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A RESEARCH PROPOSAL BY:

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Declaration: I hereby declare that the Research Report submitted for the Bachelor of Arts Honours in Psychology degree to The Independent Institute of Education is my own work and has not previously been submitted to another University or Higher Education Institution for degree purposes.

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ABSTRACT

Electroconvulsive therapy (ECT) is often portrayed as crude and barbaric as much of the perceptions have been from the results of early treatments in which a high dosage of electricity were administered without anaesthesia leading to memory loss, physical harm, catatonia and other fatalities (Wiley, 2017). Currently understanding the risk/reward ratio of this treatment is unclear as scholars like Devanand, Fitzsimons, Prudic, and Sackeim (1995) only focused on the risks of western studies. This study consisted of 6 medical professionals in South Africa with the aim to explore what they think the risks and rewards of using ECT are in terms of treating bipolar disorders in a South African context. Non probability sampling methods, in-depth interviews and qualitative content analysis were used to gather data and results showed ECT is portrayed as an invasive treatment that is not sensitive to all pathologies. Currently the risk and rewards of using this form of treatment to treat bipolar disorders is equivalent as they depend on the severity of symptoms, physiology of the patient and the severity of their conditions. Clinicians believe that more research should be conducted in order to find more natural ways of stimulating neurotransmitters by using technologies and drugs that can encapsulate hormones that target receptors.

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1. INTRODUCTION

1.1. Contextualisation

Electroconvulsive therapy (ECT) is a treatment that involves sending an electric current through the brain to trigger an epileptic seizure to relieve the symptoms of mental health problems (American Psychiatric Association, 2018). This procedure involves the placement of electrodes on the head of the patient to transmit a measured amount of electricity to the brain, resulting in a seizure that lasts no longer than a minute (Life healthcare, 2018). This procedure is administered under general anaesthesia using muscle relaxants, so that muscles only twitch slightly, and the patient's body does not convulse during the seizure (American Psychiatry Association, 2018). Electroconvulsive therapy is often portrayed as crude and barbaric (Life healthcare, 2018).

Much literature is based on the clinical implications of ECT and this may discourage patients in having the procedure; however there is evidence that this treatment may offer benefits to treating bipolar disorder (Dincer, 2018). Currently understanding the risk/reward ratio of this treatment is unclear as scholars like Devanand et al. (1995) only focused on western studies, thus the purpose of this research is to understand what medical professionals in South Africa think the risks and rewards of ECT are. The introduction of the proposed study will be broken down into five sections which will include the research rationale, research problem statement, research purpose statement, research question, and the research objectives.

1.2. Rationale

Academic rationale

The proposed research study will provide an understanding of what medical professionals think of ECT. Currently understanding the risk/reward ratio of this treatment is unclear as research conducted by previous scholars only focuses on the negative, crude and barbaric effects of ECT. Since the purpose of this research is to explore in-depth the risks and rewards according to medical professionals in South Africa; if the risk/reward ratio of ECT is known, this may either eliminate biases and misinformation regarding this form of therapy, increase the availability of this form of treatment, or this may provide a better understanding of the current risks involved since it is now administered under general anaesthesia.

Personal rationale

In modern times, there is not enough research relating to the risks and rewards of using ECT, thus, this research will add to the body of knowledge around this form of therapy as it has been found to be a potential life saver in many cases, especially in women who cannot take medicine due to pregnancy. In academia, there are studies about antidepressants and various treatments available for each mental disorder, however little emphasis is made on the risks/rewards of ECT. While many studies have addressed ECT, this study approaches it in a South African context. The proposed research will be used by peer scholars, bipolar patients and psychiatrists in practice, and the general public who want to educate themselves about ECT in a South African context. In contrast, this will help families whom have no hope left for their mentally challenged family members and will help them remain positive in helping their family members get better.

1.3. Problem Statement

Electroconvulsive therapy is often portrayed as crude and barbaric (Life healthcare, 2018). Much of the perceptions have been from the results of early treatments in which a high dosage of electricity was administered without anaesthesia leading to memory loss, physical harm, catatonia and other fatalities (Wiley, 2017). This may discourage patients in having the procedure; however there is evidence that this treatment may offer benefits to treating bipolar disorder (Dincer, 2018). Currently understanding the risk/reward ratio of this treatment is unclear as scholars like Devanand et al. (1995) only focused on the risks of western studies, thus the purpose of this research is to explore in-depth the risks and rewards of ECT according to medical professionals in South Africa.

1.4. Purpose Statement

The purpose of this research aims to understand the perceived risks and benefits of ECT according to medical professionals in South Africa.

1.5. Research Question

How do medical professionals in South Africa perceive electroconvulsive therapy as a treatment for bipolar disorders?

1.6. Objectives/Hypotheses/Sub-questions

- To uncover the benefits and risks of using ECT to treat bipolar disorders according to medical professionals in South Africa.

- To gain an in-depth understanding of how ECT may be a better option in treating patients who have not responded/are resistant to other forms of medication and therapy.

2. LITERATURE REVIEW

This following literature review will be broken down into the theoretical foundation, conceptualisation and the literature. The theoretical foundation will provide information about the endocrine theory and the generalised seizure theory as well as the mechanisms of ECT.

2.1. Theoretical foundation and how it links to the research problem

This section will discuss the endocrine theory and the generalised seizure theory as they explain the link between the ECT and neurogenesis in the hippocampus, and the neurotrophic effects of ECT.

The endocrine theory states that as we age, the endocrine system becomes less efficient in secreting hormones from glands that deliver messages to cells (Barlow, et al., 2017). These cells are programmed to receive specific messages from the hormones that circulate through the body containing information and instructions that lead to the effects of aging and mood disorders (Barlow, et al., 2017). This theory states that a dysfunction in the endocrine system is a potential cause for bipolar disorder because of the connection between the nervous and endocrine system (Patricell, 2020). The hypothesis of the endocrine theory focuses on the hyperactivity in the hypothalamic-pituitary-adrenocortical axis (HPA) which produces stress hormones. According to the endocrine theory, Barlow et al (2017) states that patients with disorders of the hormonal endocrine system become depressed and the excessive exogenous cortisol that is given as treatment causes mania, thus high levels of stress hormones suppresses neurogenesis in the hippocampus which then leads to bipolar disorder.

The endocrine theory asserts that when neurogenesis (an expression of brain plasticity) of the hippocampus becomes suppressed, cell deaths occurs which then causes the brain to alter its structure and function in a use-dependent way (Barlow et al., 2017). In this sense, neurogenesis is a sub-serve of a learning function in the brain and since the brain is now use dependent, depressive programmes and neural states of being are learnt. This theory applies to the proposed research problem by providing evidence of how ECT offers benefits to treating bipolar disorder as it produces neurogenesis in the hippocampus, thus reversing neurogenesis where the brain cells become use-dependent (Barlow et al, 2017).

ECT appears to alter the permeability of the blood brain barrier to allow the passage into the neural milieu of precursor molecules necessary for the synthesis of neurotransmitters and increases levels of serotonin by blocking the stress hormone and promoting neurogenesis in the hippocampus, which then arguably makes it a better option in treating patients with bipolar disorder (Barlow et al, 2017).

The generalised seizure theory states that the therapeutic effects of ECT are dependent on the elicitation of generalised seizures (Bolwig, 2011). According to a study conducted in Sweden by Bolwig (2011), it was deduced that generalized seizures are essential for the therapeutic effect of ECT, thus, the greater the generalization of a seizure, the stronger the brain stem is activated. These computed tomography studies looked at several brain regions during ECT. It was deduced that an extended activation of cortico-thalamic–cortical circuits during ECT is relevant for the efficacy of seizure therapy as the cortico-thalamic cortical circuit of the brain is responsible for mania in bipolar disorder (Bolwig, 2011). This theory relates to the proposed research by providing information on how ECT induces similar seizure activity and has equivalent clinical effects in the treatment of bipolar disorder (Bolwig, 2011). Bolwig (2011) asserts that the extended activation of the cortico-thalamic-cortical circuits during ECT exerts neurotrophic effects which then lead to superior therapeutic efficacy.

2.2. Review of previous literature

The following literature will provide information on bipolar disorder, the different types of bipolar disorder, diagnostic challenges, information on the relationship between neurochemistry, endocrinology and bipolar disorder; and mechanisms of ECT in both manic and depressive states of bipolar disorder. The value of the proposed research is in highlighting the differences between what the literature says and what mental health professionals believe and what they are conveying to their patients.

Bipolar disorder

Grande, Berk, Birmaher and Vieta (2015) define bipolar disorder as a recurrent chronic disorder characterised by fluctuations in mood and energy. Bipolar disorder (previously known as manic depressive illness) is characterised by episodes of mania, hypomania, and alternating/ intertwining episodes of depression and is the leading disability of mental health as it leads to cognitive and functional impairment, increased mortality by suicide, reduction in quality of life and in some instances may lead to psychotic episodes, delusions, grandiosity and messianic ideation (Grande et al., 2015).

