PREVALENCE AND CORRELATES OF DELIRIUM AMONG CHILDREN AND ADOLESCENTS WITH CHRONIC RENAL FAILURE AT THE UNIVERSITY COLLEGE HOSPITAL, IBADAN

BY

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DECLARATION

I hereby declare that this project is my original work and that it has not been submitted anywhere else for a diploma, fellowship or degree and the sources I used have been indicated and acknowledged as complete references.

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Adekanbi Mojisola. Date

CERTIFICATION

I certify that the project titled"prevalence and correlates of delirium among children and adolescents with chronic renal failure at the University College Hospital Ibadan was done by Adekanbi Mojisola Folasade of the center for Child and Adolescents Mental health, University of Ibadan Nigeria, under our supervision

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ACRONYMS

CAM-ICU	-	Confusion Assessment Method for the ICU
CAPD	-	Central Auditory Processing Disorder
CKD	-	Chronic Kidney Disease
CRF	-	Chronic Renal Failure
eGFR	-	Estimated Glomerular Filtration Rate - Lab Tests
ICU	-	Intensive Care Unit
MV	-	Mechanical Ventilation
NEOERICA	-	New Opportunities for Early Renal. Intervention by Computerised Assessment
NICE	-	The National Institute for Health and Care Excellence
PD	-	Paediatric Delirium
PICU	-	Paediatric Intensive Care Unit
RASS	-	Richmond Agitation-Sedation Scale

ABSTRACT

Background: Delirium is highly prevalent in patients with chronic renal failure (CRF). This tends to worsen the prognosis and may result in loss of will to continue to seek medical attention or result in development of self-injurious behaviours especially in children. Therefore, delirium in CRF requires a high detection rate in order to improve the outcome of CRF. Thus, bedside screening for delirium by nurses is justifiable considering their closer contact with patients compared with other health care workers. This was a descriptive study that determined the prevalence and correlates of delirium among children and adolescents with chronic renal failure at the University College Hospital, Ibadan, Nigeria, using a bedside delirium screening instrument that deployed for use by nurses.

Methodology: The study was a descriptive cross-sectional hospital-based survey involving a two stage sampling technique among 69 respondents. The socio-demographic questionnaire, Chronic Kidney Disease Patient (CKD) Questionnaire, and the Cornell assessment of paediatric delirium were the instruments of data collection. Data analysis was done using descriptive and inferential (Chi-square) statistics at significance level of $p<0.05$.

Results: Respondents' mean age was 8.4±5.0years with age range of 1-21years and 43.5% were within the age of 6-10years. Majority (60.9%) of the respondents were boys and 66.7% had primary education. The majority of the respondents (92.8%) reported living with their parents right from their childhood. Out of the respondents, 38 (61.3%) were diagnosed less than a 1year ago. The prevalence of delirium was--17.4% screened positive for delirium while 82.7% screened negative. Delirium was more prevalent in boys 14. 3% screened positive among those who use native herbs.etc.

Predictors of delirium were respondents with medical comorbidity and are significantly more likely to screen positive for delirium 8.2,95% CI (1.4_46.9) while respondents with primary education and those with secondary are significantly less likely to screen positive for delirium when compared with infants OR=0.2, 95% CI (0.001-0.319) OR = 0.029 95% CI (0.001-0.567) respectively. (Prediction is 87.0%).

Conclusions: Delirium is highly prevalent among children and adolescents with CKF. Therefore, nurses are required to have bide-side skills to detect delirum among children and adolescents with CKF.

Keywords: Children and adolescents, Delirium, Chronic Renal Failure, Cornell assessment of paediatric delirium

CHAPTER ONE
INTRODUCTION

Background to the study

Chronic kidney disease (CKD) is a devastating diagnosis with many co-morbidities which increases the risk of mortality by 30 to 150 times that of the general paediatric population (rf). Recognition of at-risk children can lead to earlier identification and risk reduction. Primary care clinicians are often unaware of the comorbid conditions and long-term consequences of CKD, particularly with respect to cardiovascular disease, nutrition and growth, neurocognitive development, and burden of disease (rf).

Delirium is a neuropsychiatric disorder characterized by disturbances of consciousness, attention, cognition, thought and perception (Burns, Gallagley and Byrne, 2004; Gupta, de Jonghe and Schieveld, 2008). These disturbances manifest as abnormal behaviour, delusions, hallucinations, misperception and misrecognition. When a medically ill patient develops these mental symptoms (especially misrecognition, delusions and hallucinations) which are associated with stigma, caregivers often seek alternate modalities of treatment and cure, which at times may be harmful to the patient (reference).

Delirium is an acute organic mental syndrome characterized by disturbance of consciousness, global cognitive impairment, disorientation and attention deficits, perceptual disturbance, decreased or increased psychomotor activity and fluctuation in presentation (Choi, 2013; American Psychiatric Association 2013).

Delirium is associated with multiple factors like prior cognitive impairment, benzodiazepine exposure, being of the male sex, high blood pressure, infections like Urinary Tract Infection and pain. Delirium is also an independent risk for long term

problems with cognitive functioning (Agarwal, et al., 2010; American Psychiatric Association 2013; Wolters, et al., 2014).

Delirium can have serious consequences, and is associated with longer duration of admissions and is anindependent predictor of Intesive Care Unit (ICU) and hospital mortality, a greater likelihood of admission to institutional care, and increased hospital costs (Travers, et al., 2013; Ryan, O'Regan, Caoimh, Clare, O'Connor, et al. 2013). Delirious patients have increased mortality as high as 8% compared with 1% in non-delirious patients, impairment in long-term cognitive function, increases in hospital length of stay and increased complications of hospital care (Vasilevskis, Han, Hughes and Ely 2012). Delirium also leads to poor activity of daily life after discharge from hospital (Abelha, et al., 2013).

In recent years, medical care and the management of children and adolescents with chronic renal failure or chronic kidney disease (CKD) have significantly developed. As a consequence, there has been considerable changes in the prognosis of these patients and survival of these patients has increased (rf). However, there is still great difficulty in the management of stress and the responsibilities that accompany CKD, as these patients deal with a life of limitations.

Despite its high prevalence, delirium is not well recognized in hospitals and left untreated; which in turn produces negative consequences on the patients' prognosis (Choi, 2013). The presence of delirium among patients with chronic renal failure tends to worsen the prognosis drastically and may result in loss of will to continue to seek medical attention or development of self-injurious behaviours. This could bring about hopelessness that is often associated with depression and the impaired orientation in

deliriu m can result in accidental injuries and this is somewhat worsen in children and adolescents who were still under growing stage.

This study was therefore designed to determine prevalence of delirium among children and adolescents with chronic renal failure at the bedside by the nurse at the University College Hospital, Ibadan. Nigeria. This has implications in the management of children and adolescents with chronic renal failure and reduction in incidence of preventable diseases early in life.

Statement of the problem

A recent systematic review of CKD in sub-Saharan Africa [Stanifer, Jing, Tolan, et al., 2009] reported a prevalence of 13.9%, but commented on the dearth of studies of good quality. Chronic glomerulonephritis remains an important cause of CKD in tropical Africa [Eghan, Amoako-Atta, Kankam and Nsiah-Asare, 2009].

Over the last two decades delirium emerged as a commonly occurring phenomenon especially among the critically ill. Delirium is also known as acute brain dysfunction or organic brain syndrome, an extremely common condition affecting patients of all age groups in critical care units (Pandharipande et al., 2006, Barr et al., 2013). The short term negative clinical outcomes documented among critically ill patients include: increased length of both critical care and hospital stay, increased number of days spent on ventilators, and increased risk of mortality (Ely et al., 2001, 2004; Bell, 2011; Baar et al., 2013).

Delirium has been estimated to affect 10% to 44% of hospitalized patients and over 20% of children and adolecsents. The prevalence of delirium is up t 30% in the pediatric intensive care unit (Traube et al., 2017). Delirium following CKD is a risk factor for long hospital stay, mortality, high cost of medical treatment and high mortality (Yasui-

Furukori et al., 2017). In children and adolescents, delirium is often underrecognized despite its serious complications

Delirium in this age group is usually characterized by severe agitation and restlessness, perceptual abnormalities, letheragy and by "children being "not themselves" (Bettencourt & Mullen, 2017) . These children are at risk of harming themselves by falling, refusing care or removing tubes and catherters placed in-situ.

Delirium in critical care areas is considered a major public health problem (Barr et al, 2013). Delirium is a source of distress for both patients and families (Macullulich et al, 2013) and is reason for financial stress to Health Service Executive (HSE) hospitals in Ireland (Boot, 2012). For instance, the additional cost of caring for complications related to critical care delirium is about 4 billion to 16 billion US dollars annually in Unites States of America (Milbrandt et al., 2008). Much has been written in the literature in the last decade about under recognition and management of delirium in critical care practice (Mantz et al, 2010, Shehabi et al., 2012). Several researchers are involved in search for optimal strategy to achieve best possible outcomes for patients suffering from delirium (Ely et al., 2012, Shehabi et al., 2012, Pandaharipande et al., 2013, Macullulich et al., 2013). Regular consultations with the critical care journals, expert bodies in the field of critical care and attending conferences indicated that a thorough examination of literature in this area was necessary to judge the congruency of practice in the developing and with that of internationally recognised best practice.

Justification

Acute kidney infection (AKI) may occur in patients with chronic renal failure and hasten the progression to kidney failure. Complications include drug toxicity, metabolic and endocrine complications, increased risk for CVD, and a variety of other recently

recognized complications, including infections, frailty, and cognitive impairment. Complications may occur at any stage, often leading to death without progression to kidney failure. Complications may also arise from adverse effects of interventions to prevent or treat the disease and associated comorbidity.

Despite growing evidence of the morbidity and mortality associated with delirium in children and adolescents, there are indications that delirium was not screened for in over 71% of paediatric intensive care units because of the difficulty of differentiating delirium in this age group from other possible diagnoses, in the context of a critical illness (Bettencourt & Mullen, 2017). Although the gold standard for identifying delirium is dome by the psychiatrist according to DSM V or ICD 10 criteria, currently, there are highly valid and reliable delirium screening tools available for use by nurses to detect delirium more so, nurses spend more time with the patients.

Thus, nurses must have adequate knowledge to recognize and possibly commence some level of intervention because of the high rate of comorbidity and mortality associated with delirium, moreover, there are several nurse-driven non-pharmacological intervention for dementia (Hipp & Ely, 2012).

Finding out the present prevalence of delirium among children and adolescents with chronic renal failure at the University College Hospital, Ibadan will therefore provide a platform for health promotion efforts. Identification of gaps in knowledge will aid in the development of health education and health promotion materials that can be utilized to address the deficiencies in knowledge. The findings will be useful for designing appropriate preventive measures programmes that will help children and adolescents adopt healthy behaviours while still young, rather than in middle or old age, when risk factors and cardiovascular diseases are highest. Behaviours that are learned and started in adolescence will carry over to adulthood (Freedman, Dietz, Srinivasan and Berenson,

1999), thus this study will help young individuals, by also finding out their risky behaviours associated with the development of delirium and help prevent them before they occur. If parents and adolescents are knowledgeable about CKD risk factors and injuries that delirium can cause, they might have an opportunity to make responsible decision to protect their wards' cardiovascular health. Overall, the lifestyle modification programs will help ensure a healthy adolescent and adult population.

Research Questions

This study provided answers to the following questions:

1. Can features of delirium be identified at the bedside by the nurse among children with renal disease?
2. What are the socio-demographic factors that are associated with delirium among children and adolescents with chronic renal failure?

Aim of the study

To determine the prevalence and correlates of delirium among children and adolescents with chronic renal failure at the University College Hospital, Ibadan.

Specific objectives

The specific objectives of this study were:

1. To determine the prevalence of delirium in chronic renal failure of children and adolescents.
2. To determine the socio-demographic factors associated with delirium among children and adolescents with chronic renal failure.
3. To determine the predictors of delirium among children and adolescents with chronic renal failure.

CHAPTER TWO
LITERATURE REVIEW

Concept of chronic illnesses

Chronic illnesses are defined as physical or mental conditions, that affect the daily functioning of individuals for intervals longer than three months a year, or for a duration of hospitalization longer than one month. Chronic illnesses include: chronic renal insufficiency, delirium, cerebral palsy, diabetes, epilepsy, Down's syndrome and other inherited chromosomal anomalies, cystic fibrosis, heart conditions, cancer, juvenile arthritis, asthma, dermatitis (including severe eczema and psoriasis), leukaemia and various types of anaemia. Further, physical handicaps that can constitute chronic illneses include limb deformities, amputations, burns and other severe dermal damage. All of these are known to affect the psychological and physical development of the child. Consequently, a child with a chronic illness is one who is unable to participate in activities considered normal for his age (Theofanidis, 2010).

The statistical data concerning the prevalence of chronic diseases in children are of great concern. Epidemiological studies show that roughly one in ten children under the age of 15 suffers from a chronic disease. Other epidemiologic studies estimate that one third of children under 18 years of age are suffering from one or more chronic disorders or diseases (Shah, et al. 2006; Costello et al., 2006; Gallasi, et al., 2006). In addition, there is an increased prevalence of other mental problems like learning and speech difficulties, sensory dysfunctions, mental handicaps and behavioural problems. These conditions can be diagnosed and assessed with the use of psychometric tools (Williams et al., 2006).

Chronic Kidney Disease as global health problem

Reflecting its rising incidence and prevalence, Chronic Kidney Disease (CKD) is a major international public health concern. Its prevalence in developed nations such as the United States currently ranges from 13-16% (Chadban, 2003; Coresh 2007; Zhang, 2008). The major causes of CKD in these populations are long standing diabetes and hypertension (Collins, 2009). Less is known about the frequency of CKD in developing countries; however, screening studies have reported prevalence varying from 2 to 16% (Ito, 2008; Sumaili, 2009; Singh, 2009; Chen, 2009; Gutierrez-Padilla, 2009). Studies in developing countries generally noted a high prevalence of hypertension and diabetes in the affected population (Sumali, 2009; Singh, 2009), but diabetes and hypertension appear to be a less common cause of CKD in these countries.

