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# MEDIKKA

Journal of the University of Nigeria Medical Students



## MENTAL HEALTH: PERSONALITY DISORDER AND DEPRESSION

### INSIDE

- FACTORS ASSOCIATED WITH DEPRESSION AMONG UNDERGRADUATE STUDENTS OF UNIVERSITY OF NIGERIA
- KNOWLEDGE, ATTITUDE AND PRACTICE OF MOTHERS TOWARDS CHILDHOOD IMMUNIZATION IN ENUGU METROPOLIS
- REGENERATIVE MEDICINE: CURRENT THERAPIES AND FUTURE DIRECTIONS
- HEPATITIS B: THE VIRUS AND DISEASE
- DEPRESSION
- THE GREEN-EYED MOSTER DISEASE: 'OTHELLO SYNDROME
- THE CONCEPT OF SCHIZOPHRENIA
- PHYSICIAN SUICIDE



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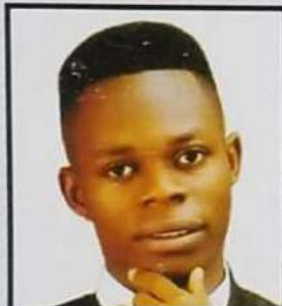
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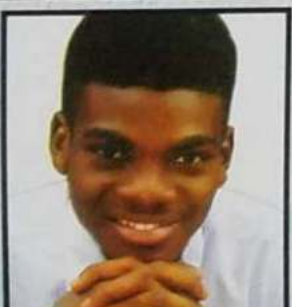
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# Editorial Note

Over the years **MEDIKKA** journal; a journal of the University of Nigeria Medical Students Association have established and distinguished itself as an internationally acclaimed journal with the widest coverage among all the student oriented journals. From 1975 that **MEDIKKA** was first printed till date, the journal has had time to develop immensely despite several hindrances.

The 2017 theme **Mental Health; Personality Disorders and Depression** was born out of the need to explore a core area of medicine that has been neglected by Nigeria and Africa in general. 2017 has seen its share of suicides by both health professionals and people in other walks of life. Thus the Editorial Board wants to change this trend of wanton deaths by bringing to the attention of the public the need to step back and take a critical look on certain mental health issues with personality disorders and depression as a point of focus. The board believes that illuminating the badly neglected area of Mental Health can go a long way in recognizing and preventing dangers associated with mental health issues.

The publication despite the myriads of problem faced from the rectification of the office of the Editor-in-Chief to the sourcing of funds was still a success only because of the amazing and sagacious personalities that helped in the production of this journal. On behalf of the Editorial Board I want to in a special way thank **UNCOMA USA** for their unflinching financial support over the years, Prof. Ezegwui H. the amiable dean of the Faculty of Medical Sciences for his fatherly guidance and donations, Prof. U.S.B Anyaehie for the priceless help offered in reaching out to our alumni and other dignitaries that space would not allow me to mention here. The board appreciates your efforts.

The acknowledgment would not be complete without a special recognition to the members of the Editorial Board. These people where my backbone throughout the rigors of production of **MEDIKKA**. I say a very big thank you to each of you and equally look forward to working with you in the future. Change is always constant and we will always aim for the best.

**ASOGWA SAMUEL UGONNA**  
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The following categories of manuscript are accepted for publication:

**Research Articles:** Original research concerning any aspect (e.g. aetiopathogenesis, epidemiology, diagnosis, management and prevention) of disease. Animal research contributions of relevance to human health are also welcome. Abstract required. (Maximum 4,000 words).

**Review Articles** including meta-analyses: Detailed systematic and critical evaluation of the literature on a specified clinical problem. Reviews should include information such as type of studies and the selection process. (Maximum 3,500 words)

**Short Communications and Case Reports:** These may be unique case reports, clinical experiences and short reports of original research. (Maximum 1,500).

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# CONTENTS

## **Original Article**

- 1 FACTORS ASSOCIATED WITH DEPRESSION AMONG UNDERGRADUATE STUDENTS OF UNIVERSITY OF NIGERIA **5**
- 2 KNOWLEDGE, ATTITUDE AND PRACTICE OF MOTHERS TOWARDS CHILDHOOD IMMUNIZATION IN ENUGU METROPOLIS **17**

## **Review Article**

- 3 REGENERATIVE MEDICINE: CURRENT THERAPIES AND FUTURE DIRECTIONS **25**
- 4 CURRENT TRENDS OF IMMUNIZATION IN NIGERIA: PROSPECT AND CHALLENGES **30**
- 5 HEPATITIS B: THE VIRUS AND DISEASE **36**

## **Educational Papers**

- 6 DEPRESSION **41**
- 7 THE GREEN-EYED MONSTER DISEASE : 'OTHELLO SYNDROME' **44**
- 8 THE CAN OF WORMS IN THE MENTAL HEALTH CARE SYSTEM- AN EXPOSE' **47**
- 9 PHYSICIAN SUICIDE **51**
- 10 THE SENSITIVE, FLUID AND PSYCHICALLY INTELLIGENT PERSON AND THE EMBRYOLOGICAL BRAIN **53**
- 11 FORDYCE DISEASE **55**
- 12 THE CONCEPT OF SCHIZOPHRENIA **57**
- 13 THE EFFECT OF PARENTAL PSYCHOPATHY IN PERSONALITY DISORDER **61**
- 14 MENTAL HEALTH: DEPRESSION AND PERSONALITY DISORDERS **64**

## **Medikka Extras**

- 15 53 MEDICAL MYTHS **66**
- 16 PHARMACOLOGY **68**
- 17 PHYSIO PRETEST **69**
- 18 MORBID **75**

# FACTORS ASSOCIATED WITH DEPRESSION AMONG UNDERGRADUATE STUDENTS OF UNIVERSITY OF NIGERIA ENUGU CAMPUS

By Ikwumezie Chidi, Ikwuakor Chikezie, Ikekpeazu Chidimma and Imade Kingsley.

(As at the time of submission, the authors were in 600 level Medicine And Surgery)

## INTRODUCTION

Depression is a state of low mood and aversion to activity that can affect a person's thought behaviour, feelings and sense of well-being.<sup>[1]</sup> It is a common mood disorder. Mood is a pervasive and sustained feeling tone that is experienced internally and that influences a person's behaviour and perception of the world.<sup>[2]</sup> Mood can be normal, elevated or low. Healthy persons experience a wide range of moods; they are usually in control of their mood or at least they feel so. In mood disorders, there is a loss of this sense of control and a subjective experience of great distress.<sup>[2]</sup>

The university is an exciting place, but it can also be very challenging. An undergraduate student may be leaving home for the first time at a young age, learning to live independently. Depression may occur in the absence of intimate, confiding relationships (social isolation) or financial difficulties. Taking tough classes and studying hard for a course that is deemed arduous, meeting new people of varied character traits and personalities, being under academic stress and getting a lot less sleep might be evident. Small or large set-backs and environmental stressor, like loss of a parent, sibling or friend, can seem like the end of the world, but these feelings usually pass with a little time. These and many more may fuel depression among some university undergraduate students.

Depressive disorders are common globally, with a prevalence of 5-10% in primary care settings. They rank fourth as causes of disability worldwide, and it has been projected that they may rank second by the year 2020.<sup>[3]</sup> At least 350 million people live with depression and is the leading cause of disability worldwide.<sup>[4]</sup>

The prevalence of depressive symptoms may be as high as 30% in the general population with women being twice as likely to be affected as men (male: 2-4%; female: 5-9%). This is a universal observation that is independent of country or culture. The most common time of onset is between the ages of 20 and 30 years, with a later peak between 30 and 40 years.<sup>[5]</sup>

If depressive disorder is not detected in the early stages it may result in a slow recovery and affect or worsen the person's physical health. It should be borne in mind that depressive disorder has significant potential morbidity and mortality. The mortality rate amongst people with a mood disorder may be as high as 15%. Depression also contributes to higher morbidity and mortality when associated with other physical disorders (e.g. myocardial infarction) and its successful diagnosis and treatment has been shown to improve both medical and surgical outcomes. It is also associated with high rates of comorbid alcohol and substance misuse, and has a considerable social impact on relationships, families, and productivity (through time off work). Suicide is the second leading cause of death in persons aged 20-35 years and depressive disorder is a major factor in around 50% of these deaths.<sup>[3]</sup> Almost one million people every year commit suicide and there are about 20 times that number who attempt it and the people who attempt it also suffer from serious physical as well as mental consequences.<sup>[4]</sup>

Depression is the most common health problem for college students.<sup>[6]</sup> Although effective treatments are available, depression often goes undiagnosed and under treated. Symptoms often are regarded by both patients and physicians as understandable given current social circumstances and/or background. Although in many cases this may be true, people should not be denied interventions that may help relieve some of the disabling symptoms of the disorder, allowing them to cope better with any current social problems. The majority of patients will present to primary care, often with problems other than low mood. Physicians ought to remain alert to this possibility as early interventions may be critical in the prevention of major morbidity and comorbidity. There remains an innate reluctance to consider pharmacological interventions for emotional problems, despite overwhelming evidence of efficacy. There is also a widespread concern that drugs which improve mood must be addictive, despite evidence to the contrary. While medication is not the only possible treatment for mild to moderate depression, when antidepressants are prescribed the onus is on the physician to give a therapeutic dose for an adequate length of time. Treatment failure is often due to patient non-compliance, particularly when the patient feels that their problems have not been taken seriously. In a group of patients who generally have feelings of low self-worth or guilt, it is critical that they understand the rationale behind any

treatment, and that their progress is regularly reviewed, at least in the early stages.

As our world continues to grow into a more unified and global community, health problems such as depression require re-evaluation and revision. Such construct, as it currently exists, have been defined within a context of limited cultural and contextual variability. Are we to hypothesize that many of the symptoms or contextual factors associated with depression—as it is currently conceptualized by the majority of the Western world—are rare and perhaps even non-existent for individuals with backgrounds that are not rooted in Western societies or that they are identical with western scenarios? No!

Thus, if the prevalence and factors associated with depression among students of University of Nigeria Enugu Campus are known, depression would be easily detected by the affected subject because the symptoms and associated factors are well-known to them and they are aware of its complications and comorbidities and how to prevent them. This will make it easier for well-trained medical personnel to manage. Thus, there will be an improvement in one's physical and social health and prolonged life expectancy in chronically ill patients. In addition, there will be a significant input to the existing knowledge of depression in developing countries like Nigeria.

The general objective of this research is to elucidate the prevalence and factors associated with depression among undergraduate students of University of Nigeria, Enugu Campus.

The specific objectives of this research include:  
To determine the prevalence of depression among undergraduates of the University of Nigeria, Enugu

### Methodology study Area

The study was carried out in University of Nigeria, Enugu Campus (UNEC), one of the four campuses in University of Nigeria. Enugu is a modern city, accessible by air, rail and road. It is about 223m above sea level with an area of about 85 square miles. It has a population of 722,664 according to the 2006 Nigerian census.<sup>[19]</sup> Enugu state is a state in the South eastern area of Nigeria and is largely populated by members of the Igbo ethnic group. It was created from the old Anambra in 1991. It is bounded by Kogi and Benue State in the North, Ebonyi State in the East, Abia State in the South, and Anambra State in the West. UNEC occupies an area of 200 hectares (2km<sup>2</sup>) located in the heart of Enugu, the administrative capital of Enugu State of Nigeria. The population of undergraduate students in UNEC is 7,000 (seven thousand). It has seven (7) faculties (Medical Sciences; Dentistry; Basic Medical Sciences; Law; Health Sciences and Technology; Business Administration; and Environmental Studies).

### STUDY POPULATION

Undergraduate students of University of Nigeria Enugu Campus (UNEC) from the seven faculties aforementioned.

### STUDY DESIGN

The study design employed was a cross-sectional epidemiological study of the analytical type.

### SAMPLE SIZE

Sample size was calculated using Cochran's sample size formula.

Minimum sample size,  $n = Z^2 p(1-p)/d^2$

Where  $Z = 1.96$  at 95% confidence limit.

$p =$  prevalence of depression from a previous study (49.8%).

$d =$  margin of error tolerated, usually 5% (or 0.05).

By substitution,  $n = 1.96^2 \times 0.498(1-0.498)/0.05^2$

Therefore, the minimum sample size,  $n = 384$

10% was added to this minimum sample size to take care of some questionnaire that may be lost or returned, but improperly filled.

### SAMPLING METHOD

Probability sampling of multi-stage technique was used. A stratified approach for both faculty and gender and calculation of the numbers for each faculty and each sex was adopted, then using the class lists obtained by permission, the individuals for the study was selected by simple random selection (SRS) using the table of random numbers. Consecutive selection of students was achieved on daily basis between 2:00pm and 6:00pm.

campus(UNEC). To determine the level of knowledge of depression among undergraduates of UNEC. To assess the attitude towards depression among undergraduates of UNEC. To identify common coping strategies for depression used by undergraduates of UNEC. To identify the common factors associated with depression among undergraduates of UNEC.

### STUDY INSTRUMENT

Questionnaire was used to collect data. It contained different depression assessment tools such as Becks Depression Inventory, Perceived Stress Scale, Self-esteem Scale, Satisfaction with Life Scale and Cope Inventory.

The Beck Depression Inventory (BDI, BDI-1A, BDI-II), created by Aaron T. Beck, is a 21-question multiple-choice self-report inventory, one of the most widely used psychometric tests for measuring the severity of depression. Its development marked a shift among mental health professionals, who had until then, viewed depression from a psychodynamic perspective, instead of it being rooted in the patient's own thoughts. In its current version, the BDI-II is designed for individuals aged 13 and over, and is composed of items relating to symptoms of depression such as hopelessness and irritability, cognitions such as guilt or feelings of being punished, as well as physical symptoms such as fatigue, weight loss, and lack of interest in sex. There are three versions of the BDI—the original BDI, first published in 1961 and later revised in 1978 as the BDI-1A, and the BDI-II, published in 1996. The BDI is widely used as an assessment tool by health care professionals and researchers in a variety of settings.<sup>[20]</sup>

The Perceived Stress Scale (PSS) was developed to measure the degree to which situations in one's life are appraised as stressful. Psychological stress has been defined as the extent to which persons perceive (appraise) that their demands exceed their ability to cope. The PSS was published in 1983, and has become one of the most widely used psychological instruments for measuring nonspecific perceived stress. It has been used in studies assessing the stressfulness of situations, the effectiveness of stress-reducing interventions, and the extent to which there are associations between psychological stress and psychiatric and physical disorders. The PSS predicts both objective biological markers of stress and increased risk for disease among persons with higher perceived stress levels. For example, those with higher scores (suggestive of chronic stress) on the PSS tend worse on biological markers of aging, cortisol levels, immune markers, depression, infectious disease, woundhealing, and prostate-specific antigen levels in men. The Perceived Stress scale was developed by SheldonCohen and his colleagues.<sup>[21]</sup>

The Rosenberg self-esteem scale (RSES), developed by sociologist Dr. Morris Rosenberg, is a self-esteem measure widely used in social-science research.

The RSES is designed similar to social-survey questionnaires. It is a ten-item Likert-type scale with items answered on a four-point scale from strongly agree to strongly disagree.



**Table 5: Marital status of respondents**

Marital status	Frequency	Percentage (%)
Single	381	99.0
Married	4	1.0
Divorced	0	0
Separated	0	0
Widowed	0	0

Most of the respondents, 381 (99%) are single.

**Table 6: Faculty of respondents**

Faculty	Frequency	Percentage (%)
Law	54	14.0
Dentistry	11	2.9
Medical sciences	94	24.4
Health sciences	111	28.8
Basic Medical sciences	7	1.8
Environmental studies	51	13.2
Business Administration	57	14.8

Majority of the respondents, 111 (28.8%) belong to the faculty of Health Sciences and the least, 7 (1.8%) belong to the faculty of Basic Medical Sciences.

**Table 7: Year of study of respondents**

Year of study	Frequency	Percentage (%)
Year 1	36	9.4
Year 2	77	20.0
Year 3	109	28.3
Year 4	70	18.2
Year 5	39	10.1
Final year	54	14.0

Majority of the respondents, 109 (28.3%) are in year 3.

**Table 8: Monthly allowance of respondents**

Monthly allowance	Frequency	Percentage (%)
<N10,000	94	26.3
N10,000 - 20,000	154	43.0
N20,000 - 50,000	91	25.4
N50,000 - 99,000	18	5.0
>N100,000	1	0.3

Most of the respondents, 154 (43.0%) receive N10,000-N20,000 as their monthly allowance.

**Table 9: Prevalence of depression among the age group**

	Normal ups and downs	Mild mood disturbance	Borderline clinical depression	Moderate depression	Severe depression	Extreme depression	Total	Depressed	Not depressed	Prevalence rate
15 - 19	54	20	8	3	4	7	96	14	82	14.58
20 - 24	164	36	15	12	7	9	243	28	215	11.52
25 - 29	25	6	1	6	1	4	43	11	32	25.6
30 - 34	3	0	0	0	0	0	3	0	3	0

**Table 10: Prevalence of depression among sex**

Sex	Normal ups and downs	Mild mood disturbance	Borderline clinical depression	Moderate depression	Severe depression	Extreme depression	Total	Depressed	Not depressed	Prevalence rate
Male	128	32	14	14	10	12	210	36	174	17.1
Female	118	30	10	7	2	8	175	17	158	9.71

Males have a higher prevalence rate (17.1) than females.

**Table 11: Prevalence of depression among religion**

Religion	Normal ups and downs	Mild mood disturbance	Borderline clinical depression	Moderate depression	Severe depression	Extreme depression	Total	Depressed	Not depressed	Prevalence rate
Christianity	241	61	24	20	10	18	374	48	326	12.8
Muslim	4	1	0	1	2	2	10	5	5	50
Traditional	1	0	0	0	0	0	1	0	1	0

Muslims have the highest prevalence rate (50).

**Table 12: Prevalence of depression among ethnic groups**

Ethnic group	Normal ups and downs	Mild mood disturbance	Borderline clinical depression	Moderate depression	Severe depression	Extreme depression	Total	Depressed	Not depressed	Prevalence rate
Igbo	228	57	23	18	12	17	355	47	308	13.2
Yoruba	4	4	0	2	0	0	10	2	8	20
Hausa	0	0	0	0	0	1	1	1	0	100
Others	14	1	1	1	0	2	19	3	16	15.8

The Hausa ethnic group has the highest prevalence rate (100).

**Table 13: Prevalence of depression with respect to marital status**

Marital status	Normal ups and downs	Mild mood disturbance	Borderline clinical depression	Moderate depression	Severe depression	Extreme depression	Total	Depressed	Not depressed	Prevalence rate
Single	243	61	24	21	12	20	381	53	328	13.9
Married	3	1	0	0	0	0	4	0	4	0

The Single have a higher prevalence rate (13.9).

**Table 14: Prevalence of depression among the faculties**

Faculty	Normal ups and downs	Mild mood disturbance	Borderline clinical depression	Moderate depression	Severe depression	Extreme depression	Total	Depressed	Not depressed	Prevalence rate
Law	35	11	2	3	0	3	54	6	48	11.1
Dentistry	9	1	0	1	0	0	11	1	10	9.1
Medical sciences	67	9	4	7	3	4	94	14	80	14.9
Health sciences	65	20	8	3	6	9	111	18	93	16.2
Basic Medical sciences	3	3	0	0	0	1	7	1	6	14.3
Environmental studies	28	9	5	3	3	3	51	9	42	17.6
Business administration	39	9	5	4	0	0	57	4	53	7.0

The faculty of Environmental studies has the highest prevalence rate (17.6) and Business administration has the least prevalence rate (7.0).

**Table 15: Prevalence of depression among the year of study**

Year of study	Normal ups and downs	Mild mood disturbance	Borderline clinical depression	Moderate depression	Severe depression	Extreme depression	Total	Depressed	Not depressed	Prevalence rate
Year 1	17	9	5	5	0	0	36	5	31	13.9
Year 2	54	11	4	1	1	6	77	8	69	10.4
Year 3	63	16	10	8	7	5	109	20	89	18.3
Year 4	50	7	2	4	3	4	70	11	59	15.7
Year 5	25	7	2	1	1	3	39	5	34	12.8
Final year	37	12	1	2	0	2	54	4	50	7.4

The 3<sup>rd</sup> years have the highest prevalence rate (18.3) and the final years have the least prevalence rate (7.4).

**Table 16: Prevalence of depression with respect to monthly allowance**

Monthly allowance	Not depressed	Depressed	Total	Prevalence rate
<N10,000	84	10	94	10.6
N10,000 - 20,000	129	25	154	16.2
N20,000 - 50,000	80	11	91	12.1
N50,000 - 99,000	13	5	18	27.8

The group with the highest prevalence rate (27.8) is those that receive a monthly allowance of N50,000-99,000.

**Prevalence rate of depression** = (no of depressed/total population) × 100  
=14.28

With respect to the study done, the prevalence rate of depression among undergraduates of UNEC is 14.28.

**Table 17: Knowledge of depression with respect to the age group**

Age group	No knowledge	Knowledge	Total	Chi-square	P-value
15 – 19	3	93	96	1.494	0.684
20 – 24	5	238	243		
25 – 29	0	43	43		
30 – 34	0	3	3		

There is no statistically significant difference in the level of knowledge of depression across all the age groups.

**Table 18: Knowledge of depression with respect to sex**

Sex	No knowledge	Knowledge	Total	Chi-square	P-value
Male	1	209	210	5.825	0.016
Female	7	168	175		

There is a statistically significant difference in the level of knowledge of depression with respect to sex.

**Table 19: Knowledge of depression with respect to religion**

Religion	No knowledge	Knowledge	Total	Chi-square	P-value
Christianity	8	366	374	0.240	0.887
Muslim	0	10	10		
Traditional	0	1	1		

There is no statistically significant difference in the level of knowledge of depression with respect to religion.

**Table 20: Knowledge of depression with respect to ethnic groups**

Ethnicity	No knowledge	Knowledge	Total	Chi-square	P-value
Igbo	6	349	355	4.315	0.229
Yoruba	1	9	10		
Hausa	0	1	1		
Others	1	18	19		

There is no statistically significant difference in the level of knowledge of depression with respect to ethnic group.

**Table 21: Knowledge of depression with respect to marital status**

Marital status	No knowledge	Knowledge	Total	Chi-square	P-value
Single	8	373	381	0.086	0.770
Married	0	4	4		

There is no statistically significant difference in the level of knowledge of depression with respect to marital status.

**Table 22: Knowledge of depression with respect to the faculties**

Faculty	No knowledge	Knowledge	Total	Chi-square	P-value
Law	1	53	54	3.374	0.761
Dentistry	0	11	11		
Medical sciences	4	90	94		
Health sciences	1	110	111		
Basic Medical sciences	0	7	7		
Environmental studies	1	50	51		
Business Administration	1	56	57		

There is no statistically significant difference in the level of knowledge of depression across the various faculties.

Table 23: Knowledge of depression with respect to the year of study

Year of study	No knowledge	Knowledge	Total	Chi-square	P-value
Year 1	2	34	36	9.201	0.101
Year 2	1	76	77		
Year 3	5	104	109		
Year 4	0	70	70		
Year 5	0	39	39		
Final year	0	54	54		

There is no statistically significant difference in the level of knowledge of depression with respect to the year of study.

Table 24: Attitude towards depression with respect to age group

Age group	Positive	Negative	Total	Chi-square	P-value
15 - 19	60	36	96	3.234	0.357
20 - 24	174	69	243		
25 - 29	32	11	43		
30 - 34	2	1	3		

There is no statistically significant difference in the attitude towards depression across all the age groups.

Table 25: Attitude towards depression with respect to sex

Sex	Positive	Negative	Total	Chi-square	P-value
Male	136	74	210	5.134	0.023
Female	132	43	175		

There is a statistically significant difference in the attitude towards depression with respect to sex.

Table 26: Attitude towards depression with respect to religion

Religion	Positive	Negative	Total	Chi-square	P-value
Christianity	260	114	374	0.439	0.803
Muslim	7	3	10		
Traditional	1	0	1		

There is no statistically significant difference in the attitude towards depression with respect to religion.

Table 27: Attitude towards depression with respect to ethnic groups

Ethnicity	Positive	Negative	Total	Chi-square	P-value
Igbo	246	109	355	0.976	0.807
Yoruba	8	2	10		
Hausa	1	0	1		
Others	13	6	19		

There is no statistically significant difference in the attitude towards depression with respect to ethnic groups.

Table 28: Attitude towards depression with respect to marital status

Marital status	Positive	Negative	Total	Chi-square	P-value
Single	266	115	381	0.735	0.391
Married	2	2	4		

There is no statistically significant difference in the attitude towards depression with respect to marital status.

Table 29: Attitude towards depression with respect to faculty

Faculty	Positive	Negative	Total	Chi-square	P-value
Law	33	21	54	17.420	0.008
Dentistry	10	1	11		
Medical sciences	74	20	94		
Health sciences	82	29	111		
Basic Medical sciences	2	5	7		
Environmental studies	31	20	51		
Business Administration	36	21	57		

There is a statistically significant difference in the attitude towards depression across all the faculties.

**Table 30: Attitude towards depression with respect to the year of study**

Year of study	Positive	Negative	Total	Chi-square	P-value
Year 1	23	13	36	10.362	0.066
Year 2	46	31	77		
Year 3	80	29	109		
Year 4	45	25	70		
Year 5	30	9	39		
Final year	44	10	54		

There is no statistically significant difference in the attitude towards depression with respect to religion.

