zesi sigulo i-catatonia, nokuba unyango ozakulufumana luzakusebenezela njani na.

Ndiye ndanikwa iphepha elichaza ngolu phando kwaye ndiluchazelwe ngu ……..

EWE NDIYAVUMA

Mna (faka igama lakho apha) ……. ndiyazikhethela ukulungenela olu phando ndiluchazelwe ngugqirha okanye umongikazi, kwaye andinyanzeliswanga.

OKANYE

Ukuba umntu akakwazi ukunika imvume ngasizathu sithile, kodwa abe engali ukulungenela uphando, kungatyikitya umzali okanye isizalwane

Isayinwe ngu…… e…….. ngomhla we…….. kwinyanga ye.....ku 2019

HAYI NDIKHETHA UKUNGALUNGENELI OLU PHANDO

Mna (faka igama lakho apha) ……. ndikhetha ukuba ndingalungeni olu phando ndiluchazelwe ngugqirha okanye umongikazi

Mna ndingu…….(Chaza uhlobene njani nomthathi-nxaxheba)
ka……(igama lomthathi nxaxheba)

Isaynwe e…… ngomhla we…….. kwinyanga ye .....ku 2019

Utyikitya apha wena okanye umzali okanye isizalwane ……

APPENDIX 3: INFORMATION LEAFLETS IN ENGLISH AND XHOSA

3.1 - INFORMATION LEAFLET (XHOSA)

Iphepha lokwazisa umthathi-nxaxheba kuphando lwesigulo i-Catatonia

Mthathi-nxaxheba obekekileyo *okanye* Mzali okanye sizalwane esibekekileyo

Ngale ncwadi sikwazisa malunga ngophando nzulu oluqhutywa ziinzululwazi ezifuna ukufunda nzulu ngesigulo ekuthiwa yi-catatonia kweli ziko lempilo. Unyango obuhleli uzakulufumna alusayi kutshintsha okanye luphazamiseke wakuthatha inxaxheba kolu phando.

Yintoni i-*catatonia*?

I-catatonia le sisigulo esiye sibangele ukuphazamiseka kwindlela umntu ashukuma ngayo apha emzimbeni. Kwabanye abantu sibangela ukuba umzimba lo ucothe kakhulu okanye ungakwazi kushuma, umntu azive eqinile, athi nokuba uyafuna ukushumisa umzimba wakhe njengesiqhelo angakwazi. Ide ibangele loo nto ngelinye ixesha ukuba umntu aphethe ehleli ndawoninye okanye emile ndawoninye de kugqithe imizuzu emininzi okanye iiyure zibe liqela. Iyakwazi nokubangela ukuba umntu angakwazi ukuphuma kwasebhedini, angakwazi kuzityisa, angakwazi kuzihlamba, asoloko elele ebhedini okanye ehleli esitulweni.

Kwelinye icala i-catatonia iyakwazi ukubangela ukuba umntu athi ngoku sele eqalile ukushukuma esithi wenza into ethile, suka umzimba lo uqine, aphethe amalungu omzimba afana neengalo, izandla, imilenze okanye iinyawo zilenga emoyeni angakwazi ukuyigqibezela laa nthsukumo ebeyiqalile. Intamo nentloko nazo ziyakwazi ukuphetha zikekele ngenxa yoku kuqina komzimba kuvela ngesiquphe.

Okokugqibela, i-catatonia iyakwazi ukuphinda ibangele intshukumo engaphaya kunesiqhelo, aphethe umntu eshuku-shukuma kakhulu, angahlali ndawonye okanye angazinzi. Abanye baye bazule ndawoninye, abanye baqhwabe izandla unomphelo okanye banqwale kungenjalo baninike intloko into engapheliyo. Iyakwazi nokuvela ngokuba omnye umntu abetha-bethe amanqindi emoyeni, omnye athi nokuba usebhedini kube ngathi unyomfa ibhaysikili into engapheliyo. Babakhona nabaphetha bethetha into enye,

okanye benze isikhalo esiphindaphindwayo okanye nayiphina intsholo abaye bayiqhube imizuzu emininzi okanye iiyure zide zibe liqela. Bakhona ke nabanye abaye balinganise loo nto ithethwa ngumntu ophambi kwabo kungenjalo balinganisa loo nto bayibona isenziwa ngumntu ophambi kwabo.

Ibangelwa yintoni i-*catatonia*?

I-catatonia iyakwazi ukubangelwa zizigulo ezithile zengqondo kungenjalo nezinye izigulo zomzimba ziyakwazi ukuhamba ne-catatonia. Ingxaki esiye siyifumane thina boogqirha neenzululwazi kukungazi xa siqala ukumbona umntu onale catatonia ukuba ingaba eyakhe ibangelwa sisigulo sengqondo na okanye sesomzimba kusini na. Yiloo tno side sabona ukuba kungakuhle ukuba sinokuyiphonononga nzulu le ngxaki.

Luqulethe ntoni olu phando?

Sijonge ekubeni wonke umntu oze kulaliswa kweli candelo, ahlolwe, kukhangelwe ukuba akahlaselwanga ziimpawu ezithile zale-catatonia kusini na. Wothi uhlolwe ngugqirha wakho ebehleli ezakuhlola kakade. Ukuba zikhona iimpawu ezithile ugqirha acinga ukuba uziqaphele apha kuwe, usenakho ukubuza ngazo umzekelo mhlawumbi ukuba ziqale nini, njani, kwaye ingaba uyaqala ukuba nazo na njalonjalo. Uzakube phofu ebhala loo nto umxelela yona. Apha ekubhaleni kwakhe kodwa akazokulibhala igama lakho nokuba ungubani kwaye uhlala phi. Oku kuhlolwa nokubuzwa nge-catatonia kungathatha imizuzu emihlanu ukuya kweli shumi kuphela. Ulwazi esiluqokelelayo ngawe kukuba nje iimpawu zesi sigulo unazo na kwaye nale mibuzo sesiyikhakanyile kuphela.

Zimbini izinto esifuna ukuziqwalasela kolu phando nge-catatonia:

1. Ingaba bangaphi abantu abafunyanwa sesi sigulo kule ngingqi?
2. Ingaba zikhona izinto ezingunobangela wokuba abanye abantu bafunyanwe sesi sigulo abanye basinde, mhlawumbi njengobubudala bomntu, isini okanye ezinye izigulo zomzimba?

Nayiphi na into esinokuyifunda eyongezelela kulwazi esele sinalo ngesi-sigulo ingasinceda kakhulu ekubeni sikwazi ukusinyanga ngcono kwixa elizayo. Ngako oko ubukho bakho nokuthatha kwakho inxaxheba kolu phando kuya kunceda abantu abaninzi abanokuthi bafunyanwe sesi sigulo.

Alukho olunye uvavanyo oza kulwenza oludibene nolu phando. Naluphi na olunye uvavanyo okanye unyango ozakuthi ulufumane emva kokuba umongikazi okanye ugqirha egqibile ukukuhlola, lunyango lwesiqhelo obuhleli uzakulufumana kakade kugirha wakho.

Ukuba ndifunyaniswe ndinazo imipawu ze-*catatonia* loo nto ithetha ukuthini?

Ukuba ufunyaniswe unazo ezinye zezi mpawu ze-catatonia, ugqira wakho wokunika unyango lakho lwesiqhelo okanye enze uvavanyo ebehleli ezakulwenza kakade olunxulumene nempilo yakho.

Kuza kwenziwa ntoni ngeziphumo zolu phando?

Iziphumo zolu phando zizakudityaniswa zibhalwe kufndiswe abanye oogqirha neenzululwazi malunga nesi sigulo, kwiinkomfa zoogqirha neenzululwazi.

Ndithini ukuba ndinemibuzo?

Ukuba unemibuzo ngolu phando, cela ukuthetha nogqirha wakho okanye umongikazi ozakube encedisa kolu phando.

Siyabulela!

Sibulela kakhulu ngexesha lakho nokuzixhesha kwakho ngolu phando.

3.2 - INFORMATION LEAFLET (ENGLISH)

Information Leaflet about a Study of Catatonia

Dear Participant / Parent/ Relative

This leaflet is provided to inform you about a study being conducted by researchers who would like to investigate a condition called catatonia at his health facility. The usual care you were going to get will not be changed or disturbed through taking part in this study.

What is catatonia?

Catatonia is a condition that affects the way a person moves his whole body or body parts. In some people it slows down the body considerably to the point where some will stop moving completely, causing the person to feel very stiff such that they are unable to move even when they want to. This may lead to a

person remaining in one position for a very long time (whether sitting or standing) to the point of many minutes or even hours. It can even cause some people to be bedridden, unable to feed themselves, or wash or attend to other daily needs.

Catatonia can also cause a person to appear frozen even after initiating a particular action, resulting in body parts like legs, arms hands or feet being frozen in awkward or unusual looking positions. The head and or neck may also be tilted at awkward angles. The change in movement can often occur suddenly.

Lastly catatonia can also cause an abnormality of excessive movement which is more than normal. A person may show excessive movement that lasts up to many minutes or hours with a seeming inability to stay still. Some people may pace up and down, others may clap orwave for long periods lasting minutes to hours, while others may show head nodding, head shaking, grimacing, etc. Some people have been seen to do shadow boxing or cycling movements even when lying down. It may also appear as repetitive speech of the same phrase, a cry or shout or other odd sound that can last for hours. Others may repeat what they hear around them non- stop or they may mimic actions of those around them as well.

What causes catatonia?

Catatonia may be seen with a number of mental illnesses but it can also be associated with some other medical conditions. The problem we run into as doctors is when a person presents with the first time with this syndrome it may be difficult in the beginning to know what the underlying cause is i.e. whether the cause is a mental condition or another medical condition. This is why conducting research on catatonia is so important.

What does this research involve?

We are looking at ensuring that everybody who is admitted into this unit s examined and screened for symptoms and signs of catatonia. Your admitting doctor will examine you as usual, which will include an initial screen for catatonia through examination only. Following this, a trained research assistant who is a nurse will proceed to do a full screen using a rating scale, to ensure that no other signs of catatonia were missed. If theresearch assistant finds any additional signs of catatonia, they will tell your treating doctor. In addition, the nurse may ask you questions like when did the symptoms start and how fast did they appear etc. She or he will note down you answers but will not include details like your name or your address which

can identify who you are. This further screening by the nurse not expected to take longer than 5 to 10 minutes. The information to be collected for the study about your condition is about the signs and symptoms and the few questions already mentioned to do with the illness, nothing more. There are two questions we would like to investigate about catatonia:

1. How many people experience this condition in this area?

2.Are there particular characteristics that make some people more prone to it and others less vulnerable to it like age, gender or other medical conditions?

Whatever we can learn about this condition, over and above what we know already will help us to come up with improved ways to diagnose it and to treat it in future. Taking part in this research will therefore help many people in future who may also get this illness.

There are no other tests you will be expected to take part in for this study. Whatever other tests or treatment interventions that follow will be those that your doctor would have undertaken anyway to help you manage your condition and get you better.