Environmental toxins are also known causes of CKD that have often been linked to striking geographic variations in prevalence. Examples include the occurrence of nephropathy associated with ingestion of food contaminated with cadmium and mercury in Japan, ochratoxin A in Tunisia, and aristolochic acid in the Balkans (Abid, 2003; Bamias, 2008; Debelle, 2008).

Morbidity and mortality associated with chronic kidney disease

A large proportion of people with chronic kidney disease (CKD) experience other long-term conditions, and this proportion increases with age (Stevens et al., 2010). The complications of CKD include cardiovascular disease (CVD); mineral and bone disorders (e.g. calcium and phosphate disorders); anaemia; malnutrition; depression; increased risk of fracture; increased risk of other non-cardiovascular disease e.g. infection and cancer (The Renal Association Guidelines, 2010).

The relationship with CVD is strong and UK population studies have demonstrated that the risk of cardiovascular death in people with diagnosed CKD far outweighs the risk of progression of the kidney disease (NICE 2008). A UK study found that only 4% of individuals progressed to end stage renal disease (ESRD) over a 5.5 year follow-up period whilst 69% had died at the end of follow-up with the cause of death being cardiovascular in 46% of cases. This high prevalence of CVD in people with CKD, and the relative lack of progression, has been confirmed in a number of other studies (John et al., 2004; Keith et al., 2004; Go, et al., 2004). This is further illustrated by results from the NEOERICA (Stevens, et al., 2007) project where 50% of those with stages 4 and 5 CKD had coexistent CVD which increased in prevalence as GFR decreased. The impact of other co-existing conditions such as diabetes, hypertension and significant anaemia also increased with more advanced kidney dysfunction.

CKD has been shown to be related to an increased risk of hospitalisation, morbidity and death. A US study (Go et al 2004) showed that a reduced eGFR (60 ml/min/1.73m3) independent of other CVD risk factors was associated with an increased risk of hospitalisation, morbidity and death in a nearly three year follow up period. The adjusted hazard ratio for cardiovascular events increased as the eGFR decreased from 1.4 (45 to 59 ml/ min/1.73 m2), to 3.4 (eGFR of less than 15 ml/ min/1.73 m2). The adjusted risk of hospitalization with a reduced eGFR followed a similar pattern. The risk of death also increased as the GFR decreased below 60 ml/ min/1.73 m2; the adjusted hazard ratio for death was 1.2 with an eGFR of 45 to 59 ml/ min/1.73 m2 increasing to 5.9 with an eGFR of less than 15 ml/ min/1.73 m2 (Chronic Kidney Disease Prognosis Consortium Association, 2010).

Data from the CKD Prognosis Consortium suggests a similar association with mortality (Chronic Kidney Disease Prognosis Consortium Association, 2010) eGFR less than 60

mL/min/1·73 m2 and albumin: creatinine ratio (ACR) 1·1 mg/mmol (10 mg/g) or more are independent predictors of mortality risk in the general population. Compared with eGFR 95 mL/min/1·73 m2, adjusted hazard ratios for all-cause mortality were 1·18 for eGFR 60 mL/min/1·73 m2, 1·57 (for 45 mL/min/1·73 m2), and 3·14 for 15 mL/min/1·73 m2. There were similar findings for CVD mortality.

Reduced kidney function is associated with poorer psychosocial functioning, higher anxiety, higher distress, decreased sense of well-being, higher depression, and negative health perception (National Kidney Foundation, 2010). Evidence is emerging that cognitive impairment, delirium and depression are very common in patients with kidney disease. All of these conditions are associated with prolonged hospitalization and an increased risk of mortality (McQuillan, 2010).

Prevalence of delirium

Delirium is an acute neurologic dysfunction in the setting of serious illness. It is characterized by a fluctuating disturbance in cognition and awareness, and it is a result of an underlying medical condition and/or its treatment. Delirium is generally a temporary state, reversing as the underlying condition abates or when iatrogenic triggers are removed (American Psychiatric Association, 2013).

Delirium in adults with critical illnesses is well characterized since it is associated with increased mortality and significant morbidity (Klein, et al., 2014). It is linked to in-hospital death and long-term cognitive impairment in survivors (Basinski et al., 2010; Girard, et al., 2010). Delirium increases time to extubation, hospital length of stay (LOS), and medical costs (Barr, et al., 2013; Mehta et al., 2015).

Much less is known about paediatric delirium (PD), largely due to lack of widespread screening (Silver, et al., 2012; Schieveld and Janssen, 2014; Kudchadkar et al., 2014). Recent years have seen the advent of three validated screening tools for use in the PICU: the Paediatric Confusion Assessment Method for the ICU (pCAM-ICU), the Preschool Confusion Assessment Method for the ICU (psCAM-ICU), and the Cornell Assessment of Paediatric Delirium (CAPD). The pCAM-ICU is an interactive, cognitively oriented tool designed for children over 5 years old (Smith et al., 2011). Similarly, the psCAM-ICU is an interactive tool used in children 6 months to 5 years old (Smith et al., 2016). Neither is validated for use in children with developmental delay. The CAPD is a strictly observational tool, designed for children of all ages and developmental abilities (Traube et al., 2014). All were developed for use by the bedside provider, allowing for rapid, real-time delirium screening in PICUs. A recent position statement by the European Society of Paediatric and Neonatal Intensive Care recommended use of CAPD as an instrument to assess paediatric delirium in critically ill infants and children (Harris et al., 2016).

An emerging body of paediatric research indicates that delirium is a common complication of childhood illness, with a prevalence greater than 20% (Schieveld and Janssen, 2014; Traube, et al., 2014). PD has been associated with severity of illness, age less than 5 years old, sedation, and mechanical ventilation (MV) (Silver et al., 2014). PD has been linked to significant increase in hospital LOS and posttraumatic stress symptoms and delusional memories in child survivors (Smeets, Tan, Vossen, et al., 2010; Silver et al., 2014; Smith et al., 2013). However, most PD research has been limited by retrospective design, narrow inclusion criteria, small number of subjects, and single-center studies (Silver, et al., 2014).

To date, there has been no large-scale multi-institutional approach to define the scope of PD. It was hypothesized that delirium prevalence would be more than 20% overall, and would be more frequent in patients who had been in the ICU for a longer period of time (greater than 3 days) (Schieveld and Janssen, 2014; Traube, et al., 2014). It has been hypothesized that risk factors associated with development of delirium would include mechanical ventilation, sedation (specifically narcotics and benzodiazepines), use of restraints, and younger age (< 5-year-old) (Smith et al., 2013; Silver et al., 2014).

As different review articles and one international study done in 11 countries of South America, North America and Spain by using RASS and CAM - ICU indicates, the prevalence of delirium among medically ill patients ranges from 10% in the general medicine ward, up to 80% in ICU (intensive care unit) to 85% in advanced cancer (Mattoo2010; Salluh et al., 2010). As a study conducted in Portugal on 562 participants, delirium prevalence was 16% (Abelha et al., 2013). Delirium prevalence was also indicated in different countries with different study population. For instance, in Australian hospitals on 499 elderly patients about 17% was found, Canada on 548 elderly patients 11% was found, and Mexico 38.3% was found (McAiney2012; Travers et al., 2013). In ICU patients the prevalence was even higher; as studies in USA indicated that delirium was about 77% in ventilated burns patients and 70% in surgical & trauma ICU (Agarwal et al., 2010). Delirium was also about 37% in ICU patients as a study conducted in Netherlands on 412 participants (Wolters et al., 2014). The studies in Iran indicated that delirium was about 23.5% in cardiac surgery ICU and 4.9% in participants with open heart surgery (Jodati et al. 2013; Shadvar 2013).

A multicenter study established that delirium is a frequent complication of critical illness in childhood, with a point prevalence of 25% across multiple institutions. The

findings were consistent with those of prior single-center studies which reported PD rates ranging from 10% to 30% (Creten, Van Der Zwaan, Blankespoor, et al., 2011; Smith, Boyd, Fuchs, et al., 2011; Smith, Brink, Fuchs, et al., 2013; Silver, Traube, Gerber, et al., 2015; Smith, Gangopadhyay, Goben, et al., 2016). Children requiring MV (likely with an increased exposure to sedatives and higher severity of illness) had a delirium prevalence of 53%. Although alarmingly high, this is less than the 60–80% reported in adults on MV, perhaps suggesting that the paediatric brain is somewhat protected from delirium development (Barr, Fraser, Puntillo, et al., 2013; Mehta, Cook, Devlin, et al., 2015). The varying prevalence rates of delirium among institutions may reflect different patient populations, varying severity of illness, heterogeneity in prescribing and sedation practices, or other unknown factors. A number of these may be amenable to intervention and could lead to a decrease in PD.

The prevalence of subtypes of delirium in critical care patients were studied in detail by researchers in the past. Peterson et al. (2006) conducted a prospective cohort study among 612 patients in a large tertiary level medical ICU and examined delirium types among ventilated and non-ventilated patients. In this study, patients were classified into two groups depending on age. Delirium was detected among 112 of 156 (71.8%) patients aged 65 and older, and 263 of 458 (57.4%) patients who were younger than 65 years. The occurrence of sub types of delirium in this study showed that hyperactive delirium was rare (1.6%), whereas hypoactive (43.5%) and mixed type (54.1%) were encountered more frequently (Peterson et al., 2006). This study concluded that patients aged above 65 are at greater risk of experiencing delirium and in the absence of delirium screening tools, hypoactive and mixed sub types can be missed. The findings of this research reflect delirium occurrences from critical care unit. It is evident from the literature that delirium occurs at similar rate in other surgical ICU which includes

cardiac units or mixed type ICU, other progressive care units (HDU) and even among wards during the patients stay in hospital (Barr et al.,2013). A subcategory of delirium related to either alcohols or recreational drugs usage can manifest with hyperactive symptoms requires use of different clinical practice guidelines (Baar et al., 2013).

It is interesting to note that the study by Traube, Silver, Reeder, et al., (2017) found the highest prevalence of delirium in critically ill children admitted with infectious/inflammatory disorders. This supports the hypothesis that inflammation plays a leading role in the development of delirium in children. The neuroinflammatory hypothesis, a prominent etiologic theory for delirium development, posits that systemic inflammation leads to cytokine release with subsequent effects within the CNS that are yet undescribed-leading to neuronal and synaptic dysfunction and ultimately clinical symptoms (Cerejeira, Firmino, Vaz-Serra, et al., 2010; Maldonado, 2013). Several studies in adults with delirium have shown increases in proinflammatory cytokines (de Rooij, van Munster, Korevaar, et al., 2007; van Munster, Korevaar, Korse, et al., 2010; McGrane, Girard, Thompson, et al., 2011), yet a causal relationship in these observational studies has not been proven. It is possible that this finding may relate to perfusion status, rather than inflammation, as these children may have had periods of end-organ hypoperfusion during their PICU stay. Additional work in understanding how the immune system may play a role in delirium pathogenesis-especially in children-appears warranted.

Several authors have highlighted the incidences and prevalence of delirium among different cohorts of patient (Godfrey et al., 2009, Meagher et al., 2009, Jones & Pisani, 2012, Frontera, 2011; Eastwood et al., 2012). Godfrey et al (2009) stated that delirium occurs in 11–42% of general medical inpatients and up to 50% of hospitalized elderly.

Delirium affects 80% of intensive care and nursing home patients (Meagher et al., 2009). The prevalence of delirium varies from 13% of young patients to 53% of older patients and up to 88% of patients with terminal cancer (Lindesay, Rockwood, & Rolfson, 2000).

It is estimated that, 70% to 80% of patients experience delirium during their stay in the critical care units (Wells, 2012; Bell, 2012). Among those patients receiving care with mechanical ventilators, 87% experience delirium (Jones & Pisani, 2012; Frontera, 2011; Eastwood et al., 2012). Poor detection results in about 50% of delirium cases being missed in clinical practice (Meagher et al., 2009, Wells, 2012). This section on incidence and prevalence indicates that delirium is a common phenomenon occurring in all health care institutions especially among the critical care units. The next section will focus on causes of delirium in critically ill patients.

Types of delirium

There are three subtypes of delirium which can be classified based on psychomotor activity, behaviour and attention (Holly et al, 2012) which includes hyper active, hypo active and a mixture of both (Inouye et al., 2001, Pun & Ely., 2007). Hyper active delirious patients, who exhibit signs such as self extubation, self-removal of invasive lines, and combative behaviour are easily identified by Critical care nurses (Girard et al, 2008). In contrast, hypoactive patients may sit quietly, withdrawn, exhausted and apathetic, which may go unrecognised and warrants a screening tool to identify early (Holly et al., 2012). Complications associated with hypo active delirium include increased number of days on mechanical ventilation, aspiration pneumonia, and pressure ulcers (Ely & Truman, 2003, Balas et al., 2009).

Delirium of mixed type exhibits characteristics and manifestation of signs between hyper active and hypo active (Godfrey et al., 2010). The patient may be calm at one point, agitated and restless sometime later (Holly et al., 2012). Identifying the hypoactive and mixed type delirious patients, remains difficult and challenging among critical care professionals (Holly et al., 2010). If not identified early, hypoactive delirium may go on to develop hyper active and mixed type of delirium, which can be far more difficult to manage (Meagher & Leanord, 2008) and is associated with negative outcomes such as prolonged critical care stay and increased chances of mortality (Ely et al., 2004).

Pathophysiology of delirium

The pathophysiology of delirium was unclear as it was reported in the previous literature by (Frontera, 2011. Many researchers have formulated various theories in order to understand what exactly causes delirium (Girard et al., 2008). The etiology of delirium cannot be confined to a single causative factor as it is believed to be multifactorial (Fong et al., 2009; Miller, 2008; Gunther et al., 2012, Ouimet et al., 2007). The development of delirium in critical care depends on complex interactions of many factors (Bourne, 2008). Most of the patients have multiple causes leading to delirium occurrence which makes it difficult to diagnose with clinical presentation (Trzepacz, 2005).