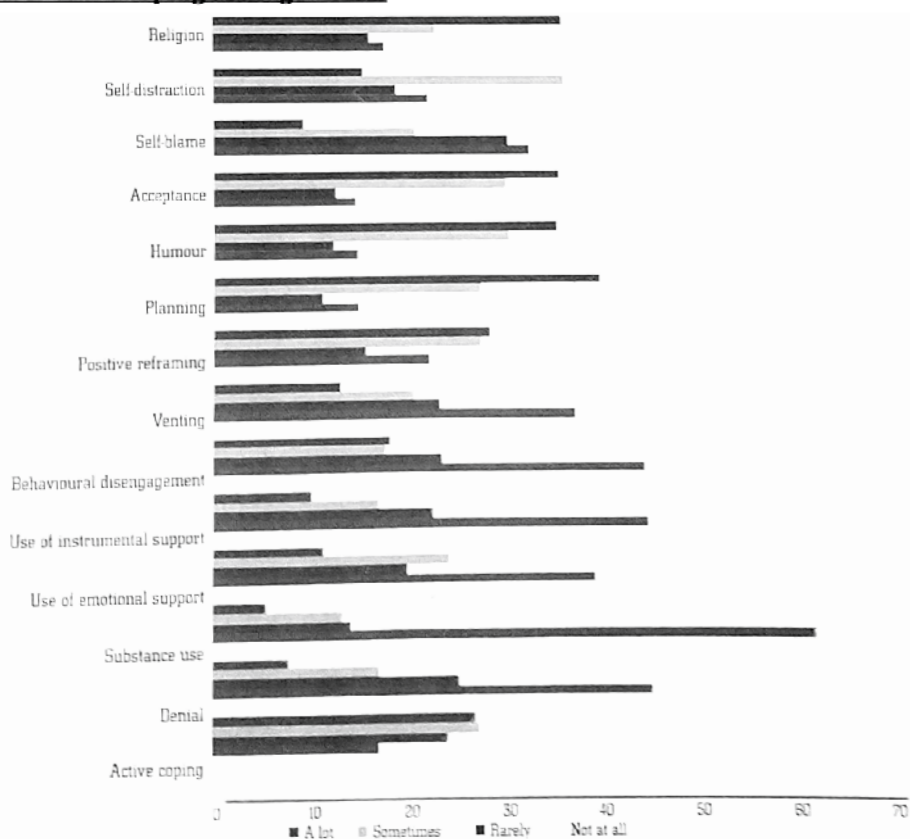
**Table 31: Assessment of coping strategies for depression**

Variables	Frequency	Percentage (%)
<b>Self –distraction</b>		
I have not been doing this at all	92	23.9
I have been doing this rarely	78	20.3
I have been doing this sometimes	151	39.2
I have been doing this a lot	64	16.6
<b>Active coping</b>		
I have not been doing this at all	69	17.9
I have been doing this rarely	97	25.2
I have been doing this sometimes	110	28.6
I have been doing this a lot	109	28.3
<b>Denial</b>		
I have not been doing this at all	183	47.5
I have been doing this rarely	102	26.5
I have been doing this sometimes	69	17.9
I have been doing this a lot	31	8.1
<b>Substance use</b>		
I have not been doing this at all	252	65.5
I have been doing this rarely	57	14.8
I have been doing this sometimes	54	14.0
I have been doing this a lot	22	5.7
<b>Use of emotional support</b>		
I have not been doing this at all	160	41.6
I have been doing this rarely	81	21.0
I have been doing this sometimes	98	25.5
I have been doing this a lot	46	11.9
<b>Use of instrumental support</b>		
I have not been doing this at all	183	47.5
I have been doing this rarely	92	23.9
I have been doing this sometimes	69	17.9
I have been doing this a lot	41	10.6
<b>Behavioural disengagement</b>		
I have not been doing this at all	182	47.3
I have been doing this rarely	96	24.9
I have been doing this sometimes	72	18.7
I have been doing this a lot	35	9.1
<b>Venting</b>		
I have not been doing this at all	153	39.7

I have been doing this rarely	95	24.7
I have been doing this sometimes	84	21.8
I have been doing this a lot	53	13.8
<b>Positive reframing</b>		
I have not been doing this at all	91	23.6
I have been doing this rarely	64	16.6
I have been doing this-sometimes	113	29.4
I have been doing this a lot	117	30.4
<b>Planning</b>		
I have not been doing this at all	61	15.8
I have been doing this rarely	46	11.9
have been doing this sometimes	113	29.4
I have been doing this a lot	165	42.9
<b>Humour</b>		
I have not been doing this at all	61	15.8
I have been doing this rarely	51	13.2
I have been doing this sometimes	126	32.7
I have been doing this a lot	147	38.2
<b>Acceptance</b>		
I have not been doing this at all	60	15.6
I have been doing this rarely	52	13.5
I have been doing this sometimes	125	32.5
I have been doing this a lot	148	38.4
<b>Religion</b>		
I have not been doing this at all	73	19.0
I have been doing this rarely	67	17.4
I have been doing this sometimes	95	24.7
I have been doing this a lot	150	39.0
<b>Self-blame</b>		
I have not been doing this at all	135	35.1
I have been doing this rarely	126	32.7
I have been doing this sometimes	86	22.3
I have been doing this a lot	38	9.9

The top five (5) coping strategies that are used a lot are *planning, religion, acceptance, humour, and positive reframing*, while the least used is *substance abuse*.

Figure 1: A multiple bar chart showing the percentage frequency of the v arious coping strategies used



**Table 32: Influence of age on depression**

Age group	Not depressed	Depressed	Total	Chi-square	P-value
15 – 19	82	14	96	7.124	0.068
20 – 24	216	27	243		
25 – 29	32	11	43		
30 – 34	3	0	3		

There is no statistically significant difference, thus depression is not affected by age.

**Table 33: Influence of sex on depression**

Sex	Not depressed	Depressed	Total	Chi-square	P-value
Male	175	35	210	3.949	0.047
Female	158	17	175		

There is a statistically significant difference, thus depression is affected by sex.

**Table 34: Influence of religion on depression**

Religion	Not depressed	Depressed	Total	Chi-square	P-value
Christianity	327	47	374	11.839	0.003
Muslim	5	5	10		
Traditional	1	0	1		

There is a statistically significant difference, thus depression is affected by religion.

**Table 35: Influence of ethnicity on depression**

Ethnicity	Not depressed	Depressed	Total	Chi-square	P-value
Igbo	309	46	355	6.94	0.074
Yoruba	8	2	10		
Hausa	0	1	1		
Others	16	3	19		

There is no statistically significant difference, thus depression is not affected by ethnicity.

**Table 36: Influence of marital status on depression**

Marital status	Not depressed	Depressed	Total	Chi-square	P-value
Single	329	52	381	0.631	0.427
Married	4	0	4		

There is no statistically significant difference, thus depression is not affected by marital status.

**Table 37: Influence of faculty on depression**

Faculty	Not depressed	Depressed	Total	Chi-square	P-value
Law	48	6	54	3.721	0.714
Dentistry	10	1	11		
Medical sciences	80	14	94		
Health sciences	94	17	111		
Basic Medical sciences	6	1	7		
Environmental studies	42	9	51		
Business Administration	53	4	57		

faculties.



There is no statistically significant difference, thus depression is not affected by the f

**Table 38: Influence of year of study on depression**

Year of study	Not depressed	Depressed	Total	Chi-square	P-value
Year 1	31	5	36	6.062	0.300
Year 2	69	8	77		
Year 3	89	20	109		
Year 4	59	11	70		
Year 5	34	5	39		
Final year	51	3	54		

There is no statistically significant difference, thus depression is not affected by the year of study.

**Table 39: Influence of monthly allowance on depression**

Monthly allowance	Not depressed	Depressed	Total	Chi-square	P-value
<N10,000	84	10	94	4.711	0.318
N10,000 - 20,000	129	25	154		
N20,000 - 50,000	80	11	91		
N50,000 - 99,000	13	5	18		

There is no statistically significant difference, thus depression is not affected by monthly allowance.

**CONCLUSIONS**

The result of this study gives an insight on the role of health education and proper management of disease conditions in promotion of health.

With respect to this, one would say that a high level of proper education of all and sundry about depression, its causes, manifestations, management and prevention, is vital to control the prevalence of depression. This is because depression, if neglected among adolescents and adults, can lead to a high rate of health-risky behaviours and criminal acts in tertiary institutions.

This also shows that, depression and its associated factors can be reduced to the barest minimum if there is propagation of the top five problem-solving coping strategies such as planning, religion, acceptance, humour and positive reframing.

Finally, the significant association of depression with sex and religion and its insignificant association with the other components of the socio-demographic data, nevertheless creates the need for a high index of suspicion and screening of depression among all individuals irrespective of age, sex, religion, ethnicity, marital status, educational and economic status.

**6.2 RECOMMENDATIONS**

First and foremost, a proper education of the masses on depression, its causes, manifestations and management are essential. This can be done through the internet, lecture, mass media, social media, movies, seminars and workshops and posters, as depression is a state of low mood and aversion to activity that can affect a person's thought, behaviour, feelings and sense of well-being. The masses should be taught how to detect depression on time. This will make treatment easy and will reduce its burden to the society, family and individuals.

It will also be nice if depression as a topic is incorporated into the curriculum of the students. This can be achieved through lectures, group discussions and seminars. If this is done, early detection by the students can be achieved, making it easier for medical and health practitioners to manage.

In addition, counselling services should also be rendered to students. This is because it creates an atmosphere where students can easily discuss their problems with their counsellors and solutions proffered to them. Appropriate coping strategies for stress are also impacted on them. Importantly too, the establishment of agencies that will make policies, train staff and establish health facilities for diagnosing and managing depression. This is needed even in tertiary institutions too as depression is one of the missed diagnosis by physicians. It will also help to screen individuals with mild and high tendency to depression.

Propagation of healthy coping strategies is also essential and if possible problem solving coping strategies is recommended since the university community might be a fertile ground for cultivation and propagation of health-risky practices, such as substance abuse, catastrophic behaviours, and so on. Therefore, coping strategies such as planning, positive reframing and acceptance are highly recommended, while the use of substance, denial and self-blame should be highly rebuked.

Finally, health agencies should involve religious leaders in the management and prevention of depression as religion was found to be the second strongest coping strategy after planning. Students should also participate in religious activities and programmes as this will provide a sense of belonging and keep health-risky behaviours remote.

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# KNOWLEDGE, ATTITUDE AND PRACTICE OF MOTHERS TOWARDS CHILDHOOD IMMUNIZATION IN ENUGU METROPOLIS

By

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## INTRODUCTION

Immunization against childhood diseases is one of the most important means of preventing childhood morbidity and mortality. Over two million deaths are delayed through immunization each year worldwide. In spite of this, vaccine-preventable diseases remain the most common cause of childhood mortality with an estimated three million deaths each year [13].

Immunization is one of the eleven components of primary health care. Prevention of diseases by immunization, a conventional public health measure, is today, the best known practical, low cost community-based way of protecting children against major killer childhood diseases. Thanks to the World Health Organization, WHO, which in 1974, formulated and launched Expanded Programme on Immunization (EPI) [14]. The EPI was aimed at reduction of morbidity and mortality caused by vaccine-preventable diseases.

Much work has been done locally, and internationally since the launch of EPI forty-two years ago to assess, review, and map out strategies in order to achieve the goals of Global Vaccine Action Plan (GVAP) by 2020 which are to Achieve a world free of poliomyelitis, Meet global and regional elimination target, Meet vaccination coverage in every region, country and community, develop, introduce new and improved vaccine and technology and exceed the millennium development goal 4 target for reducing child mortality [15]

These studies have been in the form of assessment of knowledge, attitude, practice as well as evaluation of coverage of EPI at various levels.

As at 1974 when EPI was established, no reliable figures were available on immunization coverage rate in infants. Estimating from the total quantities of vaccine used then, it could be assumed that coverage was well below 5% for infants receiving one dose of measles vaccine or third dose of either DPT or polio vaccine [16].

Thirty-six years later (2010), global status on immunization coverage with BCG rose to 90%, DPT-3, 85%, polio, 86%, and measles, 85% [17]. In the year 2014 (forty years later) the global status on immunization coverage with BCG was 86%, DPT-3, 86%, OPV-3, 86%, and measles, 85% [18]. The above figures obtained from 2010 and 2014 global immunization coverage, when compared, shows that there is an increase in global immunization coverage with DPT-3 and OPV-3 respectively, coverage for measles remained the same while that for BCG reduced [17,18].

Recent world health report on EPI update released on November 13, 2015 showed that global immunization coverage with the four core vaccines namely, BCG for protection against tuberculosis, DPT for protection against diphtheria, pertussis (whooping cough), and tetanus, polio vaccine and measles vaccine has increased from less than 5% in 1974 to 85% or more and additional vaccines have been added to the recommended schedule [20]. It has been shown that in counties where 40% of the children are fully vaccinated, rates of diseases such as polio, measles, mumps, rubella, diphtheria, pertussis (whooping cough) and meningitis caused by Haemophilus influenza type B have declined by 95 to 100% [5]. Despite the acknowledged benefits of childhood vaccinations, reports have shown that immunization coverage in Nigeria is still low [2].

Nigeria recorded national routine immunization coverage of 12% in 2003 and 36% in 2006. In 2009 Nigeria accounted for about 3.5 million (14%) of the 23.2 million children worldwide who did not receive three doses of DPT vaccine during the first year of life [19]. Currently the immunisation coverage in Nigeria stands at ..... One of the key reasons may be attributed to the rejection of selected

vaccines/vaccinations by parents or religious bodies more especially in the Northern part of this country. Many decision-makers and caregivers reject routine immunization due to rumours, incorrect information and fear [12]. Attempts to increase coverage must include awareness of peoples' attitudes and the influences of these on behaviour, hence, the pertinent need of this study in this part of our environment.

Various studies have also been carried out in different parts of Nigeria on the knowledge, attitude and practice of childhood immunization. A study done in Lagos University Teaching Hospital (LUTH), Nigeria, showed that almost all the respondents were aware of childhood immunization and that immunization could prevent childhood sickness (93.8% and 98.1% respectively). Some of the respondents, however, felt that immunization would make the children brilliant (28.8%) and grow fast (10.9%). A high percentage of mothers knew that immunization could prevent poliomyelitis, measles, diphtheria, tuberculosis, yellow fever and hepatitis but 48.6% of the respondents thought immunization could prevent malaria. Although 82.5% and 86.4% knew that immunization could be administered as an injectable and mouth drop respectively, a high percentage (55.3%) thought immunization could be in syrup formulation. As earlier mentioned, majority of the respondents had good knowledge of immunization and that immunization could prevent childhood diseases. This may be consistent with the study of Freeman et al (1992) that showed the relationship between mother's education and knowledge of the diseases immunization could prevent [21].

In Enugu a similar study was conducted and released in the year 2012. The study showed that 81.2% of the mothers mentioned the prevention of major killer diseases as the reason for immunization, 17.4% said that children are immunized to prevent or treat all diseases. Summarily, most mothers studied had good knowledge and positive perception and practice of immunization [17]

What are the knowledge, attitude and practice of mothers within Enugu metropolis towards childhood immunization? Identifying and evaluating attitudes, knowledge and practice of mothers to childhood immunization in our environment is crucial due to the role played by mothers in child care giving. This study was then aimed at ascertaining the knowledge, attitude and practice of mothers within Enugu metropolis toward childhood immunization, identifying the socio-demographic characteristics of mothers and their possible effects on childhood immunization, determining the socioeconomic and cultural factors that could affect the mothers' knowledge, attitude and practice on childhood immunization and ascertaining from the mothers factors that could contribute to childhood immunization coverage. This will enable the Government and those in charge of providing health services to provide sensible programmes and service enrolment through well-articulated policies, projects and programmes. This also generates a kind of feedback input sorely lacking in our healthcare system, which is imperative and essential towards reducing child mortality and morbidity through impact assessment due to ineffective and abortive child immunization schedules and plans. This is to ensure increased uptake, child survival and healthy growth of children in Nigeria, in addition to enhancing the quality of life. It may also suggest a perception on how to improve on the current National Programme on Immunization in Nigeria.

**Methodology**  
**study Area**

This study was carried out in selected government-owned health institutions in Enugu Metropolis, South-East Zone of Nigeria: Uwani Cottage Hospital, a secondary health

facility and Institute of Child Health of the University of Nigeria Teaching Hospital (UNTH) which is the largest tertiary health facility in the South Eastern zone. Both hospitals offer health services including immunization services to over 722,664 people resident in Enugu. (2006 population census).

**Subjects and methods**

This was a descriptive cross sectional survey in which participants were consecutively enrolled from the pool of mothers attending immunization clinics of UNTH and Uwani Cottage Hospitals respectively. The study population included women of reproductive age group who are attending clinic in selected government-owned health institutions in Enugu metropolis. Study participants were women within reproductive age group attending clinic in selected government-owned health institutions in Enugu metropolis, who have an under-five child and gave informed verbal consent for the study.

Data were collected using both interviewer-administered and self-administered questionnaire distributed depending on each respondent's choice.

The information sought on the questionnaires comprised of the following: socio-demographic and socioeconomic characteristics of the participants, knowledge, attitude and practice towards childhood immunization, perceived factors affecting childhood immunization coverage, and recommendations towards ameliorating any identified factor.

**DATA MANAGEMENT:**

After collection, the data was analyzed using SPSS and presented in tables and pie chart. Then conclusions were drawn from it.

**SOCIO-DEMOGRAPHIC CHARACTERISTICS**

**Age:** This is widely distributed with the least percentage of respondents at the extremes of the reproductive age group- 15-19 and 40 years and above (3.1% and 4.8% respectively)

AGE	FREQUENCY	PERCENTAGE
15-19YRS	7	3.1
20-24YRS	92	18.4
25-29YRS	79	32.5
30-34YRS	66	28.7
35-39YRS	23	12.3
40YRS AND ABOVE	11	4.8
TOTAL	228	100

Table showing ages of respondents  
Mean age +/- standard deviation= 29.2+/-214.2

**Highest Educational Attainment:** Most have senior school certificate (37.3%) or degree (34.6%). Only 3.1% of respondents have no formal education

Educational status	Frequency	Percentage
Senior school leaving certificate	85	37.3
Degree	79	34.6
Diploma	38	16.7
First school leaving certificate	19	8.3
No formal education	7	3.1
Total	228	100

**Occupation:** Most are traders (31.1%) or civil servants (28.9%) the least frequent occupation being farming (2 persons-0.9%).

Occupation	Frequency	Percentage
Trader	71	31.1
Civil servant	66	28.9
Student	39	17.1
Housewife	33	14.5
Artisan	17	7.5
Farmer	2	.9
Total	228	100

Table showing occupation of respondents

**Religion**

Religion	Frequency	Percentage
Christianity	224	98.2
Islam	3	1.3
African traditional religion	1	.4
Total	228	100

Table showing religion of respondents

**Marital Status**

Marital status	Frequency	Percentage
Married	216	94.7
Single	8	3.5
Widowed	4	1.8
Total	228	100

Table showing marital status of respondents

**Spouse's Occupation**

Occupation of spouse	Frequency	Percentage
Trader	90	41.1
Civil servant	79	36.1
Artisan	22	10.0
Student	16	7.3
Farmer	12	5.5
Total	219	100

**Spouse's Monthly Income**

Spouse's Monthly Income	Frequency	Percentage
5000-12000 Naira	33	22.6
15000-24000 Naira	31	18.5
25000-34000 Naira	22	13.1
35000-44000 Naira	45	26.3
Above 44000 Naira	32	17.0
TOTAL	163	100

Table showing respondents' spouse's monthly income

**Family Type**

Family type	Frequency	Percentage
Monogamous	199	91.7
Polygamous	18	8.3
Total	217	100

Table showing respondents' family type

**Number Of Children**

Number of children	Frequency	Percentage
3 or less	169	77.9
4 - 6	47	21.7
More than 6	1	.5
Total	217	100

Table showing number respondents' children

**Residential Area**

Residential Area	Frequency	Percentage
Urban area	160	70.2
Rural area	68	29.8
Total	228	100

Table showing respondents' residential area

**KNOWLEDGE**

**Awareness And Source Of Information**

All the respondents are aware of childhood immunization with the most frequent source of information being the health worker (55.7%) and newspaper the least (3.5%).

Have you heard of immunization?	Frequency	Percentage
Yes	228	100.0
No	0	0.0
If yes, what source		
A friend	15	6.6
Newspaper	8	3.5
TV	30	13.2
Radio	34	14.9
Church	14	6.1
Health worker	127	55.7

From a research conducted, measles is the most popular vaccine-preventable disease (91.2% of respondents know that it is vaccine-preventable), BCG is the most popular vaccine (95.6% of respondents know that it is one of the vaccines children receive), 79.8% of respondents know that measles vaccine is meant to protect against measles and 77.6% know that Oral Polio Vaccine (OPV) protects against polio, 96.9% know that BCG is given at birth.

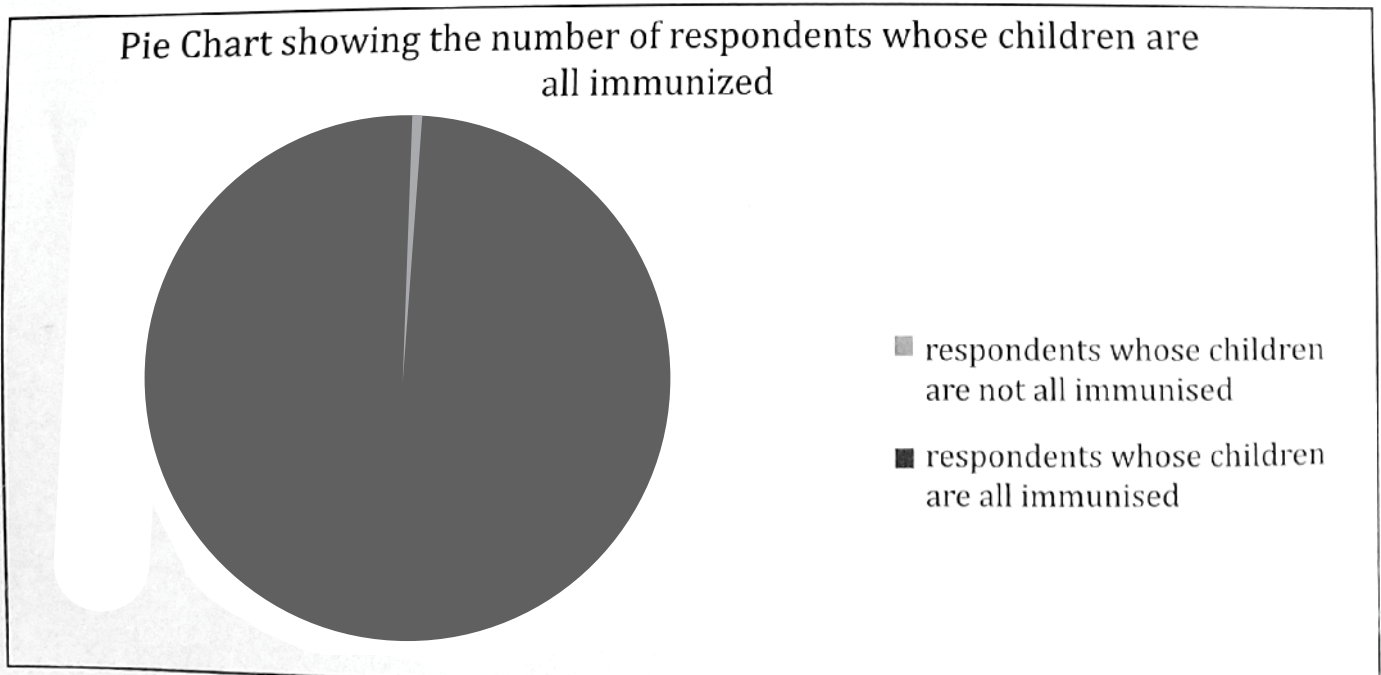
**ATTITUDE:** 0.4% of respondents (1 person) thinks immunization is unnecessary and would not recommend it to a friend or relative.

Do you think immunization is necessary?	Frequency	Percentage
Yes	227	99.6
No	1	.4
Would you recommend immunization to a friend or relative?		
Yes	227	99.6
No	1	.4

Table showing attitude of respondents towards childhood immunization

**PRACTICE AND DETERMINANTS/DETERRENTS**

0.4% of respondents said all their children are not immunized reason being that it is not necessary.



Are all your children immunized?	Frequency	Percentage
Yes	227	99.6
No	1	.4
If no why?		
Not necessary	1	.4
If yes were all your children immunized on their scheduled dates?		
Yes	217	95.2
No	11	4.8
Did your children receive full course of immunization?		
Yes	218	95.6
No	10	4.4

Table showing practice and determinants/deterrents of childhood immunization

**Place Of Vaccination**

Health centre is the most used facility for childhood vaccination with 63% of respondents stating that their children got vaccinated at a health centre as shown below:

Where were they immunized?	Frequency	Percentage
Local maternity	1	.4
Health centre	143	63.0
General hospital	73	32.2
Private clinic	8	3.5
At home during mass immunization	2	.9

Table showing place of vaccination

**RECOMMENDATION:** This varied ranging from more awareness creation (7%) to plans for continuity by government (6.6%) to reduction of cost (2.6%).

**RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS AND PRACTICE OF CHILDHOOD IMMUNIZATION**

Age	Did your children receive full course of immunization			Chi - square	P - value
	Yes	No	Total		
15 - 19yrs	7	0	7		
20 - 24yrs	37	5	42		
25 - 29yrs	70	4	74	9.252	0.099
30 - 34yrs	65	1	66		
35 - 39yrs	28	0	28		
Educational level					
No formal education	7	0	7		
First school leaving certificate	18	1	19		
Senior school leaving certificate	81	4	85	0.742	0.946
Diploma	37	1	38		
Degree	75	4	79		
Occupation					
Student	35	4	39		
Trader	68	3	71		
Civil servant	66	0	66	8.850	0.115
Farmer	2	0	2		
Housewife	30	3	33		
Artisan	17	0	17		
Religion					

Christianity	214	10	224		
Islam	3	0	3	0.187	0.911
African tradition religion	1	0	1		
Ethnic					
Igbo	204	10	214		
Hausa	2	0	2	0.684	0.877
Yoruba	10	0	10		
Others	2	0	2		
Marital status					
Single	7	1	8		
Married	207	9	216	1.464	0.481
Widowed	4	0	4		

Table showing relationship between socio-demographic characteristics of mothers and their practice of immunization

**DISCUSSION**

All mothers interviewed had heard of immunization previously and this is may be attributed to the fact that our study population were mothers attending immunization clinic. Majority (55.7%) heard about immunization from a health worker probably at antenatal clinics. This is similar to results from a study done in University of Ibadan, Nigeria on the uptake of immunization among mothers of under 5 in south-western Nigeria in 2008: the commonest source of knowledge was antenatal clinic (65.7%) followed by health educator (19.2%) [26].

However, there are still misconceptions about immunization as some mothers (67.1%) thought it prevented all diseases, 13.6% thought it could cause infertility in the female child, 46% thought immunization wasn't meant for adults and 25% thought pregnant women don't get immunized. From the study in University of Ibadan, 2% of mothers volunteered that immunization could cause infertility, and this low percentage could be attributed to the fact that the option was not listed in their questionnaire [26]. Some of these misconceptions from our results may be due to misinformation from friends or relatives and also the emphasis on the importance of only childhood immunization at most antenatal clinics.

Assessment on their knowledge of childhood immunizable diseases revealed that mothers erroneously thought immunization could prevent Headache (33.8%), typhoid (60.1%) and malaria (52.6%). This may be due to the fact that most health educators especially at antenatal clinics do not specifically state that not all childhood diseases are vaccine-preventable, hence some mothers are left to assume that it confers an all-round protection.

childhood immunization and what disease each of them protect against revealed that while most mothers were aware of the childhood vaccines; BCG (95.6%), hepatitis b (82.9%), pentavalent (75.4%), IPV (69.3%), yellow fever (87.3%), OPV (88.2%), measles (93%), less mothers were aware of the diseases they protect against; BCG-tuberculosis (75%), hepatitis b-hepatitis (71.1%), pentavalent-diphtheria (63.2%), pentavalent-pertussis (63.2%), pentavalent-tetanus (64.9%), pentavalent-Haemophilus influenza b infection (53.3%), pentavalent-hepatitis b infection (59.2%), IPV-poliomyelitis (64.5%),

yellow fever-yellow fever (74.6%), OPV-poliomyelitis (77.6%), measles vaccine-measles (79.8%). This is probably because mothers through routine immunization get to learn the names of the vaccines administered to their children over time but since most health talks either at antenatal clinics or immunization clinics do not include teaching the mothers the diseases each vaccine protects against, they are left to assume, guess, or get their knowledge from other sources (friends, immunization schedule posters at clinics, social media etc).

Assessment of their knowledge of time of administration of the vaccines revealed that most mothers were familiar with when each vaccine was supposed to be administered, especially OPV, BCG, Yellow fever and measles but were not as familiar with IPV administration probably because this is a new introduction to the NPI schedule.

Most mothers generally had good attitudes towards immunization with only 4.8% missing immunization on their scheduled dates and 4.4% having children who did not receive the full course of immunization. Majority of mothers immunized their children at health centres (63%) or a general hospital (32.2%) and volunteered their problem of having to wait too long on the queue but that did not affect their practice. This is similar to results from Yuan et al in 2000 which observed that the major barrier to immunization is waiting too long on the queue [27]. A good number of mothers whose children did not receive full course of immunization (40%) said it was because their child was sick at the time. 99.6% of mothers liked immunization and 96.5% liked how it is practiced where they have received immunization services. Mothers who did not like how immunization was practiced where they had received the services volunteered it was because of attitude of health care workers, cost of vaccines, they were delayed for so long before the services were rendered, and unavailability of vaccines on some occasions. Mothers volunteered also that they would continue with immunization for their children because it is important (6.6%), it prevents diseases (53.5%) and it is good (16.3%). Relationship Between Socio-Demographic Characteristics And Practice Of Childhood Immunization

Assessment of their knowledge of vaccines given in Null hypothesis, Ho: There is no difference between practices of childhood immunization among mothers of various socio-demographic characteristics.