Bipolar I and bipolar II

According Barlow et al. (2017), bipolar I is characterised by a manic episode and does not require a major depressive episode, however, it may involve periods of depression, and bipolar II is characterised by a hypomanic episode and a major depressive episode. Grande et al. (2015) asserts that bipolar I seems to have a more tortuous evolution and severe prognosis than bipolar II because of its cross-sectional symptom severity, whilst bipolar II has higher episode frequencies, higher rates of psychiatric comorbidities, and recurrent suicidal behaviours that impair the patients quality of life. Bipolar II is often more problematic because individuals spend more time on average in mood states as opposed to euthymic (Grande et al., 2015). Bipolar disorders are associated with severe prognosis, frequent and prolonged episodes, and increased death by suicide, additional comorbidity when having rapid cycling specifiers and mixed specifiers (Barlow et al., 2019; Grande et al., 2015).

The onset of bipolar depression is different from unipolar depression and in some instances may be characterised by psychosis, psychomotor retardation and catatonia (Grande et al., 2015). In a study conducted by Perlis, Brown, Baker and Nierenberg (2006), it was concluded that depression in bipolar disorder is triggered by having a genetic predisposition of bipolar disorder, traumatic life experiences, abuse and stressful events. Bipolar depression is also characterised by having a greater prevalence of atypical features; melancholic symptoms; and imbalances of serotonin, norepinephrine, and dopamine; which increase suicide risks for the patients (Perlis et al., 2006).

Diagnostic challenges

It is often difficult to accurately diagnose bipolar disorder simply because the onset is most commonly a depressive episode similar to unipolar depression (Barlow et al., 2017). Another difficulty is the distinction between bipolar I or II from unipolar depression because the prevalence of depressive symptoms is higher than that of hypomanic or manic symptoms during the course of bipolar disorder type I or II, and these disorders often start with a depressive episode (Phillips & Kupfer, 2013). Other types of bipolar disorder include cyclothymic disorder (characterised by several periods of hypomanic and depressive symptoms, however the depressive symptoms do not meet criteria for depressive episodes) and bipolar disorder that is not otherwise specified (characterised by depressive and hypomanic-like symptoms/episodes that might alternate rapidly, but do not meet the full diagnostic criteria for bipolar I, II and cyclothymia) (Phillips & Kupfer, 2013).

Neurochemistry of bipolar disorder

According to the cetacholaminergic hypothesis, higher levels of noradrenaline have been associated with mania and switching to mania in bipolar disorder (Kurita, 2016). Thus, using noradrenaline antidepressants increases the likelihood of switching to manic episodes in bipolar patients when treating major depression (Kurita, 2016). According to the cetacholaminergic hypothesis, higher levels of dopamine have also been associated with manic-like symptoms whilst lesions in the dopaminergic area have been found to induce depressive behaviour (Kurita, 2016; Ashok et al., 2017). Bipolar disorder is often associated with a deficit in serotonergic neurotransmission as serotonin imbalances affect an individual's mood and are one of the causes of depression in bipolar disorder which is why patients with major depressive episodes often take serotonin reuptake inhibiters (SSRI's) (Lee, Park & Lee, 2012). Low serotonin levels have been linked to increased suicide risks among bipolar patients and it has been found that low serotonin function compromises mechanisms involved in maintaining recovery from depression (Lee et al., 2012: Cowen & Browning, 2015).

Cowen and Browning (2015) state that serotonin pathways influence mood in depressed patients by altering the way the brain appraises emotionally-laden information at an implicit level. The relationship between serotonin and bipolar disorder specifically major depression, lies in the fact that lower levels of serotonin results in negative thinking patterns, thus increased suicide risks (Cowen & Browning, 2015). However, rumination, which is constantly having thoughts about something, is associated with the lack of serotonin, depression, anxiety and obsessive compulsive disorders (Lee et al., 2012). Thus, Selective Serotonin Reuptake Inhibitors (SSRI's) are often used to treat these illnesses (Lee et al., 2012).

Endocrinology of bipolar disorder

According to Patricell (2020), a dysfunction in the endocrine system is a potential cause for bipolar disorder because of its connection between the nervous and endocrine system. Research shows that hyperactivity in the hypothalamic pituitary-adreno-cortical axis (HPA) which produces stress hormones is one of the leading causes of major depression in bipolar disorder as these high levels of stress suppress neurogenesis in the hippocampus (Chakrabarti, 2011). Chakrabarti (2011) asserts that thyroid dysfunction has also been implicated in bipolar disorder as thyroid functions are connected to depressive mood

disorders and because there has been a link between thyroid dysfunction and rapid cycles among patients with bipolar disorder.

Mechanisms of ECT in manic and depressive states of bipolar disorder

ECT works by producing neurogenesis in the hippocampus, thus reversing neurogenesis where the brain cells become use-dependent (Barlow et al, 2017). ECT alters the permeability of the blood brain barrier to allow the passage into the neural milieu of precursor molecules necessary for the synthesis of neurotransmitters and increases levels of serotonin by blocking the stress hormone and promoting neurogenesis in the hippocampus, which aids in the recovery from depression. Bitemporal electrode placement during ECT has been found to be the most effective in the treatment of depressive states with respect to clinical efficacy and the speed of response, as well as mixed states and catatonia in bipolar disorder; however it has the greatest risks for temporary neurocognitive impairments (Kellner et al., 2010; cited in Abbott, Miller, Lloyd & Tohen, 2019).

Abbott et al. (2019) state that the focal placement of electrodes is most effective in treating manic states as it stimulates the left hemisphere of the brain; focal electrode placements target specific aberrant circuitry in specific bipolar states to optimize clinical outcomes. Abbott et al., (2019) hypothesised that focal electrode placement targets the state specific neuroanatomic structures implicated in bipolar disorder, thus maintaining efficacy of bitemporal electrode placement while decreasing the risks of temporary neurocognitive impairments. Due to the widespread use of antidepressants that inhibit undesirable effects of dopamine, serotonin and noradrenaline, this increases the likelihood of having mixed state episodes of bipolar disorder which are often difficult to treat and result in higher frequency of psychotic features, lower inter-episodic remission, and greater risk of suicide (Palma et al., 2016).

The understanding of ECT among clinicians

According to Dukart et al. (2014), understanding the precise mechanism of ECT is unclear as the current understanding of ECT is based on the antidepressant effect that is partially mediated by seizure induced neurotrophic effects that result in increased rates of neurogenesis, synaptogenesis and glial proliferation, particularly in the hippocampus. Dukart et al. (2014) state that modern neuroimaging experiments have shown a critical role for the subgenual cortex and the deep brain stimulation of this area as it results in alleviation of symptoms of bipolar disorder.

Concerns regarding structural brain damage caused by ECT have been largely attenuated because of a lack of experimental evidence for ECT-induced neuronal damage as there is an increase with the correlational studies reporting ECT-related hippocampal volume with clinical outcomes (Dukart et al., 2014). Dukart et al. (2014) asserts that failure to completely detect the effects of right unilateral ECT has failed to distinguish the risks from pharmacologically induced changes. According to O'Connor et al. (2003), ECT is beneficial for psychotic depression and although studies show that ECT disrupts memory functions, these functions often recover after a week of undergoing this form of therapy.

Bailene et al (2010) argues that in the treatment of bipolar disorder, ECT is a footnote to consider when all types of treatment have failed. In a study that they conducted, 80% of 272 patients successfully responded to ECT and these showed an increased expression of brain-derived neurotrophic factor (BDNF), which has a strong association with increased volumes in the hippocampus indicating that ECT may be modulating intracellular processes in patients with bipolar disorders (Bailene et al, 2010). Freeman and Cheshire (1986) conclude that there is no evidence-based research that demonstrates that ECT is better than a placebo (where anaesthetic is given to the patient, but no electric current is applied) beyond the treatment period (Wells et al, 2018).

According to Payne and Prudic (2011), serious medical outcomes that arise as a result of ECT are quite rare. Payne and Prudic (2011) state that ECT should not be considered as a treatment of last resort but should be considered under circumstances of increased clinical urgency for bipolar patients whom have depressive hallucinations, catatonia, suicidality and co-existing medical disorders such as cardiac risks and pregnancy in order to spare the patient unnecessary suffering.

Frais (2010) argues that cases of memory deficits after electroconvulsive therapy have been widely reported particularly short-term memory, long-term and autobiographical memory. Because of the positive and negative effects of ECT on memory systems, it is possible that aspects of memory function could hold the key in explaining how and why successful ECT treatment functions. Frais (2010) also argued that successful ECT treatment is effective because it facilitates and restores the function of specific memory systems that are deficient in the course of a severe depressive episode.

Risks of ECT

According to O'Conner et al. (2003), ECT is not a wholly benign procedure as it may have severe side effects on individuals as opposed to repetitive transcranial magnetic

stimulation (rTMS). These side effects include headaches, disorientations, cognitive and memory deficits, and new learning is temporarily disrupted; however rTMS is associated with attention and learning improvements (O'Connor et al., 2003). O'Connor et al. (2003) asserts that ECT leads to more pronounced difficulties on tasks of working memory and long term memory. McQueen et al. (2007) states that verbal and memory deficits are have been controversially associated with ECT. In a study that they conducted, it was deduced that some patients have a longer delay in recalling information; however ECT had little impact on their long term cognitive function (McQueen et al., 2007). Immediately after treatment, patients experience confusion which last for about several hours, retrograde amnesia which improves in a couple of month after the treatment, physical side effects which include nausea, muscle ache and headaches which can be treated with medication (McQueen et al., 2007).