If I am found to show some of the symptoms or signs of catatonia what does that mean?

If you are found to have some signs and symptoms of catatonia, the research nurse will inform your treating doctor, so that your doctor can give you the appropriate and usual treatment for your condition. Your doctor may also decide to do more tests which would be what they would have done anyway even if you were not part of the study, in order to manage your condition.

What will be done with the results of the study?

The results of the study will be collected and put together to present to scientific congresses so that other doctors and scientists can learn from them.

What should I do if I have more questions?

If you have more questions, ask your treating doctor or the researcher, research assistant or nurse.

Thank you! Thank you very much for your patience and for spending the few minutes on this study.

APPENDIX4: INSTITUTIONAL PERMISSIONS –DORA NGINZA HOSPITAL

Province of
EASTERN CAPE
HEALTH

DORA NGINZA REGIONAL HOSPITAL

DEPARTMENT OF PSYCHIATRY REQUEST FOR CEO APPROVAL OF DEPARTMENTAL RESEARCH

To	Mr P Tsibolane Chief Executive Officer Dora Nginza Hospital
From	Dr A Bronkhorst, Prof S van Wyk and Prof Z Zingela Department of Psychiatry
Subject	DEPARTMENT OF PSYCHIATRY REQUEST FOR CEO APPROVAL OF DEPARTMENTAL RESEARCH
Date	08 November 2018

Introduction
The Department of Psychiatry and Walter Sisulu University have identified research projects in catatonia as a priority for the Eastern Cape due to the severity of the illness and the potentially negative outcomes resulting from delay in recognition of the cognition

Requested support
CEO approval and support for the research project on Catatonia: *"Catatonia as a manifestation of serious mental illness: prevalence, presentation, management and outcomes in a mental health unit"*, is hereby requested on behalf of the investigators to initiate this study in the Department of Psychiatry in Dora Nginza Hospital.

Conclusion
This project is also expected to yield support for other ongoing and planned registrar research projects on Catatonia. Thank you for considering this request.

A Bronkhorst S van Wyk Z Zingela

The request for approval is hereby **granted** / **not granted** (please delete as appropriate)

Signature: ..... Designation: CEO Date: 09.11.2018

Name: M.P. TSIBOLANE

Dora Nginza Regional Hospital
Chief Executive Officer
Mr M.P. Tsibolane
Signature:.....
Date:.....

APPENDIX 5: INSTITUTIONAL PERMISSIONS

APPROVAL FROM EC HEALTH RESEARCH COMMITTEE

APPENDIX VI

Eastern Cape Department of Health

Enquiries: Madoda Xokwe
Tel No: 040 608 0710
Date: 19 December 2017
e-mail address: madoda.xokwe@echealth.gov.za
Fax No: 043 642 1409

Dear Prof. Z. Zingela

Re: Catatonia As A Presentation For Severe Mental Illness: Prevalence Of Catatonia In Two Mental Health Units In Urban And Rural South Africa (EC_201712_015)

The Department of Health would like to inform you that your application for conducting a research on the abovementioned topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Epidemiological Research & Surveillance Management. You may be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE

PGDP EASTERN CAPE 2004 - 2014

Ikamva eliqaqambileyo!

APPENDIX 6: CATATONIA RATING SCALE

APPENDIX VII

BUSH-FRANCIS CATATONIA RATING SCALE

Use presence or absence of items 1-14 for screening
Use the 0-3 scale for items 1-23 to rate severity

1. Excitement: Extreme hyperactivity, constant motor unrest which is apparently non-purposeful. Not to be attributed to akathisia or goal directed agitation 0 = Absent 1 = Excessive motion 2 = Constant motion, hyperkinetic without rest periods 3 = Full-blown catatonic excitement, endless frenzied motor activity	**2. Immobility/stupor:** Extreme hypoactivity, immobile, minimally responsive to stimuli 0 = Absent 1 = Sits abnormally still, may interact briefly 2 = Virtually no interaction with external world 3 = Stuporous, non-reactive to painful stimuli
3. Mutism: Verbally unresponsive or minimally responsive 0 = Absent 1 = Verbally unresponsive to majority of questions; incomprehensible whisper 2 = Speaks less than 20 words/ 5 min 3 = No speech	**4. Staring:** Fixed gaze, little or no visual scanning of environment, decreased blinking. 0 = Absent 1 = Poor eye contact, repeatedly gazes less than 20 seconds between shifting of attention; decreased blinking 2 = Gaze held longer than 20 seconds, occasionally shifts attention 3 = Fixed gaze, non-reactive
5. Posturing/catalepsy: Spontaneous maintenance of posture(s), including mundane (e.g. setting or standing for long periods without reacting). 0 = Absent 1 = Less than 1 minute 2 = Greater than one minute, less than 15 minutes 3 = Bizarre posture, or mundane maintained more than 15 minutes	**6. Grimacing:** Maintenance of odd facial expressions. 0 = Absent 1 = Less than 10 seconds 2 = Less than 1 minute 3 = Bizarre expression(s) or maintained more than 1 minute
7. Echopraxia/echolalia: Mimicking of examiner's movements/speech. 0 = Mimicking of examiner's movements/speech 1 = Occasional 2 = Frequent 3 = Constant	**8. Stereotypy:** Repetitive, non-goal-directed motor activity (e.g. finger-play; repeatedly touching, patting or rubbing self); abnormality not inherent in act but in frequency. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
9. Mannerisms: Odd, purposeful movements (hopping or walking tiptoe, saluting passers-by or exaggerated caricatures of mundane movements); abnormality inherent in act itself. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant	**10. Verbigeration:** Repetition of phrases or sentences (like a scratched record). 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
11. Rigidity: Maintenance of a rigid position despite efforts to be moved, exclude if cog-wheeling or tremor present. 0 = Absent 1 = Mild resistance 2 = Moderate 3 = Severe, cannot be repostured	**12. Negativism:** Apparently motiveless resistance to instructions or attempts to move/examine patient. Contrary behavior, does exact opposite of instruction 0 = Absent 1 = Mild resistance and/or occasionally contrary 2 = Moderate resistance and/or frequently contrary 3 = Severe resistance and/or continually contrary
13. Waxy Flexibility: During reposturing of patient, patient offers initial resistance before allowing himself to be repositioned, similar to that of a bending candle. 0 = Absent 3 = Present	**14. Withdrawal:** Refusal to eat, drink and/or make eye contact. 0 = Absent 1 = Minimal PO intake/interaction for less than 1 day 2 = Minimal PO intake/interaction for more than 1 day 3 = No PO intake/interaction for 1 day or more.

BUSH-FRANCIS CATATONIA RATING SCALE (CONT.)

15. Impulsivity: Patient suddenly engages in inappropriate behavior (e.g. runs down hallway, starts screaming or takes off clothes) without provocation. Afterwards can give no, or only a facile explanation. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant or not redirectable	**16. Automatic obedience:** Exaggerated cooperation with examiner's request or spontaneous continuation of movement requested. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
17. Mitgehen: "Anglepoise lamp" arm raising in response to light pressure of finger, despite instruction to the contrary. 0 = Absent 3 = Present	**18. Gegenhalten:** Resistance to passive movement which is proportional to strength of the stimulus, appears automatic rather than willful. 0 = Absent 3 = Present
19. Ambitendency: Patient appears motorically "stuck" in indecisive, hesitant movement. 0 = Absent 3 = Present	**20. Grasp reflex:** Per neurological exam 0 = Absent 3 = Present
21. Perseveration: Repeatedly returns to same topic or persists with movement. 0 = Absent 3 = Present	**22. Combativeness:** Usually in an undirected manner, with no, or only a facile explanation afterwards. 0 = Absent 1 = Occasionally strikes out, low potential for injury 2 = Frequently strikes out, moderate potential for injury 3 = Serious danger to others
23. Autonomic abnormality: Circle: temperature, BP, pulse, respiratory rate, diaphoresis. 0 = Absent 1 = Abnormality of one parameter [excluding pre-existing hypertension] 2 = Abnormality of two parameters 3 = Abnormality of three or more parameters	**TOTAL:**_____

APPENDIX 7: ETHICS APPROVAL

NELSON MANDELA
UNIVERSITY

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa mandela.ac.za

Chairperson: Research Ethics Committee (Human)
Tel: +27 (0)41 504 2347
sharlene.govender@mandela.ac.za

NHREC registration nr: REC-042508-025

Ref: [H20-HEA-PSY-002] / Approval]

18 August 2020

Prof L Stroud
Faculty: Health Sciences

Dear Prof Stroud

CATATONIA AS A MANIFESTATION OF SERIOUS MENTAL ILLNESS: PREVALENCE, PRESENTATION, MANAGEMENT AND OUTCOMES OF CATATONIA IN A MENTAL HEALTH UNIT

PRP: Prof L Stroud
PI: Dr Z Zingela

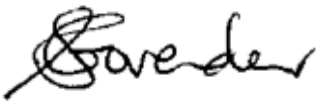
Your above-entitled application served at the Research Ethics Committee (Human) (meeting of *29 July 2020 2020*) for approval. The study is classified as a high risk study. The ethics clearance reference number is **H20-HEA-PSY-002** and approval is subject to the following conditions:

1. The immediate completion and return of the attached acknowledgement to Imtiaz.Khan@mandela.ac.za, the date of receipt of such returned acknowledgement determining the final date of approval for the study where after data collection may commence.
2. Approval for data collection is for 1 calendar year from date of receipt of above mentioned acknowledgement.
3. The submission of an annual progress report by the PRP on the data collection activities of the study (form RECH-004 available on Research Ethics Committee (Human) portal) by 15 November this year for studies approved/extended in the period October of the previous year up to and including September of this year, or 15 November next year for studies approved/extended after September this year.
4. In the event of a requirement to extend the period of data collection (i.e. for a period in excess of 1 calendar year from date of approval), completion of an extension request is required (form RECH-005 available on Research Ethics Committee (Human) portal)
5. In the event of any changes made to the study (excluding extension of the study), completion of an amendments form is required (form RECH-006 available on Research Ethics Committee (Human) portal).
6. Immediate submission (and possible discontinuation of the study in the case of serious events) of the relevant report to RECH (form RECH-007 available on Research Ethics Committee (Human) portal) in the event of any unanticipated problems, serious incidents or adverse events observed during the course of the study.
7. Immediate submission of a Study Termination Report to RECH (form RECH-008 available on Research Ethics Committee (Human) portal) upon expected or unexpected closure/termination of study.
8. Immediate submission of a Study Exception Report of RECH (form RECH-009 available on Research Ethics Committee (Human) portal) in the event of any study deviations, violations and/or exceptions.
9. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of Research Ethics Committee (Human).

Please quote the ethics clearance reference number in all correspondence and enquiries related to the study. For speedy processing of email queries (to be directed to Imtiaz.Khan@mandela.ac.za), it is recommended that the ethics clearance reference number together with an indication of the query appear in the subject line of the email.

We wish you well with the study.