There are four major factors responsible for development of ICU delirium which are: patients' previous psychological status, psychological trauma inflicted by illness, environmental stressors in ICU and organic factors affecting central nervous system (Holly et al., 2012). Field et al. (2012) explained important interactions between inflammation and brain chemistry that may contribute to delirium onset.

Neuro transmitters play a vital role in the onset of delirium (Guenther et al., 2012). The cognitive function, behaviour and mood of individuals are influenced by synthesis, release and inactivation of neurotransmitters (Girard et al, 2008). More specifically, acetylcholine and dopamine imbalance generally results in neuronal instability and unpredictable neuro transmitters' activity (Boot, 2012). Dopamine is responsible for increasing neuronal excitability whereas acetyl choline has the opposite effect (Cunningham et al., 2012). The other neurotransmitters known to be causing delirium includes gamma-amino butyric acid, nor adrenaline and serotonin.

Any imbalance between these mechanisms in brain is associated with delirium (Truman & Ely, 2008). During the presence of infection caused by trauma or surgery proinflammatory cytokines are released which include: tumour necrosis factor (TNF), interleukin 1 (IL-1) and interleukin 6 (IL-6). These increased levels of cytokine in the brain, disrupts homeostasis and interrupts functioning of neural pathways which is believed to be responsible for delirium onset (Broadhurst & Wilson, 2001; Hshieh et al., 2008). Hence the underlying pathology of delirium is still not clearly understood. However, several risk factors are associated with the onset of delirium (Bourne, 2008, Boot, 2012) which will be discussed in the next section.

Risk Factors for delirium

Numerous studies of delirium in adults have shown a strong association between development of delirium and both exposure to benzodiazepines and use of physical restraints (McPherson, Boehm, Hall, et al., 2013; Zaal, Devlin, Hazelbag, et al., 2015). A recent prospective single-center study of PD demonstrated an association between delirium and age less than 5 years, severity of illness, need for MV, and pharmacologic sedation (Silver, Traube, Gerber, et al., 2015). In the study by Traube, Silver, Reeder,

et al., (2017), it was found that slightly lower age (< 2 yr), MV, and exposure to vasopressor medications (likely a marker for severity of illness) and antiepileptics (correlating with underlying neurologic issues) were independently associated with increased risk of delirium. Furthermore, the study also found that benzodiazepines, narcotics, and physical restraints were also strongly associated with delirium. In fact, odds of delirium were four times higher for patients who were physically restrained even after controlling in a study analysis for MV and sedating medications. This may imply that physically restraining a child increases risk of delirium development, as it does in adults, or it may reflect the fact that children with delirium may require physical restraints in order to maintain necessary medical devices. The study cannot assess temporality in this point prevalence study design (Barr, Fraser, Puntillo, et al., 2013).

Even with the progress made by Traube, Silver, Reeder, et al., (2017), with observational delirium screening, 16% of children were unable to be quickly assessed for delirium. These were children with developmental disabilities, where the bedside caregiver could not clearly establish whether there was an alteration from the child's baseline neurologic examination (whether the altered awareness and cognition represented acute delirium or could better be explained by the preexisting neurologic disorder) (American Psychiatric Association, 2013). A large number of these children may have been delirious but require a more nuanced approach to tease out the complex interplay between static encephalopathy and delirium (Silver, Kearney, Traube, et al., 2015). This may have artificially lowered the delirium rate measured.

Critical care units are hostile environments to patients and the human brain exhibits exquisite sensitivity to this environment (Holly et al., 2010, Mantz et al., 2012). The brain functions of the critically ill are altered in several patients with conditions such

as: stroke, septic encephalopathy, seizures, anoxia, metabolic and inflammatory process, and drug induced neurotoxicity and disturbed circadian rhythms. Environment has a major influence on the functions of the brain in critical care patients (Mantz et al., 2012). Arend and Christensen (2009) suggested that delirium is often caused by environmental stimuli in critical care units and this belief of environmental stimuli in critical care units causing delirium was well supported by Van Rompaey et al (2009). In their prospective study on examining environmental risk factors on manifestation of delirium, it was estimated that 53% of environmental factors were responsible for delirium onset in their study.

The pre-disposing factors identified in the literature include cognitive or sensory impairments, dehydration, specific medication (psychoactive agents), older age, sleep deprivation and underlying medical condition (Agostino, 2006, Inouye et al., 2006). Some of the notable precipitating factors causing delirium are use of sedative drugs, hypnotics, primary neurological diseases, intercurrent illnesses, surgery and environment. Admissions to critical care units, presence of various invasive and monitoring devices such placement of catheters and experiencing painful interventions acts as precipitating factors of delirium onset (Inouye et al ., 2004).

Exposure to sedatives such as benzodiazepines and hypnotics is one of the strongest modifiable risk factors for developing delirium in medical, surgical and hospitalized patients (Mc pherson et al., 2009). About a third of delirium incidence in hospitals can be reduced through a multi-component intervention targeted at known modifiable risk factors (Godfrey et al., 2013).

Having discussed some of the causative factors responsible for occurrence of delirium, the next section will present clinical outcomes associated with delirium, an international

perspective of sedation practice, delirium identification by nurses, limitations of previous research, and implications for future research.

Timing of Delirium

The largest paediatric study to systematically determine the timing of delirium was conducted by Traube, et al., (2017), and it was found that the prevalence of delirium increased with length of time in the PICU. The study surmises that this may reflect an accumulation of modifiable iatrogenic risk factors over the course of the illness, and doubted that, it is related to nonmodifiable demographic risk factors (such as age, recent surgery, diagnosis at admission, or presence of seizure disorder). However, it is also possible that this reflects those patients with highest severity of illness, whose length of stay is generally longer. It was found that delirium decreased in children who had received general anesthesia in the previous 24 hours. Thus, it was believed that this reflects those patients who were recently admitted for recovery after an elective surgical procedure, with lower severity of illness and shorter time spent in the PICU when compared with the larger cohort. Only a longitudinal study to follow children throughout their ICU stay can fully explore how delirium may arise in children with critical illnesses (18). In critically ill adults, delirium screening occurs in regular intervals based on local standards, usually several times each day. Implementing such a procedure in children-either in research protocols or as part of standard practice-would allow for monitoring of trends within an individual, rather than a one-time snapshot. It is expected that a more comprehensive study may discern seasonal variation (based on disease patterns or seasonal difference in sunlight) and day/night variation in delirium rates.

Feasibility of Delirium Screening

Importantly, Traube, et al., (2017) study demonstrates the practicality of bedside screening using the CAPD. Twenty-five institutions, with varied culture and practices, were all able to complete this tool on the vast majority of their patients without difficulty.

The Society of Critical Care Medicine released clinical practice guidelines in January 2013, stating that "monitoring critically ill (adults) patients for delirium with valid and reliable delirium assessment tools enables clinicians to potentially detect and treat delirium sooner, and possibly improve outcomes". It was assumed that this is also true for critically ill children. With implementation of routine paediatric screening, clinicians will be able to detect delirium earlier, which may allow for timely intervention and optimization of management.

With regard to limitations, the CAPD was originally designed to be scored by the nurse at the end of her/his shift-taking advantage of a prolonged observational period to assess the child's neurologic performance (16). In the study by Traube, et al., (2017), the CAPD was administered by the bedside nurse at approximately mid-day so that all of the data could be collected by site coordinators. It is possible that a child may not have demonstrated the fluctuating symptoms of delirium during this time, but went on to develop delirium over the course of the next several hours, after the assessment was complete.

The study was performed during the day shift and did not account for children who showed signs of delirium at night. As such, it may have underestimated the true PD rate. In addition, although the CAPD detects all forms of delirium, it does not discriminate between them. Therefore, the study did not capture delirium subtype

(hypoactive, hyperactive, and mixed) in this study; this is an important area for future research. However, a limited amount of data was collected for this study. The believe that, this is appropriate for this study design, yet other important covariates including sedation scores, severity of illness scores, and total drug exposure will likely play a pivotal role in delirium prevalence and pathophysiology.

Chronic kidney disease children's quality of life

Quality of life (QoL) is significantly impaired due to the demands and restrictions brought on by the clinical condition and treatment (Soliday, Kool and Lande, 2001). CKD affects many life aspects of these children. On a daily basis, they are submitted to dietetic and hydric restrictions, difficult and invasive treatments, with complex drug treatments and even hospitalizations. It has been observed that they present a higher risk of worse psychosocial performance than their healthy peers (Marciano, Soares, Diniz, Lima, Silva, et.al., 2010). Literature data have shown that these emotional alterations in patients with CKD and their caregivers can also persist in the adult phase (Aldridge, 2008). Thus, it can be perceived that the management of these patients represents a challenge for the healthcare team, for the patients and their caregivers. In this context, we have tried to understand the patients' adaptive mechanisms to this new reality (Darbyshire, Oster and Henning, 2006). This review aims at clarifying the main psychosocial effects of CKD in these children and adolescents. The better understanding of these associations constitute an important step in the construction of a more humanized and effective healthcare assistance.

Children and adolescents with chronic kidney disease (CKD) are at risk of dying prematurely, predominantly from cardiovascular disease. The mortality rate of children with CKD requiring renal replacement therapy in the form of dialysis or kidney

transplantation is at least 30-fold higher than their age-matched peers, and health outcomes are not improving (McDonald, 2004). Children undergoing dialysis suffer significant disruption to their daily routine and quality of life. These children are attached to a machine that filters toxins from their blood at least 4–5 hours per day. They may have significant fluid and dietary restrictions imposed in order to manage electrolyte disturbances and fluid overload. Although transplantation is the preferred form of renal replacement therapy, children with kidney transplants are reliant on long-term maintenance immunosuppression, which is associated with adverse long-term effects such as increased infection and risk of cancer. Apart from physical health, CKD also negatively impacts on the overall psychosocial, cognitive and emotional well-being of the child (Kramer, Stel, Tizard, Verrina, Ronnholm, Palsson, Maxwell and Jager, 2009; Marciano, Soares, Diniz S, Lima, Silva, et.al., 2011; Tong, Wong, McTaggart, Henning, Mackie, et.al., 2013).

CKD is usually an irreversible, progressive disease, and if left untreated, can lead and in most cases will progress to end-stage kidney disease requiring renal replacement therapy such as dialysis and transplantation. Several known and potentially modifiable risk factors are responsible for disease progression in children and adolescents with CKD, such as blood pressure and proteinuria (Wuhl, Mehls and Schaefer, 2004). Apart from these known modifiable risk factors for renal progression, socioeconomic status may also play a role for chronic renal failure progression in children.

Burden of Care, Quality of Life Issues, and Psychosocial Issues in CKD

The burden of care for children and adolescents with CKD correlates directly with the level of kidney damage and requires time and attention by patients and their family. An example of this care includes the number of medications (mean (SD), 5.7 (4.8)) patients

take once to several times per day, with dialysis and transplant patients requiring the largest number (particularly the first 6-12 months after transplantation) (So, Layton, Bozik, et al., 2011). The complexity of care also includes procedures such as self-catheterization several times per day, fluid and dietary restrictions, blood pressure measurements daily, injections (erythropoiesis stimulating agents once to thrice weekly, growth hormone daily, or insulin several times per day), and/or home peritoneal (daily) or hemodialysis (thrice weekly) in ESKD cases.

Compared with healthy children and adolescents, patients with CKD have significantly lower health-related quality of life in the physical, school, emotional, and social domains. Interestingly, in a longitudinal national cohort of paediatric CKD patients, longer disease duration and older age were associated with higher quality of life scores in the physical, emotional, and social functioning domains, but older age was associated with lower school domain scores, likely related to prolonged neurocognitive abnormalities. Maternal education of 16 years or more was associated with higher Paediatric Quality of Life scores in the domains of physical, school, and social functioning. Short stature has been associated with lower quality of life. Moreover, patients with CKD and those with anemia have greater limitations in physical functioning, school work or activities with friends as a result of physical health, and parental effect on time and family activities. On the basis of a sleep questionnaire in a Canadian cohort, sleep disorders occur in approximately 30% of children and adolescents with CKD (including dialysis and transplant), particularly restless leg syndrome and periodic limb movements (Sinha, Davis and Matsuda-Abedini 2009).

In a regional US multi-institution study, 58.5% of patients with CKD had symptoms of a sleep disturbance (restless leg syndrome, periodic limb movements, excessive

daytime sleepiness, or sleep disordered breathing), correlating with a decrease in quality of life, independent of the level of kidney function (Davis, Greenbaum, Gipson, et al., 2012). In the North American CKD cohort, parents of children and adolescents with lower levels of renal function were more likely to report low energy, severe weakness, or day time sleepiness and consequently, overall poorer quality of life.

Delirium, depression and attention-deficit/hyperactivity disorder are common comorbidities in patients with CKD (Massengill and Ferris, 2014). Screening for these conditions and referral to psychological services are paramount in ensuring adjustment to the diagnosis of CKD. Families with a child with CKD experience emotional, physical, and financial stress; 2-parent households have better adaptation to this family challenge. Additional psychological burdens to the family include increased school absences for patients and their siblings and missed opportunities for family activities (Massengill and Ferris, 2014). Parental distractions related to the patient's chronic condition can lead to feelings of neglect by siblings and affects the family's financial well-being. Financial burdens result from interrupted work schedules, insurance copayments for medical visits or medications, and poor reimbursement for travel costs, meals, or parking. In general, parents of a chronically ill child have higher marital distress and decreased marital harmony when compared with parents of healthy children. The primary care clinician can help CKD families adapt to their child's diagnosis and treatment by performing periodic screening of family health and encouraging communication during periods of family distress ((Massengill and Ferris, 2014).