From table 4.7, all the P values in the comparisons are more than 0.05 therefore there is no statistically significant difference between practices of childhood immunization among mothers of various socio-demographic characteristics in Enugu metropolis. Null hypothesis,  $H_0$ , is therefore accepted. A study conducted by the Department of International Development and the Federal Ministry of Health on the factors influencing immunization uptake showed a rise in the uptake with socio-economic status and formal education [29]. This is at variance with this study that showed no significant association between the immunization status and the occupation of the parents or educational status. This may be attributed to the various forms of awareness and enlightenment in the society today which try to bypass barriers of information dissemination (e.g. use of local languages in immunization adverts, using radio, television broadcasts, posters at antenatal clinics and health education at antenatal clinics) and intense health education which has made immunization appear customary irrespective of social class.

In conclusion the study showed that majority of the participants is educated to a reasonable degree which most likely had an impact on not just their knowledge but also attitude and practice towards child immunization programmes. This may perhaps lend credence to the fact that female education plays a key role in health-seeking behaviours exhibited by mothers. This also takes into cognizance the efforts put into place by the health-providing authorities in ensuring that mothers take more active and participatory roles in health-related matters concerning their offspring.

Also, a significant proportion of working-class civil servant mothers who bring their children for routine immunization as revealed by the study banish any doubts about their eagerness to seek out the best for their children despite their seemingly busy work schedules. But the same cannot be said for single mothers, who often left with the burden of catering for their families more often than not do not have sufficient time required to effectively participate in the exercise.

The study also revealed the importance of the women's spouse' monthly income generated as this undoubtedly avails them of the opportunity to actively seek out health centers or agencies for their children's immunization. This may be linked to the reduced burden of contributing to the family's upkeep and sustenance, thus affording them the opportunity to create time for health-seeking behaviour for their children. This should not be seen as much of a handicap as mothers even with low-income earning spouses still actively participate. This further lends credence to the fact that the government's and other health agencies' efforts to enlighten the populace on the need to actively immunize their children are bearing massive fruits. Unfortunately, a number of women still believe that childhood immunization has the tendency to cause infertility in their female offspring. This may lend credence to the impact of multi-faceted cultural beliefs and practices on the present day life of the average citizen. Also, a significant number of women were unsure of the type of vaccines being administered to their children; this may be as a result of the lack of some crucial level of health-education missing along the chain of information passage. Majority of those who participated in the study showed

excellent and appreciable attitude to childhood immunization practice which is very encouraging. Their knowledge as to the value and importance of childhood immunization was well gasped, hence their willingness to inform others as well as to participate in further immunization exercise if the need arises.

It is therefore recommended that the Government through the Ministry of Health should advocate for more participation by the citizens through mass media enlightenment and other means to get more people on board, considering the benefits of child immunization.

Also, the need on the part of government to take child immunization to the hinterlands and remote areas is of paramount importance as the study revealed that very few mothers from those places bring their children into the town for immunization (only 29.8% of the respondents live in the rural area). This will go a long way in reducing infant and child mortality from vaccine-preventable diseases which remain a scourge in these regions.

Also, some vaccines that have not been incorporated in the National Programme on Immunization e.g. HPV vaccine should be incorporated as this will go a long way in ensuring some level of 'adequate' protection from some diseases.

Healthcare works should also step up enlightenment briefings when mothers come for immunization exercise with their children. They should not just tell them the names of the vaccines and the time but also stress on the need for timely attendance, avoiding missing immunization schedules as well as encouraging them to invite their neighbours and friends whose children need to be immunized.

Mothers should also be encouraged to avoid missing immunization schedules for their children to enable their optimal protection from these vaccine-preventable diseases. They should also be encouraged and advised that child immunization does not cause infertility in female children. They should also serve as secondary enlightenment agencies in their communities of residence as regards child immunization.

## CONCLUSIONS

The result of this study gives an insight on the role of health education and proper management of disease conditions in promotion of health. With respect to this, one would say that a high level of proper education of all and sundry about depression, its causes, manifestations, management and prevention, is vital to control the prevalence of depression. This is because depression, if neglected among adolescents and adults, can lead to a high rate of health-risky behaviours and criminal acts in tertiary institutions.

This also shows that, depression and its associated factors can be reduced to the barest minimum if there is propagation of the top five problem-solving coping strategies such as planning, religion, acceptance, humour and positive reframing.

Finally, the significant association of depression with sex and religion and its insignificant association with the other components of the socio-demographic data,

nevertheless creates the need for a high index of suspicion and screening of depression among all individuals irrespective of age, sex, religion, ethnicity, marital status, educational and economic status.

### RECOMMENDATIONS

First and foremost, a proper education of the masses on depression, its causes, manifestations and management are essential. This can be done through the internet, lecture, mass media, social media, movies, seminars and workshops and posters, as depression is a state of low mood and aversion to activity that can affect a person's thought, behaviour, feelings and sense of well-being. The masses should be taught how to detect depression on time. This will make treatment easy and will reduce its burden to the society, family and individuals.

It will also be nice if depression as a topic is incorporated into the curriculum of the students. This can be achieved through lectures, group discussions and seminars. If this is done, early detection by the students can be achieved, making it easier for medical and health practitioners to manage.

In addition, counselling services should also be rendered to students. This is because it creates an atmosphere where students can easily discuss their problems with their counsellors and solutions proffered to them. Appropriate coping strategies for stress are also impacted on them.

Importantly too, the establishment of agencies that will make policies, train staff and establish health facilities for diagnosing and managing depression. This is needed even in tertiary institutions too as depression is one of the missed diagnosis by physicians. It will also help to screen individuals with mild and high tendency to depression.

Propagation of healthy coping strategies is also essential and if possible problem solving coping strategies is recommended since the university community might be a fertile ground for cultivation and propagation of health-risky practices, such as substance abuse, catastrophic behaviours, and so on. Therefore, coping strategies such as planning, positive reframing and acceptance are highly recommended, while the use of substance, denial and self-blame should be highly rebuked.

Finally, health agencies should involve religious leaders in the management and prevention of depression as religion was found to be the second strongest coping strategy after planning. Students should also participate in religious activities and programmes as this will provide a sense of belonging and keep health-risky behaviours remote.

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# REGENERATIVE MEDICINE: CURRENT THERAPIES AND FUTURE DIRECTIONS

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## INTRODUCTION

Organ and tissue loss through disease and injury motivate the development of therapies that can regenerate tissues and decrease reliance on transplantations. Regenerative medicine, an interdisciplinary field that applies engineering and life science principles to promote regeneration, can potentially restore diseased and injured tissues and whole organs. Since the inception of the field several decades ago, a number of regenerative medicine therapies, including those designed for wound healing and orthopedics applications, have received Food and Drug Administration (FDA) approval and are now commercially available. These therapies and other regenerative medicine approaches currently being studied in preclinical and clinical settings will be covered in this review. Specifically, developments in fabricating sophisticated grafts and tissue mimics and technologies for integrating grafts with host vasculature will be discussed. Enhancing the intrinsic regenerative capacity of the host by altering its environment, whether with cell injections or immune modulation, will be addressed, as well as methods for exploiting recently developed cell sources. Finally, we propose directions for current and future regenerative medicine therapies.

## THERAPIES IN THE MARKET

Since tissue engineering and regenerative medicine emerged as an industry about two decades ago, a number of therapies have received Food and Drug Administration (FDA) clearance or approval and are commercially available (Table 1). The delivery of therapeutic cells that directly contribute to the structure and function of new tissues is a principle paradigm of regenerative medicine to date (7, 8). The cells used in these therapies are either autologous or allogeneic and are typically differentiated cells that still maintain proliferative capacity. For example, Carticel, the first FDA-approved biologic product in the orthopedic field, uses autologous chondrocytes for the treatment of focal articular cartilage defects. Here, autologous chondrocytes are harvested from articular cartilage, expanded *ex vivo*, and implanted at the site of injury, resulting in recovery com-parable with that

observed using micro-fracture and mosaicplasty techniques (9). Other examples include laViv, which involves the injection of autologous fibroblasts to improve the appearance of nasolabial fold wrinkles; Celution, a medical device that ex-tracts cells from adipose tissue derived from liposuction; Epicel, autologous keratinocytes for severe burn wounds; and the harvest of cord blood to obtain hematopoietic pro-genitor and stem cells. Autologous cells re-quire harvest of a patient's tissue, typically creating a new wound site, and their use of-ten necessitates a delay before treatment as the cells are culture-expanded. Allogeneic cell sources with low antigenicity [for example, human foreskin fibroblasts used in the fab-rication of wound-healing grafts (GINTUIT, Apligraf) (10)] allow off-the-shelf tissues to be mass produced, while also diminishing the risk of an adverse immune reaction.

Table 1. Regenerative medicine FDA-approved products

Category	Name	Biological agent	Approved use
Biologics	laViv	Autologous fibroblasts	Improving nasolabial fold appearance
	Carticel	Autologous chondrocytes	Cartilage defects from acute or repetitive trauma
	Apligraf, GINTUIT	Allogeneic cultured keratinocytes and fibroblasts in bovine collagen	— foot ulcers
	Cord blood	Hematopoietic stem and progenitor cells	Hematopoietic and immunological reconstitution after myeloablative treatment
Cell-based medical devices	Dermagraft	Allogenic fibroblasts	Diabetic foot ulcer Transfer of autologous adipose stem cells
Biopharmaceuticals	Celution	Cell extraction	—
	GEM 125	PDGF-BB, tricalcium phosphate	Periodontal defects
	Regranex	PDGF-BB	Lower extremity diabetic ulcers
	Infuse, Infuse bone graft, Inductos	BMP-2	—
	Osteogenic protein-1	BMP-7	Tibia nonunion

The efficacies of regenerative medicine products that have been cleared or approved by the FDA to date vary but are generally better or at least comparable with preexisting products (9). They provide benefit in terms of healing and regeneration but are unable to fully resolve injuries or diseases (19–21). Introducing new products to the market is made difficult by the large time and monetary investments required to earn FDA approval in this field. For drugs and biologics, the progression from concept to market involves numerous phases of clinical testing, can require more than a dozen years of development and testing, and entails an average cost ranging from \$802 million to \$2.6 billion per drug (22, 23). In contrast, medical devices, a broad category that includes noncellular products, such as acellular matrices, generally reach the market after only 3–7 years of development and may undergo an expedited process if they are demonstrated to be similar to preexisting devices (24). As such, acellular products may be preferable from a regulatory and development perspective, compared with cell-based products, due to the less arduous approval process.

#### Therapies at the Preclinical Stage and in Clinical Testing

A broad range of strategies at both the pre-clinical and clinical stages of investigation are currently being explored. The subsequent sub-sections will overview these different strategies, which have been broken up into three broad categories: (i) recapitulating organ and tissue structure via scaffold fabrication, 3D bioprinting, and self assembly; (ii) integrating grafts with the host via vascularization and innervation; and (iii) altering the host environment to induce therapeutic responses, particularly through cell infusion and modulating the immune system. Finally, methods for exploiting recently identified and developed cell sources for regenerative medicine will be mentioned.

**Recapitulating Tissue and Organ Structure.** Because tissue and organ architecture is deeply connected with function, the ability to recreate structure is typically believed to be essential for successful recapitulation of healthy tissue (25). One strategy to capture organ structure and material composition in engineered tissues is to decellularize organs and to recellularize before transplantation. Decellularization removes immunogenic cells and molecules, while theoretically retaining structure as well as the mechanical properties and material composition of the native extracellular matrix (26, 27). This approach has been executed in conjunction with bio-reactors and used in animal models of disease with lungs, kidneys, liver, pancreas, and heart (25, 28–31). Decellularized tissues, without the recellularization step, have also reached the market as medical devices, as noted above, and have been used to repair large muscle defects in a human patient (32). A variation on this approach involves the engineering of blood vessels *in vitro* and their subsequent decellularization before placement in patients requiring kidney dialysis (33). Despite these successes, a number of challenges remain. Mechanical properties of tissues and organs may be affected by the decellularization process, the process may remove various types and amounts of ECM-associated signaling molecules, and the processed tissue may degrade over time after transplantation without

commensurate re-placement by host cells (34, 35). The detergents and procedures used to strip cells and other immunogenic components from donor organs and techniques to recellularize stripped tissue before implantation are actively being optimized.

Medical imaging technologies such as computed tomography (CT) and magnetic resonance imaging (MRI) can be used to create 3D images of replacement tissues, sometimes based on the patient's own body (48, 49) (Fig. 1C). These 3D images can then be used as molds to fabricate scaffolds that are tailored specifically for the patient. For example, CT images of a patient were used for fabricating poly-urethane and polyethylene-based synthetic trachea, which were then seeded with cells (50). Small building blocks, often consisting of cells embedded in a small volume of hydrogel, can also be assembled into tissue-like structures with defined architectures and cell patterning using a variety of recently developed techniques (51, 52) (Fig. 1D).

Although cell placement within scaffolds is generally poor controlled, 3D bioprinting can create structures that combine high resolution control over material and cell placement within engineered constructs (53). Two of the most commonly used bioprinting strategies are inkjet and microextrusion (54). Inkjet bioprinting uses pressure pulses, created by brief electrical heating or acoustic waves, to create droplets of ink that contains cells at the nozzle (55, 56). Microextrusion bioprinting dispenses a continuous stream of ink onto a stage (57). Both are being actively used to fabricate a wide range of tissues. For example, inkjet bioprinting has been used to engineer cartilage by alternating layer-by-layer depositions of electrospun polycaprolactone fibers and chondrocytes suspended in a fibrin–collagen matrix. Cells deposited this way were found to produce collagen II and glycosaminoglycans after implantation (58).

Microextrusion printing has been used to fabricate aortic valve replacements using cells embedded in an alginate/gelatin hydrogel mixture. Two cell types, smooth muscle cells and interstitial cells, were printed into two separate regions, comprising the valve root and leaflets, respectively (59) (Fig. 1 E and F). Microextrusion printing of inks with different gelation temperatures has been used to print complex 3D tubular networks, which were then seeded with endothelial cells to mimic vasculature (60). Several 3D bioprinting machines are commercially available and offer different capabilities and bioprinting strategies (54).

Although extremely promising, bioprinting strategies often suffer trade-offs in terms of feature resolution, cell viability, and printing resolution, and developing bioprinting technologies that excel in all three aspects is an important area of research in this field (54).

**Integrating Graft Tissue by Inducing Vascularization and Innervation.** To contribute functionally and structurally to the body, implanted grafts need to be properly integrated with the body.

Altering the Host Environment: Cell Infusions and Modulating the Immune System. Administration of cells can induce therapeutic responses by indirect means, such as secretion of growth factors and interaction with host cells, without significant incorporation of the cells into the host or having the transplanted cells form a bulk tissue. For example, infusion of human umbilical cord blood cells can aid in stroke recovery due to enhanced angiogenesis, which in turn may have induced neuroblast migration to the site of injury. Similarly, transplanted macrophages can promote liver repair by activating hepatic progenitor cells. Transplanted cells can also normalize the injured or diseased environment, by altering the ECM, and improve tissue regeneration via this mechanism.

Existing and New Cell Sources. Most regenerative medicine strategies rely on an ample cell source, but identifying and obtaining sufficient numbers of therapeutic cells is often a challenge. Stem, progenitor, and differentiated cells derived from both adult and embryonic tissues are widely being explored in regenerative medicine although adult tissue-derived cells are the dominant cell type used clinically to date due to both their ready availability and perceived safety (8). All FDA-approved regenerative medicine therapies to date and the vast majority of strategies explored in the clinic use adult tissue-derived cells.

There is great interest in obtaining greater numbers of stem cells from adult tissues and in identifying stem cell populations suitable for therapeutic use in tissues historically thought not to harbor stem cells. Basic studies aiming to understand the processes that control stem cell renewal are being leveraged for both purposes, with the prototypical example being studies with hematopoietic stem cells (HSCs) (For example, exposure of HSCs in vitro to cytokines that are present in the HSC niche leads to significant HSC expansion, but this increase in number is accompanied by a loss of repopulation potential. Coculture of HSCs with cells implicated in the HSC niche and in microenvironments engineered to mimic native bone marrow may improve maintenance of HSC stemness during expansion, enhancing stem cell numbers for transplantation. For example, direct contact of HSCs with MSCs grown in a 3D environment induces greater CD34<sup>+</sup> expansion than with MSCs grown on 2D substrate. Another example is that culture of skeletal muscle stem cells on substrates with mechanical properties similar to normal muscle leads to greater stem cell expansion and can even rescue impaired proliferative ability in stem cells from aged animals.

Embryonic stem (ES) cells and induced pluripotent stem (iPS) cells represent potentially infinite sources of cells for regeneration and are moving toward clinical use. ES cells are derived from blastocyst-stage embryos and have been shown to be pluripotent, giving rise to tissues from all three germ layers. Several phase I clinical trials using ES cells have been completed, without reports of safety concerns (Geron, Advanced Cell Technology, Viacyte). iPS cells are formed from differentiated somatic cells exposed to a suitable set of transcription factors that induce pluripotency. iPS cells are an attractive cell source because they can be generated from a patient's own cells, thus

potentially circumventing the ethical issues of ES and rejection of the transplanted cells. Although iPS cells are typically created by first dedifferentiating adult cells to an ES-like state, strategies that induce reprogramming without entering a pluripotent stage have attracted attention due to their quicker action and anticipation of a reduced risk for tumor formation. Direct reprogramming in vivo by retroviral injection has been reported to result in greater efficiency of conversion, compared with ex vivo manipulation, and allows over the fate of each cell is crucial for their safe application. High-throughput screens of iPS cells can determine the optimal dosages of developmental factors to achieve lineage specification and minimize persistence of pluripotent cells. High-throughput screens have also been useful for discovering synthetic materials for iPS culture, which would allow culture in defined, xenogen-free conditions. In addition, the same principles used to engineer cellular grafts from differentiated cells are being leveraged to create appropriate microenvironments for reprogramming. For example, culture on polyacrylamide gel substrates with elastic moduli similar to the heart was found to enable longer term survival of iPS-derived cardiomyocytes, compared with other moduli. In another study, culture of iPS cell-derived cardiac tissue in hydrogels with aligned fibers, and in the presence of electrical stimulation, enhanced expression of genes associated with cardiac maturation.

## CONCLUSION

To date, regenerative medicine has led to new, FDA-approved therapies being used to treat a number of pathologies. Considerable research has enabled the fabrication of sophisticated grafts that exploit properties of scaffolding materials and cell manipulation technologies for controlling cell behavior and repairing tissue. These scaffolds can be molded to fit the patient's anatomy and be fabricated with substantial control over spatial positioning of cells. Strategies are being developed to improve graft integration with the host vasculature and nervous system, particularly through controlled release of growth factors and vascular cell seeding, and the body's healing response can be elicited and augmented in a variety of ways, including immune system modulation. New cell sources for transplantation that address the limited cell supply that hampered many past efforts are also being developed.

A number of issues will be important for the advancement of regenerative medicine as a field. First, stem cells, whether isolated from adult tissue or induced, will often require tight control over their behavior to increase their safety profile and efficacy after transplantation. The creation of microenvironments, often modeled on various stem cell niches that provide specific cues, including morphogens and physical properties, or have the capacity to genetically manipulate target cells, will likely be key to promoting optimal regenerative responses from therapeutic cells. Second, the creation of large engineered replacement tissues will require technologies that enable fully vascularized grafts to be anastomosed with host vessels at the time of transplant, allowing for graft survival.

Thirdly, creating a proregeneration environment within the patient may dramatically improve outcomes of regenerative medicine strategies in general. An improved understanding of the immune system's role in regeneration may aid this goal, as would technologies that promote a desirable immune response. A better understanding of how age, disease state, and the microbiome of the patient affect regeneration will likely also be important for advancing the field in many situations. Finally, 3D human tissue culture models of disease may allow testing of regenerative medicine approaches in human biology, as contrasted to the animal models currently used in pre-clinical studies. Increased accuracy of disease models may improve the efficacy of regenerative medicine strategies and enhance the translation to the clinic of promising approaches. *in vitro* culture and transplantation to be bypassed. Strategies developed for controlled release of morphogens that direct regeneration could potentially be adapted for controlling delivery of new genetic information to target cells *in vivo*, to improve direct reprogramming. Cells resulting from both direct reprogramming and iPS cell differentiation methods have been explored for generating cells relevant to a variety of tissues, including cardiomyocytes, vascular and hematopoietic cells, hepatocytes, pancreatic cells, and neural cells. Because ES and iPS cells can form tumors, a tight level of control

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## CURRENT TRENDS OF IMMUNIZATION IN NIGERIA: PROSPECT AND CHALLENGES

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### INTRODUCTION: POLICY GUIDELINES AND TARGETS OF EPI IN NIGERIA

At the end of 2011, Nigeria was estimated to have a population of 167 million [1]. The Expanded Programme on Immunization (EPI), introduced in 1978 with the aim of providing routine immunization to children less than the age of two years, recorded initial but intermittent successes. The optimum level was recorded by the early 1990s with the country achieving universal childhood immunization coverage of 81.5%. But since that period of success, Nigeria has witnessed gradual but consistent reduction in immunization coverage. By 1996, the national data showed less than 30% coverage for all antigens, and this decreased to 12.9% 2003 [2]. This figure which is consistent with the 2003 national immunization coverage survey figures is among the lowest in the world and explains the poor health status of children in the country. It is the worst in the west African subregion, only better than Sierra Leone. For instance, the polio epidemic in Nigeria is the worst in the African region and constitutes threat to other nations [3].

The vision of EPI in Nigeria is to improve the health of Nigerian children by eradicating all the six killer diseases, which are polio, measles, diphtheria, whooping cough, tuberculosis, and yellow fever. Between 1985 and 1990, as outlined in the national health plan for that period, the objectives of EPI were to strengthen immunization, accelerate disease control and introduce new vaccines, relevant technologies and tools. In 1995 in line with the above, Nigeria became a signatory to the World Health Assembly, adopted the World Health Assembly Resolution (WHAR) and United Nations General Assembly Special Session (UNGASS) goals for all countries to achieve by 2005 (i) polio eradication, (ii) measles mortality reduction and (iii) maternal and neonatal tetanus elimination (MNTE). Nigeria also adopted the millennium development goals (MDGs) calling for a two-third reduction in child mortality, as compared to 1990, the year 2005. In addition to the above, the country ratified the United Nations General Assembly Special Session (UNGASS) goals urging Nigeria to achieve by 2010 (i) ensure full immunization of children under one year of age at 90% coverage nationally with at least 80% coverage in every district or equivalent administrative unit, and (ii) vitamin A deficiency elimination. In 1998 following from the above, Nigeria laid out the core activities of EPI policies which included the following: (i) monitoring of the performance, quality and safety of the immunization system through indicators; (ii) assessment of the current burden of vaccine-preventable diseases as well as the "future" burden of vaccine preventable diseases in terms of sickness, death and disability, as well as the economic burden; (iii) assessment of the impact of vaccination strategies, through ongoing epidemiological surveillance and reliable laboratory confirmation, as well as impact assessments in Nigeria; (iv) monitoring of the national immunization policies, particularly the vaccines used in the country and the target population for these vaccines (immunization schedules); and (v) monitoring of the overall proportion of children and women who are vaccinated (immunization coverage) and ensuring that all districts of the country are well covered with vaccination

### VACCINATION OF CHILDREN

Immunization and vaccination are two of the most important public health interventions and constitute a cost effective strategy to reduce both the morbidity and mortality associated with infectious diseases.

Over two million deaths are delayed through immunization each year worldwide [6, 7]. Despite this fact, vaccine-preventable diseases remain the most common cause of childhood mortality with an estimated three million deaths each year [8]. In recent times, vaccination has had a major impact on measles deaths. From 2000 to 2005, more than 360 million children globally received measles vaccine through supplementary immunization activities. Moreover, improvements have been made in routine immunization over this period.

These accelerated activities have resulted in a significant reduction in estimated global measles deaths. Overall, global measles mortality decreased by 60% between 1999 and 2005. The largest gains occurred in Africa where measles cases and deaths decreased by nearly 75% [9]. Thus, there is a lot of pressure on health facilities in different countries in controlling the disease through

vaccination. Indeed, measles is targeted by the WHO in its expanded programme of immunization (EPI).

According to the National Programme on Immunization [10], routine immunization of children in Nigeria is carried out using the following vaccines;

- BCG ( Bacilli Calmette Guerin)—at birth or as soon as possible after birth
  - OPV (Oral Polio Vaccine)—at birth and at 6, 10, and 14 weeks of age
  - DPT (Diphtheria, pertussis, tetanus)—at 6, 10, and 14 weeks of age
  - Hepatitis B—at birth, 6 and 14 weeks
  - Measles—at 9 months of age
  - Yellow Fever—at 9 months of age
  - Vitamin A—at 9 months and 15 months of age
- According to the Nigerian Federal Ministry of Health definition, a child is considered fully vaccinated if he or she has received a BCG vaccination against tuberculosis; three doses of DPT to prevent diphtheria, pertussis (whooping cough), and tetanus; at least three doses of polio vaccine; and one dose of measles vaccine.



All these vaccinations should be received during the first year of life, over the course of five visits, including the doses delivered at birth. According to this schedule, children aged 12–23 months would have completed their immunizations and be fully immunized. To keep track of the delivery of these immunizations, Nigeria also provides parents or guardians with a health card on which each dose is recorded.

In their study, Henry *et al.* [11] showed only immunizations completed for children aged 12–23 months, the usual age group for reporting immunization rates. Their results revealed that one-fourth of all children aged 12–23 months had received the three recommended doses of polio but many missed the corresponding third dose of DPT3, which was received by only 5.1% of one year olds. Only 2.2% of children 12–23 months of age received all recommended doses. More children in Yobe (3.8%) than in Katsina (2.5%) and Zamfara (0.2%) received all recommended doses ( $p = 0.05$ ). Further analysis of the data shows that 67% of parents who were unable to receive all immunizations reported lack of vaccine as a problem, and 13% had difficulties with the long wait. Children in the urban areas have consistently higher immunization rates than those in the rural areas. Overall, 4.6% of children 12–23 months of age had received all of the recommended doses by one year of age, compared to only 1.1% in the rural areas ( $p = 0.005$ ).

The greatest urban advantage is associated with the BCG dose, which is administered at birth and probably reflects the higher proportion of births in health care facilities in the urban areas. For DPT3 and Polio3 the urban and rural rates are much closer.

Although malaria is not included in the list of childhood diseases, researches are ongoing to develop a malaria vaccine which will hitherto prevent and reduce infant malaria. Recently, a purified irradiated PFSPZ vaccine administered to individuals by inoculation in the skin proved safe, sub-optimally immunogenic and protective. Also, efforts are on towards an effective vaccination to combat influenza. In a recent report, changing the amino acid residue in the stem cell region of the HA2 sub unit of the haemagglutinin molecule showed promise as a strategy for cell culture based influenza vaccines.

#### COVERAGE

Immunization coverage is a health output the ultimate effect of which is a reduction in disease incidence. Disease surveillance systems currently lag behind coverage assessments, and reported cases of vaccinepreventable diseases in most countries are only a small, and unknown, fraction of the actual number of cases occurring. Disease surveillance systems are essential tools for effective health systems: they provide early warning of disease outbreaks and provide information essential to the management of immunization programs. Strengthening surveillance systems as part of improvement of immunization programs is therefore of vital importance. Achieving high levels of coverage is, by itself, not a sufficient indication of the effectiveness of a health care system, as deficiencies in

other areas could be widespread. However, *lack of progress* in moving towards high levels of coverage is a strong indication of failure to provide essential services to protect the health of the most vulnerable segment of a population. For diphtheria, pertussis, tetanus (DPT), a minimal coverage goal of 80 percent (three doses) by 2005 has been proposed by the Global Alliance for Vaccines and Immunization (GAVI), to be achieved in all districts in all countries.

Countries across the world, at different levels of income, have shown that this is achievable with sustained efforts [5].