Yours sincerely



Dr S Govender
Chairperson: Research Ethics Committee (Human)

Cc: Department of Research Development
Faculty Manager: Health Sciences

Appendix 1: Acknowledgement of conditions for ethical approval

WSU
Walter Sisulu University

FACULTY OF HEALTH SCIENCES
POSTGRADUATE EDUCATION, TRAINING, RESEARCH AND ETHICS UNIT

HUMAN RESEARCH COMMITTEE
CLEARANCE CERTIFICATE

PROTOCOL NUMBER	: 067/2017
PROJECT	: PREVALENCE OF CATATONIA IN TWO MENTAL HEALTH UNITS IN URBAN AND RURAL SOUTH AFRICA
INVESTIGATOR(S)	: PROF Z ZINGELA
DEPARTMENT	: PSYCHIATRY & BEHAVIOURAL SCIENCES
DECISION OF THE COMMITTEE	: APPROVED
DATE OF APPROVAL	: 07 MAY 2020
DURATION	: 1 YEAR (07 MAY 2020 – 07 MAY 2021)
CONDITIONS	: NONE

N.B You are required to provide the committee with a progress or outcome report of the research after every 6 months. The committee expects a report on any changes in the protocol as well as any untoward events that may occur at any time during the study not later than 7 days of knowing as the investigator/s.

WALTER SISULU UNIVERSITY
ACADEMIC HEALTH SERVICE COMPLEX OF THE EASTERN CAPE
POSTGRADUATE EDUCATION AND TRAINING
FACULTY OF HEALTH SCIENCES
WALTER SISULU UNIVERSITY
P/BAG X 1, WSU, 5117, E.C
TEL: (047) 502 2100 / FAX: (047) 502 2101

DR EJ NDEBIA
CHAIRPERSON

07.05.2020
DATE

DECLARATION OF INVESTIGATOR(S)

(To be completed in duplicate and one copy returned to the Research Officer at Office AB 02 GF 03 Administration Building, Sisson Street Campus, Fort Gale, Mthatha, WSU)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Research Ethics Committee. I/We agree to a completion of a 6-monthly/ yearly progress report. The committee reserves the right to withdraw approval in the event that there are serious ethical violations.

..... (Signature)

..... (Date)

N. B. Please quote the protocol number in all enquiries.

BMJ Open

A Protocol for a Prospective Descriptive Prevalence Study of Catatonia in an Acute Mental Health Unit in Urban South Africa

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-040176.R2
Article Type:	Protocol
Date Submitted by the Author:	25-Sep-2020
Complete List of Authors:	Zingela, Zukiswa; Walter Sisulu University, Psychiatry and Human Behavioural Sciences; Walter Sisulu University, Dr. Stroud, Louise; Nelson Mandela University, Psychology Cronje, Johan; Nelson Mandela Metropolitan University, Psychology Fink, Max; Stony Brook University, Psychiatry Van Wyk, Stephanus ; Walter Sisulu University, Psychiatry and Human Behavioural Sciences
Primary Subject Heading:	Mental health
Secondary Subject Heading:	Mental health, Neurology
Keywords:	Neurology < INTERNAL MEDICINE, Adult psychiatry < PSYCHIATRY, MENTAL HEALTH, Child & adolescent psychiatry < PSYCHIATRY

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A Protocol for a Prospective Descriptive Prevalence Study of Catatonia in an Acute Mental Health Unit in Urban South Africa

Zukiswa Zingela,[1] Louise Stroud,[2] Johan Cronje,[2] Max Fink,[3] Stephan van Wyk[1]

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Word Count: 4451

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ORCID: 0000000234251145

ABSTRACT

Introduction

Catatonia arises from serious mental, medical, neurological, or toxic conditions. The prevalence range depends on the setting and the range is anything from 7% to 63% percent in other countries. South African prevalence rates are currently unknown. The proposed study is a quantitative descriptive study utilising the Bush Francis Catatonia Screening Instrument as a screening tool with a data capturing information sheet to extract clinical information from patient folders. The study will investigate: 1) prevalence of catatonia, 2) clinical and demographic correlates associated with catatonia, 3) predictors of catatonia, 4) response to treatment, and 5) subjective experience of catatonia.

Methods and analysis

The setting is an acute mental health unit (MHU) within a regional, general medical hospital in Nelson Mandela Bay, South Africa which accepts referrals from within the hospital and from outlying clinics. Participants will be recruited from inpatients in the MHU from beginning of September 2020 to end of August 2021. Most admissions are involuntarily, under the Mental Health Care Act of 2002 with an age range of 13 to over 65 years. Participants who screen positive for catatonia will be followed up after discharge for three months to measure outcomes. Primary outcomes will include the 12-month prevalence rate of catatonia, descriptive and other data on presentation and assessment of catatonia in the MHU.

Secondary outcomes will include data on treatment response, participants' report of their subjective experience of catatonia and predictors of catatonia.

Descriptive statistics, multivariate binomial logistic regression, and univariate analyses will be conducted to evaluate associations between catatonia and clinical or demographic data which could be predictors of catatonia. Survival analysis will be used to examine the time to recovery after diagnosis and initiation of treatment. The 95% confidence interval will be used to demonstrate the precision of estimates. The level of significance will be $p \leq .05$.

Ethics and dissemination

The study has received ethical approval from the Research and Ethics Committees of the Eastern Cape Department of Health, Walter Sisulu University and Nelson Mandela University. The results will be disseminated as follows: at various presentations and feedback sessions; as part of a Ph.D. thesis in Psychology at Nelson Mandela University; and in a manuscript that will be submitted to a peer-reviewed journal.

Keywords: *Catatonia, assessment, screening tool, Bush Francis Catatonia Rating Scale, predictors*

Article Summary

Strengths and limitations of this study

- This is the first study to examine the prevalence of catatonia in South Africa and aims to address the lack of data on prevalence rates of catatonia, presentation, optimal management, predictors, and outcomes in this setting.
- The triangulation of information sources like the Bush Francis Catatonia Rating Scale, a validated catatonia screening tool, clinical notes, and subjective reports of catatonic episodes from the participants present a unique opportunity to investigate different aspects of catatonia.
- The descriptive nature of the study and the limited number of participants could limit the applicability of significant associations between variables regarding cause and effect and the generalisability of findings. The heterogenous nature of catatonia and interrater reliability of catatonia screening instruments are another source of potential limitations of the study.

INTRODUCTION

In the 1880s, Kraepelin described the prevalence of catatonia as close to 20% in 500 cases.[1] Modern-day studies show a range from less than 10% to 63%.[1, 2, 3] Catatonia is often treated by psychiatrists, even though underlying causes may be other medical conditions such as neurological, infectious, endocrine, and substance-induced disorders.[1] Grover et al.[4] described close to 40% of 205 patients who had delirium and two or more catatonic symptoms on the Bush Francis Catatonia Rating Scale (BFCRS).

Luchini et al.[5] characterised catatonia as an autonomous syndrome, frequently associated with mood disorders but also observed in patients with other conditions including neurological, neurodevelopmental, physical, and toxic conditions. Current evidence has provided some answers about the categorisation of catatonia, clinical presentations, interventions, and response to treatment.[5, 6, 7, 8]

The current study will investigate the prevalence of catatonia in patients of the Dora Nginza Hospital (DNH) mental health unit (MHU), associated risk factors and response to treatment. Due to the prominent role played by electroconvulsive therapy (ECT) in the treatment of catatonia, the results from this study may have applicability in public mental health planning, and availability of ECT in public hospitals.[1]

Catatonia in South Africa

There are currently no studies describing the prevalence of catatonia in South Africa (SA), which leaves clinicians blind to the burden of the disease linked to this potentially fatal syndrome. Clinicians may, therefore, be unaware of the importance of the assessment and detection of catatonia, leading to missed opportunities to intervene in what is a highly treatable condition.

White and Robins[9] described 17 patients with catatonia in SA who received antipsychotic medication. There was a deterioration in their clinical presentation into neuroleptic malignant syndrome (NMS). The risk of precipitating NMS in this case series was linked to the administration of antipsychotics. This study also challenged the notion of NMS being viewed as a separate condition to catatonia. Since then, catatonia has not been

widely studied in SA, despite the researchers' observation that it continues to present a significant and sometimes life-threatening challenge. Another study conducted in SA described the treatment of 42 catatonic patients with ECT.[10] The current study represents the first stages of aiming to fill the gap in the extant research with a prospective study on prevalence and predictive data.

Prevalence of catatonia in other parts of the world

Fink and Taylor [1] described a rate of catatonia of 10% in acutely ill psychiatric patients and Stuivenga and Morrens 2] a rate of 16.9% when applying the DSM-5 criteria. Conditions found in association with a catatonic presentation have included psychiatric diagnoses like bipolar disorder, delirious mania, psychotic depression, schizophrenia, and other medical conditions.[6, 2] In some instances, the cause leading to catatonia has been less well-defined. DSM-5 has captured the multiple possible associations that occur with catatonia by including it as a specifier for mood disorders and schizophrenia or as linked to another medical condition.[11] Catatonia also appears as an entity with undefined aetiology under 'catatonia not otherwise specified'.[8]

Choice of screening tool and rating scale

In 1996, Bush et al. designed the Bush Francis Catatonia Screening Instrument (BFCSI) a 14-item scale for screening for catatonia and a 23-item scale for rating severity of catatonia.[3, 12] They demonstrated that the scales were reliable and valid tool for diagnosis and evaluation of response to treatment. The scales have a dual utility of screening and measurement of the severity of catatonia. A systematic review of seven catatonia rating scales reported a similar finding when comparing the BFCRS with other tools to screen for

catatonia.[13] They recommend the BFCRS for routine use because of ease of use, reliability, and validity. Wilson et al.[14] found 300 out of 339 patients with acute medical and psychiatric illness screened positive for catatonia when applying the BFCRS.

The BFCSI and BFCRS have been used successfully in the MHU as screening and rating scales for the past seven years in the MHU which is the site of the current study. Other reasons supporting the utility of the scales in this study are: 1) the reported ease of use, 2) reliability, 3) validity as both a screening tool and a measure of severity, and 4) its use since 2011 in the study site has not yielded any issues with applicability or appropriateness when used in this clinical setting. Figure 1 reflects the assessment tools and process that will be applied to assess participant and collect data.

Management of catatonia

The biological treatment for catatonia has advanced over the last century, from insulin coma therapy of the early 1930s and Meduna's use of seizure-inducing camphor oil injections to Cerletti's first documented use of an electric shock procedure in 1938.[1] Available evidence on management of catatonia includes the published works from various researchers.[1, 6, 7, 9,14-19] Lorazepam and ECT are the current recommended treatments, irrespective of aetiology. They are effective in most cases.[1, 7, 9, 14, 17]

In both in the White and Robins[9] and Fricchione et al.[7] case series, intravenous administration of benzodiazepines (diazepam or lorazepam) was demonstrated as an efficacious treatment for catatonia. Response is seen relatively rapidly, i.e. within minutes of administration. Instead of a sedative effect that one observes with the administration of benzodiazepines in non-catatonic patients, those with catatonia tend to 'wake up' from stupor

or normalise from a state of extreme excitement. In the White and Robins[9] study, two patients who did not receive intravenous benzodiazepines died.