Socioeconomic status and chronic disease in children and adolescents

Despite the concerted effort by government and policy-makers to close the gap between the rich and the poor, the social and health inequality between the most affluent and the under-privileged remains. Recent research shows that children and adolescents from economically disadvantaged backgrounds have a higher prevalence of CKD, asthma and associated co-morbidities such as antibiotic resistant upper respiratory infections (Wong, Medway, Didsbury, Tong, Turner, et.al., 2014). The rates of bronchitis were at least 18.2% higher among children from the lowest quintile of equivalence income compared to the highest quintile. The current report from the Australian Institute of Health and Welfare indicates that children from lower socioeconomic backgrounds are more likely to take days off from school due to sickness compared to those with parents from an affluent background. In addition, adolescents from lower socioeconomic backgrounds are less likely to engage in health preventive strategies such as sun protection and regular dental consultations, and are more likely to be involved in adverse health-related behaviours such as smoking and excessive alcohol drinking (Turrell and Stanley, 2006). A better understanding and accurate assessment of the causal pathway between the socioeconomic determinants and health outcomes in children is critical for the development of appropriate intervention that effectively reduces the social and economically disadvantaged health disparities in children with chronic disease.

The range of socioeconomic determinants that influences the quality of life of these children is broad, and includes household income, parental occupation, mother's education, level of health insurance, and marital status. Despite the current evidence suggesting a direct link between socioeconomic status and the severity of CKD in adult CKD patients (Bello, Peters, Rigby, Rahman and El, 2008), a similar relationship

between socioeconomic status of the caregivers and the health outcomes of children and adolescents with CKD has not been established. Addressing the social determinants of health is a primary approach to achieving health equity. Understanding and expanding the knowledge base of how social and economic factors may have on the health outcomes in children with CKD is critical to influence program and policy activities, build partnership between government and healthcare workers, and to develop tailored interventions that target resource distribution to eliminate health disparities (Wong, et.al., 2014).

Current nursing knowledge and practice of delirium assessment

Nurses play a vital role in identification of delirium in ICU (Devlin et al., 2008). Flagg. (2010) argued that nurses are in close contact with patients in ICU at all times, hence they can recognise any discrete psychological changes in patients and are the ideal practioner to identify delirium. The onus of successfully implementing the delirium assessment in critical care units not only depend on nurses but also on physicians, pharmacists and other allied health professional (Devlin et al., 2007). A large, multi-centre survey of knowledge and attitudes of delirium among 784 UK junior medical practioner revealed that doctors lack basic knowledge of the diagnosis and management of delirium, and leads to its under-recognition (Davis & Macllulich., 2009). However, the literature suggests that doctors and nurses often do not screen adequately for delirium in ICU patients (Ely et al 2004, Devlin et al., 2008, Flagg 2010).

For instance, Ely et al. (2004) conducted a survey (phase I) using convenience sampling among 912 health care professionals which included physicians (n = 753), nurses (n = 113), pharmacists (n = 13), physician assistants (n = 12), respiratory care practitioners (n = 8), and others (n = 13). This survey was carried out during an annual scientific meeting for critical care professionals representing from different geographical regions

in USA. This survey concluded that only 40% (n=345) were screening for delirium and more specifically only 16% (n=146) use validated delirium screening tools (Ely et al., 2004, Wells, 2012). Sedation practices and management, which are an integral part of delirium screening practices, are outlined in the clinical practice guidelines published by the Society of Critical Care Medicine (SCCM) (2002) were not addressed in this survey at this stage. However, this area was addressed in their follow up study (Patel et al., 2009).

As a follow up to the previously mentioned study, Patel et al.(2009) conducted a study (phase II) in a wider population which included representatives of 41 North American hospitals, 7 international critical care society meetings, and the American Thoracic Society. In this study, paper based and electronic survey were used. This survey revealed some improvement in delirium screening practices with 59% of participants reporting that they routinely assessed patients for delirium and 33% incorporated validated screening tools. In this survey the authors reported face validity, which is a qualitative measure of validity and is normally considered as the least scientific measure (Parahoo, 2009). The reliability of the survey instrument was not reported. A large sample size was achieved which reduces the margin of error of survey results.

A specific survey among 601 North American intensive care nurses using a paper/web-based survey which exclusively explored practices in relation to delirium assessments found that only 3% (n=30) of nurses thought it was important to routinely screen for delirium (Devlin et al., 2008). Devlin et al. (2008) reported that only 10% (n=60) of nurses assessed for delirium during their 12 hour shift despite their local units specifying a policy for delirium screening practice.

A descriptive correlational study was conducted among 232 intensive care nurses using a self-report questionnaire in Jordan. This study examined critical care nurses knowledge and nursing practice regarding delirium in critical care units. This study included nurses working in wide range of hospitals including government, private and military. One of the inclusion criteria for this study was nurses with minimum of six months experience in critical care. This study revealed that critical care nurses in Jordan have a low to moderate level of knowledge about ICU delirium. The level of knowledge of nurses about delirium and management had a direct influence on the nurses' practice to evaluate it effectively. These findings highlight that critical care nurses have some knowledge, but lack necessary skills and ability to demonstrate evidence-based care in their practice (Hamdan-Mansour et al., 2010).

A random sampling of nationwide telephonic survey among Dutch intensive care units head nurses and doctors were carried out. Interestingly, 31% of Dutch ICU's had a protocol in place to treat ICU-delirium. This survey reported that only 14% (n = 14) out of 103 of all Dutch critical care units, monitored for delirium. Of these, only half (7%) used a tool that is validated with ICU patients despite availability of guidelines on delirium. This survey concluded that critical care units in Dutch ICUs routinely evaluated the presence of delirium with a validated instrument but less than one-third of the participants used a protocol to treat ICU-delirium (Van Eijk et al., 2008).

In Sweden, a postal survey was conducted among 82 head nurses of all intensive care units. This survey was aimed at understanding awareness of delirium observations and interventions provided which included pharmacological and nonpharmacological measures within Swedish critical care units. Response rate of 71% (n=58) was achieved. Written pharmacological guideline was available in about 26% (n=16) units.

This survey reported that 62% (n=34) of ICUs in Sweden use some form of regular screening methods, while only one ICU used a validated screening tool (CAM-ICU) to assess delirium regularly (Forsgen and Eriksson, 2010). Interestingly, the authors excluded Cardiac intensive care units, where there is high prevalence of delirium and those undergoing cardiopulmonary bypass procedures who are at higher risk. Shorter length of patient stay and limited experience of staff in cardiac ICUs were the reason given by authors for excluding cardiac surgery patients in survey which contradicts the literature. McPherson et al. (2013) argued that the increasing age, cerebrovascular and peripheral vascular disease, preoperative cerebral oxygen saturation, smoking, atrial fibrillation, renal dysfunction, metabolic syndrome, low intraoperative perfusion pressure and cardiogenic shock are associated with increased risk of postoperative delirium in Cardiac ICU. There were no report of ethical approval or waiver obtained for this study.

Christensen. (2013) explored knowledge of delirium among 53 staff nurses working in medical ICU in a teaching hospital in south East Asia using a questionnaire, purposive sampling technique was employed. This study highlighted the following concerns: only 39 % (n=20) of nurses were aware that a hospital policy existed about delirium assessment, 69% (n=33) had received no formal training on delirium screening and 46% (n=24) were not involved in delirium screening process using a screening tool. Limited knowledge of nurses on signs and symptom and negative outcomes of delirium were evident from this survey. The sample size achieved for this survey was small, hence generalisability of these findings are very limited (Polit and Beck, 2012).

Use of a validated delirium assessment screening tool in critical care units are feasible, and is the very effective way to deliver evidence-based nursing care. For example, Scott

et al. (2013) conducted a single centered service evaluation in an 18 bedded critical care unit using 78 staff nurses. A pre and post educational questionnaire survey method was used. The authors stated that ethical approval was not deemed necessary for this study which raises the credibility of this evaluative survey (Burns & Grove., 2009). However, a higher response rate 92% (72/78) and 60% (48/72) were reported respectively. In both questionnaire response, nurses considered evaluation of delirium is less important that other possible conditions such as presence of pain, agitation and altered level of consciousness. The findings of this above mentioned international research among nurses in critical care dealing with delirium cannot be applied to Irish context. A systematic review conducted by Steis and Fick (2008) stated that we cannot assume nurses read and incorporate evidence-based findings in their practice. As the information emerging from a recently concluded study in Ireland reported that nurses are poorly engaged even in large teaching hospitals in eastern seaboard region (Unpublished data).

Eastwood et al. (2012) surveyed Australian critical care nurses' attitudes towards delirium assessment in a large teaching tertiary level care ICU. This survey was carried out in two phases. In the first phase 36% (n=65/174) were encouraged to assess their patients for the presence of delirium. No educational input or interventions were provided. After a month, educational activities were rendered to encourage the nurses to use evidence-based approach in identification and management of delirium. A survey was carried out at this stage and after extensive learning activity in their units. After introduction of CAM –ICU in their units a month later the same questionnaire was used to collect the data (Wells, 2012). CAM-ICU was well received by most participants and nurses felt it was important to do a delirium assessment (Eastwood et al, 2012). Some of the limitations identified in this study include low response rate i.e. 36% (n=65/174)

and 26% (n=45/174) potentially leads to response bias. Noticeably evaluating CAM-ICU implementation process was carried over a short period (one month after introduction), only 5% (n=9) took part in both the surveys which has implications for interpreting and generalising of the findings (Gray, 2009).

Glynn and Corry (2014) conducted a descriptive, quantitative survey using a self-reporting questionnaire exploring Irish nurses' opinions and current practices in relation to delirium in ICU in Dublin Academic Teaching Hospital settings (DATHS) (n=151). In this survey less than half of the participants (38% n=57) believed that delirium is experienced by 26-50% of mechanically ventilated patients. Delirium was recognised as a very serious problem by 94% (n=143) of the participants, but only 10% (n=15) of nurses considered delirium monitoring was important in ICU. A response rate of 70% was reported in this study. It is also evident from this research that a majority of critical care nurses in DATHs believe that delirium is a serious problem but are not engaged in screening practices regularly.

The study concluded that there is a disparity between current evidence-based research and critical care nurses practices about delirium (unpublished data). The absence of empirical data, warrants further studies to evaluate how nurses in the western sea board region of Ireland are performing screening practice for delirium.

Several authors have identified that nurses lack necessary knowledge and skills to identify delirium effectively and are poorly engaged in delirium screening practices(Inouye et al., 2000, Ely et al.,2004, Van Eijk et al., 2008, Macllulich et al., 2013).It is evident from the literature that nursing staff working in critical care units internationally, are inconsistent and poorly engaged in recognition of delirium. It is

essential to examine the literature for what nurses perceive about delirium assessments and the potential barriers faced during their clinical practice.

CHAPTER THREE
RESEARCH METHODOLOGY

Study location

The study was carried out in Nephrology Unit of the University College Hospital (UCH, Ibadan. The University College Hospital is a tertiary hospital with an established an 850-bed hospital with a bed occupancy rate of 55-60% including a renal dialysis centre. Patients were recruited from all the Paediatrics wards - North-West 2, South-East 2 South-East Ground and Otunba Tunwase Children Emergency ward of UCH Ibadan.

Study design

This was a descriptive cross-sectional study set out to determine the prevalence of delirium among children and adolescents with chronic renal failure at the University College Hospital, Ibadan.

Target population

The target population were children and adolescents diagnosed with renal failure.

Study population

The study population for this research comprised children or adolescents within the age between 1-18years who were in-patients of the University College Hospital, Ibadan.

Inclusion criteria

- Children or adolescents who have been diagnosed with chronic kidney disease and have been registered in the hospital for clinical management of the disease.

Exclusion criteria

- Children or adolescents who were managed as out-patients or in-patients being managed for reasons different from chronic kidney disease or patients not registered in the hospital for clinical management of the disease.

Sample size calculation

The sample size was obtained using sample size determination formula for single proportion (Kish, 1965).

$$n = \frac{Z\alpha^2 pq}{d^2}$$

n = minimum sample size

Zα = standard normal deviate set at 1.96 (which corresponds to the 95% confidence interval and error rate of 5%

p = 94% (proportion of patients inclusive of of delirium in CKD patients according to Wong, et al (2014) in a study among school aged children (ages 6 – 18) with CKD stages I-V in four different sites in Australia.

q = 1- p

d = degree of accuracy set at 0.05 (precision set 5%)

Therefore sample size $N = \frac{(1.96)^2 \times 0.94 \times (1-0.94)}{(0.05)^2}$

$$N = \frac{0.25008816}{0.0025}$$

Sample size = 86.7 ≈ 87 with reported prevalence of 94% of delirium in CKD patients gives a minimum sample size of 87

To estimate for non-response rate:

Assuming a non-response rate at 10%,

$$n = \frac{N}{1-0.1}$$

$$= \frac{87}{0.9} = 96.66 \text{ approximately } 97$$

Minimum sample size(n) = 100

Sixty-nine patients who met inclusion criteria were included in the study due to the limited time for the study and the low number of children in the facility during the study period.

Sampling technique

A total sampling of all patients meeting inclusion criteria was carried out due to the small number of patients and the limited time duration for the study.

Study instruments

The instrument for data collection was a validated questionnaire which includes.

1. Socio-demographic questionnaire (Omigbodun et al 2008). Family and school variables
2. Chronic Kidney Disease Patient Questionnaire (Klein, 2017; Agrawal, Barnes, Ghosh and McCullough, 2009)
3. Cornell assessment of paediatric delirium (CAPD) (Klein, 2017)

1. Socio demographic questionnaire: This consists of questions relating to socio-demogrphic characteristics adapted from a questionnaire used in a previous study on adolescents in rural and urban areas Ibadan (Omigbodun et al,2008). It consists of personal information, family information and school related questions.
2. CKDP Questionnaire: this instrument was in two sections. Previous studies have shown that it demonstrates 80 to 90 percent sensitivity the first part is on Kidney Disease, it has 5 different items with sub items to measure the experience of people on kidney disease and the different measure been taken. The 2 likert scales was used for the response on the sub items which were inform of yes or no.