#### CURRENT EPIDEMIOLOGICAL SITUATION OF POLIO IN NIGERIA

1. More States in Nigeria were polio free in 2006 than in 2005: 22 States did not report wild poliovirus case in 2006 as compared to 16 in 2005.
2. NPI has adopted a more integrated strategy that aims at increasing the acceptability/ demand for immunization in general and reducing the child mortality.
3. In 2006, Nigeria reported a high poliovirus transmission mainly in six states in the northern area of the country. According to WHO data, 438 wild poliovirus cases had been confirmed in 15 states, as of June 9, 2006. This compares with 173 cases for the same period in 2005. Today Nigeria accounts for 83% of the global wild poliovirus cases in 2006 and for 98% of the cases in Africa. In 2013, Nigeria still has cases of wild poliovirus and in November, 2013, the Bill and Melinda Gate Foundation on polio eradication pledged its support for the total eradication of the poliovirus by 2015.

- Nigeria is the last polio endemic country in Africa with a high polio transmission in the northern part of the country
- Six of the country's 37 states—Bauchi, Jigawa, Kaduna, Kano, Zamfara and Katsina—accounted for 90% of all cases in Nigeria in 2006.
- The total number of confirmed wild poliovirus cases in Nigeria for the year 2005 was 801 with a total of 21 states infected. Nigeria accounted for 41% of the global wild poliovirus cases in 2005 [13].

As on March 14, 2005, 18 States in Nigeria reported the infection of wild polio virus. The infection affected 55 local government areas (LGAs) in the country, with the majority of the infected LGAs being in the northern zone. Only Edo State recorded polio infection in two of its LGAs in 2005. As of August 2005, 55 LGAs 18 states were still seriously affected by polio infections in.

The above data suggest that since 1975 when EPI started in Nigeria, and even with government attention directed to public health care (PHC) since 1985, Nigeria remains endemic to poliomyelitis. Since 2000, government has directed its EPI programme on eradication of polio [4].

In 2011, one of polio due to wild poliovirus (WPV1) was reported, with onset on February 7, from an LGA in Borno state (Marte) that was previously infected in 2010.

Table 1. Wild polio virus case

Wild polio virus type	Year	
	2010	2011
Wpv1	7	40
Wpv3	11	12
<b>Total</b>	<b>18</b>	<b>52</b>

Although the genetic data is not yet available for this case, it is highly likely that it represents a continuation of the 2010 transmission in the same area. One case due to cVDPV2 has also been reported, from Zamfara, with onset in January.

In 2010, Nigeria reported a total of 21 cases of polio due to WPV (8 WPV1 and 13 WPV3), from 21 LGAs in eight states, versus 388 cases from 198 LGAs in 27 states in 2009. This is the lowest incidence of both types over a 12-month period that Nigeria has ever recorded. Circulating vaccine-derived poliovirus (cVDPV) incidence also dropped significantly in 2010, with 27 cases reported from 23 LGAs in eight states versus 154 in 96 LGAs in 15 states in 2009. The eight cases of WPV1 were detected in 2010 in three different transmission areas; the earliest WPV1 case of the year, in Sokoto in April, was a continuation of transmission within Sokoto from 2008–2009. No further cases have been detected in this transmission chain. The four cases in Borno and the one case in Kano (in addition to multiple cases in Chad) are genetically related to each other and are due to a continuation of transmission within Borno from 2009 (and as noted above, it is likely that the February 2011 case is from the same transmission chain). The two Kebbi cases are related to each other, although there is a genetic evidence indicating missed transmission, and represent continuation of transmission in the north-central and far northwestern areas from 2008 and 2009. The 13 WPV3 cases from 2010 demonstrate different transmission patterns. While there is one clear example of continuation of transmission from 2009 in the same area in Zamfara, several states have reported cases that appear to be due to sporadic importations (Delta, Katsina, one of the Zamfara cases, FCT); and the largest group of seven cases spreading across three northwestern states (Zamfara, Kebbi, Sokoto) was due to the introduction of WPV3 previously circulating (2009) in northeastern states on the other side of the country. This transmission chain also spread to Niger and Mali. Fifteen of the 27 cVDPV2 cases with onset in 2010 are from two clear transmission chains, one involving Kano, Kaduna, and Kebbi, and the other Kano, Borno, and Yobe. There is evidence from Kano in particular, but also Kaduna, Sokoto, and Kebbi, of transmission continuing from 2009. Clearly, cVDPV2 is also moving through the country, and in 2010 a case related to the Sokoto transmission was reported from Niger Republic.

One case due to cVDPV2 was reported from Zamfara in 2011. Another case of WPV3 with an onset of paralysis on November 30 was reported in Bursari district of Yobe State. The total number of cases for 2011 was 52 [14–18]. There is a high preponderance of failure to immunize due to

reported noncompliance, and community surveys around cases confirm the importance of noncompliant and under-informed communities in sustaining poliovirus transmission [19].

#### ERADICATING POLIO

Among the greatest obstacles to polio eradication in Nigeria is the lack of basic health infrastructure, which limits vaccine distribution and delivery, as well as internal strife and the sometimes oppositional stance that marginalized communities take against what is perceived as a vertical (top down) intervention. Another challenge has been maintaining the potency of live (attenuated) vaccines in extremely hot or remote areas.

The oral polio vaccine must be kept at 2–8°Celsius for vaccination to be successful [20].

Poliovirus transmission in Nigeria has been significantly reduced in 2010 following real progress in improving programme quality and community engagement and reaching more children consistently with the vaccine. This progress provided a strong platform for completing eradication in 2011. The developments noted above demonstrate that the national programme is actively seeking new and effective ways to improve quality and to finish the job. However the ERC is hampered by a number of issues. The continued circulation of all three poliovirus types, the continued evidence of quality gaps and failure to reach all children in key high risk areas during IPDs, and the evidence of surveillance gaps detected through genetic analysis and special field investigations all show that polio can and will return with a vengeance if the programme does not rapidly succeed in further improving quality.

The inevitable distraction of political leadership in the period leading up to national and state elections is a further concern. The ERC believes that the programme must rapidly step up effort to close remaining quality gaps and complete eradication. The basic elements necessary for doing this already exist; the key will be ensuring effective implementation of existing plans and strategies. Mopup responses must achieve the intended high quality; high risk operational plans and intensified ward communication strategies must be developed and implemented in key high risk areas.

## MEASLES

The potential impediments to the eradication of measles include the lack of appreciation of disease severity, transmission among adults, waning immunity, the possibility of transmission from subclinical cases, misinformation, quality, intensity and duration of vaccine-induced immunity, low vaccination rates and coverage, the burgeoning acquired immune deficiency syndrome epidemic, vaccine failures, global travel and international spread of measles, and the threat from bioterrorism [21–23]. A key issue is the duration of vaccine efficacy in developing countries [24]. Despite intense efforts to eradicate it, measles still infects 30–40 million people worldwide and causes half a million deaths a year [25]. It is the leading killer among vaccine-preventable diseases and causes an estimated 44% of the 1.7 million vaccine-preventable deaths among children each year [26]. The case fatality rate of measles in developing countries is high, particularly among infants, and reaches 30% among patients admitted to hospital [27]. Even in affluent countries, the complication rate is high and epidemics cause severe morbidity, permanent sequelae, and death [28].

Immunization against measles is usually carried out by means of the following vaccines;

- Live vaccines
  - Live attenuated vaccines containing measles, mumps, and rubella (MMR)
- A combined measles, mumps, rubella, and varicella vaccines (MMRV)
- Human normal immunoglobulin (HNIG)
- Vitamin A supplements administered to children diagnosed with measles [29–31]

## FACTORS AFFECTING ROUTINE IMMUNIZATION IN NIGERIA

Immunization rates in northern Nigeria are some of the lowest in the world. According to the 2003 National Immunization Schedule the percentage of fully immunized infants in the targeted states was less than 1% in Jigawa, 1.5% in Yobe, 1.6% in Zamfara and 8.3% in Katsina. As a result, thousands of children are victims of vaccine preventable diseases.

There are several reasons for these low rates. Firstly, primary health care services are highly ineffective and have deteriorated due to the lack of investment in personnel, facilities and drugs, as well as poor management of existing resources. There is also a lack of confidence and trust by the public in the health services resulting from the poor state of facilities and low standards of delivery. These problems have been exacerbated by “vertical” interventions undertaken by outside agencies which undermined the capacity of the local service providers to implement sustainable programmes. At the family/community level there is a low demand for immunization due to a lack of understanding of its value [32]. Some of these problems are briefly discussed below;

## MISPERCEPTIONS OF ROUTINE IMMUNIZATION

Incorrect knowledge as to the preventive role of routine immunization is widespread in Nigeria. Quantitative

research conducted in six states in 2004 reveals that in rural Enugu, diarrhoea, fever, convulsion, vomiting and malaria are believed to be vaccine preventable diseases (VPDs), while in rural and urban Kano, malaria, teething problems, vomiting, convulsion and pneumonia are listed. During pilot community research in March 2005, a number of immunization decision makers and caregivers in Katsina state stated that only polio immunization is required that once a child has received its polio ‘drops’, it is immunized against all childhood illnesses, including those for which there is no vaccine available, e.g. acute respiratory infection [32]. Those least likely to demonstrate high levels of correct knowledge include people who do not use public facilities for the treatment of common illnesses, those who lack easy access to public health facilities, and illiterates [33].

## Influence of religion

In Nigeria, the greatest challenge to the acceptance of immunization is a religious one especially among the northern Nigerian Muslims. Generally, the Muslim north has the low immunization coverage, the least being 6% (northwest) and the highest being 44.6% (southeast).

In Ekiti state (southwest), for example, the northeast and west of Ekiti, with a stronger Islamic influence, has low immunization coverage and also poor educational attainment. Christians have 24.2% immunization coverage as compared to only 8.8% for Muslims [34].

## INADEQUATE COLD CHAIN EQUIPMENT

Over the years Nigeria has received huge quantities of cold chain equipment. Despite this support, much of the cold chain appears to be beyond repair. This is partly due to the focus on polio eradication, which uses freezers. In one zonal store, only one of the three cold rooms was working, with only a single compressor operational. Substantial numbers of solar refrigerators have been bought in the last few years; although, a useful addition these are expensive (\$5,000 each) and prone to breakdowns. At the state level, the cold stores are poorly equipped and badly managed. More than half of the refrigeration equipment is either broken or worn out. In the eight states visited, 47% of the installed solar fridges were broken and \$205,000 worth of solar equipment remained uninstalled [35].

## POLITICAL PROBLEMS

The downward trend in the coverage of all the antigens appears to be associated with political problems. In Nigeria, the boycott of polio vaccinations in the three northern states in 2003 created a global health crisis that was political in origin [36, 37].

These political problems included low government commitment to ensure the fulfilment of EPI policy as well as overcentralization in the administration of EPI at the federal level of governance in Nigeria. The poor coverage of measles between 1998 and 2005 was blamed on vaccine shortages and administrative problems, as was the case in 1996, 1999 and 2000 when polio coverage was only 26%, 19% and 26% respectively [4]. Some positions offer potential for patronage due to the large payments for NID activities.

This has led to political appointments and frequent changes in personnel as some LGA chairmen wish to bestow or repay political favours. Even at the state government level, increased political interference has been reported to be in the appointment of civil servants, also resulting in frequent changes of staff and the appointment of inappropriately qualified staff [38].

### **REJECTION OF ROUTINE IMMUNIZATION**

Another problem and challenges facing immunization programmes in Nigeria is the rejection of selected vaccines/vaccination by parents or religious bodies more especially in the northern part of this country. The reasons for such rejection are outlined below;

#### **a) Fear and confusion**

Many decisionmakers and caregivers reject routine immunization due to rumour, incorrect information, and fear. Attempts to increase coverage must include awareness of people's attitudes and the influence of these on behaviour. Fears regarding routine immunization are expressed in many parts of Nigeria. Fathers of partially immunised children in Muslim rural communities in Lagos State see hidden motives linked with attempts by nongovernmental organisations (NGOs) sponsored by unknown enemies in developed countries to reduce the local population and increase mortality rates among Nigerians. Belief in a secret immunization agenda is prevalent in Jigawa, Kano and Yobe States, where many believe activities are fuelled by Western countries determined to impose population control on local Muslim communities [32, 39].

#### **b) Low confidence and lack of trust**

Lack of confidence and trust in routine immunization as effective health interventions appears to be relatively common in many parts of Nigeria [38]. A 2003 study in Kano State found that 9.2% of respondents (mothers aged 15–49) evinced 'no faith in immunization', while 6.7% expressed 'fear of side effects'. For many, immunization is seen to provide at best only partial immunity, e.g. in Kano and Enugu [32, 40]. The widespread misconception that immunization can prevent all childhood illnesses reduces trust because when, as it must, immunization fails to give such protection, faith is lost in immunization as an intervention, for any and all diseases.

### **Shortage of vaccines and immunization supplies**

Under the NPI's the first mandate is to "support the states and local governments in their immunization programmes by supplying vaccines, needles and syringes, cold chain equipment and other things and logistics as may be required for those programmes". However, the supply of vaccines has always been problematic for Nigeria, primarily because funds were not sufficient and were not released on time. For example in 2001 the whole amount was approved but only 61% was released, the late release of funds (April 2001) meant that vaccine had to be bought on the spot market at inflated prices. In 2002 no funds were released and by March 2003 the funding cycle had only reached the stage of getting the budget approved. NPI did not supply any syringes for Rubella infection in 2005, and the only safety boxes that have been supplied are the

limited quantities given by donors for SIAs. Following an assessment in 2003, it was decided that UNICEF would supply vaccines in future. In the last quarter of 2003, UNICEF began supplying vaccines through a procurement services agreement, and this arrangement continues to date. However, it has not solved the problem of vaccine shortages. For example, cerebrospinal meningitis (CSM) vaccine was not supplied in time to allow CSM immunization to take place before the cerebrospinal meningitis season, and some states had to buy their own stocks of CSM using state funds. Measles vaccine also arrived too late to limit the effects of a measles outbreak in the north, and an insufficient quantity of measles vaccine was supplied to Abia [37].

### **PERCEIVED BENEFITS OF ROUTINE IMMUNIZATION**

Key benefits include the good health and survival of children. Another is the cost saving benefit of immunization from a lower incidence of disease and less frequent visits to the hospital. In 2004, parents in both Lagos and Enugu stated that immunization reduces mortality and morbidity, helps to minimise the anxiety associated with rearing children, and helps to maximise use of time and money.

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## HEPATITIS B: THE VIRUS AND DISEASE

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### INTRODUCTION

Hepatitis B virus (HBV) infects more than 300 million people worldwide and is a common cause of liver disease and liver cancer. HBV, a member of the *Hepadnaviridae* family, is a small DNA virus with unusual features similar to retroviruses. HBV replicates through an RNA intermediate and can integrate into the host genome. The unique features of the HBV replication cycle confer a distinct ability of the virus to persist in infected cells. Virological and serological assays have been developed for diagnosis of various forms of HBV-associated disease and for treatment of chronic hepatitis B infection. HBV infection leads to a wide spectrum of liver disease ranging from acute (including fulminant hepatic failure) to chronic hepatitis, cirrhosis, and hepatocellular carcinoma. Acute HBV infection can be either asymptomatic or present with symptomatic acute hepatitis. Most adults infected with the virus recover, but 5%-10% are unable to clear the virus and become chronically infected. Many chronically infected persons have mild liver disease with little or no long-term morbidity or mortality. Other individuals with chronic HBV infection develop active disease, which can progress to cirrhosis and liver cancer. These patients require careful monitoring and warrant therapeutic intervention. Extrahepatic manifestations of HBV infection are rare but can be difficult to diagnose and manage. The challenges in the area of HBV-associated disease are the lack of knowledge in predicting outcome and progression of HBV infection and an unmet need to understand the molecular, cellular, immunological, and genetic basis of various disease manifestations associated with HBV infection.

### DIAGNOSIS AND SEROLOGY

HBV infection leads to a wide spectrum of liver disease ranging from acute hepatitis (including fulminant hepatic failure) to chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC).<sup>2</sup> The diagnosis of HBV infection and its associated disease is based on a constellation of clinical, biochemical, histological, and serologic findings. A number of viral antigens and their respective antibodies can be detected in serum after infection with HBV, and proper interpretation of the results is essential for the correct diagnosis of the various clinical forms of HBV infection.

The typical course of acute hepatitis B is shown at the end of this writeup. HBV DNA followed shortly afterward by HBsAg and HBeAg are the first viral markers detected in serum.<sup>23</sup> HBsAg may be detected as early as 1–2 weeks or as late as 11–12 weeks after exposure, and its persistence is a marker of chronicity. HBeAg correlates with the presence of high levels of HBV replication and infectivity.<sup>24</sup> Within a few weeks of appearance of viral markers, serum alanine and aspartate aminotransferase (ALT, AST) levels begin to rise and jaundice may appear. HBeAg is usually cleared early, at the peak of clinical illness, whereas HBsAg and HBV DNA usually persist in the serum for the duration of clinical symptoms and are cleared with recovery. Antibodies to the HBV proteins arise in different patterns during acute hepatitis B. Antibody

to HBcAg (anti-HBc) generally appears shortly before onset of clinical illness, the initial antibody being mostly immunoglobulin M (IgM) class, which then declines in titer as levels of IgG anti-HBc arise. Antibody to HBeAg (anti-HBe) usually appears shortly after clearance of HBeAg, often at the peak of clinical illness. Thus, loss of HBeAg and appearance of anti-HBe is a favorable serological marker during acute hepatitis B, indicating the initiation of recovery. Antibody to HBsAg arises late during infection, usually during recovery or convalescence after clearance of HB-sAg. Anti-HBs persists after recovery, being the antibody associated with immunity against HBV. However, between 10% and 15% of patients who recover from hepatitis B do not develop detectable anti-HBs and have anti-HBc alone as a marker of previous infection. For this

reason, anti-HBc testing is the most reliable means of assessing previous infection with HBV, whereas anti-HBs testing is used to assess immunity and response to HBV vaccine.<sup>25</sup> Patients who develop chronic hepatitis B have a similar initial pattern of serological markers with appearance of HBV DNA, HBsAg, HBeAg, and anti-HBc. In these persons, however, viral replication persists and HBsAg, HBeAg, and HBV DNA continue to be detectable in serum, often in high titers. The subsequent course of chronic hepatitis B is quite variable. Most persons remain HBsAg-positive for years if not for life and have some degree of chronic liver injury (chronic hepatitis) that can lead to significant fibrosis and cirrhosis. Persons with chronic HBV infection are also at high risk to ultimately develop HCC. The diagnosis of acute hepatitis B is reliably made by the finding of IgM anti-HBc in serum, particularly in a patient with HBsAg and signs, symptoms, or laboratory features of acute hepatitis. Nevertheless, in some instances, HBsAg is cleared rapidly from the serum, and IgM anti-HBc is the only marker detectable when the patient presents with hepatitis. Testing for anti-HBc (total) and anti-HBs are not useful in diagnosis, and testing for HBeAg and anti-HBe should be reserved for persons who test positive for HBsAg. The finding of HBsAg without IgM anti-HBc suggests the presence of chronic hepatitis B, but this diagnosis generally also rest upon finding of persistence of HBsAg for at least 6 months.<sup>23,26</sup> HBV DNA testing can also be helpful in the assessment of level of viral replication and possibly helpful in assessing prognosis and need for antiviral therapy. Assays for HBV DNA levels have improved substantially over the years. The current real-time polymerase chain reaction-based assay (TaqMan) has a lower limit of detection of 5–10 HBV DNA copies/mL and can accurately quantify a wide range of levels. With this degree of sensitivity, HBV DNA can be detected early during the course of infection, arising before the appearance of other serological markers, such as HBsAg or anti-HBc. As a consequence, testing for HBV DNA has emerged as a primary approach in the diagnosis and management of HBV infection. HBV DNA testing has now become routinely used in blood product screening (nucleic acid testing)<sup>28</sup> and monitoring of patients with HBV during treatment<sup>29</sup>.

Persistently high levels of HBV DNA following resolution of hepatitis may be indicative of a failure to control the infection and an evolution into chronic infection.

### Acute Hepatitis B

About two-thirds of patients with acute HBV infection have a mild, asymptomatic and subclinical illness that usually goes undetected.<sup>30</sup> Approximately one-third of adults with acute HBV infection develop clinical symptoms and signs of hepatitis, which range from mild constitutional symptoms of fatigue and nausea, to more marked symptoms and jaundice, and rarely to acute liver failure. The clinical incubation period of acute hepatitis B averages 2–3 months and can range from 1–6 months after exposure, the length of the incubation period correlating, to some extent, with the level of virus exposure.<sup>31</sup> The incubation period is followed by a short preicteric or prodromal period of constitutional symptoms such as fever, fatigue, anorexia, nausea, and body aches. During this phase, serum ALT levels rise and high levels of HBsAg and HBV DNA are detectable. The preicteric phase lasts a few days to as long as a week and is followed by onset of jaundice or dark urine. The icteric phase of hepatitis B lasts for a variable period averaging 1–2 weeks, during which viral levels decrease. In convalescence, jaundice resolves but constitutional symptoms may last for weeks or even months. During this phase, HBsAg is cleared followed by the disappearance of detectable HBV DNA from serum. Acute liver failure occurs in approximately 1% of patients with acute hepatitis B and jaundice.<sup>32</sup> The onset of fulminant hepatitis is typically marked by the sudden appearance of fever, abdominal pain, vomiting, and jaundice, followed by disorientation, confusion, and coma.

HBsAg and HBV DNA levels generally fall rapidly as liver failure develops, and some patients are HBsAg-negative by the time of onset of hepatic coma. Patients with acute liver failure due to hepatitis B require careful management and monitoring and should be referred rapidly to a tertiary medical center with the availability of liver transplantation.<sup>33</sup>

### Chronic Hepatitis B

Chronic hepatitis B has a variable and dynamic course. Early during infection, HBeAg, HBsAg, and HBV DNA are usually present in high titers, and there are mild to moderate elevations in serum aminotransferase levels. With time, however, the disease activity can resolve either with persistence of high levels of HBeAg and HBV DNA (the “immune tolerance phase”) or with loss of HBeAg and fall of HBV DNA to low or undetectable levels (“inactive carrier state”). Other patients continue to have chronic hepatitis B, although some lose HBeAg and develop anti-HBe (HBeAg-negative chronic hepatitis B). The course and natural history of hepatitis B are discussed in detail elsewhere in these proceedings.<sup>34</sup> The overall prognosis of patients with chronic hepatitis is directly related to the severity of disease. For those with severe chronic hepatitis and cirrhosis, the 5-year survival rate is about 50%.<sup>35–37</sup> Among patients with evidence of chronic hepatitis (elevated ALT and inflammation and/or fibrosis on liver biopsy), many are asymptomatic or

have nonspecific symptoms, such as fatigue and mild right upper quadrant discomfort. Patients with more severe disease or cirrhosis may have significant constitutional symptoms, jaundice, and peripheral stigmata of end-stage liver disease including spider angiomas, palmar erythema, splenomegaly, gynecomastia, and fetor hepaticus. Ascites, peripheral edema, encephalopathy, and gastrointestinal bleeding are seen in patients with more advanced cirrhosis. ALT and AST are often elevated but may not correlate well with severity of liver disease. Bilirubin, prothrombin time, and albumin often become abnormal with progressive disease. Decreasing platelet count is often a poor prognostic sign.

Patients with chronic hepatitis may develop acute exacerbations with markedly elevated serum ALT. This scenario is more frequently described in those with HBeAg-negative chronic hepatitis B.<sup>6</sup> To distinguish between acute hepatitis B and chronic hepatitis B with a flare, anti-HBc IgM is a useful marker, as described in the previous section. However anti-HBc of the IgM class can be detected occasionally in patients with chronic hepatitis B with exacerbation. Alpha-fetoprotein (AFP), used as a marker for HCC, is often elevated in parallel with ALT during acute exacerbation.<sup>38</sup> However, it is unlikely to exceed 400 ng/mL. In patients with AFP much greater than this level, development of HCC should be suspected.<sup>39</sup> An estimated one-third of persons with chronic HBV infection will ultimately develop a long term consequence of the disease, such as cirrhosis, end-stage liver disease, or HCC. The determinants of outcome of chronic hepatitis B appear to be both viral (HBV DNA levels, HBV genotype, some HBV mutation patterns) and host-specific (age, gender, genetic background, immune status)

### Extrahepatic Manifestations of Hepatitis B

Extrahepatic manifestations of hepatitis B are present in 1–10% of HBV-infected patients and include serum-sickness-like syndrome, acute necrotizing vasculitis (polyarteritis nodosa), membranous glomerulonephritis, and papular acrodermatitis of childhood (Gianotti-Crosti syndrome).<sup>40,41</sup> Although the pathogenesis of these disorders is unclear, immune complex-mediated injury related to high level of HBV antigenemia is thought to be the cause. The serum-sickness-like syndrome occurs in the setting of acute hepatitis B, often preceding the onset of jaundice.<sup>42</sup> The clinical features are fever, skin rash, and polyarteritis. The symptoms often subside shortly after the onset of jaundice, but can persist throughout the duration of acute hepatitis B. The course of this syndrome often parallels the duration and level of HBV viremia: rapid clearance of the virus leads to rapid resolution of the illness. This disorder resembles experimental serum sickness, in which immune complexes activate the complement pathways leading to complement-mediated injury. Patients with this syndrome have low complement levels and high-level circulating immune complexes containing HBV antigens and complement components. About 30%–50% of patients with acute necrotizing vasculitis (polyarteritis nodosa) are HBV carriers.<sup>41,43</sup> This entity is more commonly seen in patients with recent exposure to HBV.

Immune-mediated vascular injury can involve large, medium, and small vessels. Early clinical features are marked constitutional symptoms, high fever, anemia, and leukocytosis. Multisystem involvement is common, including arthritis, renal disease (proteinuria and hematuria), heart disease (pericarditis and congestive heart failure), hypertension, gastrointestinal disease (acute abdominal pain and bleeding), skin involvement (vasculitic lesions), and neurological disorders (mononeuritis multiplex and central nervous system abnormalities). The disease is highly variable and has a mortality rate of 30% within 5 years if not treated. HBV-associated nephropathy has been described in adults but is more common in children.<sup>44,45</sup> Membranous glomerulonephritis is the most common form. Liver disease may be mild or absent in many of these patients. This disorder is frequently observed in countries with high prevalence of HBV infection. About 30%–60% of children with this disorder experience spontaneous remission, especially with HBeAg seroconversion. However, about 30% of adults with this condition can progress to renal failure with as many as 10% requiring dialysis or renal transplant.<sup>46</sup> Papular acrodermatitis (Gianotti-Crosti syndrome) is a distinct skin manifestation of acute HBV infection in childhood.<sup>47</sup> Skin lesions are maculopapular, erythematous, and nonpruritic, and involve the face and extremities. The syndrome lasts about 15–20 days and can either precede or follow the onset of jaundice in acute hepatitis B. Generalized lymphadenopathy and hepatomegaly have been described. Other immune-mediated hematological disorders, such as essential mixed cryoglobulinemia and aplastic anemia have been described as part of the extrahepatic manifestations of HBV infection, but their association is not as well-defined; therefore, they probably should not be considered etiologically linked to HBV.

#### OCCULT OR LATENT HBV INFECTION

Other atypical HBV infections include seronegative occult or latent HBV infections. This heterogeneous group consists of patients who are HBsAg-negative who are either seronegative for all HBV markers or positive for anti-HBc and/or anti-HBs.<sup>48–52</sup> Many of these patients are positive for HBV DNA by polymerase chain reaction either in the liver or serum or both. Some of these patients have underlying liver disease, suggestive of ongoing hepatocellular injury from persistent HBV infection. Studies in animal models have demonstrated long-term persistence of viral genomes in the serum and/or liver of animals that have biochemical and serologic evidence of viral clearance and recovery from infection.<sup>49,53</sup> The important question is whether this observation represents ongoing viral replication and therefore clinically significant infection in terms of liver disease and transmission. Existing evidence supports the notion that it indeed indicates low-level viral replication, capable of transmission.<sup>49,54</sup> Studies in liver transplantation revealed transmission of HBV infection to recipients if the donors carried the anti-HBc marker.<sup>55</sup> In addition, reactivation of HBV infection in patients with serologic evidence of recovery undergoing immunosuppression or chemotherapy has been reported.<sup>56–59</sup> These observations, together with the

immunologic studies described above, provide compelling evidence that one may not be able to completely eliminate HBV infection.