The dose range used at the study site tends to be higher and is given more frequently compared to the recommendation in the Rasmussen et al. paper.[19] This is mainly because patients at the site present at advanced stages of catatonia and tend to respond slowly or not at all when the lower or less frequent doses are employed.

The subjective experience of catatonia

Northoff et al.[20] conducted a retrospective study on 24 catatonic patients post-recovery after a catatonic episode. The patients reported intense emotions which could not be controlled and ambivalence with less focus on their altered movements. Other descriptions of catatonia have stated an extreme fear response characterized by freezing, likened to the defence seen in animals of tonic immobility or freezing in the face of danger.[21]

This study will investigate the subjective experience of catatonia as described by participants once discharged from the hospital, to shed light on the emotive and cognitive experience of catatonia in the study cohort. This may provide clues on the psychological drivers of the catatonic response and could pave the way for further research into the psychology of the catatonic response.

Aims

This study aims to determine the prevalence of catatonia in an acute mental health unit in urban South Africa and research its assessment and management in this setting.

Objectives

The two main research objectives are:

1. Screening of consenting participants admitted to the mental health unit in Dora Nginza Hospital using the BFCSI for catatonia, over a 12-month period from the 1st of September 2020 to the end of August 2021, to describe the prevalence of catatonia in this setting.
2. Description of demographic and clinical information, including response to treatment, in participants diagnosed with catatonia based on their BFCSI scores and clinical assessments performed by the admitting doctor.

Response to treatment will be according to the following parameters: A 50% reduction in signs and symptoms will be considered a response while a 100% reduction will be a considered a full resolution. Conversely, a reduction in symptoms of less than 50% will be regarded as a suboptimal response and a reduction that is more than 50% but less than 100% will be a response but without full resolution. In addition, significant clinical correlates and risk factors in participants with catatonia will be described, and participants with catatonia will be followed up once discharged at one month, two months, and three months intervals, to assess outcomes using the BFCSI and information about readmission or recurrence of any episode of mental illness. The association that will be looked at is between catatonia and demographic or clinical correlates such as age, gender, DSM 5 diagnosis, substance use, vitamin 12 deficiency and food insecurity and other co-occurring medical conditions. Participant's experience of catatonia once it has resolved will also be described.

Research design

This is a prospective, descriptive triangulation study utilising mixed quantitative and

qualitative methods. An exploratory qualitative aspect will investigate the emotive and cognitive subjective experience of participants with catatonia to establish a direction for further research. This is because there is currently limited data available on the subjective experience of catatonia, with most research focusing on quantitative aspects.

The quantitative elements of the study will include data collected from participant files of BFCSI scores upon admission, with additional clinical and demographic information collected via a pre-designed datasheet (see Appendix 1). The qualitative element will describe the participant's reported experience of the catatonic episode, post-discharge.

METHODS AND ANALYSIS

The study will take a positivist paradigm approach to investigate the potential causal relationships between catatonia and different variables via correlational studies.[22] Creswell[23] described the positivist's approach as an attempt to identify causes, which influence outcomes, the aim being to formulate laws, thus yielding a basis for prediction and generalisation. In the current study, deductive reasoning will be applied to data collected through 1) direct observation and 2) quantitative and qualitative approaches, to identify associations with catatonia, causal relationships, and possibly, predictors of catatonia.[22]

Sources of information that will be utilised for triangulation include: the participants' BFCSI/ BFCRS scores (see Appendix 2) and clinical notes; field notes taken by the research team during direct observation and interviews; and participant and relative interviews focusing on response to treatment, food insecurity, and the subjective experience of catatonia. Additionally, the mixed methods nature of the study will enable the generation of both

objective (as documented by treating and research teams) and subjective data regarding the experience of catatonia. This type of triangulation is an important tool for meeting the goals of this study while facilitating a holistic assessment of catatonia in this cohort.

The study process and outline

Two research assistants (RAs) with a background in health will be recruited to assist the researcher with fieldwork. A health background is necessary to understand the medical terminology that is utilised in the clinical notes and screening tools. A part-time administrative assistant will be contracted to assist with data capturing and collation. Fieldwork will include the recruitment of participants and collection of data by the researcher and RAs. There will be a limited follow-up component that extends to up to three months following discharge from the hospital.

The RAs will be trained by the researcher on:

1) application of the BFCSI and BFCRS to ensure they are knowledgeable about the screening tool and its interpretation, and

2) assessment of capacity to consent utilising the University of California, San Diego Brief Assessment of Capacity to Consent Questionnaire (UBACC).

The UBACC has been applied successfully in the Eastern and Western Cape in study cohorts recruited from inpatient mental health institutions. [24, 25]

The inter-rater reliability (IRR) of the BFCRS was demonstrated to be good (α=0.779) in a study looking at four different instruments to assess for catatonia. [26] In the planned study, training that will be provided by the lead researcher to the RAs on the use of the BFCSI/BFCRS will be through:

- explaining the meaning of terms used in the BFCSI/BFCRS to describe clinical signs and symptoms of catatonia and
- providing a demonstration of how to elicit and document the 14-items and 23-items in the BFCSI/BFCRS, how to capture the relevant information accurately onto the data capturing form
- ensuring RAs start with practice participants initially under direct observation of the lead researcher, before starting the actual recruitment. An IRR in the range of (α=0.61 to 0.8) during the practice scoring will be deemed acceptable for RAs to proceed to the scoring of study participants.

Inter-rater reliability will also be addressed through ensuring that everyone has a similar understanding of all items to be rated in the screening tool and how these should be recorded.

The researcher and RAs will assess participants who meet the inclusion criteria for capacity to consent, utilising the UBACC. All those with intact capacity to consent will be requested to consider entering the study (see Appendix 3 and Appendix 4). For participants who may be assessed as lacking the capacity to consent, their closest relatives or guardians will be requested to consent on their behalf through proxy consent (proxy consent and its ethical application is further discussed in the section 'Ethics and dissemination' below). Additionally, in those assessed to lack capacity to consent, such capacity will be reviewed weekly to allow for further re-engagement on their consent to take part in the study, the ultimate aim being to change from proxy consent to personal consent as soon as potential participants have regained capacity. Data collected about any participant who chooses to withdraw from the study will be removed from the study data sets and destroyed.

The research team will collect data from the clinical files of consenting participants on BFCSI/BFCRS scores and additional descriptive and demographic information as guided by the study questionnaire and study protocol. The completed data capturing forms will be submitted to the administrative assistant for data collation and entry into a spreadsheet at the end of each week. The assessment of new admissions will be daily on weekdays with the expectation being to conduct daily screening or within the first 48-hours at least. Information on clinical presentation of patients admitted over weekends will be supplemented from the clinical folders. In cases where the Researcher or RAs identify possible missed catatonia, the treating doctor will be provided with any additional information picked up during the participants' assessment to allow for a review of the patient's clinical case and management.

During the limited follow-up period, the researcher and RAs will repeat the BFCSI assessment and conduct face-to-face interviews with participants regarding their experience of catatonia at one month, two months, and three months post-discharge. Recurrence of symptoms or readmissions since the last discharge will be documented. The participant's willingness to continue with the study will be reviewed during every visit to ensure their consent remains valid throughout. Figure 2 is a summary of the study process that will be followed.

Setting

The setting will be a 35-bed acute mental health unit in Dora Nginza Hospital, a general hospital in the Eastern Cape Province in South Africa. The hospital is in Zwide, in the iBhayi area of Port Elizabeth which has a population of over one million within an urban

area that has a high morbidity of mental illness.[27] Close to 70% of the population is comprised of working age adults between 15 and 64 years and the city has an unemployment rate of close to 30%. [27] Zwide itself has a population of 238 000. [28] Health services in the hospital include obstetrics and gynaecology, paediatrics, basic surgical, internal medicine, and family medicine. The MHU is an acute inpatient unit offering 24-hour care to persons who present with acute mental illness requiring inpatient treatment. It accepts referrals from all the other hospital departments including the Accident and Emergency Department, as well as referrals from primary care clinics and district hospitals in the nearby vicinity. The usual period of admission ranges anything from three days to a few weeks.

All cases of suspected catatonia, from any of the referring departments are discussed with the MHU team and prioritized for admission into the unit. Any treatment given thereafter is discussed with the MHU team and documented in the patient's folder.

Sampling

Convenience sampling of all patients admitted to the MHU over a twelve-month period (September 2020 to August 2021) will be undertaken. Contact details of all consenting participants who have screened positive for catatonia will be entered into a database to enable contact for future follow-up at the end of one month, two months, and three months post-discharge. This information will be password encrypted.

The number of patients expected to be admitted during the study period is around 1000 based on previous unit stats over the last three years and adjusted down slightly to accommodate the effect of the COVID-19 outbreak on hospital admissions. The margin of error or confidence interval will be set at 95% and the standard deviation will be set at 0.05. To determine the total sample size required, the formula: $n=N/(1+Ne^2)$ will be utilized and

yields a minimum sample size of 286 subjects. A further 20% (57) will be added to account for data entry errors and non-responses. The appropriate sample size of participants to be screened for the prevalence of catatonia in the unit is 343.

Participants

Most people admitted to the DNH MHU are involuntary admissions under the Mental Health Care Act of 2002.[29] Age of admission ranges from 13 to over 65 years because there are no child, adolescent, or geriatric inpatient-specific services in the region.

Inclusion criteria

All patients admitted to the unit during the study period will be eligible for inclusion. Those who screen positive for two or more catatonic signs and symptoms on the BFCSI will be included during the follow-up period for the qualitative part of the study.

Exclusion criteria

Refusal to take part in the study, whether through the direct patient consent process or the proxy consent process, will result in the exclusion of the patient.

Methods of assessment and measurement

The BFCSI is a 14-item scale (see Appendix 2) that is used to screen for catatonia and the BFCRS is a 21-item scale used to rate severity.[11] The BFCSI is used on initial assessment and the full BFCRS is used to determine severity. Participants' responses to the standard interventions of intravenous lorazepam administration or ECT will be documented by the admitting doctor in the case notes. The research team will then capture this

information on a predesigned data collection sheet. When a patient presents with two or more positive items on the BFCSI, they are deemed catatonic and further management is guided by the unit protocol. A lorazepam infusion of 1mg or 2 mg is administered and a response of 50% or greater reduction in the scale score verifies the diagnosis although absence of verification does not exclude catatonia. The research team will capture information on participant's BFCSI/BFCRS scores and other clinical data this information on a predesigned data collection sheet.

The clinical data that will be collected include current psychiatric diagnosis, co-occurring medical conditions, any other treatment administered, history of substance use, history of previous catatonic episodes, vital signs like temperature on admission, blood pressure, pulse, investigations like creatinine kinase, iron levels, thyroid function tests, urea and electrolytes or any other relevant clinical investigations reflected in the file which are noted by the treating team to be of relevance to the current admission., and food insecurity. The participants' case notes will form a primary source of information as well as direct observation of the participants. Additional information will be sought from relatives if the participant is unable to respond adequately to information required on food security questions due to the severity of catatonic symptoms, or in those who are unable to provide the additional information for whatever other reason.