The second part of the instrument addresses medication aspect of CKD and this explained ability to distinguish CKD and non-CKD. It consists of 12 items on the medicine that associated to kidney diseases. Most of the questions were in form of yes or no responses. The instrument was adopted from (Klein, 2017; Agrawal, Barnes, Ghosh and McCullough, 2009) and it has been used consecutively which gave the researcher confidence that it will yield the desired results from the respondents

3. Cornell assessment of paediatric delirium (CAPD) (Klein, 2017)

This is an 8-item checklist that assesses for delirium by the bed side. It makes use of observable signals that are appropriate in children to make an assessment based on the realization that delirium presents differently in children compared to adults.

The first part of the checklists looks out for a reduction in normal activities that should be present while the second part looks at presence of pathological behaviours.

The CAPD is an adaptation of the Pediatric Anesthesia Emergence Delirium (PAED). Because the original PAED was designed to detect transient emergence delirium following anesthesia, it selects for patients with a hyperactive, agitated delirium subtype and would be incomplete for assessing the children in intensive care population. by anesthesiologists and will require intensive training before the nurse can use it (Traube et al., 2014). Thus, the screening tool should detect all types of delirium (hyperactive, hypoactive, and mixed), in patients of all ages and developmental levels. The Cornell Assessment of Paediatric Delirum (CAPD) was developed for the purpose of assessing all types of delirum and across all paeditraic and adolescent age group by the nurse. The CAPD has an overall sensitivity of 94.1% and specificity of 79.2%, the gold standard being a diagnosis of delirium made by a child psychiatrist. The overall Cronbach's α was 0.90. A scoring cut-off point of 9 showed a a good inter-rater reliability of 0.9 among nurses (Traube et al., 2014).

The Cornell Assessment of Pediatric Delirium takes less than 2 minutes to complete and easy to administer by the nurse.

Scoring: Each item of the first 4 items is scored on a likert scale. A response of never is scored 4, rarely 3. Sometimes 2. Often 1 and always 0, with lower scores indicating delirium, while for items 5 to 8, reverse scoring is used, i.e. never is 0, rarely 1, sometimes 2, often 3 and always 4. The range of the total score is 0-32, with higher scores indicating delirium.

Scoring: The cut-off point is 8, with scores of 9 and above indicating positive screen for delirium (Traube et al., 2014).

Pre-test

All instruments of data collection were pretested in a pre-test was carried among 10 children attending Oni Memoral Children Hospital Ibadan for various medical illness,

During the pre-test, all instruments were tested for applicability and reliability, where where a child psychiatrist's ICD 10 diagnoses of delirium were compared with the researcher's (nurse) diagnosis of delirium using CAPD and the diagnosis of CKD from Chronic Kidney Disease Patient Questionnaire was compared with the paediatrician diagnosis of CKD. In this pre-test, the correlation coefficient was (1.0) for both CKD diagnois and delirium screen. Inter-rater reliability between the researcher and the research assistance was 0.9 for both the CKD and delirium screen respectively.

Questionnaire administration

The administration of the questionnaires was done by the researcher with the help of a trained research assistant that was acquainted with the purpose of the study prior to the commencement of the study. The research assistant was trained on understanding of the instrument for data collection, building rapport with respondents, interviewing skills, and other ethical issues involved in research prior to the time of data collection. A visit was made to units and the wards prior to the time of questionnaire administration by the investigator so as to seek the permission of the unit heads and matrons on the wards as well as acquit them with the purpose of the study prior to the commencement of the study. In doing this, investigator built rapport with respondents and their relations, taking note of the period of hospitalisation, time of discharge and managing team.

Sampling Frame: All the patients on admission at the Paediatrics wards - North-West 2, South-East 2 South-East Ground and Otunba Atunwase Children Emergency ward of UCH Ibadan constuted the sampling frame.

Sampling Technique

In each of these 4 wards, all patients on admission were listed by their hospital number and thereafter serialized. Because the number of patients in each of the four wards where participants were selected differed, the number selected in each ward was

determined by proportional sampling method. The first participant was randomly selected and subsequent participant systematically selected until all participants were enrolled into the study.

Data collection process

Data collection was carried out for a period of three weeks. Visits were made to all the clinical wards by the researcher and research assistant to administer the questionnaire. The questionnaire was administered to study respondents at a time considered convenient for them so as not to disrupt clinical activities and at a place that ensured confidentiality.

The investigator checked the entire administered questionnaires one after the other for completeness and accuracy.

Data management and analysis

Serial number was assigned to each questionnaire for easy identification and for correct data entry and analysis. A coding guide was developed to code and enter each question into the computer for analysis. Factors that were associated with positive delirium screen were analyzed using Chi square statistics. All Chi square test was Yates corrected or Bonferonni corrected when there were more han 2 levels of comparisons followed by a post-hoc Chi square test. The Fisher test was used whrn any cell had less than 5. To determine the predictors of a positive delirum screen, binary logistic regression analyses was carried out, with positive delirium screen being the dependent variables and variables that were significantly associated with posoitive delirim screen ($p < 0.05$) during the initial univariate analysis being the independent variables. All analysis was done using the Statistical package of SPSS Version 20. and was set at $p< 0.05$.

Ethical Considerations

Informed Consent/Assent

Because of the cognitive state of participants, for those whom were above 18 years of age, informed consent was obtained by the prinicipal caregiver, while for those under 28 years of age, assent was obtained also from the principal caregiver.

In this study, a "principal caregiver" was defined as "a person from the household who was most involved with the everyday care of the case and would be very likely to respond to any request for special assistance at any time, if such a request was made by the case.

This study was performed in accordance with the declaration of Helsinki. Ethical approval was obtained from the joint University of Ibadan/University College Hospital.

Confidentiality of data:

The name of the patient was not used at any point of the study, but instead the hospital number and the initials was used for data collection. This was done to ensure confidentiality.

Beneficence to the participants:

The study encouraged children and adolescents and their relations to be aware of the causes, symptoms/sign and prevention of delirium in children or adolescents.

Non-Maleficence to participants:

The study was done at no extra risk or cost to all patients who were involved in the study. However, for the very ill patients, followed up was done till the time notice to be more convenience and appropriate to interact with the patient or caregiver so as to minimize or avoid discomfort to them.

Right to decline/withdrawal from study without loss of benefits:

Each participant was given the right not to be included in the study or to withdraw from the study without any loss of benefit or extra risk.

Voluntariness: Decision to participate in this study was entirely voluntary.

Translation of protocol

Informed consent was obtained from participants' parents or guidance. This involved explaining the scope of the study in the language best understood to the patients or their parents or caregivers. There was language translation from English to local language of the patients for better understanding of the protocol of the study to those who do not understand English Language.

CHAPTER FOUR
RESULTS

Socio-demographic characteristics of respondents

Respondents' mean age was 8.4±5.0years with age range of 1-21years and 66.7% were <10years of age. Majority (60.9%) of respondents were boys 62.3% were Christian (Orthodox and Pentecostal) and 66.7% had primary education. About half (52.2%) of respondents maintained that they had been guided by their religion teaching as well as 75.4% had their family life been guided by religion teaching.

Table 4.1: Socio-demographic characteristics of patients (N=69)

Variable	Frequency (No)	Percentage (%)
Age group in years		
<7	25	36.2
≥7	44	63.8
Sex		
Male	42	60.9
Female	27	39.1
Level of education		
Infant	5	7.2
Primary education	46	66.7
Secondary education	15	21.7
Post-secondary education	3	4.3
Religion		
Islam	26	37.7
Orthodox Christian	17	24.6
Pentecostal Christian	26	37.7
Family type		
Monogamous	47	68.1
Polygamous	22	31.9
Marital status of parents		
Married	61	88.4
Separated/divorced	2	2.9
Parents is dead	6	8.7
Whom patient lived with		
Parents	60	87.0
Mother	3	4.3
Father	3	4.3
Grandparents	1	1.4
Uncle/aunt	2	2.9

Table 4.2: Patients' work engage in for monetary gain

Variable	No	%
Engage in Any Work for Monetary Gain		
Yes	11	15.9
No	58	84.1
Type of work doing		
Bakery worker	1	9.1
Hawking	4	36.3
Hairdressing	1	9.1
Making of beads	2	18.2
Shoe making	1	9.1
Farm work	1	9.1
Bricklaying	1	9.1
Total	11	100.0

Knowledge of CKD Diagnosis in respondents

Table 4.3 below shows respondents'/caregivers' knowledge of CKD. According to the table, approximately 62(90.0%) admitted that they were told that they have kidney disease. Out of 62 respondents who admitted being told, those who had their diagnoses less than a year prior to this study were majority 38(61.3%). Those who confirmed having chronic kidney disease (CKD) through the test of protein in the urine were many (56.5%). However, majority (82.6%) were informed about the causes of CKD (Table 4.3).

Table 4.3: Knowledge of CKD Diagnosis in respondents

Variable	No	%
Ever been told of having kidney disease		
Yes	62	89.9
No	7	10.1
Total	69	100.0
Period of first diagnosed		
<1year	38	61.3
1-3years	13	21.0
3-5years	9	14.5
≥5years	2	3.2
Total	62	100.0
Method of diagnosis		
Blood test (elevated creatinine)	23	37.1
Protein in the urine	4	6.5
Both	35	56.5
Total	62	100.0
Received information on causes of kidney disease		
No	57	82.6
No response	12	17.4
Total	69	100.0

Not all totals equal to 69 because not applicable and no responses had been deleted

Observed Symptoms of features of CKD by Respondents

Table 4.4 below illustrates respondents' observed symptoms of CKD symptoms. According to the table, the highest proportion 42.1% reported that the observed symptom was blotted body.

Knowledge on Features of CKD	No	%
Bloated body	8	42.1
Excessive weight gain	3	26.3
Swollen lower limbs	2	10.5
Reduction in urine production	2	10.5
Itching & redness of the eyes	1	5.3
Yellowish eyeball	1	5.3
Total	19	100.0

Knowledge about Aetiology of CKD before Admission

Table 4.5 below shows the knowledge of the respondent on causes of CKD. According to the table, the largest proportion 53.6% were not aware of the cause of the CKD before seeking medical intervention.

Table 4.5: Knowledge about Causes of CKD*

Presence of CKD sign or symptom	No(%)	Yes(%)
Kidney problems at birth or in childhood	58(84.1)	11(15.9)
Hospitalization due to kidney failure	32(46.4)	37(53.6)
Kidney failure while hospitalized for another reason?	64(92.8)	5(7.2)
Kidney stones?	65(94.2)	4(5.8)
Bladder or kidney infections?	65(94.2)	4(5.8)
Difficulty emptying your bladder?	61(88.4)	8(11.6)
Bladder or other urologic surgery?	69(100.0)	0(0.0)
Radiation to the abdomen or pelvis?	68(98.6)	1(1.4)
Chemotherapy for cancer?	68(98.6)	1(1.4)
Family history of kidney disease?	68(98.6)	1(1.4)
Blood in the urine?	66(95.7)	3(4.3)
Foamy urine?	37(53.6)	32(46.4)

*Multiple Responses Given

Cornell Assessment of Paediatric Delirium (CAPD)

Table 4.6 below shows the prevalence of respondents who scored 9 and above on the CAPD (positive delirium screen). According to the table, 12 (17.4%) respondents screened positive for delirium, while the remainder, 57 (82.7%) screened negative

Table 4.6: Prevalence of Positive Screen for Delirium in CKD

Screen Positive	N	%
Yes	12	17.4
No	57	82.8

Association between Socio-demographic variable and Positive Delirium Screen

Table, a significantly higher proportion of respondents who were < 7 years of age, 32.0% screened positive for delirium compared with those who were ≥ 7 years of age, 9.1%, FE, p = 0.02.

There was also a significantly difference in the proportion of respondents who screened positive for delirium based on their class, X2 = 15.0, p = 0.002. This was significant after Bonferonni adjustment. Post-hoc pairwise comparisons show that the difference was accounted by a higher proportion of infants who screened positive for delirium compared with those who were in elementary class and screened positive for delirium (80.0% versus 13.0%), FE p = 0.003 and also by a higher proportion of infants who screened positive for delirium compared with those who were in secondary class and screened positive for delirium (80.0% versus 13.3%), FE p = 0.02.

A significantly higher proportion of respondents whose parents were either single, separated or widowed, 50.0% screened positive for delirim, compared with those respondents whose parents were married, 16.4%, FE p = 0.04.

Similarly, a higher proportion of respondents who has had CKD for 1 to 10 years 91.7% screened positive for delirum compared with those who had had the CKD for < 1 year, 64.4%, FE p = 0.02.

Table 4.9: Association between Socio-demographic variable and Positive Delirium Screen

	Positive Delirium Screen			
Variable	Yes	No	X2	P
	n (%)	n (%)		
Age group (in years)				
<7	8 (32.0)	17 (68.0)	FE	0.02
≥7	4 (9.1)	40 (90.9)		
Sex				
Boy	6 (14.3)	36 (85.7)	0.7	0.4
Girl	6 (22.2)	21 (77.8)		
Religion				
Islam	20 (76.9)	6 (23.1)	0.4	0.5
Christianity	37 (86.0)	6 (14.0)		
Class				
Infant	4 (80.0)	1 (20.0)	15.0	0.002BS
Primary education	6 (13.0)	40 (87.0)		
Secondary education	2 (13.3)	13 (86.7)		
Post-secondary education	0 (0.0)	3 (100.0)		
Family type				
Monogamous	9 (19.1)	38 (80.9)	0.3	0.6
Polygamous	3 (13.6)	19 (86.4)		
Marital status of parents				
Married	10 (16.4)	51 (83.5)	FE	0.04
Separated/divorced/Widowed	4 (50.0)	4 (50.0)		
Whom patient lived with				
Both Parents	10 (16.7)	50 (83.3)	6.3	0.1
Mother	2 (66.7)	1 (33.3)		
Father	0 (0.0)	3 (100.0)		
Grandparents	0 (0.0)	1 (100.0)		
Uncle/aunt	0 (0.0)	2 (100.0)		
Family History Of Delirium				
No	12 (17.6)	56 (82.4)	0.2	0.6
Yes	0 (0,0)	1 (100.0)		
Duration of Diagnosis of CKD				
<1 Year	29 (64.4)	16 (35.6)	4.6	0.03
1-10 Years	22 (91.7)	2 (8.3)		

FE - Fisher Exact Test; BS: significant after Bonferonni correction.