2.3. Conceptualisation

Anaesthesiologist: perioperative physicians who provide medical care to patients before, during, and after surgical procedures University of Pretoria (2020). Anaesthesiologists are responsible for delivering anaesthesia safely to patients in virtually all health care settings, including all major medical and tertiary care facilities (University of Pretoria, 2020).

Autobiographical memory: memory containing information about yourself and personal experiences (Brewer, 1986). This type of memory is believed to be impacted temporarily after the admission of electroconvulsive therapy. Its relevance in the proposed study lies in the assumption by Devanand et al (1995) that ECT causes problems with autobiographical memory.

Bipolar disorder: the occurrence of manic/mixed manic episodes alternating with major depressive episodes (Barlow et al., 2017). This is a type of chronic mood disorder that can last for years or can be life-long. Its relevance is the study is to understand the risks and rewards of ECT in treating this disorder.

Catatonia: "a behavioural syndrome characterised by an inability to move normally" (Barlow et al., 2017, p.260). This type of syndrome falls into bipolar disorder specifiers. Its relevance in the proposed study is to highlight that ECT may remove this syndrome and its symptoms.

Electroconvulsive therapy (ECT): a form of psychiatric treatment that involves inducing seizures with the use of electrical stimulation while a patient is under general anaesthesia (Barlow et al., 2017). This is a key term of the proposed research in which this research

aims to understand the risks and rewards of using this therapy according to mental health professionals in South Africa.

Exploratory study: “a scientific method of observation to gather non numerical data” (du Plooy-Cilliers, Davis & Bezuidenhout, 2018, p.75). This type of study is used in the proposed study with the aim to improve existing research on a particular topic; in this case electroconvulsive therapy. Its relevance in the proposed study is to improve existing research of the risks and rewards of ECT in treating bipolar disorder.

General anaesthesia: an anaesthetic that affects the whole body causing unconsciousness (American Psychiatry Association, 2018). This is used in treatment to keep the patient from feeling any sort of pain during various surgery and electroconvulsive therapy. Its relevance in the proposed study is to make sure that the patient is unconscious during the treatment to prevent serious side effects.

Medical professionals: in the proposed study, this includes anaesthesiologists, psychiatrists and psychologists.

Neurogenesis: the formation of new neurons from the neural stem and progenitor cells which occur in various brain regions such as the sub granular zone of dentate gyrus in the hippocampus and the sub granular zone of lateral ventricles (Begega et al, 2017). The use of electroconvulsive therapy causes the formation of neurons which replace problematic neurons that contribute to bipolar disorder. This is relevant in the proposed study as it provides an understanding of what happens to the brain during ECT.

Patients: a person receiving medical treatment (Barlow et al., 2017). In the proposed study this term is relevant as it refers to individuals who suffer from bipolar disorder and have not responded to other forms of treatment.

Psychiatrist: Mental health professionals, who diagnose mental health disorders, manage medication; hold a specific focus on chemical imbalances of the brain (Ryback, 2016).

Psychologists: experts in psychosocial therapy and concentrate on the mind emotions of a patient (Ryback, 2016).

Seizure: a sudden and uncontrolled neuronal disturbance in the brain (Barlow et al., 2017). This occurs in the individual who receives treatment and is relevant in the proposed study as it will help individuals understand what this term entails.

Therapy: treatment used to heal and relief an illness or disorder (Barlow et al., 2017). In the proposed study, therapy occurs in a form of using electric convulsions to trigger a seizure which in turn triggers neurogenesis.

3. RESEARCH DESIGN AND METHDOLOGY

According to du Plooy-Cilliers et al. (2018, p.24), ‘’a research methodology is a guiding system for solving problems; usually referring to qualitative, quantitative and mixed methods.” Information found in this section will cover the research paradigm, research design, population, sampling, data collection methods and data analysis methods.

3.1. Outline of worldview/paradigm/tradition

Du Plooy-Cilliers et al. (2018, p.19) states that “a paradigm describes a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done, and how results should be interpreted.” The proposed research will use an interpretivist paradigm which will allow the researcher to interpret the subjective responses from those whom data will be collected from (du Plooy-Cilliers et al., 2018). Interpretivism is influenced by hermeneutics, phenomenology, and symbolic interactionism. Du Plooy-Cilliers et al. (2018, p.19) states that “a paradigm describes a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done, and how results should be interpreted.” The proposed research uses an interpretivist paradigm which allows the researcher to interpret the subjective responses from those whom data will be collected from (du Plooy-Cilliers et al., 2018). Interpretivism is influenced by hermeneutics, phenomenology, and symbolic interactionism.

Hermeneutics is concerned with theory and the method of the interpretation of human action, phenomenology is concerned with the way in which individuals make sense of the world around them and symbolic interactionism is concerned with shared meaning that permits humans to interpret signs or action (du Plooy-Cilliers et al., 2018). Interpretivism aims to gain an in-depth understanding of a specific phenomenon and requires the researcher to spend hours in direct contact with those being studied in order to be able to appreciate how they experience daily life and to get an understanding of what is meaningful and relevant to them (du Plooy-Cilliers et al., 2018).

The epistemological position of this paradigm highlights that what is factual depends heavily on the context and interpretation of information (du Plooy-Cilliers et al., 2018). Researchers who use this paradigm believe that truth is independent of a person’s

interpretation of facts, thus, do not make generalisations about phenomenon (du Plooy-Cilliers et al., 2018). This paradigm will help understand the risks and rewards of ECT according to medical professionals in South Africa. The use of this paradigm will benefit the proposed study by providing knowledge that is different from the abstract world of our minds.

The ontology of this paradigm asserts that “the social world is fluid and fragile and changes as people’s perceptions change” (du Plooy-Cilliers et al., 2018, p.29). Researchers who use this paradigm believe that people experience their sense of reality based on individual differences and their various circumstances (du PlooyCilliers et al., 2018). According to du Plooy-Cilliers et al., (2018, p.31) “interpretivists researchers aim to study reality subjectively and use methods that are sensitive to content.” This paradigm will therefore aid the proposed study in gaining in-depth understanding of multiple realities of medical professionals which will further provide better understanding of the risk and reward ratio of using ECT in the treatment of bipolar disorders. According to du Plooy-Cilliers et al., (2018), the axiology of interpretivism lies in the complex understanding of unique realities as it allows the researcher to openly discuss the value that shape their research as well as their own interpretation and the interpretation of participants. This allows the proposed study to openly discuss the risk and rewards of using ECT in South Africa.

An interpretivist paradigm is used in the proposed study as the paradigm aims to gain an in-depth understanding of a specific phenomenon and aims to highlight that what is factual depends heavily on the context and interpretation of information (du Plooy-Cilliers et al., 2018). This paradigm will help understand and describe meaningful social actions surrounding the use of ECT according to health practitioners in South Africa. The use of this paradigm will benefit the proposed study by providing knowledge that is different from the abstract world of our minds.

3.2. Research approach and design

The proposed study uses qualitative research methods which aid in presenting interpretive data and exploring the risk and rewards of electroconvulsive therapy in treating bipolar disorder according to health professionals in South Africa. The proposed research study will use in-depth interviews as a qualitative method whereby the researcher will be working inductively with the use of cross-sectional design as data will be collected only once (du Plooy-Cilliers, 2018). The use of inductive theorising allows the researcher to make subjective conclusions of the risks and rewards of ECT according to the health

professional of South Africa, the study is exploratory with the aim of gathering new information about ECT in a South African context (Du Plooy-Cilliers et al., 2018). The study will also use the narrative enquiry as a qualitative research methodology as this will allow the understanding of ECT according to health professionals in South Africa.

3.3. Population

3.3.1. Population

According to Du Plooy-Cilliers et al (2018), a population is the total group of people or entities from whom information is required. For the purpose of the study, the population includes medical professionals in South Africa whom are registered with the Health Professions Council of South Africa (HPCSA).

3.3.2. Unit of analysis

According to Roller and Lavrakas (2015), a unit of analysis refers to the portion of content that will be the basis for decisions made during the development of codes. For the purpose of this research, the unit of analysis will be information collected during interviews with Anaesthesiologists, Psychologists and Psychiatrists.

3.3.3. Target and accessible population

According to Mack (2019), a target population is a group of individuals that fall within the population parameters that the researcher wishes to understand. An accessible population refers to only the population that can only be included in the proposed study (du Plooy-Cilliers et al., 2018). The target population of the proposed study is medical professionals in South Africa who deal with ECT and also deal with patients who suffer from bipolar disorder. Due to the Covid-19 pandemic, the accessible population will be medical professionals in the Gauteng and Limpopo regions.

3.3.4. Population parameters (characteristics)

Du Plooy-Cillers et al (2018) state that population parameters refer to the nature, size, and unique characteristics of the population of the research study. In the proposed study, the population characteristics will include: male and female psychiatrists, psychologists and anaesthesiologists. These anaesthesiologists, psychologists and psychiatrists will come from different racial groups and cultural backgrounds to limit cultural beliefs from hindering with the whole purpose of the research.