Regarding social determinants of mental health, current evidence indicates that those who are poor or disadvantaged suffer disproportionately from common mental disorders and their adverse consequences.[30] The strength of the association with poverty has at times varied depending on the type of poverty measure used. Food insecurity as a poverty measure is one of the factors with a consistent and strong association with common mental

disorders.[31] In this study, the administration of a food security questionnaire will be utilised to assess the correlation of poverty to catatonia. Two food insecurity questions are drawn from the USDA's 18-question Household Food Security Scale.[32] They make up The Hunger Vital Sign Questionnaire, a validated two-question food insecurity screening tool used in the clinical setting. The questions are:

1. Within the past 12 months, we worried whether our food would run out before we got money to buy more.
2. Within the past 12 months, the food we bought just did not last and we did not have money to get more.

During the follow-up period, participants will be asked to describe their experience of the catatonic episode as well as their perception of recovery.

Expected outputs

- The 12-month prevalence rate of catatonia.
- Descriptive and other data on presentation and assessment of catatonia in the DNH unit.
- Data on treatment response, short-term outcomes, and subjective experience of catatonia.
- Predictors for catatonia based on clinical correlates and other descriptive data collected.
- Recommendations and guidelines for the management of catatonia and possible prevention strategies.

Data management and analysis

Quantitative data collected will be summarised using descriptive statistics. Categorical variables will be presented using frequency tables, percentages, and graphs. Two or more categorical variables will be compared using contingency tables (e.g. 2 X 2 Table) and the expected frequencies will be calculated to determine the type of test best suited to determine the extent of any identified relative associations. If the expected frequencies in all cells are ≥5 then the Chi-squared test will be used and if the expected frequencies are < 5 in any cells, then the Fisher's exact test will be used.

Binomial logistic regression will also be conducted to determine the predictors of catatonia and to estimate the risk ratio. If the numerical data are not normally distributed, non-parametric statistics will be used (median and interquartile range). The best fitting model of multivariate analysis will be chosen through forward selection of model building. The model with the lowest Bayesian information criterion will be selected as the better model and the 95% confidence interval will be used to estimate the precision of estimates. Survival analysis will be used to determine the time to recovery and the hazard ratio (i.e. the total number and timing of each event indicating relapse in this study) will be reported for this purpose.

Qualitative data collated during the follow-up period will be analysed to elucidate the subjective experience of catatonia in this cohort. Aspects of the thematic analysis presented by Braun and Clarke [32] will be applied to identify themes. Themes will be identified through a framework approach identifying word repetition, local expressions, metaphors and similarities, differences, and keywords. A tentative hypothesis and theory regarding the

experience of catatonia will be presented based on emergent themes. Data collected during the quantitative and qualitative segments of the study will be analysed separately but compared for congruency of reported information to enhance data integration.

In summary, data integration will be in the form of:

i. converting information gathered from the quantitative aspects of the study into numerical information that can be processed through application of statistical methods to test for correlations and associations.

ii. identifying common themes through field notes taken when interviewing participants during the outpatient stage of the study.

iii. Assessing congruency between common themes about the subjective experience of catatonia as described by participants and commonly identified presenting symptoms as highlighted in case notes and listed in the data collection sheet. The advantage of this approach is that it strengthens the validity and reliability of the study.

Patient and public involvement

No formal patient advisory committee was set up and there was no patient or public involvement in the design and planning of the study.

ETHICS AND DISSEMINATION

Ethics clearance has been granted for the study by the Eastern Cape Department of Health Ethics Committee (see Appendix 5 and 6), the Walter Sisulu University Research and Ethics Committee and the Nelson Mandela University Human Research Ethics Committee (see Appendix 7). The study does not have any intervention arm.

All patients admitted to the unit will be presented with an information leaflet on the study in English or Xhosa. Consent for inclusion in the study will be obtained from all participants who have the capacity to consent, which will be determined through application of the UBACC. Proxy consent will be sought from a relative or guardian for all patients who lack the capacity to consent or are minors between the ages of 13 and 18 years of age. The use of proxy consent in mental health research is applicable for those who lack the capacity to consent and the nearest relative or guardian consents on their behalf. It is permissible within the mental health care setting due to the challenges with capacity to consent that may exist in patients with acute mental illness.[33] Proxy consent ensures that respondents' rights are guarded while making it possible to include individuals or groups who may potentially benefit from scientific advances gained from research. This approach is also supported by the Helsinki Declaration on ethical research which states that 'for a research subject who is legally incompetent, physically or mentally incapable of giving consent or is a legally incompetent minor, the investigator must obtain informed consent from the legally authorised representative in accordance with applicable law'.[34] The Department of Health Guidelines on ethics in health research similarly state that persons should not be excluded unfairly based on discrimination or disability.[35]

The Mental Health Care Act (MHCA) of 2002 also makes a reference as to whom may be considered an associate of a patient admitted under the Mental Health Care Act: e.g. a spouse, next of kin, partner, associate, parent, or guardian.[29] A similar approach will be taken for this research. All data will be anonymised and stored under lock and key, with access granted to the research team only.

Dissemination of results

The results will be presented at feedback sessions with the Hospital Board, Eastern Cape Department of Health and at national and international congresses and may be used to compile guidelines on assessment and management of catatonia in the region. They will also be compiled as a thesis, which will be submitted for examination for a Ph.D. in Psychology at Nelson Mandela University. A research report based on the study results will be submitted to peer-reviewed journals to be considered for publication.

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AUTHOR CONTRIBUTIONS

Z Zingela conceived the idea and devised the project and its main conceptual ideas assisted by S van Wyk and M Fink. L Stroud and J Cronje supervised the development of this manuscript and provided editorial input.

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COMPETING INTERESTS STATEMENT

The authors have no competing interests to declare.

Figure 1

Assessment Tools

Figure 2

The Study Process

Figure 1: Assessment Tools

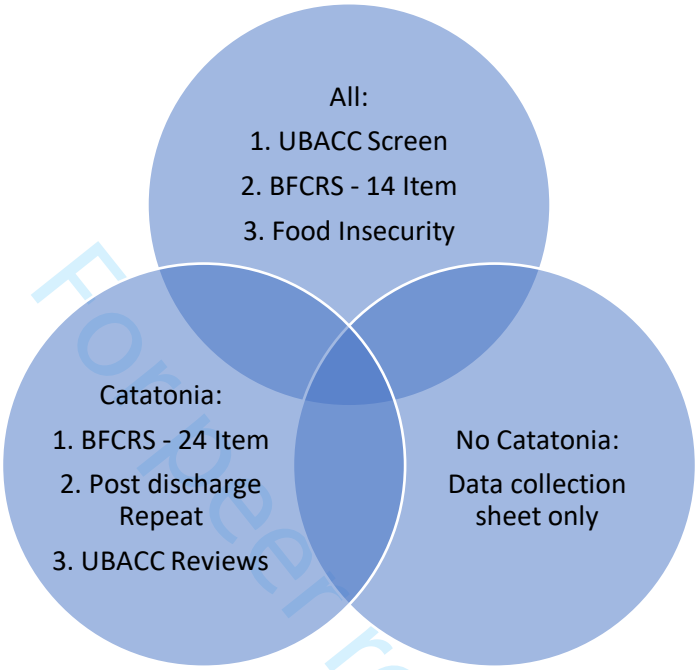
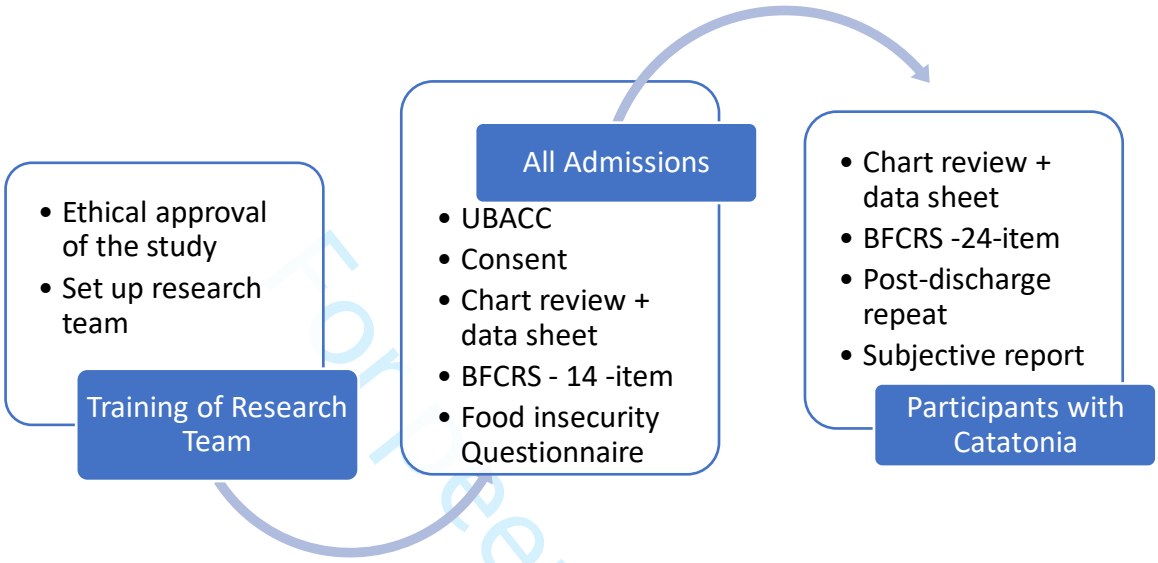


Figure 2: Study Process



APPENDICES

APPENDIX 1: DATA COLLECTION SHEET

<table>
<tr><td colspan="3">Enrolment No:</td><td colspan="10">Tick applicable box or insert answer in area shaded in white</td></tr>
<tr><td colspan="3">Unit</td><td colspan="10">Is the Patient Catatonic now?
(Fill in the BFCRS item 1 to 14 to answer this question), 2 or more signs mean Yes, there is catatonia</td></tr>
<tr><td colspan="3">DNH</td><td colspan="5">If No then tick this box and fill in ONLY Sections A,G,H,I, and J</td><td colspan="5">If Yes then tick this box and fill in sections A, B, C, D, E, F, G, H, I, and J.</td></tr>
<tr><td colspan="4">A. Age</td><td colspan="2">Sex</td><td colspan="4">Ethnicity</td><td>1st admission</td><td>Catatonic symptoms before?</td><td>DSM -5 Diagnosis in file?</td><td>Susb tance Use?</td><td>Another medical condition</td></tr>
<tr><td>< 16</td><td>6 - 35</td><td>36 - 65</td><td>> 65</td><td>F (0)</td><td>M (1)</td><td>B</td><td>C</td><td>I</td><td>W</td><td>Yes
No</td><td>Yes
No</td><td>Yes
Diagnosis
…….
…….
No</td><td>Yes
No</td><td>Yes
No</td></tr>
<tr><td colspan="10"></td><td>No of previous admissions</td><td>No of times had catatonia previously</td><td>No of previous diagnoses?</td><td></td><td>No of medical condition s?</td></tr>
<tr><td colspan="10"></td><td>Not known</td><td>Not known</td><td>Not known</td><td>Not know n</td><td>Not known</td></tr>
<tr><td colspan="4">B.
BFCR Scale Score</td><td colspan="2">BZD Given
Yes / No
If yes
Doses given
1 -2</td><td colspan="4">Name of BZD given:
Lorazepam
Clonazepam</td><td>Blood Pressure</td><td>Pulse