Clinical Characteristics and Positive Delirium Screen

Table 4.9 shows the clinical characteristics of patients with CKD who screenedpositive for delirium. According to the table, a significantly higher proportion of respondents who received abdominopelvic irradiation 60% screened positive for delirium compared with those who did not receive abdominopelvic irradiation, 14.6%, FE p = 0.03. Also, a significantly higher proportion of respondents who received cancer chemotherapy 75% screened positive for delirium compared with those who did not receive cancer chemotherapy. 13.8%, FE p = 0.015.

Furthemore, a significantly higher proportion of respondents who has opoid withdrawal 85.1% screened positive for delirium compared with 0.0% who had no opioid withdrawal and screen positive for delirium FE p = 0.028. In addition, a significantly higher proportion of respondents who had comorbid physical illness 35.3% screened positive for delirium compared with those who did not have comorbid physical illness, 13.4% FE = sreen positive for delirium FE p = 0.01.

Table 4.9: Clinical Characteristics and Positive Delirium Screen

	Positive Delirium Screen			
Variable	Yes	No	X2	P
	n (%)	n (%)		
Kidney Failure for Another Medical Illness				
No	11 (17.2)	53 (82.8)	0.03	0.9
Yes	1 (20.0)	4 (80.8)		
Kidney stones				
No	11 (16.9)	54 (83.1)	0.2	0.7
Yes	1 (25.0)	3 (75.0)		
Urinary Tract Infection				
No	11 (16.9)	54 (83.1)	0.2	0.7
Yes	1 (25.0)	3 (75.0)		
Abdomino-pelvic Irradiation				
No	9 (14.06)	55 (86.0)	FE	0.03
Yes	3 (60.0)	2(40.0%)		
Cancer Chemotherapy				
No	9 (13.8)	56 (84.8)	FE	0.015
Yes	3 (75.0)	1 (25.0)		
Obstructive Uropathy				
No	10 (16.4)	51 (83.5)	0.4	0.5
Yes	2 (25.0)	6 (75.0)		
On Analgesic Medications (NSAID)				
Yes	9 (17.0)	44 (83.0)	0.03	0.9
No	3 (18.8)	13 (81.3)		
On Herbal Supplements				
Yes	6 (18.2)	27 (81.8)	0.03	0.9
No	6 (16.7)	30 (83.3)		
Comorbid Physical Illness				
Yes	4 (8.5)	43 (91.5)	FE	0.01
No	8 (35.4)	14 (63.6)		
Opioid Withdrawal				
Yes	57 (85.1)	10 (14.9)	FE	0.028
No	0 (0.0)	2 (100)		
Foamy Urine				
No	8 (21.5)	29 (78.4)	1.0	0.3
Yes	4 (12.5)	28 (87.5)		
Blood In Urine				
No	12 (18.2)	54 (81.8)	0.7	0.4
Yes	0 (0.0)	3 (100.0)		

Predictors of Positive Delirium Screen

Table 4.10 shows the predictors of positive delirium screen. According to the table, respondents with medical comorbidity are significantly more likely to screen positive for delirium, OR = 8.2, 95% CI (1.4-46.9), while respondents with primary education and those with secondary are significantly less likely to screen positive for delirium when compared with infants OR = 0.02, 95% CI (0.001-0.319), OR = 0.029, 95% CI (0.001-0.567) respectively.

Table 4.10: Predictors of Positive Delirium Screen (Prediction 87.0%)

Independent Variables	OR	95% C.I		Sig
		Lower	Upper	
Age				
< 7	1			
>7	2.2	0.8	4.4	0.12
Class				
Infant	1			
Primary education	0.02	0.001	.319	0.01
Secondary education	0.029	0.001	.567	0.02
Post-secondary education	0.000	0.000	1.000	1.0
Marital Status				
Married	1			
Unmarried)	0.02	0.000	1.4.	0.8
Parent dead	0.34	0.01	1.34	0.9
Medical Comorbidity				
No	1			
Yes	8.2	1.4	46.9	0.02
Opioid Withdrawal				
No	1			
Yes	1.6	0.2	3.20.	0.99
Constant	2.2			
Abdomino-pelvic Irradiation				
No	1			
Yes	1.3	0.34	2.11	0.18
Cancer Chemotherapy				
No	1			
Yes	1.2	0.21	2.03	0.23

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Discussion

Socio-demographic characteristics of respondents

The participants of the present study were predominantly male, with a mean age of 8.4±5.0years. This profile of the participants is similar to that of a typical profile of the patient observed for delirium in study setting of research conducted by Grover, Subodh, Avasthi, Chakrabarti, Kumar, Sharan, et al., (2009). Patients' educational level in this study was low as the majority, 66.7% do not have more than elementary education. This reflected that almost all participants were totally dependent. This results was similar to the sociodemographic profile of the study by de Menezes, et.al., (2017). The reason for this is not far fetched, as the sample for the study was drawn from a paediatric and adolescent population.

Knowledge of respondent about features of CKD

The vast majority of the respondents, almost 1 in 10 were aware of their diagnosis and about 6 in 10 were diagnosed only less than a year. Despite that about 8 in 10 respondents did not receive adequate information on the causes of the CKD and 8 in 10 respondents just observed symptoms suggestive of fliud retention (bloating, weight gain, oedema of lower limbs) that necessitated medical attention. This is no unexpected, as a common presentation of kidney failure are symptoms of fluid retention, which is a major risk factor for cardiovascular mortality (Hung et al., 2014).

Nevertheless, when the various possible symptoms were profiled, more than a half of the respondents were not aware of the causes of CKD before seeking medical intervention

However, education and economic background of caregivers (patients parents or relations) may constitute hinderances to prompt help-seeking.

Prevalence of Positive Screen for Delirium in CKD

In the present study, the prevalence of positive delirium screen was 17.4%. This figure is lower than the figure (20.6%) reported by Traube et al. (2014) among 111 patients who were between the infant age and 21 years of age in a child and adolescent intensive csre unit (ICU) and the 21.0% reported by (Silver et al., 2015). However, in a repeat study, Traube et al. (2017) reported positive screen in 17% of 1547 children and adolescents studied. The reason for these close figures may be because the CAPD was used in all the studies with which the result of present study was compared.

With an overall prevalence rate of 17.4% in the study population, delirium is a common problem in pediatric and adolescent care. This study clearly indicates that delirium is becoming a concern among paediatric patients. The overall prevalence of delirium (17.4%) in this study was supported by the study done in Ireland on hospitalised children which was 17.6% by using confusion assessment method and 19.6% by DSMIV TR, Australian hospitals 17%, and Portugal study 16% (Abelha, Luís, Veiga, Parente, Fernandes, et al. 2013; Travers, Byrne, Pachana, Klein and Gray 2013; Ryan, O'Regan, Caoimh, Clare, O'Connor, et al., 2013). With an overall prevalence rate of 20.6% in our study population, delirium is a common problem in paediatric critical care (Traube, et.al., 2014).

The CAPD used in the current study was designed to fill a critical gap in the ability of paediatric care unit to identify patients who may be suffering from delirium. As the CAPD is a delirium screening tool, patients who screen positive will require to be re-assessed by the child psychiatrist to establish a propoer ICD 10 diagnois.

Association between Socio-demographic variable and Positive Delirium Screen

The present study also found that respondents who were less than 7 years of age and specifically infants significantly screened positive for delirim than older patients. Thus is very significant given that the brain of the infant is more vulnerable to the toxic/metabolic effects of critical illnesses, a vulnerability that gradually reduces with increasing age, when there is a reveral in old age.(Inouye, Schlesinger, & Lydon, 1999; Martini, 2005),

An important observation in the current study is a hgher delirium screen among parents of patients were either single, separated or widowed. This might suggest limited social support among those who were not married making it difficult for them to seek help. Studies have shown that marriage acts as buffers during period of adversities and difficulties (Lasebikan & Ayinde, 2013), which could be the case among caregivers of patients with CKD.

The study also found that a significantly 6 in 10 respondents who received abdominopelvic radiotherapy screened positive for delirium compared with those who did not receive abdominopelvic radiotherapy. This is nor unexpected given radiotherapy a known cause of delirium(Schubert et al., 2018). Specifically, Schubert et al. (2018) found that almost 40% of patients in an acute treatment unit who received radiotherapy developed post-radiotherapy delirium.

The study also found that 75% of respondents on cancer chemotherapy screened positive for delirim. This again is not surprising given that the use of chemotherapy drugs that penetrate the blood brain barrier is a risk factor for delirium(Matsuoka, Yoshiuchi, Koyama, Otsuka, & Nakagawa, 2014) Indeed, anticancer drugs such as methotrexate, cisplatin, vincristine, procarbazine, asparaginase, cytarabine (cytosine arabinoside), 5-fluorouracil, ifosfamide, tamoxifen (rare), etoposide (high-dose),

nitrosourea compounds, alkylating agents (high-dose or arterial route) have been reported to be associated with increased risk of developing delirium (Bush et al., 2018). Another interesting factor in the present study was the association between opioid withdrawal and delirium. Although delirium secondary to opioid withdrawal was believed to be rare, several incident cases have been reported (Das, Sah, Nandi, & Das, 2017; Sharma, Kumar, Sharma, & Kanwar, 2017). However, what delirium associated with opioid withdrawal suggests is a possible dependence syndrome. By implication, such patients could have been on long-term opioid treatment for the pain associated with CKD. Nevertheless, it should however be noted that while the aetiology of delirium is multifaceted, medications such as benzodiazepines, opioid and anticholnergics account for r 12%–39% of all cases of delirium (Alagiakrishnan & Wiens, 2004).

Expected, the study found 35.3% of patients with physicial comorbidity had screened positive for delirium. Indeed, studies have shown one of the major causes for high mortality rate in delirium is the presence of physical comorbidities (Bourdel-Marchasson et al., 2004; Ely et al., 2004).

Predictors of Positive Delirium Screen

The present study also found that the predictors of positive delirium screen were young age, being an infant, elementary education and presence of medical comorbidity,

This infers that the younger an individual the more likely he will develop delirium from CKD. It should be noted that being in elementary class is also a function age. Indeed studies have shown that the risk for developing delirium is highest at the two extremes of ages.

Thus, the study also highlights the association between a high physical illness burden and delirium. By implications, the presence of a medical comorbidity requires

pharmacotherapy which could lead to polypharmacy, drug-drug interaction, adverse drug reaction and delirium (Garpestad & Devlin, 2017). Beyond this, the presence of physical illness itself is also a risk factor for delirium (Slooter, Van De Leur, & Zaal, 2017).

Limitation of the study

The current study has a lot of limitation, First is the small sample size. Future studies will require a larger sample size in order to increase the power of the study,

Secondly, the Cornell Assessment of Paediatric Delirium is expected to be strictly among paediatric and children, Therefore, extending its use to adolescents has the tendency to produce spurious result.

Third, the Cornell Assessment of Paediatric Delirium is only a screening instrument. Future studies therefore require the addition of a diagnostic instrument, Future studies addressing the above limitations would be useful.

Conclusion

Despite the growing attention given to the delirium of individuals with renal disease, patients still remain underdiagnosed and undertreated. Very few studies have been published on the treatment of delirium in children especially among those with CKD in this population, and doubts still hover over treatment effectiveness and safety. Early diagnosis of CKD is essential to enhance patient quality of life and improve the outcome of renal disease. Therefore, having a multidisciplinary team to care for patients with kidney disease is becoming increasingly important. Once manifested, delirium is associated with increased morbidity and mortality. For that reason, prevention based on risk factor identification, early recognition, as well as an effective management, particularly if based on non-pharmacological strategies, is essential, because of the prevalence and the adverse outcomes associated with this disorder.

Recommendations

Based on the results of this study, these suggestions are therefore made:

1. Delirium is a serious cause and complication of hospitalization in children patients and should be considered to be a medical emergency until proven otherwise.
2. Irrespective of the specific etiology of delirium, the condition has the potential to markedly affect the overall outcome and prognosis of severely ill patients, as well as substantially increasing health-care utilization and costs. For these reasons, prevention, early recognition and effective treatment of delirium are essential.
3. Timely and optimal management of people with delirium should be performed with identification of any possible underlying causes, dealing with a suitable care environment and improving education of health professionals.

4. The nursing care the delirium patients receive, as well as the nursing role within the multidisciplinary delivery of care is of upmost importance.
5. There should also be a framework clearly provided for a takeoff on further clinical research, training for detection and treatment of delirium that will include an active participation of psychiatrists.
6. Every unit in paediatrics and children and adolescents psychiatric should ensure that they have a policy for delirium assessment.
7. Guidance needed for paediatrics and children and adolescents psychiatric to develop skills recognising delirium at the earliest, use of validated delirium tools during their clinical practice and provide evidence based care is so important in delirium management.
8. In order to address the magnanimity of challenge of delirium in multidisciplinary team approach is vital. Therefore, critical care, practitioners such as anaesthetics, medical team members, physiotherapist and occupational therapist need to be studied about their practices, beliefs and perceptions regarding delirium and its management.

Suggestion for further studies

To address the limitation observed in this study instrument, prospective research efforts should focus on the generalizability of results between different age groups when looking at association between age and delirium manifestation. Of particular importance is to ascertain whether results from paediatric studies are applicable to the adult and geriatric populations. The significance of this information becomes more pronounced when considering that the vast majority of emergency delirium (ED) research has been centered on the paediatric population. Given the multifaceted nature of ED, therapeutic inconsistencies across, and even within the different age groups, are

expected. However, expanding the current understanding of treatment options across all ages will be vital to formulating a standard treatment protocol that will inevitably reduce morbidity, mortality, and resource utilization associated with ED.