3.4. Sampling

Sampling involves taking a group of people, objects or items from a larger population for measurement (du Plooy-Cillers et al., 2018).

3.4.1. Probability or non-probability sampling

The proposed study uses non-probability sampling methods. Non-probability samples are those in which the probability that a subject is selected is unknown and results in selection bias in the study (Acharya, Prakash, Saxena & Nigam, 2013).

3.4.2. Sampling method

Purposive sampling is used with the aim to obtain the population that is in line with the parameters of the study (du Plooy-Cillers et al, 2018). The researcher chose to use this type of sampling method because it does not require a sampling frame and since the proposed study is qualitative, generalising the results is not the goal of the research. The researchers purposively choose elements that are included in the sample, in simple terms, only elements that have certain characteristics that are relevant to the proposed research were included and those that are irrelevant were disregarded (du Plooy-Cillers et al, 2018). According to Acharya et al. (2013), purposive sampling is often used on the basis of the convenience of the researcher whereby respondents are often chosen because they are in the right place at the right time.

Advantages of using this type of non-probability sampling method are that it is most commonly used, it is less expensive and there is no need for a list of all the population elements (du Plooy-Cilliers et al., 2018; Acharya et al., 2013). However, this non-probability sampling method is not without limitations; the foremost being variability and bias cannot be measured or controlled, and results from the data cannot be generalised beyond the sample (Acharya et al., 2013). Using purposive sampling makes the proposed study vulnerable to selection bias and error, however, the sample for the proposed study will include male and female medical professionals in the Gauteng and Limpopo, who are different in ethnicity, culture and religion, in order to eliminate selection bias. The sample for the proposed study will include medical professionals whom are registered with the health professions council of South Africa which will make it easier to defend the selection of participants of the study (Glen, 2015).

3.4.3. Sample size

A maximum of 6 participants forms part of the sample size and thus, meets the requirements of a qualitative study as only 6 elements are prescribed. However the sample size of 6 to 10 will make it difficult for the proposed study to reach data saturation.

3.5. Data collection

3.5.1. Data collection method

Data was collected in the form of in-depth interviews that consisted of 10 open-ended questions which allowed the participants to each answer in their own words, thus, allowing them to also include underlying ideas that they may have, feelings and additional information which the researcher may not have considered (du Plooy-Cilliers et al, 2018). In-depth interviews allow the respondent to clarify their points and give detailed explanations (du Plooy-Cilliers et al., 2018). In-depth interviews are qualitative data collection methods which allow the researcher to pose questions to the participants with the aim of learning more about their views, opinions and beliefs about a particular phenomenon (du Plooy-Cilliers et al., 2018, p.188).

In-depth interviews allow the researcher to establish rapport with participants in order to make them feel more comfortable which can generate more insightful responses, and they allow the researcher to ask follow up questions in order to generate a rich understanding around the risks and rewards of using ECT to treating bipolar disorder according to these health professionals (Steber, 2017). In contrast, in-depth interviews may be quite time consuming, as interviews must be transcribed, organized, analysed, and reported (Steber, 2017). However, the use of in-depth interviews helps understand how health professionals who deal with ECT in South Africa perceive electroconvulsive therapy as a treatment for bipolar disorder, and also helps discover the benefits and risks of using ECT according to their understanding.

The researcher chose to use interviews as opposed to a questionnaire in order to avoid dishonest answers; avoid having unanswered questions, and to avoid different interpretations and understanding of questions (Debois, 2019). Using questionnaire would have had a negative impact on the study in the sense that some questions are hard to analyse and questionnaires don't allow for participants to ask for clarity on questions that they do not understand and to elaborate more on their answers (Debois, 2019). The purpose of this study is to get an overall understanding of what medical professions think of ECT in terms of its risks and rewards in treating bipolar disorder, and this understanding would be better achieved by using in-depth interviews as they allow the participants to also include underlying ideas that they may have, feelings and additional information which the researcher may not have considered (du Plooy-Cilliers et al., 2018).

In the proposed study, interviews were conducted through telephone calls because of the current pandemic. These calls were recorded with a second mobile device and prior to the

telephone interviews, participants were emailed an information sheet and consent forms so that they can read, understand, and give consent. Giving the participants the information sheet prior to the interview also allowed them to consult the research team on sections that they do not understand.

3.5.2. Data collection application

Participants were contacted prior to the interview date and were asked to participate in the study. Once they agreed, their email addresses were obtained in order to send them an information sheet and consent forms for participation, and audio recording. Once they have read through the emails, they then responded with dates and times of their availability. On these dates, the researcher established rapport which made participants comfortable and used whatsapp and zoom calls to contact the participants and also reminded them of the information listed in the information sheet, ensured their confidentiality and also ensured that the study will not in any way deceive them and were also informed that they have the right to withdraw from participating.

Participants were also informed that they will not be getting incentives for participating, as incentives have been found to distort results (du Plooy-Cilliers et al, 2018). Interviews, which consisted of 10 open-ended questions, were conducted. Questions asked in each interview were standard and identical for all six participants. These calls were recorded with an additional mobile device when these calls were made. The questions asked, allowed the participants to elaborate more on their answers, clarify their points and give detailed explanations around their understanding of using ECT in treating bipolar disorder, which then allowed them to give their expert opinions as well as their personal opinions.

The participants however decided to answer questions in relation to catatonia, mania, and depression in bipolar disorder as they believed that bipolar disorder is rather broader than the researcher had initially anticipated. These interviews ranged from 22 to 35 minutes for all six participants. After the interviewing process, the recordings were then transcribed and stored for safe keeping. During this phase, the researcher faced some challenges whereby some of the participants were not available on dates that they had set so they had to reschedule the interviews. Some participants were not able to print out the consent form to sign, however they read the information sheet and gave verbal consent to participate and that the calls be recorded for data analysis purposes.

3.6. Data analysis

3.6.1. Data analysis method

According to Heish and Shannon (2005), content analysis is qualitative research technique that uses three distinct approaches to interpret meaning from the content of text data and adhere to the naturalistic paradigm. In conventional content analysis, coding categories are derived directly from the text data; with a directed approach, analysis starts with a theory or relevant research findings as guidance for initial codes; and a summative content analysis involves counting and comparisons, followed by the interpretation of the underlying context (Hsieh & Shannon 2005, cited in du Plooy-Cilliers et al, 2018).

Qualitative content analysis, particularly conventional content analysis was used to analyse the data of the proposed study as it allows for an inductive approach, aids the transcription of open-ended questions; helps identify common themes and codes which were found in the transcript of the questionnaires, as well as the preconceived and pre structured theoretical frameworks (Hsieh & Shannon 2005, cited in du Plooy-Cilliers et al, 2018). The researcher chose to use conventional content analysis as opposed to thematic analysis because the process of analysing messages in the interviews that were conducted determined the frequency of the messages that were communicated (Hitesh, 2020). Meaning, it provided a safe, unobtrusive way for examining communicative messages that were transcribed from the interviews (Hitesh, 2020).

However, the disadvantage of using this data analysis method is that it is time consuming, subjective and puts the researcher at risk for making mistakes especially when making a rational analysis to attain a higher level of understanding of what medical professionals think of ECT in treating bipolar disorder (Hitesh, 2020). Major steps in qualitative content analysis were followed and information was coded according to the similarity of answers; these steps included: preparing the data, defining the coding unit to be analysed, developing categories and a conceptual framework, testing the coding scheme on a sample text, coding all text, assessing consistency, drawing conclusions from the coded data, and reporting the research methods and findings (du Plooy-Cillers et al, 2018).

Upon feedback, a summarised version of the results was used and guided by the research question and objectives. Data was coded into various themes; clarity and consistency of the data was tested by using fracturing of data, and data was contextualised based on the conceptual framework (du Plooy-Cillers et al, 2018; Luo, 2019). Conclusions were based on existing theories, previously conducted studies and interpretation of data from the

interview which explained what mental health professionals' think of ECT which in turn helped determine the risk and reward ratio in a South African context.

3.6.2. Data analysis application

Raw data from the interview recordings were prepared and transcribed. The use of qualitative content analysis was mainly used to find patterns in the recorded interviews (Luo, 2014). Content analysis was used to analyse the occurrence of certain texts that were transcribed from all six interviews. In order to gain an in-depth understanding of what medical professionals think and understanding of ECT to treat bipolar disorder, the researcher analysed frequent terms such bipolar disorder, mania, depression and catatonia. Inferences in qualitative content analysis were achieved by analysing the meaning and semantic relationships of concepts that appeared in relation to mania, depression, catatonia and ECT (Luo, 2014).

To gain a more qualitative understanding of ECT in treating bipolar disorder, or rather mania and depression in bipolar disorder, the researcher located the word ECT and identified phrases that the participants allocated to ECT (such as the prevalence of bipolar disorder being 1 is to 1000, ECT being a treatment of last resort, medicine and the clinical urgency of patients before receiving ECT), and analysed the meaning of these relationships to better understand the intended message that was being portrayed. Qualitative content analysis was then used to find correlations and patterns of how medical professionals think of ECT in terms of its effectiveness and efficiency in treating bipolar disorder (Luo, 2014).