<70
71-100</td><td>Body Temp
<35
35 -37</td><td colspan="2">Respiratory Rate/ O2 Sats
<90%
91 – 93</td></tr>
</table>

	3 - 4 5 or more	Diazepam Midazolam Dose…… …. Other Treatment? ……	**Systolic:** <120 120 -139 140 – 180 181 – 220 >220	**Diastolic:** <70 80 -90 91-110 110-120 >120	101-120 121-160 >160	38 – 40 >40	94 – 96 97 – 99 100
Initial Score <6 6-12 12-24 24-36 >36	1st dose <6 6-12 12-24 24-36 >36	2nd dose <6 6-12 12-24 24-36 >36	3rd dose <6 6-12 12-24 24-36 >36			4th dose <6 6-12 12-24 24-36 >36	5th dose <6 6-12 12-24 24-36 >36

<table>
<tr><td rowspan="4">C. Length of time and degree of response to BZD</td><td colspan="2">1st hour after admission</td><td colspan="2">2-3 days</td><td>4-6 days</td><td>Degree of Response</td></tr>
<tr><td colspan="6">Mild = Less than 25% reduction in No. of symptoms</td></tr>
<tr><td colspan="2">2 to 6 hours after admission</td><td>7-10 days</td><td>11-14 days</td><td>>14 days</td><td>Moderate = 25% to 50% reduction in No. of symptoms</td></tr>
<tr><td colspan="2">7 to 47 hours after admission</td><td colspan="3">Reason ECT was not given after the 1st 3 days of admission (from clinical notes)
……</td><td>Good = Response of more than 50% reduction in No. of symptoms
Response to BZD not sustained</td></tr>
<tr><td rowspan="3">D. ECT and response</td><td colspan="2" rowspan="2">Yes</td><td>Number of Sessions</td><td colspan="2">Response</td><td>Response to ECT not sustained</td></tr>
<tr><td rowspan="2"><4
5-9
10-12
>12</td><td colspan="2">Nil
Remission of catatonia
Other (specify)……..</td><td colspan="2">Maintenance ECT prescribed or required?</td></tr>
<tr><td colspan="2">No</td><td>Time to 50% improvement
<3 days
4-7 days
>1 week</td><td>Time to full Resolution
<3 days
4-7 days
>1 week</td><td>Yes, prescribed? If so what is the No. of sessions?</td><td>No, not prescribed</td></tr>
<tr><td rowspan="4">E. Duration of Catatonia prior to admission if known

OR
Not Known</td><td>Hours to 3 days</td><td>Duration of Catatonia Prior to admission?</td><td colspan="5" rowspan="4">Any other additional information?</td></tr>
<tr><td>4 days to 2 weeks</td><td>NOT known
OR</td></tr>
<tr><td>3 to 4 weeks</td><td>< 3 days
4 to 7 days</td></tr>
<tr><td>More than 4 weeks</td><td>>7 days</td></tr>
<tr><td>F. Type of onset</td><td>Hours to days</td><td>Gradual</td><td>Fluctuating</td><td colspan="2">Mostly Excited Form?</td><td>Mostly Slowed Form?</td></tr>
</table>

				Excited/ Stereotypy/ Mannerism		Stupor/ Withdrawal/ Rigidity/ Mutism/ Staring		
G. Food Insecurity	1.Within the past 12 months, we worried whether our food would run out before we got money to buy more.							
	Often True	Sometimes true	Never true	Don't know	Other			
	2.Within the past 12 months, the food we bought just didn't last and we didn't have money to get more.							
	Often true	Sometimes true	Never true	Don't know	Other			
H. Substances		YES	NO	Alcohol	Cannabis	Amphet	Heroin	Metamphet
				Cocaine	Opiods	Nicotine	Other (Specify)	

I.Medical Illness	No	Yes	If Yes, chose from the following if on history only		If Yes, choose from the following if current		If HIV			
			HPT	DM	HPT	DM	On HAART?		No	
			Epilepsy	HIV	Epilepsy	HIV	If HIV on HAART, Regime?		If HIV, CD4?	
			Head Trauma	TB	Head Trauma	TB	If HIV, Viral Load?		Other (specify)	
			SLE or Auto/I	Other (specify)		Other (specify)				
J. Investigations:	**CK (u/l)**		CK≤200	**Fe µmol/l**	Fe 9 to 30	**VitB12 pmol/l**	B12 ≤ 107		**Auto/I Screen**	
1.CK – Creatinine Kinase	CK 201 -1000		CK ≥1000	Fe ≤ 9	Fe ≥ 30	B12 108 - 221	B12 ≥ 221	RF	ESR	ANA
2.Fe – Iron								< 14IU/ml OR >14IU/ml	< 29 OR > 29	Pos OR Neg
3.B12 – Vitamin B12										
4.TSH – Thyroid Stimulating Hormone										
5.T4 – Thyroid Hormone										
6.ANF – Nuclear Factor	**Endocrine**		**TSH miu/l**	≤0.38	≥5.33	**Cortisol**	≤184		≥618	
Rheumatoid Factor			**Normal TSH** 038 to 5.33			**Normal (AM)** 185 to 617				
			T4 pmol/l	≤ 7.2	≥ 16.4	**Cortisol (PM)**	≤ 276 (pm)		≥ 276	
			Normal T4 7.2 to 16.4			≤ 276				
END OF INPATIENT DATA CAPTURING SECTIONS										

BEGINNING OF OUTPATIENT FOLLOW UP SECTION FIR PATIENTS WHO HAD CATATONIA					
K. Follow-up Period ONLY	**Date of Discharge**	**1 month**	**2 months**	**3months**	**Other**
Please tick the applicable box	Recurrence of Catatonia? Yes No	Recurrence of Catatonia? Yes No	Recurrence of Catatonia? Yes No	Other?	
	Re-Admission? Yes No	Re-Admission? Yes No	Re-Admission? Yes No	Other?	
Please describe (in your own words) your experience/ of the catatonic episode in terms of your thoughts, feelings and behaviour	Uyacelwa uchaze (ngawakho amazwi) ngamava akho ngexesha ubune catatonia ngokwengcinga zakho, indlela obuziva ngayo nezinto obuzenza.	**PARTICIPANT RESPONSE RECORDED VERBATUM (USE AUDIO RECORDER)** **Thoughts** **Feelings** **Behaviour**			

APPENDIX 2: CATATONIA RATING SCALE

APPENDIX VII

BUSH-FRANCIS CATATONIA RATING SCALE

Use presence or absence of items 1-14 for screening
Use the 0-3 scale for items 1-23 to rate severity

1. Excitement: Extreme hyperactivity, constant motor unrest which is apparently non-purposeful. Not to be attributed to akathisia or goal directed agitation 0 = Absent 1 = Excessive motion 2 = Constant motion, hyperkinetic without rest periods 3 = Full-blown catatonic excitement, endless frenzied motor activity	**2. Immobility/stupor:** Extreme hypoactivity, immobile, minimally responsive to stimuli 0 = Absent 1 = Sits abnormally still, may interact briefly 2 = Virtually no interaction with external world 3 = Stuporous, non-reactive to painful stimuli
3. Mutism: Verbally unresponsive or minimally responsive 0 = Absent 1 = Verbally unresponsive to majority of questions; incomprehensible whisper 2 = Speaks less than 20 words/ 5 min 3 = No speech	**4. Staring:** Fixed gaze, little or no visual scanning of environment, decreased blinking. 0 = Absent 1 = Poor eye contact, repeatedly gazes less than 20 seconds between shifting of attention; decreased blinking 2 = Gaze held longer than 20 seconds, occasionally shifts attention 3 = Fixed gaze, non-reactive
5. Posturing/catalepsy: Spontaneous maintenance of posture(s), including mundane (e.g. setting or standing for long periods without reacting). 0 = Absent 1 = Less than 1 minute 2 = Greater than one minute, less than 15 minutes 3 = Bizarre posture, or mundane maintained more than 15 minutes	**6. Grimacing:** Maintenance of odd facial expressions. 0 = Absent 1 = Less than 10 seconds 2 = Less than 1 minute 3 = Bizarre expression(s) or maintained more than 1 minute
7. Echopraxia/echolalia: Mimicking of examiner's movements/speech. 0 = Mimicking of examiner's movements/speech 1 = Occasional 2 = Frequent 3 = Constant	**8. Stereotypy:** Repetitive, non-goal-directed motor activity (e.g. finger-play; repeatedly touching, patting or rubbing self); abnormality not inherent in act but in frequency. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
9. Mannerisms: Odd, purposeful movements (hopping or walking tiptoe, saluting passers-by or exaggerated caricatures of mundane movements); abnormality inherent in act itself. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant	**10. Verbigeration:** Repetition of phrases or sentences (like a scratched record). 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
11. Rigidity: Maintenance of a rigid position despite efforts to be moved, exclude if cog-wheeling or tremor present. 0 = Absent 1 = Mild resistance 2 = Moderate 3 = Severe, cannot be repostured	**12. Negativism:** Apparently motiveless resistance to instructions or attempts to move/examine patient. Contrary behavior, does exact opposite of instruction 0 = Absent 1 = Mild resistance and/or occasionally contrary 2 = Moderate resistance and/or frequently contrary 3 = Severe resistance and/or continually contrary
13. Waxy Flexibility: During reposturing of patient, patient offers initial resistance before allowing himself to be repositioned, similar to that of a bending candle. 0 = Absent 3 = Present	**14. Withdrawal:** Refusal to eat, drink and/or make eye contact. 0 = Absent 1 = Minimal PO intake/interaction for less than 1 day 2 = Minimal PO intake/interaction for more than 1 day 3 = No PO intake/interaction for 1 day or more.

BUSH-FRANCIS CATATONIA RATING SCALE (CONT.)