Patients with serologic evidence of recovery probably have low-level viral replication that is effectively controlled by an active immune response. The possibility that these occult infections are caused by HBV mutants has been proposed. Although mutations have been reported in various regions of the viral genome,<sup>60–63</sup> definitive evidence in support of a pathogenic role of these mutants is lacking. Furthermore, whether liver disease can indeed result from these occult HBV infections is controversial. At present, there are no convincing studies in support of a causal relationship. Therefore, these occult HBV infections, other than the special situations described above, may not be clinically important.

#### Abbreviations

AFP alpha-fetoprotein  
 ALT alanine aminotransferase  
 anti-HBc antibody to HBcAg  
 anti-HBe antibody to HBeAg  
 anti-HBs antibody to HBsAg  
 AST aspartate aminotransferase  
 cccDNA covalently closed circular DNA  
 DR direct repeats  
 HBsAg hepatitis B surface antigen  
 HBeAg hepatitis B e antigen  
 HBcAg hepatitis B core antigen  
 HBV hepatitis B virus  
 HBxAg hepatitis B x protein  
 HCC hepatocellular carcinoma  
 IgM immunoglobulin M  
 kb kilobase  
 L-HBsAg large HBsAg  
 M-HBsAg middle HBsAg  
 ORF open reading frame  
 pgRNA pregenomic RNA  
 pol HBV DNA polymerase  
 RT reverse transcriptase  
 S-HBsAg small HBsAg



**Table 1**  
Hepatitis B Virus Serological and Virological Markers

HBsAg HBeAg	HBV infection, both acute and chronic High-level HBV replication and infectivity; marker for
HBV DNA	treatment response Level of HBV replication; primary virologic marker for
Anti-HBc (IgM)	treatment response Acute HBV infection; could be seen in flare of chronic
Anti-HBc (IgG) Anti-HBs	hepatitis B Recovered or chronic HBV infection Recovered HBV infection or marker of HBV vaccination; immunity to HBV infection (titer can be measured to assess
Anti-HBe	vaccine efficacy) Low-level HBV replication and infectivity; marker for
Anti-HBc (IgG) and anti-HBs Anti-HBc (IgG) and HBsAg Anti-HBc (IgG) and/or anti-HBs and HBV DNA (PCR)	treatment response Past HBV infection; could lose anti-HBs Chronic HBV infection Latent or occult HBV infection

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# DEPRESSION

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## INTRODUCTION

Often times, individuals do encounter some adverse life events which would naturally trigger sad moments, but then, clinic depression is said to occur when the sadness becomes excessive in terms of severity and duration.

It can be defined as an organic psychotic mood disorder, whereby the individual involved feels very sad, and exhibits a number of signs and symptoms as outlined by either of the International classification of diseases-tenth edition (ICD-10), or the Diagnostic Statistical Manual of Mental Disorders-fifth edition (DSM-IV) classification systems (as outlined below)

It is a major cause of disability and suicide all over the world. It can occur as a component of some psychiatric syndromes, or as a complication of some medical conditions/diseases.

## Epidemiology

It's occurrence is worldwide.

It occurs twice as high in women as in men.

Surveys in industrialized regions suggest that:

- The mean age of onset is about 27 years.
- A 1 year prevalence in the general population is about 2-5%.
- A lifetime prevalence is about 10-20%.
- Prevalence in the chronically ill medical patients is about 10-20%.
- The rates are higher in the unemployed, and the divorced.
- The rates are higher in the uneducated too.

A research conducted by Gureje et al in 21 out of the 36 states of Nigeria suggest that:

- A lifetime prevalence rate is about 3.1%
- A 12 month prevalence is about 1.1%
- Age of onset is about 29.2 years
- Median duration of an episode is about 1 year
- Average number of episodes in a lifetime is about 1.5 times.

## Aetiology

### 1. Biological determinants

#### Genetic factors

- **Family studies:** This suggests familial aggregation. The risk of depressive disorders are increased in first degree relatives of both unipolar depression, and bipolar disorder patients.

- **Twin studies:** This suggests that aggregation of mood disorders in families is due to genetic factors. Here, it was found out that the concordance rate of unipolar depression for monozygotic twins is about 45%, but it is about 20% in dizygotic twins. But generally, the genetic influence seems to be greater in bipolar disorders than in the unipolar disorder.

**Adoption studies:** this separates the genetic from the environmental influences, it compares rate of mood disorders in biological relatives with those in adopted relatives.

It suggests that the rate of mood disorders in adopted away children of affected parents is higher than in adopted away children of healthy parents.

**The mono-amine hypothesis:** This suggests that depressive disorders are due to abnormalities in a monoamine neurotransmitter system at one/more

sites in the brain. The monoamines being considered are: serotonin, noradrenaline, and dopamine.

Tests concluded on this hypothesis came to the conclusion that:

- Low brain serotonin receptor function interacts with other vulnerability factors to cause depressive symptoms.
- Subjects at risk of mood disorders are vulnerable to decreases in both serotonin and catecholamine neurotransmission.

Impaired dopamine function may play a role in the manifestation of depressive symptoms. This is because cerebrospinal fluid levels of homovanillic acid (dopamine metabolite) is consistently low in depressed patients, and dopamine neurons in the mesolimbic system play a key role in incentive behavior and reward (processes which are disrupted in depressed patients).

These conclusions are buttressed by the facts that drugs that act on the above mentioned monoamine's neurotransmission/receptors (either by preventing their reuptake, or by inhibiting their metabolism) have been seen to produce remissive effects in the depressed patients.

**Hypothalamo-pituitary-adrenal axis :** The hypothalamus releases Corticotrophin releasing hormone in response to perception of physical and psychological stress. This hormone causes secretion of Adrenocorticotropin releasing hormone by the pituitary gland. This stimulates the adrenal gland to cortisol into the plasma.

High levels of cortisol effects a negative feedback to the axis thereby preventing excess release of cortisol. It has been discovered that derangement of the HPA axis which involves a compromise of the negative feedback loop leading to hypersecretion of cortisol during stress, is responsible for some cases of depression.

This is supported by the fact that hypercortisolaemia has been found in patients with severe and psychotic depression, and also by the fact that physical long term consequences of depression include type II diabetes mellitus, and coronary heart disease (both are conditions known to be enhanced by actions of increased plasma cortisol).

**The role of cytokines:** These are known to be secreted in large amounts in occasions of physical (malignancies) and psychological stress. They are known to trigger depression by:

- Causing derangement of the HPA axis
- Impairment of the central serotonin system
- Expression of tryptophan metabolizing enzymes etc.

This is supported by the discovery that there is increased levels of cytokines in depressed patients, and also that anti-inflammatory agents like acetyl salicylic acid have some antidepressant effects.

Other known causes of depression include:  
Circadian rhythm derangement  
Glutamatergic neurotoxicity etc

**Effects of physical illness/conditions:** About 50% of Cushing's syndrome patients, HIV patients etc have been seen to come down with major depression. It can also occur in the puerperal period in some women.

**1. Psychological determinants**

- 1. Early environment:** Childhood deprivation of parental affection (especially maternal), either in the form of loss, or separation, has been seen to be a predisposing factor to depression later on in life. Family discord and lack of adequate care also predispose to depression even in the non separated families. Over protective parenting styles are also associated with non melancholic depression in adult life. People who were victims of sexual/physical abuse in childhood have also been seen to have developed major depression later on in life too.
- 2. Social environment:** Economic stress (unemployment, poor accommodation), emotional stress (as seen in the divorced, students, and those who work for long hours) have been seen to be predisposing factors to major depression.
- 3. Pre-morbid personality:** certain kinds of personality developments have been associated with predisposition to mood disorders. For example, pre-morbid anxiety, cyclothymic personality, and the sociotropic cognitive style in people increases the risk of depression after adverse life events.

**Classification**

This is based on the International Classification Of Diseases -Tenth Edition (ICD-10), And The Diagnostic And Statistical Manual Of Mental Disorders -Fifth Edition (DSM-5).

- ICD 10 Classification
- 1. Based on severity: They can be classified into Mild, Moderate, Severe depressive episodes ( with or without psychotic symptoms)
- 2. Based on duration: They can be classified as Acute depressive episodes, Persistent (dysthymia, cyclothymia), or Recurrent depressive disorders.
- 3. Other depressive episodes: Such as Atypical depression.

- DSM 5 Classification:
- 1. Based on severity: Major depressive disorders.
- 2. Based on duration: Major, and Persistent (dysthymic disorder) depressive disorders.
- 3. Based on etiology: These could include: Substance/Medication Induced Depressive Disorders, Medical Illness Associated Depressive Disorders etc
- 4. Based on timing: there could be the Premenstrual Dysphoric Depression.
- 5. Others: these could either be Specified, or the Unspecified Depressive Disorders.

**Clinical features**

- Appearance: The individual tends to pay less attention to his/her dressing, the facial expression depicts extreme sadness. Gestural movements are markedly reduced, and the person tends to maintain a downward gaze.
- Mood: This depicts misery. The low mood is not seen to improve in circumstances where ordinary feelings of sadness could be alleviated.
- Thoughts: These are mainly negative. They always tend towards pessimism, guilt, and, worthlessness.
- Anhedonia: This refers to lack of interest/enjoyment in things which prior to the state, the person enjoyed doing.
- Psychomotor retardation: the patient's actions are slowed-these could reflect in their speech, flow of thoughts, and even their walking steps.
- Anxiety, and irritability are quite frequent symptoms.
- Biological symptoms: Loss of appetite, weight, and libido; fatigue, amenorrhea, and insomnia ( terminal insomnia is the most common) etc can all be seen.
- Psychotic symptoms: These include delusions (could be persecutory, depressive, or even be delusions of guilt), and hallucinations ( 2<sup>nd</sup> person auditory hallucinations are most common).

These are mainly seen in severe depression.

**Diagnosis**

- Depressive episodes (ICD-10):** These episodes could be mild, moderate, or severe-based on the number of the minor, and major symptoms expressed by the patient.
1. Mild depressive episode: the patient expresses 2 of the major symptoms, and at least 2 of the minor symptoms.
  2. Moderate depressive episode: the patient expresses 2 of the major symptoms, and at least 3 of the minor symptoms.
  3. Severe depressive episodes: the patient expresses all of the major symptoms, and at least 4 of the minor symptoms.
- These symptoms should have lasted for a period of at least 2 weeks.
- The major symptoms include: low mood, reduced energy, and anhedonia.
- The minor symptoms include: reduced concentration, reduced self esteem, ideas of guilt/ worthlessness/ self harm, disturbed sleep, reduced appetite, etc.
- Psychotic depression is severe depression with psychotic features( hallucinations and delusions).

### Prognosis

- v Major depression is often recurrent, hence, long term maintenance treatment may need to be considered.
- v Same drugs used during the acute and continuation phase can still be used for the long term maintenance as long as the side effects are being well tolerated, else, lithium can also be effective for long term maintenance in some people.
- v Patients have been seen to respond better to pharmacotherapy combined with psychotherapy, compared to pharmacotherapy alone.
- v Patients with resistant depression have been seen to respond better to a combination of two different classes of anti depressant drugs.
- v A combination of an atypical antipsychotic, or lithium with an antidepressant drug (especially SSRI) has been seen to produce good results in patients with severe depression associated with psychotic symptoms.
- v Long term consequences of untreated depression could include: osteoporosis, type 2 diabetes mellitus, ischaemic heart disease, and even suicide.

### Conclusion

Depression has been seen to occur atleast a few times in passing in the lives of most individuals- especially after the occurrence of some sad events in their lives. Their having been able to surmount it wasn't just because they were not genetically prone to it, or that they didn't have any medical condition predisposing them to it, rather, it all falls back on the fact that they had grown with a healthier personality, and a better attitude towards life's sad events,

If parents/guardians could learn to spend more time with their children, help them build good relationships with people (and God too), and make them feel quite special, no doubts, the adult that would emerge from such childhood would be better equipped to face the world!!.

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# THE GREEN-EYED MONSTER DISEASE : 'OTHELLO SYNDROME'

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## INTRODUCTION

There are many monsters in Medicine. So many with mysterious pathophysiology. Such is the case of these green-eyed monster disease whose name stems from the works of English literature, Shakespeare play titled "Othello".<sup>(1)</sup> It may be a rare disease but it's impact is fatal thus the need for health professionals, medical students and doctors especially psychiatrists and neurologists. Yes... neurologists! Despite not being able to unravel it's aetiology, neurological as well as psychiatric conditions have been associated with it<sup>(2)</sup>. Also, if knowledge about this condition becomes widely known, one may know if this home shattering disease is actually rare or a victim of missed diagnosis.

## HISTORICAL BACKGROUND

The name Othello comes from the character in the Shakespearean play "Othello" who murdered his wife, Desdemona as a result of false belief that she was unfaithful<sup>(3)</sup>. Though recently, workers asserted that Othello was rather deceived by his friend, Iago thus had no Othello Syndrome<sup>(3)</sup>.

"Oh, beware, my lord, of jealousy!

It is the green-eyed monster which doth mock

The meat it feeds on. That cuckold lives in bliss

Who, certain of his fate, loves not his wronger;

But, oh, what damnèd minutes tells he o'er

Who dotes, yet doubts— suspects, yet soundly loves!"

(Iago, Act III, Scene iii of Shakespearean Othello)<sup>(4)</sup>

This green-eyed monster was named by the English psychiatrist, John Todd (1914-1987) in a book he published with K. Dewhurst<sup>(5)</sup>. He was also the first to name the Alice in wonderland syndrome<sup>(6)</sup> (also called Todd's syndrome or Lilliputian hallucinations).

It is interchangeably called "the morbid jealousy", "the delusional jealousy", "the erotic jealousy syndrome", or "the Othello psychosis".<sup>(6)</sup>

## DEFINITION

*The Green-eyed Monster:* Green signifying sick, eye signifying a tool for appreciation of beauty, love and monster signifying an alien, green-eyed monster simply means **jealousy**. It was coined following Shakespeare works; "The Merchant of Venice (1596)" and "Othello (1604).

*Othello Syndrome:* It is a syndrome of delusion of infidelity in a spouse or partner<sup>(6)</sup>. It is characterised mainly by obsessions and delusions.<sup>(6)</sup>

Symptoms of Othello Syndrome include:

- Accusing partner of looking or giving attention to other people.
- Questioning of the partner's behavior.
- Interrogation of phone calls, including wrong numbers or accidental phone calls, and all other forms of communication.
- Not allowing any social media accounts, Facebook, Twitter etc.
- Going through the partner's belongings.
- Always asking where the partner is and who they are with.
- Isolating partner from their family and friends.
- Not letting the partner have personal interests or hobbies outside the house.
- Controlling the partner's social circle.
- Claiming the partner is having an affair when they withdraw or tries to escape abuse.
- Accusing the partner of holding affairs when the marriage's sexual activity stops because of the abuse.
- Verbal and/or physical violence towards the partner; the individual who is considered to be the rival, or both.
- Blaming the partner and establishing an excuse for jealous behavior.

- Denying the jealous behavior unless cornered.
- Threatening to harm others or themselves.

## EPIDEMIOLOGY

There is no known prevalence for Othello Syndrome currently due to the absence of community survey tracking of its existence in individuals. However, recently it is generally considered a rare disorder<sup>(3)</sup>.

It affects both sex. It's incidence is appreciably higher and infinitely more dangerous in male subjects<sup>(5)(9)</sup>. In a research conducted by Jonathan G. et al, 61.9% of patients were male. Also, the average age of onset was 68 years, 69.5% had underlying neurological disorders while 33.3% had psychiatric disorders. Of the 76.7% that had neurodegenerative disorders, Voxel-based morphometry showed that there is a greater grey matter loss in the dorsolateral frontal lobe in those with Othello than those who don't.<sup>(10)(11)</sup>. Understanding these can help in establishing better ways of managing the disease and creating room for breakthroughs<sup>(10)(11)</sup>. It has also been shown to be associated with dopaminergic agonists intake in Parkinsons patients<sup>(12)(13)</sup> as withdrawing from the medications showed improvements of symptoms<sup>(14)(15)</sup>. It has also been associated with several psychiatric conditions like dementia, schizophrenia and even conditions like alcoholism<sup>(11)(9)</sup>.

## FORMS<sup>(9)</sup>

1. **Obsessions:** the individual's own thoughts are egodystonic (the distress caused by thoughts that are unwanted and viewed as contrary to conscious wishes); they are acknowledged to be senseless, and usually resisted.
2. **Extreme obsessions:** much time is taken up by jealous concerns, and there is a great difficulty in putting the concerns out of the mind
3. **Delusions:** the individual's own thoughts are egosyntonic; they are regarded as true, and not resisted.

## AETIOLOGICAL FACTORS<sup>(3)(13)</sup>

There are no known aetiology to Othello Syndrome. However, some conditions have been associated with it. They include:

- *Neurological conditions:* stroke, brain tumors, brain injuries, neurodegenerative disorders, parkinsonism

- *Psychiatric conditions:* schizophrenia, borderline personality disorder, dementia, affective disorders, sexual dysfunction
- *Other medical conditions:* alcoholism, drug intoxication, dopaminergic agonists in Parkinsons patients.

### **MANAGEMENT<sup>(3)</sup>**

#### **Assessment<sup>(3)</sup>**

In an attempt to counsel or treat the morbid jealousy of an individual, proper and thorough assessment must be employed. This approach is broad in nature, but necessary so as to provide adequate information that will aid in the possible reparation of a dynamic containing a morbidly jealous person. To begin, a careful history should be taken of both partners if possible; separate and together. It is imperative that a full and detailed psychiatric history and mental state examination be recorded for the jealous partner; doing so may enable one to distinguish whether the jealousy is obsessional or delusional in nature.

#### **PSYCHIATRIC HISTORY<sup>(3)</sup>**

*Presenting difficulties:* neurotic or psychotic jealousy

*Past psychiatric history:* neurotic or psychotic disorders, deliberate self-harm and attempted suicide

*Family history:* mental illness including pathological jealousy

*Relationship history:* incorporating both the current and previous relationship and taking account of the quality of the relationships and the difficulties experienced

*Forensic history:* previous and pending charges and convictions as well as deviant behavior which was not reported or did not result in a charge or conviction (including aggressive behavior and stalking)

*Medical history:* organic causes which may be responsible for the morbid jealousy

After completing the assessment, it is best to deliver information about risk with both individuals in the relationship. Due to confidentiality, the patient should give consent for this information to be shared unless there is a risk to another individual and it is serious and immediate. This is the only case in which confidentiality is invalid. The professional should ensure that all necessary steps are taken to guarantee the safety of a potential victim, keeping in mind that it is possible that authorities may have to be alerted regarding the matter. If the professional has reason to believe that there is a high risk of harm to themselves or another person, the individual who is morbidly jealous should be admitted to hospital as soon as possible to prevent any negative outcomes for any parties involved.

#### **TREATMENT<sup>(3)</sup>**

Othello Syndrome encompasses various psychiatric states and the best way to approach treatment depends on the symptoms that are observed in the individual. Therefore, prognosis and outcomes vary from person to person and depends on the situation and the complexities of the interpersonal relationships being observed. While psychotherapy can be an effective method of treating morbidly jealous persons, it is not sufficient when the nature of their illness is more serious. It is not possible to say that there is one form of treatment that is superior over all those that are currently available. Even though this may

be true, cognitive behavioral therapy is the treatment that has proven to be most effective.

Treatment involves;

1. **Medical:** Treatment of the primary psychiatric condition, antipsychotic medication, antidepressant medication
2. **Psychological:** Psycho education for the affected person and the partner, behavioral therapy, cognitive therapy, individual psychotherapy, insight oriented psychotherapies, family therapy, couple therapy
3. **Social:** Geographical separation of the partners, social work involvement for child protection issues, alcohol and substance misuse treatment

### **DIFFERENTIAL DIAGNOSIS**

§ *Obsessional jealousy-* is jealousy that is characterized by intrusive and excessive thoughts, and may be accompanied by compulsive checking of the partner.<sup>(14)</sup>

§ *Borderline personality disorder (BPD)-* is a serious mental disorder marked by a pattern of ongoing instability in moods, behavior, self-image, and functioning.<sup>(15)</sup>

§ *Non pathological jealousy*

### **NEGATIVE IMPACTS OF OTHELLO'S SYNDROME<sup>(3)</sup>**

- *To self:* suicide, restlessness, injury to self with sharps,
- *To partner:* homicide, physical abuse, depression
- *To children:* emotional and physical abuse, homicide
- *To others:* assault, burden, violence

### **CONCLUSION<sup>(1)</sup>**

This green-eyed monster, Othello is a source may be rare but it's impact is fatal. Thus, a good knowledge and in-depth research into it will be of so much good not just to the individuals but families and society also. Therefore doctors should have a high level of suspicion for this neuropsychiatric disease whose pathophysiology is yet to be known but has been claimed to be associated with various neurological and psychiatric disorders.

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# THE CAN OF WORMS IN THE MENTAL HEALTH CARE SYSTEM- AN EXPOSE'

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## ABSTRACT

A global survey of community orientated mental health reforms and services are advocated. We cannot hope to provide an exhaustive international survey in a short space, so this research seeks to identify some aspects of mental health malpractice such as failure to conduct a proper suicide risk assessment, failure to prevent a patient's suicide, improper diagnosis or treatment, Tardive dyskinesia, failure to warn, boundary violations, false "repressed" memories which we have firsthand information and knowledge of focusing on some leading edge aspects of community mental health service innovations or systems reforms in different countries. Like the community crisis and early interventions services, community residential respite and rehabilitation/recovery services, interventions for prevention of suicide and deliberate self-harm community care management and assertive community care services, community based day programs and vocational services. Against this backdrop, some aspects of Human Right violations and unlawful and unethical conducts and practices prevalent in the mental health care system are exposed. The research finds that the mental health care facility/systems are largely obscure, unattended and neglected. The ones in existence are well equipped with inhuman humans that perpetuate insanity instead of sympathizing and empathizing with patients. The research therefore advocates a more pluralistic and humane approach in the care and treatment of the mentally challenged patients in the care of these professed professional through the continued respect of their human rights, listening to and loving them, giving them a reason to find peace in their depressed and deranged state of mind.

## 1. INTRODUCTION

It is important for us to learn our rights and to insist on being treated respectfully and with dignity. We do not have to sit back and assume there is nothing we can do about the injustices we may have suffered at the hands of professionals who seem so much more powerful than we may feel. Not all psychiatrists are bad and many of us can recall professionals that have been very helpful to us. But for those of us who have been injured physically or emotionally by a psychiatrist, there is action we can take. The upsurge in the number of lawsuits against mental health professionals is largely the product of three separate but powerful changes in the mental health care delivery system. First, the development of relatively safe and powerful medications for the treatment of some of the most debilitating illnesses schizophrenia, personality disorder, depression, and bipolar disorder among them - helped to solidify what had beforehand been a very mushy standard of care.<sup>1</sup> With power comes responsibility. Thus, ironically, the development of this new pharmacological arsenal boosted psychiatry's status in the medical community while subjecting psychiatrists to increased malpractice exposure. Historically, patients have found it difficult to sue their mental health provider. After all, this is the very person with whom, in times past, the patient spent hours of each week, sharing their deepest thoughts. With the growth of managed care, a single, monthly fifteen-minute appointment with a psychiatrist has become the norm. The average length of hospital stays has tumbled. Although many patients concurrently receive psychotherapy from a nonmedical provider (an arrangement known as "split treatment"), few patients now develop any close relationship with their psychiatrists. As a result, patients are more willing to sue when treatment goes wrong. Poor quality mental health services can violate basic human rights, lead to negative therapeutic outcomes and prevent people from enjoying the highest standard of physical and mental health. However, poor quality of care can be substantially redressed through concerted and systematic quality improvement strategies. Evidence is now emerging that the very substantial burden of disease attributable to mental disorder can be significantly reduced through high-quality evidence-based mental health care. While prescribing methods for improving the quality of mental health services is challenging, not least because there is tremendous variation in the availability of financial and human resources in different countries, providing guidance to countries to assist them to attain better quality mental health care is necessary, important and expedient.

## 2. THE MALPRACTICES IN THE MENTAL HEALTH CARE UNIT

This aspect of the research is to identify specific negligent practices by the practitioners and highlight the meaning and implication of such negligent act.

### 1.1. FAILURE TO CONDUCT A PROPER SUICIDE RISK ASSESSMENT.

The standard of care requires the clinician to conduct a

proper suicide risk assessment of each potentially suicidal patient. To do a proper assessment, you must consider all of the relevant factors and reach a reasonable assessment, based upon these factors, of the patient's risk for suicide. Other factors which must be considered are demographic like the patient's age, gender, marital status, sexual orientation, employment and living circumstances all impact upon the patient's risk for suicide. The patient's history must also be considered.

Finally, the clinician must consider the patient's presentation at the time of the assessment. The standard of care requires that all suicide risk assessments be documented in the record. If a clinician fails to perform, or improperly performs, an assessment, or if the clinician unreasonably underestimates the patient's risk, she may well be liable if the patient commits, or attempts to commit suicide.

### 1.1. Failure to prevent a patient's suicide.

Once a proper suicide risk assessment has been performed, the clinician has a duty to take reasonable steps to prevent the patient's of suicide. The reasonableness of the clinician's response obviously depends upon the degree of risk present. Where the patient is at high risk for suicide, the clinician must hospitalize the patient, involuntarily when necessary. When the risk is lower, the clinician may choose to increase the number and frequency of sessions with the patient, contact the patient's family to encourage them to monitor the patient more closely, or alter the treatment plan in some other way. At a minimum, the clinician must inquire about, and take steps to eliminate, the patient's access to lethal means. Sixty percent of suicides occur with firearms. The clinician who fails to take steps to remove the suicidal patient's access to a firearm commits rank malpractice. When the patient is in an inpatient setting, the nursing staff has a duty to monitor the patient with sufficient regularity and to remove from the patient articles (such as shoelaces, shirts, and other clothing) which could be used to commit suicide. The point is illustrated by *Sloan v. Edgewood Sanatoriu*<sup>2</sup> one of the first appellate cases in the United States to hold a mental health facility liable for failing to monitor and prevent an inpatient suicide. In the inpatient setting, the physician has a duty to order suicide precaution checks at levels commensurate with the patient's risk.

### 1.2. Improper diagnosis or treatment.

There is a myth that psychiatric diagnoses are ill defined - that mental health professionals, after properly assessing a patient, are likely to reach different diagnoses of the same patient. The truth is that psychiatric diagnoses are very well defined. The Diagnostic and Statistical Manual (DSMIV-TR) is widely considered the bible of psychiatric diagnoses.<sup>3</sup> Clear criteria define each diagnosis. Unfortunately, these psychiatric diagnoses have two fundamental flaws. First, unlike other areas of medicine, disorders are classified according to their symptom clusters, not according to their etiology. This means that two patients with the same symptoms will be diagnosed with the same disorder, even if there are different causes of the disorder. Second, usually a diagnosis is made based upon the presence or absence of certain symptoms, not upon their intensity. Thus, a patient with only *moderate* fatigue, weight loss, impaired concentration, dysphoria, and anhedonia (loss of interest in things which used to interest the patient) may be diagnosed with major depressive disorder, when a patient who has only four of these symptoms - but has them *severely* - may not meet the diagnosis. Nevertheless, diagnosis is very important in psychiatry because these diagnostic classifications guide all of the research and treatment protocols. We have effective treatments for many - if not most - of the DSM-IV

diagnoses. Without making the proper diagnosis, the chances are that the proper treatment won't be offered.