Codes were developed and these included the prevalence of bipolar disorder in the Gauteng and Limpopo regions, clinical urgency of ECT, medicine taken after ECT, effectiveness of ECT, efficiency of ECT, and the success rate of ECT. Transcriptions of interviews were coded according to the similarity of answers in various categories which aided in the process of drawing conclusions from the coded data and the reporting of the research methods and findings (du Plooy-Cillers et al, 2018).

4. FINDINGS AND INTERPRETATION OF FINDINGS

Prevalence of bipolar disorder in Gauteng and Limpopo regions

Presentation of findings

Participants were unable to give an accurate number of the prevalence of bipolar disorder but rather gave an estimated number in their practices and in the country. Two psychiatrists stated that bipolar disorder affects about 2% of the South African population,

an anesthesiologist stated that it affects every 1 in 1000, one psychologist stated that they were unsure of the statistics and would have to research on it, one other psychologist was also unsure but rather mentioned that the onset is from ages 9 to 15 and the last psychologist asked not answer the question as they did not want to give inaccurate answers. As seen in figure 1, the prevalence of bipolar disorder was at an estimate of 28% in participant A's practice, 23% in participants B's practice, 17% in the hospital that participant 3 works in, 19% in participant D's practice, 28% at the hospital where participant E works and 35% at the institution that participant F works in.

Interpretation of findings

According to the literature, the onset of bipolar disorder is different from unipolar depression and may be characterised by psychosis, psychomotor retardation and catatonia (Grande et al., 2015). This makes it hard to have an accurate prevalence in each province due to the fact that most of these professionals get referrals with patients in depressive states and the manic episodes manifest at a later state. Arguably, not all medical professionals know about the prevalence of bipolar disorder but base their knowledge and understanding on patients that they interact with. In contrast, bipolar disorder is more prominent in rural/less developed provinces in South Africa. This may be due to the socioeconomic factors that patients find themselves and the lack of adequate mental health resources and/or cultural beliefs (Mokoena, Madiba & Mokoena-Molepo, 2014).

Clinical urgency of ECT

Presentation of findings

Participant A and B stated that the clinical urgency of ECT is applicable to resistant depression, bipolar mood disorder, mania, catatonia, and hallucinations and delusions in Schizophrenia. Participant C only stated severe depression, mania and catatonia, whilst participant D and F believe that the clinical urgency of this treatment should be given to patients with schizophrenia and major depression with psychotic episodes. Participant E believes that the clinical urgency of ECT is applicable to psychiatric patients who are resistant to medication and are at risk of harming themselves or others. According to Participant A and C, ECT should be a treatment of last resort when other modalities are not working.

In addition, participants B and E believe that patients should only receive ECT when they are resistant to treatment, have had past suicide attempts and are hospitalized for

elevated suicide risks. Participant D and F believe that this form of treatment should be administered to psychiatric patients who suffer from schizophrenia and catatonia.

Interpretation of findings

The clinical urgency of ECT is only applicable to severe medically resistant cases due to the fact that participant A,B and C be believe that ECT has a lot of short term physiological side effects to the brain, heart, other neural problems; however long term side effects include muscle pain, heart failure for patients with a pace maker, and the use of ECT should depend on the patients risk stratification. Participant C stated that one of the reasons why this treatment remains a treatment of last resort is due to the fact that if the patient has a complication from the electrical shock, it may cause neuroleptic malignant syndromes, brain aneurism, intracranial lesions and other long term problems. Participant D, E and F also believe that this form of treatment should be used when therapy and pharmacological treatment has failed as their current hope for their patients is through pharmacological treatment and therapy. The purpose of this research aims to understand the perceived risks and benefits of ECT according to medical professionals in South Africa.

These findings link with the research question and problem statement by answering how these medical professionals perceive ECT as a treatment for medically resistant mania and depression in bipolar disorder. Similarly, these medical professionals seems to believe that ECT should be a treatment of last resort which the researcher begs to differ as literature states that there is evidence that this treatment may offer benefits to treating bipolar disorder (Dincer, 2018).

Medication taken after ECT

Presentation of findings

Participant C states that post operatively, patients are given oxygen and placed in a recovery position. They are given a small dose of mizadolem (a benzodiazepine) to help relief headaches, nausea and to also keep them comfortable and their psychiatrists decide on further treatment for them. Participant A and C stated that patients whom were treated for mania, continue with their lithium oriented treatment to prevent depression, and patients whom had ECT for depression, continue with the medication that was initially prescribed depending on the severity of their condition and may range from Selective Serotonin Reuptake Inhibitors such as Paroxetine and Fluvoxamine, Serotonin and Noradrenaline Reuptake inhibitors such as venlafaxine and other antidepressants.

Interpretation of findings

The endocrine theory asserts ECT offers benefits to treating bipolar disorder as it produces neurogenesis in the hippocampus, thus reversing neurogenesis where the brain cells become use dependent (Barlow et al, 2017). The hypothesis of this theory focuses on the hyperactivity in the hypothalamic-pituitary-adrenocortical axis (HPA) which produces stress hormones and is implicated in BD (Barlow et al., 2017). Although participants mentioned schizophrenia and catatonia, findings were solely presented for the purpose of mania and depression in bipolar disorder. According to participant A and B, patients should continue with their pharmacological treatment due to the fact that ECT does not reverse bipolar disorder but rather helps the hippocampus and neurotransmitters respond better to pharmacological treatment. Participants C, D, E and F believe that only psychiatrists may prescribe medication to patients after ECT; however it would be beneficial for them to also continue with psychotherapy. The purpose of this research aims to understand the perceived risks and benefits of ECT according to medical professionals in South Africa.

According to literature provided by Dukart et al. (2014), understanding the precise mechanism of ECT is unclear as the current understanding of ECT is based on the antidepressant effect that is partially mediated by seizure induced neurotrophic effects that result in increased rates of neurogenesis, synaptogenesis and glial proliferation, particularly in the hippocampus. These findings aid the research problem by providing a clear understanding of how ECT may offer benefits to treating bipolar disorder (Dincer, 2018). These findings also aid the research objective by highlighting how ECT may be a better option in treating patients who have not responded/are resistant to other forms of medication and therapy.

Effectiveness of ECT

Presentation of findings

Participant C stated that ECT is not sensitive to all pathologies. Participant A and C believe that patients who are more depressed tend to react better than those in mania; however participant B believes that ECT is effective in treating both mania and depression in bipolar disorder. Participant D, E and F believe that they have seen patients whom have had ECT and were doing better in therapy. However participant F also mentioned that although they seem to be doing quite well, patients often relapse at a later stage and seem to be in a worse condition that before. Meaning that those whom are treated for depression tend to have depression with psychotic episodes and some are institutionalized for elevated suicide risks.

Interpretation of findings

The generalised seizure theory states that the therapeutic effects of ECT are dependent on the elicitation of generalised seizures (Bolwig, 2011). Bipolar disorder is associated with severe prognosis, frequent and prolonged episodes, and increased death by suicide, additional comorbidity when having rapid cycling specifiers and mixed specifiers (Barlow et al., 2019; Grande et al., 2015). Participant B asserts that these specifiers may account for the relapse in patients. Participant C believes that the myotonic seizure during ECT activates the brain stem. Just as the theory stated, Participant A and C believe that an extended activation of cortico-thalamic–cortical circuits during ECT exerts neurotrophic effects that help medically resistant patients respond better to their pharmacological treatment (Bolwig, 2011).

Efficiency of ECT

Presentation of findings

Participant B and C believe that ECT impacts the neurochemical functioning of the brain to increase the efficiency of pharmacological treatment. They believe that it is a rather invasive procedure that causes other physiological derangements. As mentioned by participant C, ECT involves inducing a myotonic seizure to the brain to stimulate the secretion of noradrenaline, serotonin and dopamine to increase the functioning of the hypothalamus; Participant A and C believe is not efficient in treating bipolar disorder but rather helps patients respond better to pharmacological treatment. Participant D also believe that ECT works well with pharmacological treatment and psychotherapy. Participant E and F believe that ECT is not efficient for all medically resistant bipolar patients as they have had patients who committed suicide years after having ECT.

Interpretation of findings

As stated in the literature review, ECT appears to alter the permeability of the blood brain barrier to allow the passage into the neural milieu of precursor molecules necessary for the synthesis of neurotransmitters and increases levels of serotonin by blocking the stress hormone and promoting neurogenesis in the hippocampus, which participant A, B and C agree (Barlow et al, 2017). However, it may be argued that by blocking the stress hormone and promoting neurogenesis, this may account for the relapse among patients and may also account for additional specifiers and comorbidities that patients often have when they relapse from the treatment.

These findings answer the research question and the first research objective in terms of providing an in-depth understanding of how medical professionals in South Africa perceive

electroconvulsive therapy as a treatment for bipolar disorders. Arguably their understanding may be anecdotal as most of their understanding is based on the interactions and experiences that they have had. It may be that they are not as exposed to this form of treatment as sufficiently as other western countries. Although there are exceptional results in some patients whom have had ECT, these medical professionals seem to be too concerned of other medical conditions that may arise from having a myotonic seizure to the brain.