15. Impulsivity: Patient suddenly engages in inappropriate behavior (e.g. runs down hallway, starts screaming or takes off clothes) without provocation. Afterwards can give no, or only a facile explanation. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant or not redirectable	**16. Automatic obedience:** Exaggerated cooperation with examiner's request or spontaneous continuation of movement requested. 0 = Absent 1 = Occasional 2 = Frequent 3 = Constant
17. Mitgehen: "Anglepoise lamp" arm raising in response to light pressure of finger, despite instruction to the contrary. 0 = Absent 3 = Present	**18. Gegenhalten:** Resistance to passive movement which is proportional to strength of the stimulus, appears automatic rather than willful. 0 = Absent 3 = Present
19. Ambitendency: Patient appears motorically "stuck" in indecisive, hesitant movement. 0 = Absent 3 = Present	**20. Grasp reflex:** Per neurological exam 0 = Absent 3 = Present
21. Perseveration: Repeatedly returns to same topic or persists with movement. 0 = Absent 3 = Present	**22. Combativeness:** Usually in an undirected manner, with no, or only a facile explanation afterwards. 0 = Absent 1 = Occasionally strikes out, low potential for injury 2 = Frequently strikes out, moderate potential for injury 3 = Serious danger to others
23. Autonomic abnormality: Circle: temperature, BP, pulse, respiratory rate, diaphoresis. 0 = Absent 1 = Abnormality of one parameter [excluding pre-existing hypertension] 2 = Abnormality of two parameters 3 = Abnormality of three or more parameters	**TOTAL:**_____

APPENDIX 3: INFORMED CONSENT FORM INFORMED CONSENT – ENGLISH

INFORMED CONSENT FOR A STUDY ON CATATONIA

Dear Participant or Relative

We are requesting your consent to enroll you in a study on catatonia and how the symptoms respond to the treatment you are going to be given.

YES, I AGREE TO BE ENROLLED

I …….....

agree in **voluntarily** taking part in the study as explained to me by the doctor/ nurse

OR

(In cases where the patient is incapable of giving consent but is not opposed to taking part in the study, then a relative or custodian may provide informed consent by also signing below)

I …… being the .....of …… **willingly** agree that he/she may take part in the study which has been explained to us by the doctor/ nurse

Signature of participant/relative/ custodian: ……..

Signed by …… at.....on the …… of.....2019

NO, I DO NOT AGREE TO BE ENROLLED

I

…….....

do not agree in taking part in the study as explained to me by the doctor/ nurse OR

I …… being the .....of …… do not agree that he/she may take part in the study which has been explained to us by the doctor/ nurse

Signature of participant/relative/ custodian:

……

FOR OFFICE USE ONLY: ASSESSMENT OF CAPACITY TO CONSENT BASED ON UBACC

Does the patient….	***Yes***	***No***
1. Understand the information relevant to the decision?	**……**	**……...**
2. Retain the information long enough to consider it?	**……..**	**……...**
3. Weigh the information as part of the decision-making process?	**……...**	**……...**
4. Communicate their decision in some way?	**……...**	**……...**

Please Note: Should there be a no answer to any of the 4 questions above then the patient lacks capacity to consent and a relative or custodian may then be requested to provide informed consent.

INFORMED CONSENT - ISIXHOSA

IPHEPHA-MVUME LOPHANDO NGESIGULO SE-CATATONIA

Mthathi-nxaxheba obekekileyo okanye Mzali okanye sizalwane esibekekileyo

Sicela imvume yakho yokuphanda nzulu ngeempawu zesi sigulo i-catatonia, nokuba unyango ozakulufumana luzakusebenezela njani na.

Ndiye ndanikwa iphepha elichaza ngolu phando kwaye ndiluchazelwe ngu ……..

EWE NDIYAVUMA

Mna (faka igama lakho apha) ……. ndiyazikhethela ukulungenela olu phando ndiluchazelwe ngugqirha okanye umongikazi, kwaye andinyanzeliswanga.

OKANYE

Ukuba umntu akakwazi ukunika imvume ngasizathu sithile, kodwa abe engali ukulungenela uphando, kungatyikitya umzali okanye isizalwane

Isayinwe ngu…… e…….. ngomhla we…….. kwinyanga ye.....ku 2019

HAYI NDIKHETHA UKUNGALUNGENELI OLU PHANDO

Mna (faka igama lakho apha) ……. ndikhetha ukuba ndingalungeni olu phando ndiluchazelwe ngugqirha okanye umongikazi

Mna ndingu…….(Chaza uhlobene njani nomthathi-nxaxheba)
ka……(igama lomthathi nxaxheba)

Isaynwe e…… ngomhla we…….. kwinyanga ye .....ku 2019

Utyikitya apha wena okanye umzali okanye isizalwane ……

APPENDIX 4: INFORMATION LEAFLETS IN ENGLISH AND XHOSA

4.1 - INFORMATION LEAFLET (XHOSA)

Iphepha lokwazisa umthathi-nxaxheba kuphando lwesigulo i-Catatonia

Mthathi-nxaxheba obekekileyo *okanye* Mzali okanye sizalwane esibekekileyo

Ngale ncwadi sikwazisa malunga ngophando nzulu oluqhutywa ziinzululwazi ezifuna ukufunda nzulu ngesigulo ekuthiwa yi-catatonia kweli ziko lempilo. Unyango obuhleli uzakulufumna alusayi kutshintsha okanye luphazamiseke wakuthatha inxaxheba kolu phando.

Yintoni i-*catatonia*?

I-catatonia sisigulo esiye sibangele ukuphazamiseka kwindlela umntu ashukuma ngayo apha emzimbeni. Kwabanye abantu sibangela ukuba umzimba lo ucothe kakhulu okanye ungakwazi kushuma, umntu azive eqinile, athi nokuba uyafuna ukushumisa umzimba wakhe njengesiqhelo angakwazi. Ide ibangele loo nto ngelinye ixesha ukuba umntu aphethe ehleli ndawoninye okanye emile ndawoninye de kugqithe imizuzu emininzi okanye iiyure zibe liqela. Iyakwazi nokubangela ukuba umntu angakwazi ukuphuma kwasebhedini, angakwazi kuzityisa, angakwazi kuzihlamba, asoloko elele ebhedini okanye ehleli esitulweni.

Kwelinye icala i-catatonia iyakwazi ukubangela ukuba umntu athi ngoku sele eqalile ukushukuma esithi wenza into ethile, suka umzimba lo uqine, aphethe amalungu omzimba afana neengalo, izandla, imilenze okanye iinyawo zilenga emoyeni angakwazi ukuyigqibezela laa nthsukumo ebeyiqalile. Intamo nentloko nazo ziyakwazi ukuphetha zikekele ngenxa yoku kuqina komzimba kuvela ngesiquphe.

Okokugqibela, i-catatonia iyakwazi ukuphinda ibangele intshukumo engaphaya kunesiqhelo, aphethe umntu eshuku-shukuma kakhulu, angahlali ndawonye okanye angazinzi. Abanye baye bazule ndawoninye, abanye baqhwabe izandla unomphelo okanye banqwale kungenjalo baninike intloko into engapheliyo. Iyakwazi nokuvela ngokuba omnye umntu abetha-bethe amanqindi emoyeni, omnye athi nokuba usebhedini kube ngathi unyomfa ibhaysikili into engapheliyo. Babakhona nabaphetha bethetha into enye,

okanye benze isikhalo esiphindaphindwayo okanye nayiphina intsholo abaye bayiqhube imizuzu emininzi okanye iiyure zide zibe liqela. Bakhona ke nabanye abaye balinganise loo nto ithethwa ngumntu ophambi kwabo kungenjalo balinganisa loo nto bayibona isenziwa ngumntu ophambi kwabo.

Ibangelwa yintoni i-*catatonia*?

I-catatonia iyakwazi ukubangelwa zizigulo ezithile zengqondo kungenjalo nezinye izigulo zomzimba ziyakwazi ukuhamba ne-catatonia. Ingxaki esiye siyifumane thina boogqirha neenzululwazi kukungazi xa siqala ukumbona umntu onale catatonia ukuba ingaba eyakhe ibangelwa sisigulo sengqondo na okanye sesomzimba kusini na. Yiloo tno side sabona ukuba kungakuhle ukuba sinokuyiphonononga nzulu le ngxaki.

Luqulethe ntoni olu phando?

Sijonge ekubeni wonke umntu oze kulaliswa kweli candelo, ahlolwe, kukhangelwe ukuba akahlaselwanga ziimpawu ezithile zale-catatonia kusini na. Wothi uhlolwe ngugqirha wakho ebehleli ezakuhlola kakade. Ukuba zikhona iimpawu ezithile ugqirha acinga ukuba uziqaphele apha kuwe, usenakho ukubuza ngazo umzekelo mhlawumbi ukuba ziqale nini, njani, kwaye ingaba uyaqala ukuba nazo na njalonjalo. Uzakube phofu ebhala loo nto umxelela yona. Apha ekubhaleni kwakhe kodwa akazokulibhala igama lakho nokuba ungubani kwaye uhlala phi. Oku kuhlolwa nokubuzwa nge-catatonia kungathatha imizuzu emihlanu ukuya kweli shumi kuphela. Ulwazi esiluqokelelayo ngawe kukuba nje iimpawu zesi sigulo unazo na kwaye nale mibuzo sesiyikhakanyile kuphela.

Zimbini izinto esifuna ukuziqwalasela kolu phando nge-catatonia:

1. Ingaba bangaphi abantu abafunyanwa sesi sigulo kule ngingqi?
2. Ingaba zikhona izinto ezingunobangela wokuba abanye abantu bafunyanwe sesi sigulo abanye basinde, mhlawumbi njengobubudala bomntu, isini okanye ezinye izigulo zomzimba?

Nayiphi na into esinokuyifunda eyongezelela kulwazi esele sinalo ngesi-sigulo ingasinceda kakhulu ekubeni sikwazi ukusinyanga ngcono kwixa elizayo. Ngako oko ubukho bakho nokuthatha kwakho inxaxheba kolu phando kuya kunceda abantu abaninzi abanokuthi bafunyanwe sesi sigulo.

Alukho olunye uvavanyo oza kulwenza oludibene nolu phando. Naluphi na olunye uvavanyo okanye unyango ozakuthi ulufumane emva kokuba umongikazi okanye ugqirha egqibile ukukuhlola, lunyango lwesiqhelo obuhleli uzakulufumana kakade kugirha wakho.

Ukuba ndifunyaniswe ndinazo imipawu ze-*catatonia* loo nto ithetha ukuthini?

Ukuba ufunyaniswe unazo ezinye zezi mpawu ze-catatonia, ugqira wakho wokunika unyango lakho lwesiqhelo okanye enze uvavanyo ebehleli ezakulwenza kakade olunxulumene nempilo yakho.

Kuza kwenziwa ntoni ngeziphumo zolu phando?

Iziphumo zolu phando zizakudityaniswa zibhalwe kufndiswe abanye oogqirha neenzululwazi malunga nesi sigulo, kwiinkomfa zoogqirha neenzululwazi.

Ndithini ukuba ndinemibuzo?

Ukuba unemibuzo ngolu phando, cela ukuthetha nogqirha wakho okanye umongikazi ozakube encedisa kolu phando.

Siyabulela!

Sibulela kakhulu ngexesha lakho nokuzixhesha kwakho ngolu phando.

4.2 - INFORMATION LEAFLET (ENGLISH)

Information Leaflet about a Study of Catatonia

Dear Participant / Parent/ Relative

This leaflet is provided to inform you about a study being conducted by researchers who would like to investigate a condition called catatonia at his health facility. The usual care you were going to get will not be changed or disturbed through taking part in this study.

What is catatonia?