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APPENDIX I

PARENTAL INFORMED CONSENT FORM (FOR PARENT)

Purposes of research: The purpose of the research is to determine prevalence and correlates of delirium among children and adolescents with chronic renal failure at the University College Hospital, Ibadan.

Procedure of the research: If you agree to allow your child to take part in this study, your child will be asked a few questions about his or her acknowledge on prevalence and correlates of delirium among children and adolescents with chronic renal failure. The education/enlightenment on the knowledge and understanding about delirium in children and adolescents with chronic renal failure will be of no extra cost to your child. You are free to refuse your child to take part in this study or withdraw from it at any point. However, your child's participation will be greatly appreciated. I expected to recruit 100 participants into the study.

Expected duration of research and of participants' involvement: Your child involvement in this study will last a month.

Non-maleficence to the participants: The study will be done at no risk to the participants that would participate in the study.

Confidentiality: Information elicited from this study will only be accessed by the researcher and her co-investigator and no other person will be opportune to have access to it. Your child's name will not appear on any material collected by me nor will it be used in any report of publication produced from this study.

Voluntariness: Your decision to allow your child to participate in this study is entirely voluntary.

Alternatives to participation: Your refusal to allow your child to participate in this study will involve no penalty and will not affect his or her academic progress or performance negatively in any way.

Due inducement: You will not be paid any fees on your child to participate in this research.

Consequences of participants' decision to withdraw from research and procedure for orderly termination of participation: You can choose to withdraw your child from the research at any time. Please note that some of the information that has been obtained about your child before you choose to withdraw him or her may have been modified or used in reports and publications. These cannot be removed anymore. However, I promise to make good faith effort to comply with your wishes as much as it is practicable.

What happens to research participants when the research is over: If you so wish, to allow your child to participate, I will inform you of the outcome of the research through your phone. During the course of this study, you will be informed about any information that may affect your child continued participation or his or her academic period.

STATEMENT OF PERSON OBTAINING INFORMED CONSENT:

I have fully explained this research to the participant/participants' parents and have given sufficient information, including risks and benefits, to make an informed decision.

Name: _____

Date: _____ Signature: _____

STATEMENT OF PERSON GIVING CONSENT

I have carefully read the description of the research or have had it translated into language I understand. I have also talked it over with the investigator to my satisfaction in allowing my child. I understand that my child participation is voluntary. I know enough about the purpose, methods, risks and benefits of the research to judge that I want to allow my child to take part in it. I understand that I may freely stop child being part of this study at any time. I have received a copy of this consent form and additional information sheet to keep for myself on behalf of my child.

Date _____ Signature: _____

Name: _____

Witness' Signature_____

Witness' Name_____

APPENDIX II

IWE IGBAYONDA LODO OBI LATISE IWADI

IDI IWADI: Koko iwadi yi ni latimo ohun to fa itankaele ati ajemo arundeliriumu (aisan ran won-ran tabiipo ipalọlọ ti o tobi) larin omodeati odolangba ti o ni arun kindirin ni ile- iwosan isegun oyinbo ti Orita-Mefa, (UCH) Ibadan.

ATONA FUN IWADI YI: Ti o ba finu-findo gba lati je ki omo re kopa ninu iwadi yi, a o bi ni awon ibeere ranpe nipa imo re nipa itankaele ati ajemo ti arun deliriomu larin omode ati odo-langba ti o ni arun kindirin. Eko/iforoyeni lori imo ati oye nipa deliriomu larin omode ati odolangba ti o ni arun kindirin ki yio je ohun to joju. O ni eto lati ko ki omo re kopa ninu iwadi yii tabi ki o fa sehin ninu kikopa re nigbakugba.

Sugbon, kikopa re yoo je idunu wa. Mo ni anfani lati yan ogorun olukopa fun iwadi yii.

AKOKO TI IWADI YI YOO IGBA ATI FUN AWON OLUKOPA: Kikopa ninu iwadi yi yoo wa sopin ni eyin osu kan.

AWON NKAN TI IWADI YI LE NAA AWON AKOPA: Iwadi yi ko ni ewu kankan si olukopa ninu iwadi yii.

IFINUFINDO KOPA: Sise ipinu lati je ki omo re kopa ninu iwadi yi je afinufindo se.

IPAMIRAN SI KIKOPA: Aimakopa re ninu iwadi yi koni ifiyajeni kankan ninu, ti kosini din itoju gbigba re ku ni ile-iwosan yi ni ona kankan

FIFUN NI FUN KIKOPA: Modaju pe kosi fifunni ni owo kankan fun kikopa ninu iwadi yi.

ABAJADE ERONGBA AWON OLUKOPA FUN FIFA SEYIN NINU IWADI ATI ILANA TI YE SI DIDEKUN KIKOPA: Ti o ba wu o, o ni anfani lati je ki omo re le yeba ninu iwadi yi nigbakigba abi asikokasiko toba wu o. Ki o simo dajudaju pe awon oro ti a ti gba nipa re ki e to gba lero lati yeba ni ale ti se n kan le lori tabi lo ninu

atejade. Eyi le nira lati yo jade. Mo si se ileri pe ma faramo lati tele awon ipinu mii niwongba toba ti sese funmi.

OHUNTOLESELE SI AWON OLUKOPA NINU IWADI YI LEYIN TI IWADI YI BAKASE NILE: Ti e ba fe mo, hun o fi abajade esi iwadi yii toyin leti lori ero-alagbeka yin. Bi iwadi yi base ntesiwaju, ni a o si ma fitoyin leti ni igbadegba awon ohun to le je idena fun tesiwaju ninu iwadi.

AWON NTONISE PELU OLUGBAYONDA FUN IWADI YI:
Motifarabale salaye yekeyeke lori iwadi yi fun obi iwo olukopa, mo si tiso opo nkan toromo iwadi yi fun won, ati pelu awon ewu ati anfani toromoo,ki e to se ipinu latokan yin fun kikopa omo yin.

ORUKO:……

OJO:…… IBUWOLU:……

GBOLOHUN TOROMO ENI TONFUN OLUWADI NI IYONDA LATIKOPA:

Mo tika gbogbo ohun ti iwadi yi dale lori ati pelu gbo itupale re ni ede ti mo gbo. Mo si titun forowero pelu Oluwadi nipa iwadi yi siitelorun mi lori re. Mosimo pe kikopa omo mi je fifinufindo se. Mo si ni oye tokunrere si awon ilana, awon idojuko pelu awon anfani toromo n kan gbogbo lori iwadi yii. Mo si tun mope mo le ma jeki omo mi kopa mo nigbakugba abi asikokasiko to ba wumi ninu iwadi yii. Mositigba okan ninu iwe igbayonda latikopa ati afikun iwe to n se alaye lori re fun ara mi.

Ojo:…… Ibuwolu:…….

Oruko:……..

Ibuwolu Eleri:……..…….……

Oruko Eleri:……..…….……

APPENDIX III

INFORMED CONSENT FORM (FOR PATIENT)

Purposes of research: The purpose of the research is to determine prevalence and correlates of delirium among children and adolescents with chronic renal failure at the University College Hospital, Ibadan.

Procedure of the research: If you agree to take part in this study, you will be asked a few questions about your acknowledge on prevalence and correlates of delirium among children and adolescents with chronic renal failure. The education/enlightenment on the knowledge and understanding about delirium in children and adolescents with chronic renal failure will be of no extra cost to you. You are free to refuse to take part in this study or withdraw from it at any point. However, your participation will be greatly appreciated. I expected to recruit 100 participants into the study.

Expected duration of research and of participants' involvement: Your involvement in this study will last a month.

Non-maleficence to the participants: The study will be done at no risk to the participants that would participate in the study.

Cost to the participants: This study will be of no cost to you apart from your hospital fees which you would have incurred or be charged for your being hospitalised on the sickness that brought you initially.

Benefits: The study will encourage children and adolescents and their relations to be aware of the causes, symptoms/sign and prevention of delirium in children or adolescents.

Confidentiality: Information elicited from this study will only be accessed by the researcher and her co-investigator and no other person will be opportune to have access

to it. Your name will not appear on any material collected by me nor will it be used in any report of publication produced from this study.

Voluntariness: Your decision to participate in this study is entirely voluntary.

Alternatives to participation: Your refusal to participate in this study will involve no penalty and will not affect your academic progress or performance negatively in any way.

Due inducement: You will not be paid any fees to participate in this research.

Consequences of participants' decision to withdraw from research and procedure for orderly termination of participation: You can choose to withdraw from the research at any time. Please note that some of the information that has been obtained about you before you choose to withdraw may have been modified or used in reports and publications. These cannot be removed anymore.

However, I promise to make good faith effort to comply with your wishes as much as it is practicable.

What happens to research participants when the research is over: If you so wish, I will inform you of the outcome of the research through your phone. During the course of this study, you will be informed about any information that may affect your continued participation or your academic period.

STATEMENT OF PERSON OBTAINING INFORMED CONSENT:

I have fully explained this research to the participant and have given sufficient information, including risks and benefits, to make an informed decision.

Name: _____

Date: _____ Signature: _____

STATEMENT OF PERSON GIVING CONSENT

I have carefully read the description of the research or have had it translated into language I understand. I have also talked it over with the investigator to my satisfaction. I understand that my participation is voluntary. I know enough about the purpose, methods, risks and benefits of the research to judge that I want to take part in it. I understand that I may freely stop being part of this study at any time. I have received a copy of this consent form and additional information sheet to keep for myself.

Date _____ Signature: _____

Name: _____

Witness' Signature_____

Witness' Name_____

APPENDIX IV

IWE IGBAYONDA LATISE IWADI (FUN ALAISAN)

IDI IWADI: Koko iwadi yi ni latimo ohun to fa itankaele ati ajemo arun deliriumu (aisan ran won-ran tabiipo ipalọlọ ti o tobi) larin omodeati odolangba ti o ni arun kindirin ni ile- iwosan isegun oyinbo ti Orita-Mefa, (UCH) Ibadan.

ATONA FUN IWADI YI: Ti o ba finu-findo gba lati kopa ninu iwadi yi, a o bi o ni awon ibeere ranpe nipa imo re nipa itankaele ati ajemo ti arundeliriomularin omodeati odolangba ti o ni arun kindirin. Eko/iforoyeni lori imo ati oye nipadeliriomu larin omodeati odolangbati o ni arun kindirin ki yio je ohun to joju. Eni eto lati ko kikopa ninu iwadi yii tabi ki e fa sehin ninu kikopa yin nigba kuu gba.

Sugbon, kikopa re yoo je idunu wa. Mo ni anfani lati yan ogorun olukopa fun iwadi yii.

AKOKO TI IWADI YI YOO IGBA ATI FUN AWON OLUKOPA: Kikopa ninu iwadi yi yoo wa sopin ni eyin osu kan.

AWON NKAN TI IWADI YI LE NAA AWON AKOPA: Iwadi yi ko ni ewu kankan si olukopa ninu iwadi yii.

ANFAANI IWADI: Iwadi yi yo ran omode ati odolangba pelu awon ebi won lowo lati mo nipa isokunfa, apere/ami ati idena deliriomu ninu omode tabi odolangba.

IBO ASIRI OLUKOPA NINU IWADI: Iro tabi oro ti mo ba gba lenu olukopa ninu iwadi yii yoo je ohun ti oluwadi ati akin-egbe re nikan yoo ni anfani sii, ko tun si elomiran ti yoo ni anfani sii.Oruko yin kosini farahan ninu iwe fun iwadi kankan ninu eyi ti mo ba gba lowo yin. A kosi nilo fun iwe atejade kankan lori iwadi yi.

IFINUFINDO KOPA: Sise ipinu latikopa ninu iwadi yi je afinufindo se.

IPAMIRAN SI KIKOPA: Aimakopa re ninu iwadi yi koni ifiyajeni kankan ninu, ti kosini din itoju gbigba yin ku ni ile-iwosan yi ni ona kankan

FIFUN NI FUN KIKOPA: Modaju pe kosi fifun ni ni owo kankan fun kikopa ninu iwadi yii.

ABAJADE ERONGBA AWON OLUKOPA FUN FIFA SEYIN NINU IWADI ATI ILANA TI YE SI DIDEKUN KIKOPA: Ti o ba wu o, o ni anfani lati yeba ninu iwadi yi nigbakigba abi asikokasikotobawu o. Ki o simo dajudaju pe awon oro ti a ti gba nipa re ki e to gba lero lati yeba ni ale ti se kan le lori tabi lo ninu atejade. Eyi le niran lati yojade. Mo si se ileri pe ma faramo lati tele awon ipinu mii niwongba tobasese funmi pelu liana yii.

OHUNTOLESELE SI AWON OLUKOPA NINU IWADI YI LEYIN TI IWADI YI BAKASE NILE: Ti e ba fe mo, hun o fi abajade esi iwadi yii toyin leti lori ero-alagbeka yin. Bi iwadi yi base ntesiwaju, ni a o si ma fitoyin leti ni igbadegba awon o n tole je idena fun tesiwaju ninu iwadi bati ilera yin.

AWON NTONISE PELU OLUGBAYONDA FUN IWADI YI:

Motifarabale salaye yekeyeke lori iwadi yi fun iwo olukopa, mo si tiso opo nkan toromo iwadi yi fun o, ati pelu awon ewu ati anfani toromoo,ki o to se ipinu latokan re fun kikopa.

ORUKO:……..

OJO:…… IBUWOLU:…….

GBOLOHUN TOROMO ENI TONFUN OLUWADI NI IYONDA LATIKOPA:

Mo tika gbogbo ohun ti iwadi yi dale lori ati pelu gbo itupale re ni ede ti mo gbo. Mo si titun forowero pelu Oluwadinipa iwadi yi siitelorun mi lorire. Mosimo pe kikopa mi je finufindo se. Mo si ni oye tokunrere si awon ilana, awon idojuko pelu awon anfani toromo n kan gbogbo lori iwadi yii. Mo si tun mope mo le makopamo nigbakugba abi asikokasiko to ba wumi ninu iwadi yii. Mositigba okan ninu iwe igbayonda latikopa ati afikun iwe to n se alaye lori re fun ara mi.