According to Ward, Fromson, Cooper, Oliveria and Almeida (2018), ECT is safe in pregnancy. In a South African context, women are at risk of having spontaneous abortions, and in such instances, clinicians often have to prioritize the mother as she is their primary objective; however participants A, B and C work with obstetricians during the procedure to help keep both the mother and the baby safe. In contrast, medical professionals believe that ECT is rather invasive and should not be introduced upon the early phases of diagnosis because it would be unethical to introduce such a modality on patients whom are still trialling medication.

Participant D believes that in instances whereby psychiatrists and anesthesiologists prioritize the mother over her pregnancy, this may cause depression and complicated grief when the mother starts to recover and this may be detrimental for her therapy processes. Participant D also mentioned that bipolar patients form a mother-child bond long before the child is born, so whether or not the mother is in mania, depression of catatonia, the same efforts used to prioritize the mother should also be applicable to her pregnancy.

Success rate of ECT

Presentation of findings

The success rate of ECT pertaining to participant A, B and C is about 30% in the Gauteng province. Patients who are resistant to medication either refuse this treatment, have other underlying medical conditions that prevent them from having the procedure or do not afford it. Patients in Limpopo are referred to Akeso Clinic in Gauteng for ECT. The reason why participant A and B agree with participant C about the low success rate is because, not a lot of patients are referred for ECT as it is mostly used as a treatment of last resort and often when the patient relapses, they often switch states based on the type of pharmacological treatment that they have been given. Because ECT helps the hippocampus and various neurotransmitter into responding to medication, lithium oriented medication often causes patients to switch states.

Interpretation of findings

3/6 participants perceive ECT as beneficial yet invasive procedure depending on the patients' risks stratification. They believe that it works best when treating depression in bipolar disorder as opposed to mania. Participants believe that risks depend on the physiology of the patients; however there may be complications from the electric shock which may cause neuroleptic malignant syndromes, brain aneurism, intracranial lesions and other long term problems. Abbott et al. (2019) states that the focal placement of electrodes is most effective in treating manic states as it stimulates the left hemisphere of the brain and targets specific aberrant circuitry in specific bipolar states to optimize the clinical outcomes; and 3/6 participants attest to this statement. These findings provide an understanding as to how electrode placement target different regions of the brain in treating bipolar disorder which also aids in understanding how ECT may be a better option in treating patients who have not responded/are resistant to other forms of medication and therapy.

Participants also stated that patients may have memory loss which lasts for a couple of hours but their memory optimally improves from about a week after having the procedure. As discussed in the literature review, participants believe that bi-temporal electrode placement during ECT is effective in the treatment of depressive states with respect to clinical efficacy and the speed of response, as well as mixed states and catatonia in bipolar disorder; however it has the greatest risks for temporary neurocognitive impairments (Kellner et al., 2010; cited in Abbott, Miller, Lloyd & Tohen, 2019).

5. VALIDITY AND RELIABILITY / TRUSTWORTHINESS OF FINDINGS

According to du Plooy-Cilliers et al. (2018), trustworthiness is the concept used to measure reliability and validity in qualitative studies; and is divided into credibility, transferability, dependability and confirmability. Credibility in qualitative studies refers to the accuracy with which the researcher interprets feedback provided by the participants and is increased when research findings are believable from the participants perspective (du Plooy-Cilliers et al., 2018). The proposed research ensures credibility through the in-depth interviews with medical professionals specifically anaesthesiologists, psychologists and psychiatrists in the Gauteng and Limpopo regions. Feedback is interpreted without changing any answers received from participants to ensure credibility.

Transferability refers to the ability of the research findings to be applied to similar situations and still reach similar results (du Plooy-Cilliers et al., 2018). The proposed research focuses on similar situations which are all around bipolar disorders, similar

population (medical professionals in the Gauteng and Limpopo region) and the same phenomena (understanding the risks and rewards of using ECT in treating bipolar disorder). If another researcher should use the same participants, same interview questions and data, they should be able to achieve the same results as those that are found in the proposed study.

According to du Plooy-Cilliers et al. (2018), dependability is the quality of the process of integration that takes place between the data collection method, data analysis and the theory generated from the data. In other words, it is the extent to which the study could be repeated by different researchers and that findings would be consistent (Statistic solutions, 2019). The diagnostic statistical manual for mental disorders has listed symptoms of bipolar disorders which are standard and the procedure of ECT is standard, this proposed study will be dependable because the only difference that is found in the results is the variety of opinions according to medical professionals. There is consistency in data collection, data analysis and data interpretation which ensures that the study is dependable.

Confirmability is determined by how well the data collected supports the findings and interpretation of the researcher (du Plooy-Cilliers et al., 2018). According to Statistics solutions (2019), findings should be neutral and should not be based on potential bias or personal motivation of the researcher. To establish confirmability, the proposed study will provide an audit trial which will highlight steps taken in the data analysis process in order to provide rationale for the decisions made.

6. CONCLUSION

6.1. Summary of findings as they relate to the research question, problem, hypotheses or objectives

As seen in figure 2, it may be argued that data collected from these participants are anecdotal and backed up by scenarios that could happen. Participants believe that more research should be conducted in order to find more natural ways of stimulating neurotransmitters to help the body produce dopamine and serotonin for depression and to stabilize acetylcholine, dopamine and serotonin for mania. Clinicians believe that there is a window that needs to be explored in terms of finding better ways to produce neurotransmitters, and these may include technologies like cyclodetxrin, and drugs that can encapsulate hormones and target the receptors that will help the hormones work maximally for bipolar disorder.

In a South African context, ECT is portrayed as an invasive treatment that is not sensitive to all pathologies. 3/6 participants believe that this form of treatment stimulates the hippocampus and increases the efficiency of pharmacological treatment. In application to the research question, the risk and rewards of using this form of treatment to treat bipolar disorder is equivalent as they depend on the severity of symptoms and the physiology of the patient and the severity of their condition. Literature proves that ECT appears to alter the permeability of the blood brain barrier to allow the passage into the neural milieu of precursor molecules necessary for the synthesis of neurotransmitters and increases levels of serotonin by blocking the stress hormone and promoting neurogenesis in the hippocampus, which then arguably makes it a better option in treating patients with bipolar disorder (Barlow et al, 2017), clinicians believe that

Although Frais (2010) argued that successful ECT treatment is effective because it facilitates and restores the function of specific memory systems that are deficient in the course of a severe depressive episode, clinicians in South Africa believe that ECT is a very invasive procedure and would not recommend it to patients but will rather use this form as treatment in instances that all forms of therapy and medication has failed. This applies to the research problem as it may be argued that the medical professionals in South Africa base their understanding of this form on treatment on western studies. This also applies to the research objectives as it uncovers various risk stratifications that were not included in the literature (i.e neural problems and heart failure).

6.2. Ethical considerations

It is unethical to conduct research on mentally ill individuals, thus results from anaesthesiologists, psychiatrists and psychologists are used in this study (Resnick, 2015).

Ethical considerations for the participants

According to du Plooy-Cilliers et al. (2018), research participants are affected by a number of ethical issues. In the proposed study participants are formally informed through an information sheet that is provided and they are given the opportunity to give consent. In terms of ethical data collection, participants were informed that sensitive information and personal details will be protected, they were not be required to include names of the patients/ family members who suffer from bipolar disorder and sensitive information was also be protected. Incentives were not be provided in this study as they have been proven to distort research findings (du Plooy-Cilliers, 2018). To ensure confidentiality, personal information is only known to the researcher and will not be available to anyone else.

Ethical considerations for the researcher

To ensure ethical considerations on the side of the researcher, this study did not in any way deceive neither participants, nor will the researcher falsify any information as this will result in research bias with distorted results. The researcher did not misuse information or use inappropriate research methods as this may be harmful to the participants and deceiving to the funding bodies of the proposed research (du Plooy-Cilliers, 2018).

6.3. Limitations of the study

Limitations in this study was the accessibility of the medical professionals. Since they are genuinely very busy professionals, they may not be available during the research period; thus, the researcher may have to extend the duration of the research (du-Plooy-Cilliers, 2018). Another limitation such as the shifts in condition may surface and may include new developments on ECT during the primary phase of research. Cultural issues of the professionals may also be a limitation since certain cultures view mental illness as a traditional calling (Howitt & Cramer, 2017). To mitigate these constraints, the researcher had to set up appointments in advance to arrange a suitable time to conduct the interviews, and the researcher constantly reviewed updated research on ECT. In terms of the sample size; having 6 participants made it difficult for the proposed study to reach data saturation.

In terms of data collection methods whereby interviews were conducted telephonically due to corona virus, this may have hindered the participants in sharing information that may have been useful that the researcher may not have thought about. Network problems were also an issue during these phone calls and video calls, thus disrupting the conversation. Conducting interviews online and not face to face may have lead to participants just answering the interview questions in a straight forward manner and not elaborating on their answers.

Collecting information once for this research will also be a limitation. Since there may be new developments on ECT during the primary phase of research, these professionals may change their perspectives and opinions as new research emerges and this may hinder with the trustworthiness of the study should the dependability of the study be tested. During the interviews, the issue around the risk and rewards of ECT moved in a direction not intended by the researcher, to mitigate this, the researcher allowed the participants to express their opinion in that regard and linked it back to the topic to redirect the

conversation back to discussing the what they think about the risks and rewards of ECT without offending or demeaning the participant.