### 1.3. Tardive dyskinesia.

Most effective treatments have side effects. In the 1940s and 1950s, the lobotomy (officially known as the "prefrontal leucotomy") became a popular treatment for psychotic agitation. What is now forgotten is that the lobotomy was generally a very effective treatment. Unfortunately, the procedure reduced the patient to a hollow shell, devoid of any personality or awareness of the world around him. With the invention of antipsychotic medications (sometimes known as neuroleptics), psychiatry found a way to eliminate psychotic hallucinations and delusions with far fewer side effects. Unfortunately, one very serious side effect of antipsychotics (especially of the older, conventional antipsychotics, like Haldol, Thorazine, and Mellaril) remains: tardive dyskinesia (TD). Patients with TD suffer through involuntary movements of the head, neck, trunk, and extremities. Often, they will make wormlike movements with their tongue; smack their lips, chew, and grimace, as their arms or legs make writhing, uncontrollable motions. If caught early, the disorder can often be extinguished by discontinuing the antipsychotic and prescribing counteracting medications such as reserpine and levodopa. Where it is not caught early, the disorder can become permanent, subjecting patients to a lifetime of discomfort and insensitive ridicule. TD cases usually involve one or more of three areas of negligence. If the patient is placed on an antipsychotic for any reason other than the treatment of psychosis. Second, if a psychiatrist places the patient on an antipsychotic for a period of time longer than clinically necessary. Finally, if the clinician unreasonably fails to detect the onset of TD, or fails to take steps to reverse it, he or she will be negligent.

### 1.4. Failure to Warn.

In *Tarasoff v. Regents of the University of California*,<sup>4</sup> the California Supreme Court rocked the mental health world by holding that a psychotherapist who knows, or should know, that his patient presents a serious danger of violence to another has a duty to take steps to protect the intended victim from harm. Usually this duty can be discharged by simply warning the intended victim.

Since *Tarasoff's* case numerous States have adopted this so-called "duty to warn."

### 1.1. Boundary Violations.

It is established that there should be, indeed must be, a treatment boundary separating the mental health professional and his or her patient. The term "boundary violation" refers to any violation of this treatment boundary. Most commonly, the boundary violation involves sexual contact between a mental health professional and his or her patient. All such contact is negligent, despite attempts by some experts to justify or excuse such conduct. Plaintiffs routinely win boundary violation lawsuits when brought.

Sometimes, in the midst of victory, the plaintiffs do not actually end up receiving any compensation for the wrong they have suffered. Although sexual misconduct has received the most attention, boundary violations may come in other forms. Sometimes a mental health professional improperly establishes a close friendship with his or her patient, by, for example, going to dinner frequently, traveling out of town, or interacting socially in other ways. Such non-professional conduct may become a negligent boundary violation if it interferes with the treatment relationship.

### 1.1. False "repressed" Memories.

Some mental health professionals believe that serious mental disorders are the result of very bizarre forms of early childhood trauma. Employing hypnosis or guided imagery, they lead their patients to believe that they were the victims of graphic sexual abuse, that family member were leaders of satanic cults who forced them to engage in horrendous acts of violence, or that they were abducted by aliens (yes, of the extraterrestrial type). Unfortunately, many patients come to fully believe that these are accurate memories from their childhood, without having received warnings that delayed memories are unreliable and uncertain. Our firm recently settled a case where a patient was encouraged to confront her parents about her newfound "memory" of her dad the supposed leader of her neighborhood satanic cult - forcing her to cut out her neighbor's heart when the patient was the tender age of three. Shortly after the confrontation with her parents, the patient committed suicide. All too often, contrary to the mental health professional's intent, the patient's newly discovered memories become the patient's new reality, leading to greater depression, an increased sense of hopelessness, and often a suicide attempt or suicide.

### 2. Phases of Human Right Violations on Mental patients

The enormity of oppression going on in the mental health care facility are enormous, criminal, cruel and abusive. Where the patients asks for help, they are given a diagnosis that will stay with them for the rest their lives that limits them in whatever they do, limit their relationship and activities which makes them poor, ostracized and homeless. They may be locked up for years and years, they may be killed, beaten, tassed, transported in shackles and chains with no bathroom breaks, they are strip-searched, incarcerated for weeks without any care or treatment, they are put in restraints or seclusions for indefinite periods without care for their personal needs. They might also be given dangerous psychotropic drugs in the likes of thorazin with great life threatening side effects. They are punished or denied services where they inadvertently refuse medications.

Most mental health practitioners and carers bully, threaten and ridicule them. Those of them who are parents risk having their children taken away from them and as a result they lose their parental rights. So many are physically, emotionally and sexually abused and ignored just for being a mental patient. The system will not fail to ball it into their sick brains that they have disordered brains, that they have

myth of chemical imbalance and the illness model. The system will approve the use of interventions that have not been proven safe and effective like the electroshock and psychotropic medications which are interventions that benefits only the doctors, institutions and corporations and governments. Complaining will be interacting with a system that offers specific desirable services if you accept other mandatory but undesirable treatment, interacting with a system that overmedicates adults and children with dangerous drugs that cause brain shrinkage and lasting side effects like tardives dyskinesia, obesity and diabetes.<sup>5</sup>

The activist patients will be facing head on with a system where everything is being done by set and rigid formulas instead of being individualized to meet specific individual needs. They will also be up against a system that holds together "people" that are unwanted by society forcing them into "ones size fit" paradigm. A system that may provide two choices viz forced treatment or imprisonment, a system that is inclined to drug more and more and more of the children instead of finding out what is -troubling them and working to correct it-and a system that uses chemicals and restraints and sometimes even electroshock on children and in effect destroying generations. Their voluntary admissions would perhaps be turned into involuntary with their consents and as a result receive involuntary electroshock and forced outpatient electroshock thereby ending up in a care home staffed by indenture servants who do not know and would not care to know their languages and with no training.<sup>6</sup> They would be traumatized over and over by the change of staff and environment and a break in chain of care givers. The patients are probably served by peer support workers. Patients are not seem as humans but are seen as specimens for practical and projects.

### 4. Protecting Ourselves Against Unlawful And Unethical Psychiatric Practices.

The research suggests that to protect ourselves and patients from unethical psychiatric practices the following steps is to be taken always: The most important thing to do is talk with the psychiatrist and asks questions about why she or he is proposing a particular treatment.

If you are uncertain, ask again. Seek a second opinion if you feel that would help. It is very important to keep notes, to keep your own records, or to keep your own independent diary of what happens at each visit with your psychiatrist.<sup>7</sup> If you are on an inpatient unit, write letters to friends or relatives that you trust and tell them about the things that are going on from day to day. Periodically review your clinic record and to ask that the record be corrected if there are mistakes in it or to seek to add your own statement to the record if something is inaccurate. Of course the laws regarding access to psychiatric records vary from state to state so you will have to know what the state law allows.

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#### 5. Summary and Conclusion

The key principles for mental health practitioners are not limited to the following; the promotion of an optimal quality of life for and with mental illness, deliver services with the aim of facilitating sustained recovery, involving people using services in all decision regarding their treatment, care, support and opportunity to choose their treatment and setting, recognize the right of the person to have their nominated career involved in all aspects of their care, learn about and value the lived experiences of people using services and their family or careers, recognize and support the rights of children and young people affected by a family member with mental illness to appropriate information, care, and protection, support participation by people and their families as an integral part of mental health service development, planning, delivery and evaluation, tailor mental health treatment, care and support to meet specific needs of the individual, in delivering mental health treatment and support impose the least personal restriction on the rights and choices of

people, taking into account their living situation, level of support within the community and the needs of their family and carers, are aware of and implement evidence-informed practices and quality improvement processes, participate in professional development activities and reflect what they have learnt in practices.<sup>8</sup>

Improving the quality of mental health care involves respect for the rights of people with mental disorders and the provision of the best care possible, consistent with national circumstances. Quality encompasses the achievement of equitable care that is evidence-based and is cost-effective. To achieve optimal quality, the systems for delivering mental health care must be conducive to treatment and recovery. This requires the alignment of policy and commitment of key partners, alignment of funding, accreditation procedures for services, development and application of service standards and ongoing routine quality improvement. The World Health Organization guidance package for quality improvement in mental health services, condensed in this paper, provides an integrated resource for the planning and refining of mental health systems on a national scale. Beginning with national policy, it formulates a stepwise approach to quality improvement that remains flexible and can be adapted to the widely varying requirements of different countries. Phases of quality improvement are designed to facilitate their use across a range of national circumstances and to ensure that the quality improvement cycle is ongoing.

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## PHYSICIAN SUICIDE

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The World Health Organization (WHO) defines suicide as the act of deliberate killing of oneself. Risk factors for suicide include mental disorder (such as depression, personality disorder, alcohol dependence, or schizophrenia), and some physical illnesses, such as neurological disorders, cancer, and HIV infection. Committing suicide is not a new phenomenon. There was a recorded case in the Holy Scripture, the Bible. One of the disciples of Jesus, Judas Iscariot is an example of one who committed suicide. Down the ages and in all climes, suicide cases abound but appear to be on the increase these days which is a disturbing trend.

According to Medscape, it has been known for more than 150 years that physicians have an increased propensity to die by suicide. It was estimated in 1977 that on average the United States loses the equivalent of at least one small medical school or a large medical school class to suicide. Exact numbers are not known. Although it is impossible to estimate with accuracy because of inaccurate cause of death reporting and coding, the number most often used is approximately 3-400 physicians/year, or perhaps a doctor a day. **Of all occupations and professions, the medical profession consistently hovers near the top of occupations with the highest risk of death by suicide. This is in no way restricted to developed countries as many erroneously think. In fact the number of completed suicides in Nigeria has been on a great increase of recent as reflected in the incessant newspaper reports of suicide. Still, if there are inaccurate death reporting and coding in the US you can imagine that it is way worse in Nigeria.**

Sadly, although physicians globally have a lower mortality risk from cancer and heart disease relative to the general population (presumably related to knowledge of self-care and access to early diagnosis), they have a significantly higher risk of dying from suicide, the end stage of an eminently treatable disease process. Perhaps even more alarming is that, **after accidents, suicide is the most common cause of death among medical students.**

What would make a person want to take his/her life? In every population, suicide is almost invariably the result of untreated or inadequately treated depression or other mental illness that may or may not include substance or alcohol abuse, coupled with knowledge of and access to lethal means. Depression is very common in medical students and physicians. However, because of the stigma associated with depression in almost all cultures, which seems to be greatly magnified among medical practitioners, self reporting likely underestimates the prevalence of the disease in medical populations. Indeed, although physicians seem to have probably heeded their own advice about avoiding smoking and other common risk factors for early mortality, they are decidedly reluctant to address depression, a significant cause of morbidity and mortality that disproportionately affects them. Because of

their greater knowledge of and better access to lethal means, physicians have a far higher suicide completion rate than the general public. The most common means of suicide by physicians are lethal medication overdoses and firearms.

### DEPRESSION IN MEDICAL STUDENTS

After accidents, suicide is the most common cause of death among medical students.

The nature of our medical schools which keep admitting more than they have capacity to train is unbearable. Many are failed in the professional exams without provision for psychological support. Also, the method of training which largely involves public embarrassment in clinics and ward rounds tip students into depression and suicidal ideation. Harassment and belittlement by professors, higher-level trainees, and even nurses contribute to mental distress of students and development of depression in some. Stressful aspects of physician training—such as long hours, having to make difficult decisions while being at risk for errors due to inexperience, learning to deal with death and dying, frequent shifts in workplace, and estrangement from supportive networks, such as family—could add to the tendency towards depressive symptoms in trainees. A few schools are implementing programs to recognize and deal with depression and other stresses in medical trainees.

### DEPRESSION IN PHYSICIANS

Physicians have been known to rank high in suicide cases. Most doctors are stressed and depressed because of their workload, poor remuneration, family expectation and friends. Also, the rigor of training to become a specialist, examination stress and its high failure rate are enough to frustrate an average doctor. Also, the disappointment that the profession is not as glorious and as comfortable as one has been made to believe while in medical school. Hence, it makes the 6-8 full academic years spent in school and another 6-9yrs of specialization more or less a colossal waste of time. Many doctors are going through a lot but hardly have time to attend to their health. This they continue to manage till the breaking point. Nigeria as a system has failed its medical doctors. People are migrating everyday out of this country because the environment is very terrible. It's only in this country that doctors will be massively sacked for demanding for their legitimate wages. It's only in this country that a non-doctor will be grandstanding to have all the assets of doctors and want to be this or that without willing to go through the rigor of medical training. It's only in this country that medical doctors will be owed for six months to one year. It's only in Nigeria that people will finish in medical school and getting housemanship (which is the compulsory one year training after medical school) will be much more difficult than it is for a camel to pass through the needle's eye.

It's only in this nation that doctors will spend 6-9 years to specialize only to be jobless afterwards as no hospital is willing to employ such if he or she does not have the right connections. It's only in Nigeria that medical doctors work an average of 28-36 hours per day! The environment is hostile, frustrating and unproductive for the younger ones, hence the reasons for the recent surge in those that are leaving the shores of this country for a better place. Unfortunately, those who don't have the means to do so will continue to cope with the system until they get to the breaking point.

However, when they are at this point, there is no adequate provision through a strengthened mental health to assist them.

To some extent, however, physicians' reluctance to reach out is self-imposed. They may feel an obligation to appear healthy, perhaps as evidence of their ability to heal others. Inquiring about another physician's health can shatter this mutual myth of invulnerability, and volunteering support or assistance unasked may seem like an affront to a colleague's self-sufficiency. Thus, the concerned colleague or partner may say nothing, while wondering privately if the colleague has become impaired.

Physicians find it painful to share their experience of mental illness with others and know that doing so is somewhat risky; therefore, published accounts of physician depression are very difficult to find. However, recent highly publicized cases of resident and physician suicides and subsequent sharing of experiences of depression by physicians suggest that either the incidence of depression is rising, or we are beginning to be more able

to admit and to address the immensity of the problem. Marriage is in most populations considered to be an effective buffer to emotional distress. This does not seem to be true for women physicians. It is believed that physician divorces are less frequent compared to the general population, but marital problems are common, perhaps in part because of the tendency of physicians to postpone addressing marital problems and to avoid conflict in general. Marital problems, separation, or divorce can certainly contribute to depressive symptoms, which can increase the likelihood of suicidality if unaddressed. Litigation-related stress can precipitate depression and, occasionally, suicide.

#### **PROBLEMS WITH TREATING PHYSICIAN DEPRESSION**

Many clinicians are uncomfortable treating fellow physicians, especially in the realm of mental health. The "VIP syndrome," characterized by well-intentioned, but superficial or inadequate, treatment based on collegiality and concerns about confidentiality, can detract from the effectiveness of therapy.

Physicians who have reported depressive symptoms (even those for which they are receiving effective treatment) to their licensing boards, potential employers, hospitals, and other credentialing agencies have experienced a range of negative consequences, including loss of their medical privacy and autonomy, repetitive and intrusive examinations, licensure restrictions, discriminatory employment decisions, practice restrictions, hospital privilege limitations, and increased supervision.

# THE SENSITIVE, FLUID AND PSYCHICALLY INTELLIGENT PERSON AND THE EMBRYOLOGICAL BRAIN

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## INTRODUCTION

Before we begin, we would like to state that while this write-up is based on already carried out research works and evidence backed hypotheses, there is no strong scientific backup for the application and inferences derived from these hypotheses in the context used herein. They are just scientific guesses and ideas that give a possible explanation on how the above topics are related.

Vital to grasping the concept of the article is an understanding of how the brain works, more specifically how it creates and stores memories. The human brain quite simply is made up of a lot of neurons- specialised cells that can transmit impulses and interpret signals, but interestingly, these neurons are connected to each other in infinitely complex ways such that one neuron can be connected to thousands of other neurons in interconnected pathways creating a super neuronal network capable of storing and interpreting unlimited amounts of information indefinitely! But how are memories formed you may ask? well, these neurons are connected with each other by what is called synapses and repeated transmission of signals along the same pathways over and over again sensitize the synapses, making it easier for information to flow along these paths and leaving behind what is known as a memory trace or engram. From the interpretation of the visual signals from the eyes to that of the hearing signals from the ears, these impulses are brought together to code one memory such as that of sitting in opera house. There is evidence to show that there are certain substances synthesised De Novo that help in the consolidation of this memory by maintaining the new connections created by these engrams, the latest of which from the Columbia university medical centre suggests that these substances are prion like molecules capable of renewing themselves once synthesised and helping in forming long term memory. These pathways while well defined are not mutually exclusive and as such one pathway may be part of hundreds of memories while one memory may be composed of multiple pathways, this neural plasticity is the basis of the explanations provided in this text.

## THE EMBRYOLOGICAL BRAIN

All cells in a given individual possess the same DNA and are capable of the performing all the functions possible but as the body ages and matures, they begin to only express specific characteristics necessary for their specific functions in the body. The DNA here is reminiscent of a book containing all the chapters but from which only certain chapters are read. This process is called differentiation and its opposite- dedifferentiation is a key component in carcinogenesis.

In relation to the neurons of the brain, as they mature, they lose certain functions- cell division being one of the first, and can be said to become more 'rigid' and set in definite pathways. This may be explained by the fact that protein synthesis and turnover reduce as they mature. These proteins are very necessary in the maintenance of neuronal pathways and more importantly, generation of new pathways like cytoskeletons as well as in the synthesis of substances required to temporarily or permanently store information. Therefore it can be said that our brains are at their most versatile at the embryological age when synapses and pathways can be made freely. Having said this, it is possible that in some individuals, certain areas of their brain don't fully mature and remain fluid therefore retaining the ability to make super intricate connections which allows them to possess peculiar intellectual abilities such as those seen in savants and child prodigy. It also stands to reason that other parts of the brain that would have matured and provided stability in personality, sexual orientation or social interactions would be deficient causing lapses in the individual's identity. This brings us to our next topic.

## PERSONALITY FLUIDITY

Just as mentioned above, individuals with brains functioning as though younger than their actual age retain a certain fluidity and this may especially be evident in their personality whose stability and final nature is dependent on the maturity of certain areas of the brain. A very good modality to use is that of sexual orientation which is set at a very young age as the individual first begins to relate with other children. Here, the proteins synthesised to permanently connect sexual arousal with the opposite sex in specific neuronal pathways are not synthesised or synthesised insufficiently resulting in a completely fluid or flexible sexual orientation. These individuals' sexual standing then tend to be crafted by their experiences and influences or perhaps even randomly ending up either normal or contradictory to the social norm. One then wonders less why many notable geniuses in our history such as Leonardo da Vinci and numerous other great minds had fluidity in their personalities and ideals if not in their sexual orientations. This also underscores the importance of a complete family setting in augmenting genetic variation and forming a 'complete' individual.

## SENSITIVITY

Sensitivity here connotes the receptivity of an individual to not only social, verbal and visual input but also to input from sources electromagnetic waves, infra red and others not fully understood. In two individuals of the same age but of differently aged brains, being exposed to the same stimulus, the one with the younger brain would be more likely to couple these experiences with his/her personality either consciously or subconsciously. These individuals would be regarded as more impressionable and empathic towards emotional influences.

Apart from the contemporary sensitivity, it has been noted that certain people possess the ability to sense unusual stimuli such as electromagnetic waves and interpret these stimuli correctly.

A recent research has uncovered proteins in our brain capable of sensing electromagnetic waves- the cryptochromes and has also shown their role in regulating our biorhythms. It is possible that people with exceedingly fluid areas of their brain are able to use these stimuli after years of subconsciously linking events with wave patterns to sense unorthodox things such as a mother sensing the cries of her baby miles away or a brother sensing his sibling in distress. At times such interpretations manifest much later than the time of occurrence resulting in delayed sensitivity and seemingly unexplained feelings. At times the information coded from these stimuli may only be apparent in dreams when the brain is quietest and free of other drowning stimuli.

### **PSYCHIC INTELLIGENCE**

This refers to the ability of certain people to be aware of events or occurrences in the past present or future at remote distances. To explain this concept, we must first delve into the nature of time and its implication on our senses. Contrary to popularly held belief, events do not occur in a sequence- past, present and future but all at the same time just like in the pages of a storybook but our senses are only able to experience them sequentially. Alternatively, just as events are occurring simultaneously on earth but separated by distance, and a traveller can't say they happened later simply because it took him time to get there, we too can't place events in a sequential order simply because we experienced them that way.

Therefore it stands to reason that some stimuli may transcend these sensual barriers and link events seemingly in the past present or future. Individuals with fluid, partially developed brains reason in a logical manner from

cause to effect and those who are able to sense these stimuli may be able to interpret occurrences at different points in time or space which follow a logical sequence through potentiation of synaptic pathways. This may explain the feeling of déjà vu where a person distinctly feels like a present event has occurred before simply because his/her brain was just able to predict the event before their normal senses were able to pick it up. These predictions may also be apparent in dreams as the subconscious mind usually plays a major role in the interpretation of the stimuli resulting in what we call visions. It is possible that this unique framework may predispose these individuals to neurological problems, tumours and other psychological problems such as bipolar disorder amongst others

In conclusion, there are many things science is yet to understand, many things that happen even to us that seem only to be explained spiritually, we hope this article has provided a possible scientific explanation to these events and as you progress in life, the writers only have one advice to give: keep an open mind.

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## FORDYCE DISEASE

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### INTRODUCTION

Also called Apocrine Miliaria, Sweat Retention Disease or Apocrine duct occlusion is a rare skin disorder that occurs mainly in women of ages 13 and 35 years. However, it sometimes affects men and children. It is an infrequently occurring chronic pruritic papular eruption that localises to areas where apocrine glands are found. The aetiology of Fordyce disease currently is unknown. The eponym is based on the 1902 report by G. Fox and J. Fordyce. It is not associated with any disease or illness, nor are they infectious rather they are believed to represent a natural occurrence on the body. No treatment is therefore needed unless the individual has cosmetic concerns.

Fordyce spots, also termed Fordyce granules, are visible sebaceous glands that appear on the genitals and/or on the face and in the oral mucosa of the mouth which is normally devoid of sebaceous glands. They appear as small, painless, raised, pale, red, yellow or white spots or bumps of 1 to 3mm in diameter that may appear on the scrotum, shaft of the penis or on the labia, vermilion border of the lips, the buccal and alveolar mucosa and on the tonsillar pillar. Sweating is often absent in affected area.

Most affected individuals consult a dermatologist because they are afraid they might have contracted a sexually transmitted disease or some form of cancer.

### EPIDEMIOLOGY

#### Sex

This variation of normal anatomy is seen in the majority of adults. It is estimated 80% of people have oral Fordyce spots, but seldom are granules found in large numbers. They are not usually visible in children and tend to appear at about age 3, then increasing in puberty and become more obvious in later adulthood. They are more prominent in males. A distinct predilection for women exists for Fox-Fordyce disease; the female to male ratio is 9:1.

#### Frequency

The disease is an infrequent condition. Geographic influence is not evident. Many case reports of the disease mention heat, humidity, and stress as exacerbating factors. Reports of Fordyce disease are most common from the United States; however, a geographic limitation is not evident.

#### Race

No racial preference is evident.

#### Age

Most common in women aged 13-35 years; it is rare before this age.

### PATHOLOGY

Appear as yellow-white papules. It is similar to normal sebaceous glands of skin, but lack hair follicles and almost always lack ductal communication with surface. May be hyperplastic and nodular. Neoplastic transformation is very rare, but reported.

#### CAUSES

The definite increased prevalence in women has led to an unapproved theory of hormonal influences. In 1956, Shelley and Levy proposed *apocrine miliaria* as the cause. Reports of cases of Fordyce disease in prepubertal girls are evidence against the hormonal theory. The exact pathophysiology is still unknown.

A number of factors, including:

- 1) Emotional and/or hormonal influences and
- 2) Alterations in sweat components, have been implicated in Fox-Fordyce disease.

The disease has also been reported to occur after laser hair removal.

### PATHOPHYSIOLOGY

It is a disease of the skin and mucous membranes.

The observed pathophysiology is a keratin plug in the hair follicle infundibulum obstructing the apocrine acrosyringium and producing an apocrine anhidrosis.

Histologically, a rupture of the apocrine excretory duct occurs, and spongiotic inflammation results. Extravasations of sweat and inflammation is postulated to cause the intense itching.

In 2003, Kamada et al published a histopathologic analysis from which they concluded that the 2 types of this disease are:

- 1) Apocrine (follicular) type and
- 2) Apocrine (nonfollicular) type

### MANAGEMENT HISTORY

Fox-Fordyce disease frequently appears under conditions of heat, humidity, and friction, often appearing suddenly. Many patients present after decades of symptoms. Few patients are asymptomatic. Most patients relate pruritus that disturbs sleep.

Changing antiperspirants has not been reported to help. Some patients report diminution of sweating after the onset of symptoms.

### DIAGNOSIS

Diagnosis is mainly via clinical findings. Immunohistochemical studies might prove useful in the future.

Large numbers of the lobules coalesce into a definitely elevated mass may be called a benign sebaceous hyperplasia, and occasional small keratin-filled pseudocysts may be seen and must be differentiated from epidermoid cyst or dermoid cyst with sebaceous adnexa. The pathologist must be careful to differentiate such lesions from salivary neoplasms with sebaceous cells, such as sebaceous lymphadenoma and sebaceous adenoma, and their malignant counterparts sebaceous lymphadenocarcinoma and sebaceous carcinoma.

Oral Fordyce granules are usually not biopsied because they are readily diagnosed clinically, but they are often seen as incidental findings of mucosal biopsies of the buccal, labial and retromolar mucosa. The granules are similar to normal sebaceous glands of the skin but lack hair follicles and almost always lack a ductal communication with the surface. The glands are located just beneath the overlying epithelium and often produce a local elevation of the epithelium. Individual sebaceous glands are large, with central dark nuclei and abundant foamy cytoplasm. The surrounding stroma may contain occasional chronic inflammatory cells because of trauma with adjacent teeth.

#### **DIFFERENTIAL DIAGNOSES**

- Acneiform Eruptions
- Miliaria
- Folliculitis
- Milia

#### **MEDICAL CARE**

Many Fox-Fordyce disease patients improve when placed on an oral contraceptive pill. Based on the observations of follicular occlusion, Shelley proposed topical tretinoin cream as therapy in 1972. Reports of success with topical retinoids followed, along with reports of success with topical steroids, topical clindamycin, clindamycin in alcoholic propylene glycol solution, hormonal therapy in women, ultraviolet light, dermabrasion, and surgical excision. Usually, these therapies were not curative and were often complicated by intolerable irritation. In 1994, Effendy et al reported the short-term success of isotretinoin when given for 4 months in a daily oral dose of 15-30mg; the condition returned 3 months after cessation of therapy.

Advise patients of the chronicity and the possible need for long-term therapy because Fox-Fordyce disease is often

controlled but not cured.

Management with topical retinoids and antibiotics have brought some hope to patients with Fox-Fordyce disease for decades. Often their presence is considered normal anatomic variance rather than a true medical condition. Long term follow up studies are not available; therapy may be prolonged for every long time. Acceptable therapy should be safe and relatively inexpensive.

Fordyce disease has no risk of loss of life or limb. Patients often experience severe pruritus. Therefore, the patient's quality of life may be adversely affected.

#### **SURGICAL CARE**

Surgical excision of affected areas in the axilla has been performed in the past, but is seldom recommended. Chae et al reported treatment of Fox-Fordyce disease with liposuction-assisted curettage. Pulse dye laser has been reported as a possibly effective treatment.

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# THE CONCEPT OF SCHIZOPHRENIA

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## INTRODUCTION

The word Schizophrenia comes from a Greek word that means to split. There is a split between what is going on in the person's mind and what is actually happening.

Schizophrenia is a severe mental disorder. It is characterized by profound disruptions in thinking, feelings, language, perception and relationship with others. It often includes psychotic experiences such as hallucination and delusion. And contrary to the popular belief, schizophrenia is not a split or multiple personality.

## EPIDEMIOLOGY

Accounts of a schizophrenia-like syndrome are rare before the 19th century. Detailed case reports from 1797 and 1809, are regarded as the earliest cases of the disorder. Schizophrenia was first described as a distinct syndrome affecting teenagers and young adults by Bénédict Morel in 1853, termed *démence précoce* (literally 'early dementia'). The term *dementia praecox* was used in 1891 by Arnold Pick in a case report of a psychotic disorder. In 1893 Emil Kraepelin introduced a new distinction in the classification of mental disorders between *dementia praecox* and mood disorder (termed manic depression and including both unipolar and bipolar depression). Kraepelin believed that *dementia praecox* was primarily a disease of the brain, and a form of dementia, different from other forms of dementia such as Alzheimer's disease which usually happen later in life.