Catatonia is a condition that affects the way a person moves his whole body or body parts. In some people it slows down the body considerably to the point where some will stop moving completely, causing the person to feel very stiff such that they are unable to move even when they want to. This may lead to a

person remaining in one position for a very long time (whether sitting or standing) to the point of many minutes or even hours. It can even cause some people to be bedridden, unable to feed themselves, or wash or attend to other daily needs.

Catatonia can also cause a person to appear frozen even after initiating a particular action, resulting in body parts like legs, arms hands or feet being frozen in awkward or unusual looking positions. The head and or neck may also be tilted at awkward angles. The change in movement can often occur suddenly.

Lastly catatonia can also cause an abnormality of excessive movement which is more than normal. A person may show excessive movement that lasts up to many minutes or hours with a seeming inability to stay still. Some people may pace up and down, others may clap orwave for long periods lasting minutes to hours, while others may show head nodding, head shaking, grimacing, etc. Some people have been seen to do shadow boxing or cycling movements even when lying down. It may also appear as repetitive speech of the same phrase, a cry or shout or other odd sound that can last for hours. Others may repeat what they hear around them non- stop or they may mimic actions of those around them as well.

What causes catatonia?

Catatonia may be seen with a number of mental illnesses but it can also be associated with some other medical conditions. The problem we run into as doctors is when a person presents with the first time with this syndrome it may be difficult in the beginning to know what the underlying cause is i.e. whether the cause is a mental condition or another medical condition. This is why conducting research on catatonia is so important.

What does this research involve?

We are looking at ensuring that everybody who is admitted into this unit s examined and screened for symptoms and signs of catatonia. Your admitting doctor will examine you as usual, which will include an initial screen for catatonia through examination only. Following this, a trained research assistant who is a nurse will proceed to do a full screen using a rating scale, to ensure that no other signs of catatonia were missed. If theresearch assistant finds any additional signs of catatonia, they will tell your treating doctor. In addition, the nurse may ask you questions like when did the symptoms start and how fast did they appear etc. She or he will note down you answers but will not include details like your name or your address which

can identify who you are. This further screening by the nurse not expected to take longer than 5 to 10 minutes. The information to be collected for the study about your condition is about the signs and symptoms and the few questions already mentioned to do with the illness, nothing more. There are two questions we would like to investigate about catatonia:

1. How many people experience this condition in this area?

2.Are there particular characteristics that make some people more prone to it and others less vulnerable to it like age, gender or other medical conditions?

Whatever we can learn about this condition, over and above what we know already will help us to come up with improved ways to diagnose it and to treat it in future. Taking part in this research will therefore help many people in future who may also get this illness.

There are no other tests you will be expected to take part in for this study. Whatever other tests or treatment interventions that follow will be those that your doctor would have undertaken anyway to help you manage your condition and get you better.

If I am found to show some of the symptoms or signs of catatonia what does that mean?

If you are found to have some signs and symptoms of catatonia, the research nurse will inform your treating doctor, so that your doctor can give you the appropriate and usual treatment for your condition. Your doctor may also decide to do more tests which would be what they would have done anyway even if you were not part of the study, in order to manage your condition.

What will be done with the results of the study?

The results of the study will be collected and put together to present to scientific congresses so that other doctors and scientists can learn from them.

What should I do if I have more questions?

If you have more questions, ask your treating doctor or the researcher, research assistant or nurse.

Thank you! Thank you very much for your patience and for spending the few minutes on this study.

APPENDIX 5: INSTITUTIONAL PERMISSIONS –DORA NGINZA HOSPITAL

Province of
EASTERN CAPE
HEALTH

DORA NGINZA REGIONAL HOSPITAL

DEPARTMENT OF PSYCHIATRY: MBELA MENTAL HEALTH UNIT
Spondo Street · Zwide · Port Elizabeth · 6205
Private Bag X 11851 · Port Elizabeth · 6055
Telephone +27 41 406 4350 · Fax +27 41 4064687

DEPARTMENT OF PSYCHIATRY REQUEST FOR CEO APPROVAL OF DEPARTMENTAL RESEARCH

To	Mr P Tsibolane Chief Executive Officer Dora Nginza Hospital
From	Dr A Bronkhorst, Prof S van Wyk and Prof Z Zingela Department of Psychiatry
Subject	DEPARTMENT OF PSYCHIATRY REQUEST FOR CEO APPROVAL OF DEPARTMENTAL RESEARCH
Date	08 November 2018

Introduction
The Department of Psychiatry and Walter Sisulu University have identified research projects in catatonia as a priority for the Eastern Cape due to the severity of the illness and the potentially negative outcomes resulting from delay in recognition of the cognition

Requested support
CEO approval and support for the research project on Catatonia: *"Catatonia as a manifestation of serious mental illness: prevalence, presentation, management and outcomes in a mental health unit"*, is hereby requested on behalf of the investigators to initiate this study in the Department of Psychiatry in Dora Nginza Hospital.

Conclusion
This project is also expected to yield support for other ongoing and planned registrar research projects on Catatonia. Thank you for considering this request.

A Bronkhorst S van Wyk Z Zingela

The request for approval is hereby **granted** / **not granted** (please delete as appropriate)

Signature: ..... Designation: CEO Date: 09.11.2018

Name: M.P. TSIBOLANE

Dora Nginza Regional Hospital
Chief Executive Officer
Mr M.P. Tsibolane

Signature:.....

Date:.....

APPENDIX 6: INSTITUTIONAL PERMISSIONS

APPROVAL FROM EC HEALTH RESEARCH COMMITTEE

APPENDIX VI

Eastern Cape Department of Health

Enquiries: Madoda Xokwe
Tel No: 040 608 0710
Date: 19 December 2017
Fax No: 043 642 1409
e-mail address: madoda.xokwe@echealth.gov.za

Dear Prof. Z. Zingela

Re: Catatonia As A Presentation For Severe Mental Illness: Prevalence Of Catatonia In Two Mental Health Units In Urban And Rural South Africa (EC_201712_015)

The Department of Health would like to inform you that your application for conducting a research on the abovementioned topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Epidemiological Research & Surveillance Management. You may be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE

APPENDIX 7: ETHICS APPROVAL

NELSON MANDELA
UNIVERSITY

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa mandela.ac.za

Chairperson: Research Ethics Committee (Human)
Tel: +27 (0)41 504 2347
sharlene.govender@mandela.ac.za

NHREC registration nr: REC-042508-025

Ref: [H20-HEA-PSY-002] / Approval]

18 August 2020

Prof L Stroud
Faculty: Health Sciences

Dear Prof Stroud

CATATONIA AS A MANIFESTATION OF SERIOUS MENTAL ILLNESS: PREVALENCE, PRESENTATION, MANAGEMENT AND OUTCOMES OF CATATONIA IN A MENTAL HEALTH UNIT

PRP: Prof L Stroud
PI: Dr Z Zingela

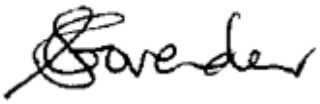
Your above-entitled application served at the Research Ethics Committee (Human) (meeting of *29 July 2020 2020*) for approval. The study is classified as a high risk study. The ethics clearance reference number is **H20-HEA-PSY-002** and approval is subject to the following conditions:

1. The immediate completion and return of the attached acknowledgement to Imtiaz.Khan@mandela.ac.za, the date of receipt of such returned acknowledgement determining the final date of approval for the study where after data collection may commence.
2. Approval for data collection is for 1 calendar year from date of receipt of above mentioned acknowledgement.
3. The submission of an annual progress report by the PRP on the data collection activities of the study (form RECH-004 available on Research Ethics Committee (Human) portal) by 15 November this year for studies approved/extended in the period October of the previous year up to and including September of this year, or 15 November next year for studies approved/extended after September this year.
4. In the event of a requirement to extend the period of data collection (i.e. for a period in excess of 1 calendar year from date of approval), completion of an extension request is required (form RECH-005 available on Research Ethics Committee (Human) portal)
5. In the event of any changes made to the study (excluding extension of the study), completion of an amendments form is required (form RECH-006 available on Research Ethics Committee (Human) portal).
6. Immediate submission (and possible discontinuation of the study in the case of serious events) of the relevant report to RECH (form RECH-007 available on Research Ethics Committee (Human) portal) in the event of any unanticipated problems, serious incidents or adverse events observed during the course of the study.
7. Immediate submission of a Study Termination Report to RECH (form RECH-008 available on Research Ethics Committee (Human) portal) upon expected or unexpected closure/termination of study.
8. Immediate submission of a Study Exception Report of RECH (form RECH-009 available on Research Ethics Committee (Human) portal) in the event of any study deviations, violations and/or exceptions.
9. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of Research Ethics Committee (Human).

Please quote the ethics clearance reference number in all correspondence and enquiries related to the study. For speedy processing of email queries (to be directed to Imtiaz.Khan@mandela.ac.za), it is recommended that the ethics clearance reference number together with an indication of the query appear in the subject line of the email.

We wish you well with the study.

Yours sincerely



Dr S Govender
Chairperson: Research Ethics Committee (Human)

Cc: Department of Research Development
Faculty Manager: Health Sciences

Appendix 1: Acknowledgement of conditions for ethical approval

WSU
Walter Sisulu University

FACULTY OF HEALTH SCIENCES
POSTGRADUATE EDUCATION, TRAINING, RESEARCH AND ETHICS UNIT

HUMAN RESEARCH COMMITTEE
CLEARANCE CERTIFICATE

PROTOCOL NUMBER	: 067/2017
PROJECT	: PREVALENCE OF CATATONIA IN TWO MENTAL HEALTH UNITS IN URBAN AND RURAL SOUTH AFRICA
INVESTIGATOR(S)	: PROF Z ZINGELA
DEPARTMENT	: PSYCHIATRY & BEHAVIOURAL SCIENCES
DECISION OF THE COMMITTEE	: APPROVED
DATE OF APPROVAL	: 07 MAY 2020
DURATION	: 1 YEAR (07 MAY 2020 – 07 MAY 2021)
CONDITIONS	: NONE

N.B You are required to provide the committee with a progress or outcome report of the research after every 6 months. The committee expects a report on any changes in the protocol as well as any untoward events that may occur at any time during the study not later than 7 days of knowing as the investigator/s.

WALTER SISULU UNIVERSITY
ACADEMIC HEALTH SERVICE COMPLEX OF THE EASTERN CAPE
POSTGRADUATE EDUCATION AND TRAINING
FACULTY OF HEALTH SCIENCES
WALTER SISULU UNIVERSITY
P/BAG X 1, WSU, 5117, E.C
TEL: (047) 502 2100 / FAX: (047) 502 2101

DR EJ NDEBIA
CHAIRPERSON

07.05.2020
DATE

DECLARATION OF INVESTIGATOR(S)

(To be completed in duplicate and one copy returned to the Research Officer at Office AB 02 GF 03 Administration Building, Sisson Street Campus, Fort Gale, Mthatha, WSU)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Research Ethics Committee. I/We agree to a completion of a 6-monthly/ yearly progress report. The committee reserves the right to withdraw approval in the event that there are serious ethical violations.

..... (Signature)

..... (Date)

N. B. Please quote the protocol number in all enquiries.