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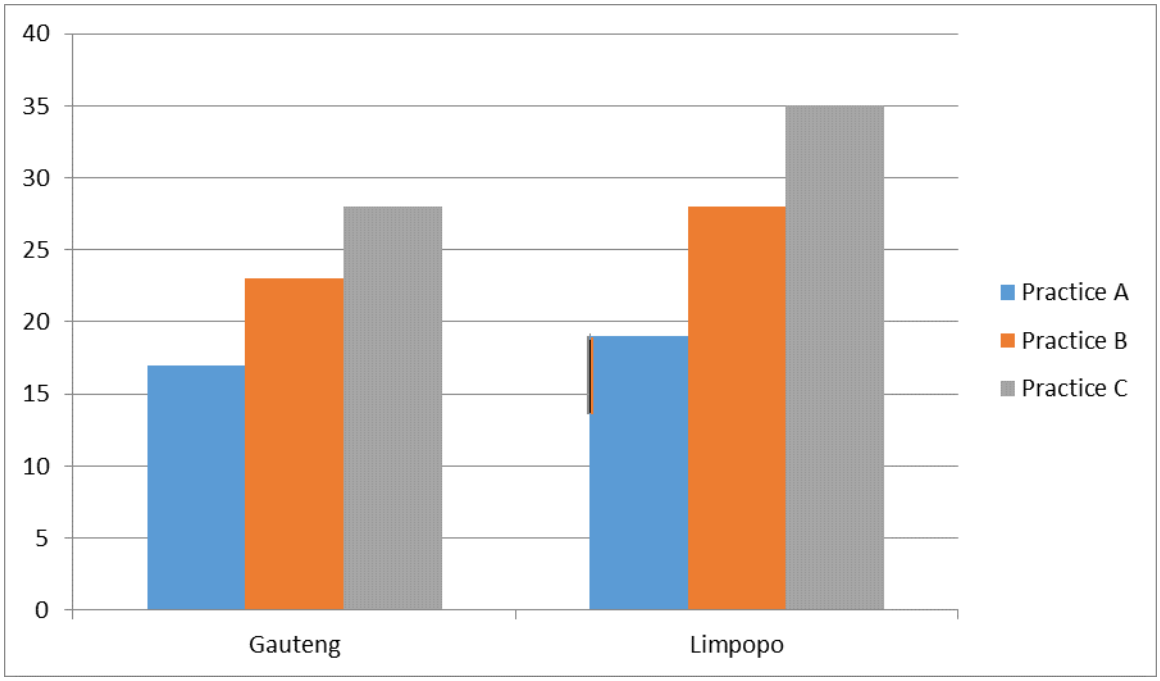
8. ANNEXURES

8.1. Annexure A – Figures

Figure 1: Prevalence of bipolar disorder in Gauteng and Limpopo



8.2. Consent Form

EXPLANATORY INFORMATION SHEET AND CONSENT FORM FOR PARTICIPANTS

To whom it may concern,

My name is Carol Mabuza and I am a student at IIE Varsity College Sandton. I am currently conducting research under the supervision of Dr Hunter about the perceived risks and benefits of ECT in treating bipolar disorder according to mental health professionals in South Africa. I hope that this research will enhance our understanding of what mental health professionals in South Africa think of ECT with regards to the improvement of treatment methods, successes and risks.

I would like to invite you to participate in my study. In order to explain to you what your participation in my study will involve, I have formulated questions that I will try to fully answer so that you can make an informed decision about whether or not to participate. If you have any additional questions that you feel are not addressed or explained in this information sheet, please do not hesitate to ask me for more information. Once you have read and understood all the information contained in this sheet and are willing to participate, please complete and sign the consent form below.

What will I be doing if I participate in your study?

I would like to invite you to participate in this research because you are a mental health professional. If you decide to participate in this research, I would like to conduct an interview with you virtually or in person if you are comfortable. You can decide whether or not to participate in this research. If you decide to participate, you can choose to withdraw at any time or to decide not to answer particular interview questions.

Are there any risks/ or discomforts involved in participating in this study?

Whether or not you decide to participate in this research, there will be no negative impact on you. There are no direct risks or benefits to you if you participate in this study. You might, however, indirectly find that it is helpful to talk about your underlying beliefs about

mental health and electroconvulsive therapy. If you find at any stage that you are not comfortable with the line of questioning, you may withdraw or refrain from participating.

Do I have to participate in the study?

- Your inclusion in this study is completely voluntary;
- If you do not wish to participate in this study, you have every right not to do so;
- Even if you agree to participate in this study, you may withdraw at any time without having to provide an explanation for your decision.

Will my identity be protected?

I promise to protect your identity. I will not use your name in any research summaries to come out of this research and I will also make sure that any other details are disguised so that nobody will be able to identify you. I would like to ask your permission to record the interviews, but only my supervisor, I and possibly a professional transcriber (who will sign a confidentiality agreement) will have access to these recordings. Nobody else, including anybody at IIE Varsity College Sandton, will have access to your interview information. I would like to use quotes when I discuss the findings of the research but I will not use any recognisable information in these quotes that can be linked to you.

What will happen to the information that participants provide?

Once I have finished all interviews, I will write summaries to be included in my research report, which is a requirement to complete my Bachelor of Arts Honours in Psychology. You may ask me to send you a summary of the research if you are interested in the final outcome of the study.

What happens if I have more questions about the study?

Please feel free to contact me or my supervisor should you have any questions or concerns about this research, or if there is anything you need to know before you decide whether or not to participate.

You should not agree to participate unless you are completely comfortable with the procedures followed.

My contact details are as follows:

Mabuza Carol

The contact details of my supervisor are as follows:

Dr John Hunter

Consent form for participants

I, _____, agree to participate in the research conducted by Carol Mabuza about the risks and rewards of using electroconvulsive therapy to treat bipolar disorder.

This research has been explained to me and I understand what participation in this research will involve. I understand that:

1. I agree to be interviewed for this research.
2. My confidentiality will be ensured. My name and personal details will be kept private.
3. My participation in this research is voluntary and I have the right to withdraw from the research at any time. There will be no repercussions should I choose to withdraw from the research.
4. I may choose not to answer any of the questions that are asked during the research interview.
5. I may be quoted directly when the research is published, but my identity will be protected.

_____ _____

Signature Date

Consent form for audio-recording/ video recording

I, _____, agree to allow Mabuza Carol to audio record my interviews as part of the research about the risk and rewards of using electroconvulsive therapy to treat bipolar disorder.

This research has been explained to me and I understand what participation in this research will involve. I understand that:

1. My confidentiality will be ensured. My name and personal details will be kept private.
2. The recordings will be stored in a password protected file on the researcher's computer.
3. Only the researcher, the researcher's supervisor and possibly a transcriber (who will sign a confidentiality agreement) will have access to these recordings.

_____ _____

Signature Date

8.3. Annexure B – Interview Schedule/Questionnaire

- What is the prevalence of bipolar disorder in the Gauteng region?
- How often do you refer patients for ECT?
- What causes the clinical urgency before prescribing electroconvulsive therapy to patients with bipolar disorder?
- What is the remission of ECT in treating mental health disorders such as bipolar disorder?
- After administering ECT, what forms of medication do patients take (if any) and for how long?
- Is electroconvulsive therapy effective and efficient?
- What are the side effects of using electroconvulsive therapy in the treatment of bipolar disorder?
- What are the current success rates of this form of treatment?
- What are the benefits of using this form of treatment?
- What does ECT do to the brain?
- Would you say, using ECT to treat bipolar disorder is better than using clinical medication? Especially in patients whom are not responding well to medicine?

8.4. Annexure C – Ethical Clearance Letter

THE INDEPENDENT INSTITUTE OF EDUCATION

29 July 2020

Student name: Nolizwe Carol Mabuza
Student number: 16006397
Campus: IIE's Varsity College Sandton

Re: Approval of Honours in Psychology Proposal and Ethics Clearance

HONOURS/PGDIP ETHICAL CLEARANCE LETTER

Your research proposal and the ethical implications of your proposed research topic were reviewed by your supervisor and the campus research panel, a subcommittee of The Independent Institute of Education's Research and Postgraduate Studies Committee.

There are some aspects that you still need to address in your proposal. You will need to address these aspects in consultation with your supervisor before you may proceed (see below):

Please discuss with your supervisor/navigator/lecturer how you will address these issues listed below:
Please note: **Your fieldwork may only proceed once you address the following issues:**

- Please make all the changes suggested/recommended by your supervisor.
- Your final interview schedule/questionnaire needs refinement. Your supervisor needs to sign off your final interview schedule or questionnaire.

In the event of you deciding to change your research methodology in any way, kindly consult your supervisor to ensure all ethical considerations are adhered to and pose no risk to any participant or party involved. A revised ethical clearance letter will be issued.

We wish you all the best with your research!

GENERAL CONDITIONS TO BE FULFILLED IN RELATION TO RESEARCH

Permission is granted to proceed with the above study subject to the conditions listed below being met and may be withdrawn should any of these conditions be flouted.