Eugen Bleuler coined the term "schizophrenia", which translates roughly as "split mind", in 1908. The word was intended to describe the separation of functioning between personality, thinking, memory, and perception. Bleuler realized that the illness was not a dementia because some of his patients improved rather than got worse.

In the early 1970s, the criteria for determining schizophrenia were the subject of numerous controversies. Schizophrenia was diagnosed far more often in the United States than in Europe. This difference was partly the result of looser criteria for determining whether someone had the condition in the United States, where the DSM-II manual was used. In Europe, the ICD-9 manual was used. A 1972 study, published in the journal *Science*, concluded that the diagnosis of schizophrenia in the United States was often unreliable. These factors resulted in the publication of the DSM-III in 1980 with a stricter and more defined criteria for the diagnosis.

Schizophrenia affects more than 21 million people worldwide and affecting about 1% of Americans. More men are affected than women: the number of males with the disorder is 1.4 times greater than that of females. Schizophrenia usually appears earlier in men.

There are some factors that predisposes one to this disorder and they include:

- **Age and Sex:** Although schizophrenia can occur at any age, the average age of onset tends to be in the late teens to the early 20s for men, and the late 20s to early 30s for women. It is uncommon for schizophrenia to be diagnosed in a person younger than 12 or older than

40.

- **Genetics:** Having a family history of psychosis greatly increases its risk. Schizophrenia occurs at roughly 10% of people who have first degree relative (which could be a parent or sibling) with the disorder. The highest risk occurs when an identical twin is diagnosed with schizophrenia. The unaffected twin has 50% chance of developing the disorder.
- **Pre-Birth factors:** When a pregnant mother is predisposed to infection, Stress, malnutrition or lack of Oxygen. This might result in a slight increase in the risk of schizophrenia later in the life of the baby. People who are hospitalized for severe infection are also at higher risk.
- **Substance use:** Some studies have suggested that taking mind-altering drugs during teen years and young adulthood can increase the risk of schizophrenia. A growing body of evidence indicates that smoking marijuana may increase the risk of serious mental illness including schizophrenia. Excessive use of some drugs or alcohol possibly to deal with boredom, depression or loneliness can also increase its risk.

## AETIOLOGY

Schizophrenia is not caused by just one genetic variation, but a complex interplay of genetic makeup and environmental influences.

**Genetics(Hereditary ):** Scientists recognize that the disorder tends to run in families and that a person inherits a tendency to develop the disease. Similar to some other genetically-related illnesses, schizophrenia may appear when the body undergoes hormonal and physical changes (like those that occur during puberty in the teen and young adult years as stated above).

**Brain-Chemistry:** Problems with certain brain chemicals including neurotransmitters called dopamine and glutamate may contribute to Schizophrenia. Neurotransmitters allow brain cells to communicate with each other. Networks of neurons are likely involved as well.

**Viral Infections and Immune Disorders:** Schizophrenia may also be triggered by environmental events such as viral infections or immune disorders. For instance babies whose mothers get the flu while they are pregnant are at higher of developing schizophrenia later in life.

## **PATHOPHYSIOLOGY**

Scientists believe that people with schizophrenia have an imbalance of the brain chemicals or neurotransmitters: dopamine, glutamate and serotonin. These neurotransmitters allow nerve cells in the brain to send messages to each other. The imbalance of these chemicals affects the way a person's brain reacts to stimuli--which explains why a person with schizophrenia may be overwhelmed by sensory information (loud music or bright lights) which other people can easily handle. This problem in processing different sounds, sights, smells and tastes can also lead to hallucinations or delusions. Some research suggests that problems with the development of connections and pathways in the brain while in the womb may later lead to schizophrenia.

The pathology could also come from the brain connections. The human brain has 100 billion neurons; each one of these neurons are connected to many other neurons. One neuron may have as many as 20,000 connections; there is between 100 trillion and 500 trillion neural connections in the adult human brain. There are many different parts or 'regions' of the brain. To complete a task - like recalling a memory - usually more than one region of the brain is involved, and they are connected by neural networks which are like the brain's wiring. It is believed that there are problems with the brain's wiring in schizophrenia. Then finally, Schizophrenia may be from the structure of the brain. Some people who have schizophrenia have differences in their brain structure compared to those who do not have the disorder. These differences are often in the parts of the brain that manage memory, organization, emotions, the control of impulsive behavior, and language. For example, there is less brain volume in the frontal cortex and temporal lobes, and problems within the corpus callosum, the band of nerve fibers which connects the left side and the right side of the brain. People with schizophrenia also tend to have larger lateral and third ventricles. The ventricles are spaces within the brain filled with cerebrospinal fluid.

## **MANAGEMENT**

The treatment of schizophrenia is based upon the phase of the illness the person is in. There are three treatment phases:

### **Acute Phase**

The goals of treatment during the acute phase of treatment, defined by an acute psychotic episode, are to prevent harm, control disturbed behavior, reduce the severity of psychosis and associated symptoms (e.g., agitation, aggression, negative symptoms, affective symptoms), determine and address the factors that led to the occurrence of the acute episode, effect a rapid return to the best level of functioning, develop an alliance with the patient and family, formulate short- and long-term treatment plans, and connect the patient with appropriate aftercare in the community

### **Stabilization Phase**

During the stabilization phase, the goals of treatment are to reduce stress on the patient and provide support to minimize the likelihood of relapse, enhance the patient's adaptation to life in the community, facilitate continued

reduction in symptoms and consolidation of remission, and promote the process of recovery. If the patient has improved with a particular medication regimen, continuing to use of that regimen and monitoring are recommended for at least 6 months.

### **Stable Phase**

The goals of treatment during the stable phase are to ensure that symptom remission or control is sustained, that the patient is maintaining or improving his or her level of functioning and quality of life, that increases in symptoms or relapses are effectively treated, and that monitoring for adverse treatment effects continues. Regular monitoring for adverse effects is recommended. For most persons with schizophrenia in the stable phase, psychosocial interventions are recommended as a useful adjunctive treatment to pharmacological treatment and may improve outcomes. Antipsychotic medications substantially reduce the risk of relapse in the stable phase of illness and are strongly recommended.

Schizophrenia can also be managed at an individual level by the followings;

**Manage Stress.** Stress can trigger psychosis and make the symptoms of schizophrenia worse, so keeping it under control is extremely important. Know your limits, both at home and at work or school. Don't take on more than you can handle and take time to yourself if you're feeling overwhelmed.

Try to get plenty of sleep. When you're on medication, you most likely need even more sleep than the standard eight hours. Many people with schizophrenia have trouble with sleep, but lifestyle changes such as getting regular exercise and avoiding caffeine can help.

**Avoid alcohol and drugs.** It's indisputable that substance abuse affects the benefits of medication and worsens symptoms. If you have a substance abuse problem, seek help.

**Maintain connections.** Having friends and family involved in the treatment plan can go a long way towards recovery. People living with schizophrenia often have a difficult time in social situations, so surrounding self with people who understand this can make the transition back into daily social life smoother.

And it could be managed in the Family level by the following;

**Respond calmly.** To your loved one, the hallucinations seem real, so it doesn't help to say they are imaginary. Calmly explain that you see things differently. Pay attention to triggers. You can help your family member or friends understand, and try to avoid, the situations that trigger his or her symptoms or cause a relapse or disrupt normal activities.

**Help ensure medications are taken as prescribed.** Many people question whether they still need the medication when they're feeling better, or if they don't like the side effects. Encourage your loved one to take his or her medication regularly to prevent symptoms from coming back or getting worse.

Help avoid drugs or alcohol. These substances are known to worsen schizophrenia symptoms and trigger psychosis. If your loved one develops a substance use disorder, getting help is essential.

### **HISTORY AND EXAMINATION FINDING**

Diagnosing schizophrenia is not easy. Sometimes using drugs such as methamphetamines or excessive use of some antidepressants can cause a person to have schizophrenia like symptoms. The difficulty of diagnosing the illness is compounded by the fact that many people who are diagnosed do not believe they have it. When diagnosing for schizophrenia the mental health professional looks out for symptoms and they are Physical Examination and Laboratory Examination.

Physical Examination: This can be grouped into three: positive symptoms, cognitive symptoms and negative symptoms.

#### **Positive Symptoms of Schizophrenia**

In this case, the word positive does not mean "good." Rather, it refers to obvious symptoms that are exaggerated forms of thinking or behavior that become irrational. These symptoms, which are sometimes referred to as psychotic symptoms, include:

**Delusions:** Delusions are strange beliefs that are not based in reality and that the person refuses to give up, even when presented with factual information. For example, the person suffering from delusions may believe that people can hear his or her thoughts, that he or she is God or the devil, or that people are putting thoughts into his or her head or plotting against them.

**Hallucinations:** These involve perceiving sensations that aren't real, such as seeing things that aren't there, hearing voices, smelling strange odors, having a "funny" taste in your mouth, and feeling sensations on your skin even though nothing is touching your body. Hearing voices is the most common hallucination in people with schizophrenia.

**Catatonia** (a condition in which the person becomes physically fixed in a single position for a very long time).

Disorganized symptoms of schizophrenia are a type of positive symptom that reflects the person's inability to think clearly and respond appropriately. Examples of disorganized symptoms include:

Talking in sentences that do not make sense or using nonsense words, making it difficult for the person to communicate or engage in conversation

Shifting quickly from one thought to the next

Being unable to make decisions

Writing excessively but without meaning

Forgetting or losing things

Repeating movements or gestures, such as pacing or walking in circles Having problems making sense of everyday

#### **Cognitive Symptoms of Schizophrenia**

Cognitive symptoms include:

Poor executive functioning (the ability to understand information and to use it to make decisions)

Trouble focusing or paying attention

Difficulty with working memory (the ability to use information immediately after learning it)

### **Negative Symptoms of Schizophrenia**

In this case, the word negative does not mean "bad," but reflects the absence of certain normal behaviors in people with schizophrenia. Negative symptoms of schizophrenia include:

Lack of emotion or a very limited range of emotions  
Withdrawal from family, friends, and social activities

Reduced energy

Reduced speech

Lack of motivation

Loss of pleasure or interest in life

Poor hygiene and grooming habits.

### **INVESTIGATION**

Of the total population, one in two people living with schizophrenia does not receive care for the condition. Care of persons with schizophrenia can be provided at community level with active family and community involvement. Schizophrenia has a great human and economic costs. This condition results in decrease in life expectancy of 12 to 15 years, primarily because its association with being overweight, not exercising smoking cigarettes with high nicotinic contents, excessive use of alcohol and some other drugs. An increased rate of suicide plays a lesser role. In Sumer 2013, for the first time, brain tissue development was replicated in three dimensions by a scientist cloning a human "mini-brain" using stem cells. This could help schizophrenia and other neurological research.

In a family treatment called "open-dialog" in Finland, 9 out of every 10 people with schizophrenia "get well". In developing countries where doctors use less drugs, 2 out of 3 patients get well from schizophrenia. In Western countries, where medications are used as treatment, 1 out of 3 get well but many suffer sideeffects such as diabetes, obesity and brain damage.

### **DRUG TREATMENT**

The first-line psychiatric treatment for schizophrenia is antipsychotic medication, which can reduce the positive symptoms in about seven to fourteen days. However, medication fails to improve negative symptoms or problems in thinking significantly. Many antipsychotics are Dopamine antagonists (a substance interfering with how another substance works.) High concentrations of Dopamine are thought to be the cause of hallucinations and delusions.

For this reason blocking Dopamine reception helps against hallucinations and delusions. These antipsychotics are classified based on two types: First Generation (Typical) Antipsychotics and Second Generation (Atypical) Antipsychotics.

#### **First Generation (Typical) Antipsychotics**

These medications can cause serious movement problems that can be short (dystonia) or long term (called tardive dyskinesia), and also muscle stiffness. Other side effects can also occur.

Chlorpromazine (Thorazine)  
 Fluphenazine (Prolixin)  
 Haloperidol (Haldol)  
 Loxapine (Loxitane)  
 Perphenazine (Trilafon)  
 Thiothixene (Navane)  
 Trifluoperazine (Stelazine)

**Second Generation (Atypical) Antipsychotics**

These medications are called atypical because they are less likely to block dopamine and cause movement disorders. They do, however, increase the risk of weight gain and diabetes. Changes in nutrition and exercise, and possibly medication intervention, can help address these side effects.

Aripiprazole (Abilify)  
 Asenapine (Saphris)  
 Clozapine (Clozaril)  
 Iloperidone (Fanapt)  
 Lurasidone (Latuda)  
 Olanzapine (Zyprexa)  
 Paliperidone (Invega)  
 Risperidone (Risperdal)  
 Quetiapine (Seroquel)  
 Ziprasidone (Geodon)

One unique second generation antipsychotic medication is called clozapine. It is the only FDA approved antipsychotic medication for the treatment of refractory schizophrenia and has been the only one indicated to reduce thoughts of suicide. However, it does have multiple medical risks in addition to these benefits. Read a more complete discussion of these risk and benefits.

A third, smaller category of drugs used to treat schizophrenia is known as "miscellaneous antipsychotic agents." Miscellaneous antipsychotic agents function differently than typical or atypical antipsychotic medications. Loxapine (Adasuve, Loxitane) is one such miscellaneous antipsychotic and is used to treat agitation in people with schizophrenia.

Side effects are common with antipsychotic drugs. They range from mild side effects such as dry mouth, blurred vision, constipation, drowsiness and dizziness which usually disappear after a few weeks to more serious side effects such as trouble with muscle control, pacing, tremors and facial ticks. The newer generation of drugs have fewer side effects. However, it is important to talk with your mental health professional before making any changes in medication since many side effects can be controlled.

While medication may help relieve symptoms of schizophrenia, various psychosocial treatments can help with the behavioral, psychological, social, and occupational problems associated with the illness. Through therapy, patients also can learn to manage their symptoms, identify early warning signs of relapse, and develop a relapse prevention plan. Psychosocial therapies include:

**Rehabilitation:** which focuses on social skills and job training to help people with schizophrenia function in the community and live as independently as possible.

**Cognitive remediation** involves learning techniques to compensate for problems with information processing, often through drills, coaching and computer-based exercises, to strengthen specific mental skills involving attention, memory and planning/organization.

**Individual psychotherapy**, which can help the person better understand his or her illness, and learn coping and problem-solving skills.

**Family therapy**, which can help families deal more effectively with a loved one who has schizophrenia, enabling them to better help their loved one.

**Group therapy/support groups**, which can provide continuing mutual support.

**Cognitive behavioral therapy (CBT)** is an effective treatment for some people with affective disorders. With more serious conditions, including those with psychosis, additional cognitive therapy is added to basic CBT (CBTp). CBTp helps people develop coping strategies for persistent symptoms.

**CONCLUSION**

Most people with schizophrenia are not violent so with proper treatment, most people with it can lead productive and fulfilling lives. Depending on the level of severity and the consistency of treatment received they are able to live with their families or in community settings rather than in long-term psychiatric institutions.

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# THE EFFECT OF PARENTAL PSYCHOPATHY IN PERSONALITY DISORDER

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## INTRODUCTION

The role of a parent in the upbringing of a child cannot be disputed; the child watches and has his behavior patterns modeled from what he sees them do. This is to say that parental psychopathology is a robust non-specific predictor associated with a substantial proportion of offspring disorders.

## DEFINITION

Personality disorders (PD) are a group of psychiatric conditions characterized by experience and behavior patterns that cause serious problems with respect to any two of the following: thinking, mood, personal relations, and the control of impulse

## DESCRIPTION

Personality disorders is divided into several subtypes depending on the behavioral traits in question, the world health organization classifies it into the following clusters:

### Cluster A disorders

These disorders include the following:

- **Schizoid personality disorder.** Schizoid personalities are introverted, withdrawn, solitary, emotionally cold, and distant. Often absorbed with their own thoughts and feelings, they fear closeness and intimacy with others. People suffering from schizoid personality tend to be more daydreamers than practical action takers, often living "in a world of their own."
- **Paranoid personality disorder.** Paranoid personalities interpret the actions of others as deliberately threatening or demeaning. People with paranoid personality disorder are untrusting, unforgiving, and often resort to angry or aggressive outbursts without justification because they see others as unfaithful, disloyal, or dishonest. Paranoid personalities are often jealous, guarded, secretive, and scheming, and may appear to be emotionally "cold" or excessively serious.
- **Schizotypal personality disorder.** Schizotypal personalities tend to have odd or eccentric manners of speaking or dressing. They often have strange, outlandish, or paranoid beliefs and thoughts. People with schizotypal personality disorder have difficulties **bonding** with others and experience extreme **anxiety** in social situations. They tend to react inappropriately or not react at all during a conversation, or they may talk to themselves. They also have delusions characterized by "magical thinking," for example, by saying that they can foretell the future or read other people's minds.

### Cluster B disorders

Cluster B disorders include the following:

- **Antisocial personality disorder .** Antisocial personalities typically ignore the normal rules of social behavior. These individuals are impulsive, irresponsible, and callous. They often have a history

of violent and irresponsible behavior, aggressive and even violent relationships. They have no respect for other people and feel no remorse about the effects of their behavior on others. Antisocial personalities are at high risk for substance abuse, since it helps them to relieve tension, irritability, and boredom.

- **Borderline personality disorder.** Borderline personalities are unstable in interpersonal relationships, behavior, mood, and self-image. They are prone to sudden and extreme mood changes, stormy relationships, unpredictable and often self-destructive behavior. These personalities have great difficulty with their own sense of identity and often experience the world in extremes, viewing experiences and others as either "black" or "white." They often form intense personal attachments only to quickly dissolve them over a perceived offense. Fears of **abandonment** and rejection often lead to an excessive dependency on others. **Self-mutilation** or suicidal threats may be used to get attention or manipulate others. Impulsive actions, persistent feelings of boredom or emptiness, and intense anger outbursts are other traits of this disorder.
- **Narcissistic personality disorder.** Narcissistic personalities tend to have an exaggerated sense of self-importance, and are absorbed by fantasies of unlimited success. They also seek constant attention, and are oversensitive to failure, often complaining about multiple physical disorders. They also tend to be prone to extreme mood swings between self-admiration and insecurity, and tend to exploit interpersonal relationships.

### Cluster C disorders

Cluster C disorders include the following:

**Avoidant personality disorder.** Avoidant personalities are often fearful of rejection and unwilling to become involved with others. They are characterized by excessive social discomfort, **shyness**, fear of criticism, and avoidance of social activities that involve interpersonal contact. They are afraid of saying something considered foolish by others and are deeply hurt by any disapproval from others.

- They tend to have no close relationships outside the **family** circle and are upset at their inability to form meaningful relationships.
- **Dependent personality disorder.** As the name implies, dependent personalities exhibit a pattern of dependent and submissive behavior, relying on others to make decisions for them. They fear rejection, need constant reassurance and advice, and are oversensitive to criticism or disapproval. They feel uncomfortable and helpless if they are alone and can be devastated when a close relationship ends. Typically lacking in self-confidence, the dependent personality rarely initiates projects or does things independently.
- **Obsessive Compulsive personality disorder.** Compulsive personalities are conscientious, reliable, dependable, orderly, and methodical, but with an inflexibility that often makes them incapable of adapting to changing circumstances. They have such high standards of achievement that they constantly strive for perfection. Never satisfied with their performance or with that of others, they take on more and more responsibilities. They also pay excessive attention to detail, which makes it very hard for them to make decisions and complete tasks. When their feelings are not under strict control, when events are unpredictable, or when they must rely on others, compulsive personalities often feel a sense of isolation and helplessness.

#### EFFECT OF PARENTS PSYCHOPATHY

The World Health Organization (WHO) World Mental Health (WMH) Surveys offer a unique opportunity for one to know the associations of parent disorders with offspring disorders from WMH surveys in 22 countries in the world. The WMH Surveys were carried out in ten countries classified by the World Bank as high income (Belgium, France, Germany, Italy, Japan, The Netherlands, Northern Ireland, Portugal, Spain, USA), six classified as upper-middle income (Brazil, Bulgaria, Lebanon, Mexico, Romania, South Africa) and six classified as low/lower-middle income (Colombia, India, Iraq, Nigeria, Peoples Republic of China, Ukraine). Although virtually all parent disorders examined (major depressive, generalized anxiety, panic, substance and antisocial behaviour disorders and suicidality) were significantly associated with offspring disorders in multivariate analyses, little specificity was found. Comorbid parent disorders had significant sub-additive associations with offspring disorders. Population-attributable risk proportions for parent disorders were 12.4% across all offspring disorders, generally higher in high- and upper-middle- than low-/lower-middle-income countries, and consistently higher for behaviour (11.0-19.9%) than other (7.1-14.0%) disorders.

#### PREVENTION AND TREATMENT

Personality disorders usually persist throughout life and are not readily treated. However, they often become less

extreme with age. There are many types of help available for the different personality disorders. Treatment may include individual, group, or family psychotherapy. Medications, prescribed by a patient's physician, may also be helpful in relieving some of the symptoms of personality disorders, such as problems with anxiety (anxiolytic drug) and delusions. Psychotherapy is a form of treatment designed to help children and families understand and resolve the problems due to PD and modify the inappropriate behavior. In some cases a combination of medication with psychotherapy may be more effective. PD psychotherapy focuses on helping patients see the unconscious conflicts that are causing their disorder. It also helps them become more flexible and is aimed at reducing the behavior patterns that interfere with everyday living. In psychotherapy, patients have the opportunity to learn to recognize the effects of their behavior on others. The different types of psychotherapies available to children and adolescents include the following:

- Cognitive behavior therapy (CBT). CBT combines two forms of therapy the cognitive therapy and the behavior therapy it is focused on improving a child's moods and behavior by examining confused or distorted patterns of thinking. With CBT, the child learns that thoughts cause feelings and moods that can influence behavior. For example, if a child has problematic behavior patterns, the therapist seeks to identify the underlying thinking that is causing them. The therapist then helps the child replace this thinking with thoughts that result in more appropriate feelings and behaviors.
- Dialectical behavior therapy (DBT). This is an intensive form of CBT and there is some evidence that emotionally unstable personality disorder may benefit.
- Family therapy
- Group therapy (GT)
- playtherapy
- interpersonal psychotherapy

#### **Alternative treatment**

Alternative treatments are available for personality disorders and most are complementary to conventional psychotherapy. They include the following:

- Coloring therapy
- Creative arts therapies
- Neurolinguistic programming

#### CONCLUSION

Personality disorders are better prevented than treated, parents should understand the effect of their behavior on their children. Child abuse and neglect consistently evidence themselves as antecedent risks to the development of personality disorders in adulthood. When a couple constantly quarrels in front of their children they are sending a message to these children, therefore this should be avoided.



The Nigerian government should also find ways to protect children from homes which do not create the right environment for growth, because these children might end up becoming burdens to the society.

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# MENTAL HEALTH: DEPRESSION AND PERSONALITY DISORDERS

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## MENTAL HEALTH: DEPRESSION AMONG MEDICAL STUDENTS

According to the world health organization, health is far beyond the absence of illness to include the physical, social and mental well being of an individual. And according to an American surgeon mental health is the successful performance of mental functions resulting in productive activities, fulfilling relationship with other people and providing the ability to adapt to change and cope with adversity. (Wikipedia, 2017). Mental illness is the most skewed aspect of health in our environment "just madness for many" which is schizophrenia while a great deal of abnormalities of thought, mood, speech and perceptions are not considered as deviations from health, despite affecting the individuals day in day activities, relationships and academic performance.

Abnormal deviation from mental health causes mental illness and they include depression, anxiety disorder, relationship problems, grief, addiction, ADHD, learning disabilities and mood disorders.

What is depression? 'Depression is more than just being sad' the American psychologist Association Journal says. So many a times in the course of medical training students develop this miserable, slow, lethargic, insomniac, agitated or impaired learning state. I had a friend who was coincidentally my room mate and classmate also. A brilliant chap as that, young and enthusiastic so we used to study together since she was in my class. She was a straight "A" student, having graduated as the BGS of her secondary school and also having the highest Jamb and post UTME average score. She was among (if not only) the persons we were expecting to have not less than two distinctions in the coming 2<sup>nd</sup> MBBS professional examination. The result of our first test as 2<sup>nd</sup> MBBS student was a shock to us all as she was not among the first 20 people in the result list. Of course this could have been acceptable if it were me but not her. This was a great setback; she stopped eating, most time crying silently, started missing classes and stayed in the room most times. The cheerful, spirited girl I know was no longer herself.

She stopped attending masses and found an excuse anytime I asked her to escort me shopping (and these were the thing she loved doing). She often woke up at night and found it difficult sleeping back. All these continue for month until I called her parents and they came and carried her away.

What could she be suffering from, was it depression? It's certainly not just a passing blue mood but rather it was a persistent feeling of sadness and worthlessness along with lack of desire to engage in formerly pleasurable activities. It's an established fact that doctors (medical student inclusive) have higher rates of depression than the average person. Though we don't have any statistics on this in Nigeria, in a new research conducted on 129,000 medical students in 47 countries, 27% of the medical student had depression or symptoms of it and 11% reported suicidal thoughts during medical school (journal of the American medical Association). Even after being diagnosed "only 16% of the medical student who screened positive actually saw someone for treatment" another research done by Dr. Douglas Mata revealed. According to time health journal, medical training is notoriously stressful and competitive;

requiring long hours of studying, training and staying awake. In an article written by Richard Gundesman in the conversation newsletters, Richard is of the opinion that the reason why medical students suffer from depression could be that medical student are more perfectionist than others and more liable to be discouraged when they make mistakes (this explains friend's case) or it could be that medical students are especially compassionate and more liable to become depressed by frequent contact with suffering. In another study conducted on medical student in Cameroon by Nduiara Stewart et al, it had the conclusion that "the prevalence of major depressive disorders among medical students in Cameroon is high and is associated with the presents of chronic disease, major life events, female gender and being a student at the clinical level". In another study conducted on Turkish medical student by Ediz et al, it showed that depression and anxiety were more frequently reported by federal students.

Depression was more frequent among first year student & student in a poor economic situation and those who were not satisfied with their medical education and the frequency of depression was seen to decrease with increasing grades". The reason why being a female medical student was implicated as a risk factor for depression could be that female are known to give in their best and get their hopes high so that in the event of a failure( in grades) they crash down.

What could be the cause of depression? According to Freud (1977) he stated that the causes of depression are due to biological factors. In an articles published by Saul McLeod in 2015 (simply psychology Journal) depression according to operant conducting is caused by the removal of positive reinforcement from the environment Seligman referred to depression as the "common cold" of psychiatry because of its frequency of diagnosis. Considering the biological factors, depression is caused by reduced levels of serotonin, catecholamines, and dopamine in the brain. Since serotonin is responsible for controlling sleep, aggression, eating, sexual behaviours and mood, people with reduced serotonin level have sleep abnormalities, eat less or more, show reduced sexual behavior and have depressed mood.

Dopamine is responsible in controlling our drive to self out rewards and also our ability to obtain a sense of pleasure, low dopamine level in depressed people can explain why they don't get the same sense of pleasure out of activities or people that they did before becoming depressed. Reduced level of glutamate and increase level of GABA can be a cause also.

It is quite disheartening "the hunter is now being hunted" those that are supposed to be managing depressed people (doctors and medical students) are the ones being depressed. What kind of world will we be creating when we become "our patients". Depression being the most common psychiatry diagnosis is easily preventable. We should make an effort to realize early enough those of us that have a genetic predisposition to depression, those of us that are female medical students.

More works and research needs to be done on medical students in Nigeria. It's clearly under diagnosed in Nigeria because medical students and doctors do suffer from it but because sheer failure to pay attention and recognize the clinical manifestation of depression among us and this has steered many of our students into having chronic problems in their academic and relationship.