Ojo:…… Ibuwolu:…….

Oruko:……..

Ibuwolu Eleri:……..…….…….

Oruko Eleri:……..…….…….

APPENDIX VI

SOCIODEMOGRAPHIC QUESTIONNAIRE IN ENGLISH & YORUBA

Serial Number: __ __ __ __

Today's Date: __ __/__ __/__ __

Please write the answers to the questions or draw a circle where it applies to you. This is not an examination it is only to find out about you and your health.

Jọwọ kọ idahun si awọn ibeere ti o jẹ mọ ọ, tabi ki o fa igi si abẹ eyi to o jẹ mọ ọ. Eleyii kii ṣe idanwo; a kan fẹ mọ nipa rẹ ati ilera rẹ ni.

SECTION I: Personal Information

1. Name of School (1. Orukọ ile-iwe):

2. Class (2. Kilaasi):_____

3. Where do you live? (Address of Present Abode):_____

3. Nibo ni o n gbe? (Ibugbe):

4. What is your date of birth? Date of Birth: _____ _____ _____

4. Kini ọjọ ibi rẹ? Ọjọ ibi: Day Month Year

Ọjọ Oṣu Ọdun

5. How old are you? _____

5. Ọmọ ọdun melo ni ọ? _____

6. Are you a boy or a girl? (1) Boy ☐ (2) Girl ☐

6. Ṣe ọkunrin tabi obinrin? (1) Ọkunrin (2) Obinrin

7. Do you practise any religion? (1) No ☐ (2) Yes ☐

7. Njẹ ẹ manse ẹsin kankan? (1) Bẹẹkọ (2) Bẹẹni

8. Please write down the exact place you attend for worship

8. Kọ ibi ti o ti maa njọsin

(a) Islam ☐ (b) Orthodox Christian ☐ (c) Pentecostal Christian ☐

(d) Traditional religion ☐ (e) Other _____

(a) Bi'josin awon Musulumi ☐ (b) Elesin Igbagbo Majemu-atijo ☐

(c) Elesin Igbagbo Majemu-titun (d) Elesin Ibile (e) Omiran ……..

9. How much does the teaching of your religion guide your behaviour?

9. Bawo ni igbagbọ rẹ ṣe ntọ ihuwasi rẹ?

(a) Very much ☐ (b) much ☐ (c) Just a little ☐ (d) Not at all ☐

(a) O ntọ ọ gan an (b) O ntọ ọ ☐ (c) O ntọ ọ diẹ ☐ (d) Ko tọ ọ rara ☐

10. How much does the teaching of your religion guide your family life?

10. Bawo ni ẹsin naa se se pataki to ni ẹbi ẹ?

(a) Very much ☐ (b) much ☐ (c) Just a little ☐ (d) Not at all ☐

(a) O ṣe pataki gan-an ☐ (b) O ṣe pataki ☐ (c) O ṣe pataki diẹ ☐

(d) Ko ṣe pataki ☐

Family Information

11. Family Type: (a) Monogamous ☐ (b) Polygamous ☐

11. Iru ẹbi: (a) Oniyawo kan ☐ (b) Oniyawo meji tabi ju bẹẹlọ ☐

12. Number of Mother's Children: _____

12. Ọmọ melo ni Iya rẹ ni?: _____

13. Number of Father's Children: _____

13. Ọmọ melo ni Baba rẹ ni?: _____

14. What is your position among your father's children? _____

14. Ipo wo lo wa ninu awon ọmọ baba rẹ? _____

15. What is your position among your mother's children? _____

15. Ipo wo lo wa ninu awọn ọmọ iya rẹ? _____

16. Marital Status of Parents:

16. Ibagbepọ awọn obi rẹ:

(a) Married ☐ (b)Separated/Divorced ☐ (c) Father is dead ☐

(d) Mother is dead ☐ (e) Mother & Father are dead ☐

(a) Ṣe wọn gbe pọ? ☐ (b) Ṣe wọn ti kọ ra wọn silẹ? (c) Baba ti ku ☐

(d) Iya ti ku ☐ (e) Iya ati Baba ti ku ☐

17. How many husbands has your mother had? _____

17. Ọkọ melo ni Iya rẹ ti ni ri? _____

18. Who do you live with presently?

18. Tani o n gbe pẹlu lọwọlọwọ?

(a) Parents ☐ (b) Mother ☐ (c) Father ☐ (d) Grandparents ☐

(e) Grandmother ☐

(a) Awọn obi ☐ (b) Iya nikan ☐ (c) Baba nikan ☐ (d) Iya ati Baba Agba ☐

(e) Iya Agba nikan ☐

(f) Grandfather ☐ (g) Other (please specify) _____

(f) Baba Agba nikan ☐ (g) Awọn Iyoku (Jọwọ sọ nipato) _____

19. Who brought you up from your childhood?

19. Talo tọ ẹ dagba lati kekere?

(a) Parents ☐ (b) Mother ☐ (c) Father ☐ (d) Grandparents ☐ (e) Grandmother ☐

(a) Awọn obi ☐ (b) Iya nikan ☐ (c) Baba nikan ☐ (d) Iya ati Baba Agba ☐

(e) Iya Agba nikan ☐

(f) Grandfather ☐ (g) Other (please specify) _____

(f) Baba Agba nikan ☐ (g) Awọn Iyoku (Jọwọ sọ nipato) _____

20. How many different people have you left your parents to live with from your childhood?_____

20. Awon eniyan ọtọọtọ melo ni o fi awon obi rẹ silẹ lati lọ gbe pẹlu wọn?_____

21. If more than one person, list the people, time spent and whether experience was good or bad?

21. Ti o ba ju ẹnikan lọ, ka wọn, akoko ti o lo lọdọ ẹnikọọkan ati bi o ba dara tabi ko dara? _____

Person lived with Ẹni ti o ba gbe	From which age to which age Ọmọ ọdun melo ni ọ nigba naa	Experience (good or bad) Iriri rẹ nibẹ (O dara tabi ko dara)
_____	_____	_____
_____	_____	_____
_____	_____	_____

22. Do you do any kind of work to earn money before or after school? 1. Yes ☐ 2. No ☐

22. Njẹ o maa nṣiṣẹ lati ri owo lehin tabi saaju ki o to lọ si ile iwe? 1. Bẹẹni ☐ 2. Bẹẹkọ ☐

23. If yes, please describe what you do _____

23. Ti o ba je bẹẹni, ṣe alaayeohun ti o ṣe _____

24. Level of Father's Education:

24. Iwe melo ni Baba rẹ ka?

(a) No Formal Education ☐ (b) Koranic School ☐ (c) Primary School ☐

(d) Secondary School ☐ (e) Post Secondary (Non-University) ☐

(f) University Degree and above ☐ (e) I do not know ☐

(a) Ko kawe rara ☐ (b) Ile-keu ☐ (c) Ile-Iwe Alakọbẹrẹ ☐ (d) Ile iwe girama ☐

(e) Ile-iwe agba (Yatọ fun yunifasiti) ☐ (f) Yunifasiti ati ju bẹẹ lọ ☐ (e) Nko mo ☐

25. Occupation of Father: (Write the exact occupation) _____/I do not know

25. Iṣẹ wo ni Baba rẹ n ṣe: (Kọ iṣẹ ti wọn nṣe pato lẹkunrẹrẹ) _____/Nko mo

26. Level of Mother's Education

(a) No Formal Education (b) Koranic School (c) Primary School

(d) Secondary School

(a) Ko kawe rara (b) Ile-keu (c) Ile-Iwe Alakọbẹrẹ (d) Ile iwe girama

(e) Post Secondary (Non-University) (f) University Degree and above (e) I do not know

(e) Ile-iwe agba (Yatọ fun yunifasiti) (f) Yunifasiti ati ju bẹẹ lọ (e) Nko mo

27. Occupation of Mother: (Write in the exact occupation) _____/ I do not know

27. Isẹ wo ni iya rẹ nṣe: (Kọ iṣẹ ti wọn nṣe pato lẹkunrẹrẹ) _____

28. Do you like your family? Yes No

28. Ṣe o fẹran ẹbi rẹ? Bẹẹni Bẹẹkọ

29a. If Yes, Why? _____

29a. Bẹẹni, Ṣe alaye? _____

29b. If No, Why? _____

29b. Bẹẹkọ, Ṣe alaye? _____

Chronic Kidney Disease Patient Questionnaire

You have most likely been referred to this clinic by a health care professional or yourself to address concerns about impaired kidney function. This is a short questionnaire designed to help your doctor fully evaluate and manage your kidney health.

Section I: Kidney Disease

1. Have you ever been told you have kidney disease? Yes / No

(If no, skip to next section)

2. How long has it been since you were first diagnosed? (Circle one)

< 1 year / 1-3 years / 3-5 years / 5-10 years / > 10 years

3. How was this diagnosed? (Check those that apply)

1. Blood test (elevated creatinine)
2. Protein in the urine
3. Other: _____

4. Have you been told what caused your kidney disease (e.g. diabetes, high blood pressure, glomerulonephritis, kidney stones, medication, related to surgery or severe medical illness)?

_____

_____

5. Have you ever had any of the following (Check if yes):

SN	Presence of CKD sign or symptom	Yes	No
CKD5i	Kidney problems at birth or in childhood?		
CKD5ii	Hospitalization due to kidney failure?		
CKD5iii	Kidney failure while hospitalized for another reason?		

CKD5iv	Kidney stones?		
CKD5v	Bladder or kidney infections?		
CKD5vi	Difficulty emptying your bladder?		
CKD5vii	Bladder or other urologic surgery?		
CKD5viii	Radiation to the abdomen or pelvis?		
CKD5ix	Chemotherapy for cancer?		
CKD5x	Family history of kidney disease?		
CKD5xi	Blood in the urine?		
CKD5xii	Foamy urine?		

6. If you answered yes to any of the above, please enter more details here:

_____

_____

_____

Section II: Medications

7. Do you use regularly pain or antiinflammatory medicines or NSAIDS (i.e. Aleve, naproxen, ibuprofen, Motrin)? 1. Yes ☐ 2. No ☐

a. If yes, how often? 1) At least daily ☐ 2) 3 times per week ☐

3) once a week ☐ 4) once a month ☐

8. Do you use herbal supplements? 1. Yes ☐ 2. No ☐

a. If yes, list them here please:

_____

_____

APPENDIX VII

DELIRIUM OBSERVATIONAL CHECKLIST

- ~ Abnormal facial expression
- ~ Crying
- ~ Inconsolability
- ~ Purposeful actions
- ~ Abnormal leg position
- ~ Restlessness
- ~ No eye contact
- ~ No awareness of surroundings

A	Observation	Never 4	Rarely 3	Sometimes 2	Often 1	Always 0	Score
1	Does the child makes eye contact with the caregiver?						
2	Are the child's actions purposeful?						
3	Is the child aware of his/her surroundings?						
4	Does the child communicate needs and wants?						
	Observation	Never 0	Rarely 1	Sometimes 2	Often 3	Always 4	Score
1	Is the child restless?						
2	Is the child inconsolable?						
3	Is the child underactive – very little movement while awake?						
4	Does it take the child a long time to respond to interactions?						
Total							

BEHAVIOR OBSERVATIONAL CHECKLIST

Observable Behavior	Yes (1)	No (0)	Possible Causes	Yes (1)	No (0)
Complaining/irritability	1	0	Pain, anxiety, mood dysregulation, other physical illness symptoms, side effects of opiates/sedatives	1 1 1 1 1	0 0 0 0 0
Decreased eating	1	0	Decreased appetite, pain, nausea, fear of vomiting	1 1 1 1	0 0 0 0
Clinging or demanding with primary parent	1	0	Increased attachment behavior, separation anxiety	1 1	0 0
Thumb sucking, regression in speech, loss of bladder or bowel control, passive in self-care/feeding	1 1 1 1	0 0 0 0	Regression (care seeking, feeling helpless)	1	0
Nightmares, reacting fearfully	1 1	0 0	Fantasies of punishment, fear of mutilation, fear of death	1 1 1	0 0 0
Phobic or conversion symptoms			Anxiety	1	0
Withdrawn, flat affect			Depression, trauma, side effects of opiates/sedatives	1 1 1	0 0 0

APPENDIX VIII

LETTER OF ETHICAL REVIEW COMMITTEE APPROVAL

INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)
College of Medicine, University of Ibadan, Ibadan, Nigeria.

Director: **Prof. Catherine O. Falade,** *MBBS (Ib), M.Sc., FMCP, FWACP*
Tel: 0803 326 4593, 0802 360 9151
e-mail: cfalade@comui.edu.ng lillyfunke@yahoo.com

UI/UCH EC Registration Number: **NHREC/05/01/2008a**

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Prevalence and Correlates of Delirium among Children and Adolescents with Chronic Renal Failure at the University College Hospital, Ibadan

UI/UCH Ethics Committee assigned number: UI/EC/18/0047

Name of Principal Investigator:

Address of Principal Investigator:

Date of receipt of valid application: 26/01/2018

Date of meeting when final determination on ethical approval was made: **N/A**

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and *given full approval by the UI/UCH Ethics Committee.*

This approval dates from **28/03/2018 to 27/03/2019.** If there is delay in starting the research, please inform the UI/UCH Ethics Committee so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the* UI/UCH EC *assigned number and duration of* UI/UCH EC *approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC at least four weeks before the expiration of this approval in order to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. *No changes are permitted in the research without prior approval by the* UI/UCH EC *except in circumstances outlined in the Code. The* UI/UCH EC *reserves the right to conduct compliance visit to your research site without previous notification.*

UI/UCH EC
28 MAR 2018
APPROVED
COLLEGE OF MEDICINE

Dr. R. O. Akinyemi
For: Director, IAMRAT
Chairman, UI/UCH Ethics Committee
E-mail: uiuchec@gmail.com