Please note: The panel has not considered the merits, accuracy or ethical soundness of the research. The only merits examined are the use of The IIE as a sample.

Permission is granted subject to the following conditions:

1. The researcher(s) will need to obtain informed consent in writing from all of the participants in his/ her sample if the study is not anonymous.
2. The researcher(s) may only use the data collected for research purposes and in no other way.
3. Photographs of human subjects may only be taken if relevant to the research, informed consent was obtained, and even with informed consent, the photographs may not be published on any online platforms.
4. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
5. No names or identifying information of participants may be used within the research and the research must be voluntary.
6. Please make it clear that the information will not be used punitively in any way and participants may in no way be counselled/advised based on this.

Supervisor: Dr John Hunter

Campus Postgraduate Coordinator (CPC):

JENNA-LEE RAMNARAIN

8.5. Annexure D – Examples of Data Collected

Phone rings

Participant C: Hello

Researcher: Hello, how are you

Participant C: I'm good and yourself?

Researcher: I'm well. So I'm going to have to read out and information sheet and consent form to you although I have already emailed it to you. This is for recording purposes and proof that I did explain to you what your participation in the research will mean and what is expected of you.

Participant C: Okay.

Researcher: It's not that long. [*reads out information sheet and consent forms*]. Since this interview is on a call, please just give your verbal consent for recording puposes.

Participant C: I give my consent that you can record the call and I'm going to participate in your research.

Researcher: Thank you so much. So the first question in my questionnaire is as follows. I basically want to know, based on your line of profession and knowledge, what is the prevalence of bipolar disorder in South Africa?

Participant C: [Uhm]. I'm not too sure but let me rather say 1 in a 1000.

Researcher: Okay, thank you very much for your answer. The next question is… Okay. Since you are anaesthesiologist

Participant C: Its pronounced Anae-sthesi-ologist

Researcher: I just wanted to find out from you if you have ever administered ECT before?

Participant C: Yes

Researcher: And then, uhm, what causes the clinical urgency before administering ECT to patients?

Participant C: The indication for ECT is for resistant depression, and bipolar mood disorder, mania and catatonia.

Researcher: Yes

Participant C: So, we are urged to use it as a last sort of treatment when all the other modalities are not working. Basically when the patient is resistant to treatment.

Researcher: Okay. Thank you very much. And then my next question is, what is the remission of ECT in treating mental health disorders such as bipolar disorder?

Participant C: We don't normally use ECT for bipolar disorder hey.

Researcher: Well according to the literature review of my research, there are certain people who have bipolar disorder but stay in the major depressive state for a long time and the manic episodes manifest at a later time. And before the manic episode, they are diagnosed with major depression. Thus they are often prescribed benzodiazepines which then causes mania.

Participant C: Okay, so, what was the question?

Researcher: The question is what is the remission of ECT in mental health disorders such as treating bipolar disorder?

Participant C: I want to understand the word remission. Do you mean reduction?

Researcher: Yes.

Participant C: I would change that word from the questionnaire because you are going to confuse a lot of people. Non the less, ECT would decrease the manic state, EFFECTIVELY.

Researcher: Would it also help with major depression in bipolar disorder?

Participant C: Yes.

Researcher: I also wanted to find out. This is the next question, after administering ECT, what forms of medications do patients take? If any, and for how long?

Participant C: I should remind you that I look at the clinical work from a point of an anaesthesiologist. I am not part of the long term treatment of patients. I basically just give aesthetics drugs and drugs to recover, and support them after ECT and then I don't treat them after that. So, do you want me to talk about that?

Researcher: Yes

Participant C: Post operatively, I would do a post procedure supportive treatment in the sense that I would support the patient with oxygen, put them on a recovery position, and

then give them something for headache, nausea and vomiting. And then give them a small dose of mizadolem just to keep them confortable.

Researcher: Thank you very much for your answer. Im going to ansk you the next question. So according to my literature review, a lot of studies ae based on the risks of ECT such as memory loss. I feel like a lot of research has focused more on the negatives and less on the positives. So according to you and your experience with ECT, would you say that ECT is effective and efficient?

Participant C: Uhm. The thing is, it is not sensitive with all pathologies. Patients who are more depressed tend to react better than those in mania. So, to answer your question, I would say yes, it is effective.

Researcher: Okay, but in terms of efficiency, do you believe that ECT should only be used as a treatment of last resort or should it maybe be introduced in early phases of diagnosis.

Participant C: ECT is a rather invasive procedure which causes other physiological derangements. So, you wouldn't want to use such a modality on patients who are still reacting to pharmacological treatment. So my answer is No.

Researcher: Okay. And then according the number of patients that you have actually administered ECT to, what would you say is the success rate of this form of treatment?

Participant C: Its success rate would be about 30%. Uhm, honestly, a lot of patients don't recover fully from whatever psychiatric condition that have that is resistant to treatment and requires ECT… Not only bipolar mood disorder. So most of my patients, I anaesthetised them for the past 4 years and I see all of them coming back. It would be safe to assume that either the others who don't come back have had a success with treatment or have died.

Researcher: Shooooooooooo (*shocking sounds*). Okay, so I want to understand from an anaesthesiologist point of view, what does ECT do to the brain?

Participant C: During ECT, we are basically sending an electrical signal to the brain, and we inducing a mytonic seizure. Uhm, we are stimulating the release of serotonin, dopamine and noradrenaline for the better part of the functioning of the hypothalamus and all those brain centres.

Researcher: So does ECT have long term side effects or just the short ones?

Participant C: ECT has a lot of short term side effects. Mainly physiological to the brain, the heart, and the patients might also have problems with neural transmissions but these don't last for too long. The long term ones are muscle pain and heart failure. This also depends on the patients risk stratification. If the patient has a high risk of having long term complications from and electrical shock, such as a patient with a pace maker, patient who may suffer from neuroleptic malignant syndromes or has an aneurism or an intracranial lesion then they will have long term problems if they get ECT.

Researcher: Okay, so this will be the last question. My literature review has content on how ECT promotes neurogenesis in the brain, so, what is your overall impression of ECT?

Participant C: ECT is the only available treatment of last resort and this needs to change. As clinicians, we need to find better ways of stimulating natural ways of the body to produce its own neurotransmitters. ECT is just too invasive.

Researcher: Thank you so much for participating. If you have any questions in relation to the outcomes of my research, feel free to contact me or my supervisor. Enjoy the rest of your evening.

Participant C: No problem. Hope your research goes well. Bye bye.

[*Hangs up the phone*].

9. Final report summary

Research purpose/Objective	Primary research question	Research rationale	Literature review	Paradigm	Approach	Data Collection Methods	Ethics	Key Findings	Recommendations
To uncover the benefits and risks of using ECT to treat bipolar disorders according to medical professionals in South Africa.	How do medical professionals in South Africa perceive electroconvulsive therapy as a treatment for bipolar disorders?	In academia, there are studies about antidepressants and various treatments available for each mental disorder, however little emphasis is made on the risks/rewards of ECT. While many studies have addressed ECT, this study approaches it in a South African context.	Theme 1: Bipolar disorder Theme 2: Bipolar I and II Theme 3: Diagnostic challenges Theme 4: Neurochemistry of bipolar disorder Theme 5: Endocrinology of bipolar disorder Theme 6: Mechanism of ECT in manic and depressive states Theme 7: Understanding of ECT among clinicians Theme 8: Risks of ECT	Interpretivism Epistimology: help understand the risks and rewards of ECT according to medical professionals in South Africa Ontology: aid in gaining in-depth understanding of multiple realities of medical professionals in South Africa Axiology: understand and describe meaningful social actions surrounding the use of ECT in South Africa	Qualitative Population Male and female psychiatrists, psychologists and anaesthesiologists who come from different racial groups and cultural backgrounds and are registered with the HPCSA	In-depth interviews	Participants were given an information sheet with detailing what is expected of them in this research. They gave consent. Protected their identity. Incentives were not be provided as they have been proven to distort research findings. Participants were not deceived. The proposed study did not misuse information or use inappropriate research methods as this	Medical professionals in South Africa base their understanding of ECT around literature formulated in Western studies.	Conduct the research on a national level and have more than 6 participants to actually have an accurate understanding of ECT.
Research problem	Research Objectives	Key Concepts	Key theories			Sampling	Data analysis methods	Limitations	Key contributions
Understanding the risks and rewards of using ECT to treat bipolar disorder in South Africa is unknown	To gain an in-depth understanding of how ECT may be a better option in treating patients who have not responded/are resistant to other forms of medication and therapy.	Anaesthesiologist, Autobiographical memory, Bipolar disorder, Catatonia, Electroconvulsive therapy (ECT), Exploratory study, General anaesthesia, Medical professionals, Neurogenesis, Patients, Psychiatrist, Psychologists, Seizure and Therapy				Non probability sampling methods. Purposive sampling. Sampling size of 6 participants.	Unit of analysis: interviews from anaesthesiologists, psychologists and psychiatrists. Method: content analysis.	Availability of participants, Current pandemic, shift in conditions, network problems,	The proposed research adds to the body od knowledge about ECT in a South African context.