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## 53 MEDICAL MYTHS

There is massive amount of medical misinformation circulating in the world today, some of which are unfortunately causing an epidemic of chronic illness and leading the common man to believe nonsense. This article is mostly for entertainment and would therefore not make much effort to prove the medical truths behind these myths. Tighten your seat belts, therefore, for you may not know if one of your beliefs would be one of these 'myths'.

1. To get rid of hiccups, have one startle you or for a child, put a strand of cloth on his head,
2. We only use 10% of our brains. Motivational speakers use this one to encourage people to tap into their hidden talents. Some even go further to say that Albert Einstein was the only one to use up to 20% of his brain. Hollywood is not an exception as they portrayed this myth in the award winning movie "LUCY".
3. If you swallow chewing gum it stays in your stomach for seven years before dissolving. I trust that the acid in your stomach is laughing at this one.
4. If you swallow the seed of a fruit, it soon grows into a full tree inside you: what are you? A garden?
5. Reading in dim light or with candles ruins your eyesight.
6. Staying too close to the computer or television huts your eyes.
7. You should drink at least 8 glasses of water a day.
8. Fingernails and hair continue to grow after death.
9. Shaving your hair makes it grow back faster, coarser and darker.
10. Chili food and spicy food gives you ulcers. Ulcers are caused most of the time by the bacteria *Helicobacter pylori* and sometimes by overuse of Aspirin and other NSAIDs.
11. A woman cannot get pregnant during her period.
12. Eating at night makes you fat. This one is good news for the ladies.
13. Babies get fevers when they are teething. Parents should not wade off a babies fever when they are teething, it can be dangerous.
14. Pregnancy lasts nine months. Everyone is wrong about this one. Pregnancy actually lasts nine and half months, counting from the moment of inception.
15. Cracking your knuckles will cause arthritis later in life.
16. Cancers are incurable. This is the 21<sup>st</sup> century. Today about 80% of children with leukemia worldwide survive, and yes, some are completely cured.
17. Back pain should be treated with bed rest. It has been proven medically that bed rest does more harm than good, so when next you get a back ache, it is better to continue your ordinary activities.
18. It is harder to lose weight than to gain weight.
19. Chocolate and fat foods give you acne. Acnes are due to the blocking of sebaceous glands on the skin by the bacterium *Propionibacterium acne*.
20. Staying under the sun gives you skin cancers. The reverse is the case. Skin experts have proven that vitamin D produced in the skin by appropriate exposure to sunlight has a cancer protection activity.
21. Cholesterol causes heart disease. Saturated, Unsaturated fats and cholesterol play myriads of role in maintenance of the body's internal milieu. They provide building blocks for cell membranes and are required in the synthesis of varieties of hormones and also act as carriers for important fat soluble vitamins.
22. Eating fatty diets will make you fat. It is actually sugar, especially fructose, that causes excess weight gain.
23. An apple a day keeps the doctor away. Yes, apples have enough vitamin C and fibre, but that is not all you need. If certain viruses or bacteria get into your system, an apple will unfortunately do nothing to protect you.
24. Natural sugar, like honey, is better than processed sugar. Sugar in natural products and sugar in processed products are the same.
25. Drinking cold water can worsen your cold.
26. Sugar is addictive.
27. Your blood turns blue when it is out of oxygen. Blood never turns blue; it actually turns dark red when it is out of oxygen. It only looks blue because you are seeing it through several layers of tissue which filters the colour.
28. Humans have five senses. Did you forget balance, temperature, proprioception and nociception?
29. Taking vitamin supplements keeps you healthy. Staying healthy has much more to it than popping some daily tablets.

30. Drinking alcohol destroys your brain cells. This is unless you take a whole gallon of it over a very long period of tie.
31. Sugar causes diabetes. Eating sugar in moderation won't give you diabetes, furthermore Diabetes is a complex disease affected by both genetic and environmental factors.
32. Stress causes high blood pressure. Stress can temporarily increase your blood pressure which is a positive for your body's mechanism to match the stress but not enough to cause hypertension.
33. Humans got HIV because someone had sex with a monkey. Yes it came from monkeys but is through other body fluid contact. Monkey hunters had contact with monkey blood. There is no evidence of human-monkey sex being the means of transmission of HIV.
34. Malt and milk therapy for instant energy. Next time you are in dire need of strength run the nearest chemist shop and get your glucose sachet at a cheaper rate than malt and milk which would not solve your immediate energy needs. Maltose in malt and lactose in milk still need to undergo breakdown unlike glucose that is rapidly absorbed.
35. Medical proof to this statement.
36. Conjunctivitis is transmitted by eye contact. This one sounds more like Nollywood. Medical proof shows that it is rather transmitted by contact. Note that not all conjunctivitis are transmissible, some are hypersensitivity reactions as seen in people with atopic conditions.
37. Epilepsy is contagious. The cause of epilepsy is not transmissible as it is due to asynchronous nervous discharge from the neurons in the brain.
38. When pepper gets into your eye, lick salt. There is no proof of this fact; some people argue that it works. I usually use a lot of clean water to wash my face, try that sometime.
39. Early morning urine is good for your health. I don't think my kidneys are stupid enough to remove healthy substances from my body without cause, if they removed it, then I don't need them.
40. When a lactating mother without her baby starts lactating, then it means her baby is crying at home. It is not only the suckling effect on the breast that stimulates milk let down.
41. If you spit on the ground and someone matches it that means that you will soon have a sore throat. Sore throats are caused by the bacteria *Streptococcus*. Next time you get it, go get a Strepsil and its history.
42. If your eyelids hurt, then you are about to get a boil. Just pluck out your eyelash in that area and you are good to go. First, you will look like a dog without your lash. Secondly, the boil will still grow. Caveat: you may not need to take antibiotics, most are self-limiting.
43. Dipping your legs into cold water helps prevent sleep. Students are desperately in need of a way to reduce night sleep during exams but this is not one of them.
44. *Staphylococcus aureus* is a deadly killer. This is one myth herbal medicine men use in getting their customers but the truth is that Staph is actually one of our normal flora, i.e. it normally lives on our skin and helps protect us from very harmful microorganisms. It is only in rare cases that they need to be treated as they cause self-limiting diseases like boil.
45. Donating blood often helps you stay healthy. This is not true as donation of blood more than 3-4 times a year is not good. Some people do not even have enough blood to give out.
46. Spoon in the mouth of epileptics help to stop the attack. This is not true but in tonic-clonic and myoclonic seizures, there is need to prevent jamming the teeth against the tongue and injuring it. That is the purpose of the spoon.
47. Appendicitis is due to frequent swallowing of stones. Appendicitis is inflammation of the appendix; it can be due to obstruction of its lumen by worms or by bacterial infections.
48. Drinking oil helps prevent absorption of poison. Not always, in fact not most of the time. Especially with acids e.g. Hypo or other household bleaches.
49. Salt water prevents Ebola. Many people lost their lives to this myth while others who survived put their body's electrolytes into confusion.
50. All doctors have terrible hand writings. I have seen doctors with very nice legible hand writing.
51. Mother's urine and onion can be used to abort convulsion in children
52. Cow dung applied to the umbilical stump helps to protect the baby. Jeez
53. Drinking Andrews Liver Salt after unprotected sex helps to prevent pregnancy. Big LOL

## PHARMACOLOGY

- 1) Concerning status epilepticus which of the following is not true
  - A. IV diazepam is the drug of choice
  - B. IV phenytoin may be used
  - C. Phenobarbital in large doses may be indicated
  - D. Oral phenytoin may be used
  - E. NOTA
- 2) Which of the following drugs inhibits GABA-transaminase
  - A. Tiagabine
  - B. Vigabatrine
  - C. Pregabalin
  - D. Gabapentine
  - E. Religabine
- 3) Which of the following drugs is useful in the treatment of pheochromocytoma
  - A. Phenylephrine
  - B. Propranolol
  - C. Phentolamine
  - D. Epinephrine
  - E. NOTA
- 4) Propranolol induced adverse effects include all the following except
  - A. Bronchoconstriction
  - B. "Super sensitivity" of beta adrenergic receptors (rapid withdrawal)
  - C. Hyperglycemia
  - D. Sedation, sleep disturbances, depression, and sexual dysfunction
- 5) Select the odd one out
  - A. Mephensin
  - B. Diazepam
  - C. Tizanide
  - D. Succinylcholine
  - E. Carisoprodol
- 6) Used in treatment of painful muscle spasm
  - A. Succinylcholine
  - B. Atracurium
  - C. Mephensin derivatives
  - D. AOTA
  - E. NOTA
- 7) This can be used to induce labour
  - A. Oxytocin
  - B. Ergometrine
  - C. AOTA
  - D. NOTA
- 8) This can be used to augment a normally progressing labour
  - A. Oxytocin
  - B. Ergometrine
  - C. AOTA
  - D. NOTA
- 9) Which of the following drugs causes hallucination
  - A. LSD
  - B. Heroin
  - C. Cocaine
  - D. Opium
- 10) Addiction is associated with the existence of
  - A. Psychological dependence
  - B. Physiological dependence
  - C. Tolerance
  - D. AOTA
  - E. NOTA
- 11) For prophylaxis of migraine pick out the odd one out
  - A. Propranolol
  - B. Verapamil
  - C. Amitriptyline
  - D. Ergotamine
  - E. Methysergide
- 12) Which of these Local Anesthetics (LA) is used in ENT procedures
  - A. Benzocaine
  - B. Lidocaine
  - C. Tetracaine
  - D. AOTA
  - E. NOTA
- 13) Which of the following LA can be used in an intact skin
  - A. 5% Lidocaine
  - B. 2% Lidocaine
  - C. Eutectic lidocaine and prilocaine
  - D. AOTA
  - E. NOTA
- 14) Proton pump inhibitors include the following except
  - A. Metronidazole
  - B. Esomeprazole
  - C. Rabeprazole
  - D. Pantoprazole
  - E. Lansoprazole
- 15) This drug is a sulphone
  - A. Amoxicillin
  - B. Beclomethasone
  - C. Tetracycline
  - D. Pyridoxine
  - E. Dapsone

**SECTION A**

**Instructions: In Q 1-50 choose the most appropriate option**

1) Which of the following best describes hypercapnia?

- a. moderate amounts of Co<sub>2</sub> in blood
- b. decreased level of Co<sub>2</sub> in blood
- c. carbon dioxide narcosis
- d. low level of O<sub>2</sub> in blood
- e. retention of Co<sub>2</sub> in the body.

2) Cyanosis is typified by

- a. blueness of skin
- b. low blood oxygen
- c. oxygenated haemoglobin
- d. tachycardia
- e. high blood oxygen.

3) Concerning atrial and vena caval reflexes, the following are untrue except.

- a. They are high pressure receptors in the atria and vena cava
- b. they can be mimicked by the Bainbridge reflex use of atrial balloons and by the Bezold-jarish reflex
- c. causes bradycardia.
- d. are control systems involved in short term regulation of arterial blood pressure.
- e. stimulates the contraction of atrial and vena caval walls

4) The probability of turbulence is a function of all except.

- a. diameter of blood vessel
- b. viscosity of blood
- c. velocity of blood flow
- d. Reynolds formula
- e. Reynolds number.

5) In cerebral blood flow

- a. Nitrous oxide is used in kety and schmit technique.
- b. sympathetic discharge in cushings reflex causes cerebral vasoconstriction.
- c. brain cells are not significantly vulnerable to ischaemia.
- d. white matter receives three times supply as grey matter.
- e. decreased PCO<sub>2</sub> does not have marked effect on cerebral blood flow.

6) In cardiac cycle

- a. Isometric contraction phase lasts 0.5 sec
- b. The intraventricular pressure rises to a minimum of 120mmHg on the left and 25mmHg on the right
- c. systole lasts longer than diastole.
- d. prodiastole occurs late in diastole.
- e. Filling phase occurs late in diastole.

7) In blood flow in a vessel,

- a. highest velocity is in the centre.
- b. polycythaemia decreases viscosity of blood.
- c. anaemia increases viscosity of blood.
- d. flow is directly proportional to viscosity.
- e. flow is indirectly proportional to the size of the vessel.

8) CCK

- a. causes contraction of the gall bladder.
- b. increases secretion of enterokinase.

c. inhibits gastric emptying.

d. only a and c are true.

e. all are true.

9) Achalasia may be caused by.

- a. decreased LES tension.
- b. weak oesophageal peristalsis.
- c. inhibition by ACH release.
- d. myotomy.
- e. only b and c are true.

10) Vomiting centre stimulation results in all of the following except,

- a. deep breath.
- b. glottis closure.
- c. supero-inferior movement of the larynx.
- d. closure of the posterior nares.
- e. none of the above.

11) Which of the following protects the gastric mucosa against excess gastric juice.

- a. bile salts.
- b. NSAIDS
- c. prostaglandins
- d. vinegar
- e. no exception.

12) Glomerular filtration rate can be affected by all of the following except.

- a. inulin
- b. electrical charge on the glomerular membrane.
- c. degrees of contraction of mesangial cells.
- d. capsular oncotic pressure .
- e. there is no exception.

13) Which of the following statements is not correct.

- a. blood flow in the renal medulla is 1-2% of the total renal blood flow.
- b. angiotensin II preferential constricts the afferent arteriolar vessels.
- c. over hydration will cause depression of the rennin system.
- d. filtration of cationic substances is slightly greater than that of neutral substances.
- e. the vasa recta are a modification of the peritubular capillaries.

14) Total body water.

- a. Is inversely related to lean body mass.
  - b. Typically is greater than 65% in the obese.
  - c. is significantly reduced in children and infants.
  - d. women are generally known to have increased volumes compared to men.
  - e. all of the above are incorrect.
- role in the counter current exchange system.

15) The following are true of renal tubules

- a. about 65% of the glomerular filtrate is reabsorbed in the proximal tubule.
- b. the descending limb of the LOH is relatively impermeable to Na and other solutes.
- c. the distal tubule is completely impermeable to water.
- d. all of the above are correct.
- e. only a and b are correct.

16) in the loop of henle.

- a. ADH causes water reabsorption.
- b. all parts are permeable to water.
- c. the thick ascending limb is responsible for the multiplier effect.
- d. all the loops dip deep into the medulla to create a high medullary interstitial osmolarity.
- e. the thick ascending limb plays the greatest

17) Which of the following is/are correct about renal plasma clearance?

- a) creatinine clearance gives a perfect estimate of glomerular filtration rate
- b) Inulin clearance is about 125ml/min
- c) clearance of para-aminohippuric acid gives renal plasma flow
- d) B&C
- e) all of the above

18) Which of the following is/are correct concerning the renal tubules?

- a) The epithelium of the collecting duct is made up of principle cell and intercalated cells
- b) About 65% of the glomerular filtrate is absorbed in the proximal convoluted tubule.
- c) The descending arm of the loop of Henle is relatively impermeable to Na and other solutes.
- d. the macula densa cells are modified distal tubule cells.
- e. all of the above.

19) the proximal convoluted tubule.

- a. has its epithelial cells united by tight apical junctions.
- b. 65% of filtered water and sodium is absorbed here.
- c its contents is isotonic with plasma.
- d. reabsorption of protein is by pinocytosis.
- e. all of the above.

20) Transport across the renal tubules.

- a. involves both active and passive transport.
- b. is uniform throughout the length of the tubules.
- c. exhibits a transport maximum.
- d. does not require any enzyme activity.
- e. all except b and d.

21) Which of the following statements is/are incorrect.

- a. glucose reabsorption is an example of secondary active transport
- b. the thin loop of henle is impermeable to water.
- c. intracellular fluid volume is measured indirectly.
- d renal blood flow has two capillary beds
- e. only b and d are correct.

22) In cardiogenic shock.

- a. there is activation of the rennin angiotensin mechanism.
- b. there is increase in blood pressure.
- c. there is acid base imbalance especially alkalosis.
- d. the central venous pressure is usually low.
- e. b and d only.

23) During haemorrhage.

- a. arterial baroreceptors are strongly stimulated.
- b. redistribution of ECF occurs.

- c. plasma proteins are replaced within one week.
- d. there is fall in 2,3DPG.
- e. b and c only.

24) which of the following is untrue about mesenteric circulation.

- a. blood flow to the mucosa is greater than the rest of the intestinal wall.
- b. mesenteric circulation responds to metabolic changes in the body.
- c. unlike cerebral circulation, mesenteric circulation is autoregulated.
- d. anastomosis between the mesenteric vessels is extensive.
- e. blood flow after a meal may be doubled within three hours.

25) the following may not affect viscosity of blood flow.

- a. the packed cell volume.
- b. decrease in red blood cells.
- c. hereditary spherocytosis.
- d. b and c only.
- e. none of the above.

26) Concerning cardiopulmonary inhibitory reflex,

- a. site of receptors may be known.
- b. vagal fibers are the efferent pathway.
- c. there is increase in blood pressure .
- d. there is decrease in heart rate.
- e. c and d only.

27) total body water.

- a. can be measured by dilution technique using Evans blue.
- b. in a 70 kg man, has a volume of approximately 29l.
- c. it is a smaller proportion of body weight in men than women.
- d. forms a greater proportion of the body weight in adults than children.
- e. forms a smaller proportion of body weight in fat people than thin.

28) the amount of glucose in urine depends on the following except.

- a. filtered load of glucose.
- b. amount of glucose ingested.
- c. transport maximum of tubules.
- d. permeability of the bowmans capsule to glucose.
- e. all of the above.

29) rennin is a substance secreted in the.

- a. afferent arterioles.
- b. efferent arterioles.
- c. capillaries of the lungs.
- d. liver.
- e. macula densa cells.



30) which of the following is not true about body fluid volumes.

- a. ICF volume is about 28L.
- b. ECF volume is about 24L.
- c. TBW is about 42L.
- d. ISF is about 10.5L.
- e. plasma is about 25% of the ECF volume.

31) peristalsis.

- a. is absent in the terminal part of the ileum.
- b. is primarily not affected by ANS.
- c. shows slow wave at a rate dependent on the BER.
- d. is stimulated primarily by ANS.
- e. occurs in the rectum.

32) fat digestion

- a. starts in the stomach
- b. ends in the transverse colon.
- c. involves CCK.
- d. increases with decreased micelle formation.
- e. none of the above.

33) Gastric secretion.

- a. is increased by alcohol.
- b. is decreased by alcohol
- c. is decreased by vitamins .
- d. it is not affected by sight.
- e. none of the above.

34) The following are true except.

- a. constipation is basically caused by increased colonic water reabsorption.
- b. in diarrhea there is loss of anions and cations.
- c. steatorrhea can be caused by relative or absolute increase in HCO<sub>3</sub> secretion.
- d. the stool in diarrhea always takes the shape of its container.
- e. second messengers such as cAMP can play a role in diarrhea.

35) Contents of gastric juice include all of the following except.

- a. HCL.
- b. pepsin.
- c. Gelatinase.
- d. tributyrase.
- e. extrinsic factor.

36) Lipase secreted by the Ebner's glands.

- a. is very active in the stomach.
- b. is very active in the mouth.
- c. is responsible for digestion of 40% of fats.
- d. it is secreted with pancreatic enzymes.
- e. a and c are correct.

37) Factors that disrupt mucosal barrier include all except

- a. palm wine.
- b. acetic acid.
- c. bile salts.
- d. prostacyclin.
- e. none of the above.

38) The slow waves observed in the GIT smooth muscles.

- a. occur at a constant rate throughout the GIT.
- b. can generate spike potentials.
- d. excited by sympathetic stimulus
- e. b and c are correct.

39) Which part of the nephron is involved in counter current mechanism.

- a. distal convoluted tubule.
- b. proximal convoluted tubule.
- c. loop of henle.
- d. glomerulus.
- e. bowmans capsule.

40) The glomerular membrane is made up of the following except.

- a. capillary endothelium.
- b. basement membrane.
- c. podocytes.
- d. stellate cells.
- e. microvilli.

41) Production of concentrated urine includes all of the following except.

- a. involves only nephrons with long LOH.
- b. occurs in high concentration of ADH.
- c. High renal ISF osmolarity is produced in counter current mechanisms.
- d. divided into counter current multiplier and exchanger mechanisms.
- e. counter current exchanger occurs in the LOH only.

42) Postural hypotension is not seen in patients with.

- a. Shy-Drager syndrome.
- b. sympathomimetic drugs.
- c. Bradbury-Eggleston syndrome.
- d. familial dysautonomia.
- e. patient suffering from parkinsons disease.

43) Which of the following does not cause secondary hypertension.

- a. pyelonephritis.
- b. cushings syndrome.
- c. oral contraceptives.
- d. ischaemic heart disease.
- e. coarctation of the aorta.

44) In cardiogenic shock,

- a. there is activation of the rennin angiotensin system.
- b. there is increase in kidney areas.
- e. none of the above.

45) Which of the following statements is untrue.

- a. increase in atrial pressure may cause 4<sup>th</sup> heart sound.
- b. the amplitude of the second heart sound is higher than that of the 1<sup>st</sup> heart sound.
- c. mummurs are heard at sites of aneurysm.
- d. mummurs due to narrowing of the outlet valves are heard during diastole.
- e. systolic mummurs are present in anaemic patients.

- 46) In the aorta,  
 a. it is regarded as the pressure store in the body.  
 b. contain large amount of smooth muscle.  
 c. increase in diameter during diastole.  
 d. all of the above.  
 e. only a and c are correct.

48) which of the following will decrease end diastolic volume.

- a. cardiac tamponade  
 b. increased atrial contraction.  
 c. increased activity of skeletal muscle pump.  
 d. increase in ventricular compliance.  
 e. none of the above.

49) Concerning cells of the excitatory and conducting tissues,

- a. bundle of His conducts impulses faster than AV node.  
 b. calcium influx is largely responsible for the prepotential seen in these cells.  
 c. ROC and PSC calcium channels are found on these cells,  
 d. the right vagus nerve mainly innervates the AV node.  
 e. a and b are correct.

50) During the cardiac cycle,

- a. systole lasts for 0.3 sec.  
 b. prodiastole lasts for 0.04 sec.  
 c. left ventricle contracts before the right ventricle.  
 d. all of the above.  
 e. only a and b are correct.

#### SECTION B

**Instruction: In Q 51-65 match each word with the most appropriate option A-E. One option may be used more than once**

51) Thals factor.

52) jaundice

53) vasodilation.

54) myasthenia gravis

55) intrinsic factor

- a. vitamin B12  
 b. cholelithiasis  
 c. neurogenic shock  
 d. achalasia.  
 e. hypovolemic shock.

56). PCT

57). DCT

58). thick ascending limb of LOH

59). glomerulus

60). macula densa

- a. Na,K,2CL transporter.  
 b. Messangial cells

c. Major site of H secretion.

d. Gluconeogenesis

e. Senses change in Na

61) a. renal GFR

62) renal blood flow

63). infusion of 3L of 0.9% NaCl

64). increased angiotensin II secretion.

65). increased oncotic/osmotic pressure in glomerular capillaries.

- a. Creatinine  
 b. Decreased GFR  
 c. Increased GFR  
 d. PAH  
 e. Increased ECF volume

#### SECTION C

**Instruction: Mark T or F against each option in Q 66-85. Each incorrect answer attracts a penalty.**

66). Concerning body fluids.

- a. water constitutes 10% of total body weight  
 b. water constitutes 70% of total body weight.  
 c. water constitutes 70% of lean body weight.  
 d. water constitutes 70% of total lean body weight in obese people  
 e. water constitutes more than 70% of total body weight in infants.

67) Stimulus for rennin release includes

- a. fall in GFR  
 b. change in posture.  
 c. increased K ion in filtrate reaches the macula densa.  
 d. vasoconstriction of afferent arterioles.  
 e. increase in ECF volume.

68) The following are required for the production of concentrated urine.

- a. high concentration of aldosterone.  
 b. high concentration of rennin.  
 c. high concentration of ADH  
 d. increased ECF osmolarity  
 e. high renal interstitial fluid osmolarity.

69) Which of the following is/are true.

- a. ICF makes up 2/3 of total body water.  
 b. ECF makes up 2/3 of total body water.  
 c. major anions are ADP, AMP, ATP.  
 d. plasma makes up about 1/4 of ECF  
 e. none of the above.

70) Shock

- a. there are sub-cellular changes  
 b. may be due to pulmonary embolism.  
 c. central circulating blood volume is decreased in cardiogenic shock  
 d. myocardial infarction is the most common cause of cardiogenic shock.  
 e. marked vasoconstriction is a feature of septic shock.

72) concerning saliva

- a. it cleanses the oral cavity.
- b. zymogen granules are specific to mucous cells.
- c. mucin and mucus mean the same thing.
- d. the parotid secretion constitutes about 70% of saliva.
- e. sublingual secretions are viscous.

73) Concerning gastrointestinal secretions.

- a. about 1-1.5L of saliva is produced per day.
- b. approximately 2-3L of pancreatic juice is produced daily.
- c. gastric juice has a pH of 1-3.5.
- d. the pH of saliva ranges from 8.0-9.0.
- e. sublingual secretions are viscous.

74) Bile.

- a. salts are synthesized at the rate of 0.3g per day.
- b. pigments are derived from broken down red blood cells.
- c. approximately 600 -1200mls is secreted per day.
- d. pH ranges from 7.8-8.6 in the gall bladder.
- e. helps in the transport and absorption of end products of fat digestion.

75) Concerning malabsorption,

- a. may present as excessive absorption,
- b. may be accompanied by weight loss.
- c. does not involve constipation.
- d. may be genetic.
- e. is a common cause of death among children.

76) the major features of congestive heart failure include.

- a. pedal oedema.
- b. exophthalmos.
- c. orthopnea.
- d. hepatomegaly.
- e. headache.

77) hypertension,

- a. has both primary and secondary forms
- b. has both benign and malignant forms
- c. it is determined by the cardiac output and the peripheral resistance.
- d. it is more common in whites.
- e. it is never found in children.

78) The amount of glucose in urine depends on the following except.

- a. the filtered load of glucose
- b. amount of glucose ingested
- c. amount of NaCl ingested.
- d. transport maximum of the tubule.
- e. all of the above.

79) Renin is a substance secreted in the

- a. afferent arteriole
- b. efferent arteriole
- c. capillaries of the lungs
- d. liver
- e. macula densa cells.

80) O<sub>2</sub>-Haemoglobin dissociation curve

- a. increase in temperature shifts the curve to the right

- b. increase in pH shifts the curve to the left.
- c. increase in Pco<sub>2</sub> shifts the curve to the right
- d. decrease in 2,3 DPG shifts the curve to the right.
- e. decrease in 2,3 BPG shifts the curve to the right

81) In absorption of nutrients.

- a. vitamin D<sub>3</sub> plays a major role in Ca absorption.
- b. parathyroid hormone plays a major direct role in Ca absorption.
- c. Fe is stored after absorption as transferrin in the blood.
- d. vit B<sub>12</sub> and folic acid absorption are Na dependent.
- e. all of the above are correct.

82) Which of the following is false.

- a. secretin increases the pancreatic secretion of bicarbonate rich fluid.
- b. CCK increases the pancreatic secretion of enzyme rich fluids.
- c. The rate of bile salt synthesis is dependent on the bile salt concentration in the portal blood.
- d. folic acid deficiency can cause pernicious anaemia.
- e. rate of bile salt synthesis is 0.3g per hour.

83) All of the following are generally regarded as vasodilators

- a. hypoxia.
- b. nitric oxide.
- c. bradykinin.
- d. norepinephrine.
- e. histamine.

84) Pitting oedema may result from.

- a. trauma.
- b. renal disease.
- c. hypersensitivity reaction.
- d. lymphatic obstruction.
- e. hypoproteinaemia.

85) The renal threshold for glucose depends on .

- a. secretion of insulin.
- b. the tubular maximum for glucose.
- c. pulse pressure.
- d. tubular load for glucose.
- e. glucagon secretion.

#### SECTION D

**Instruction: Use the following code to answer Q 86-100. Choose**

- A if statement and reason are true and show cause effect.
- B. if statement and reason are true but do not show cause effect,
- C if statement is true but reason is false
- D if statement is false but reason is true
- E if both statement and reason are false

86) An increase in PCV will cause turbulence BECAUSE the velocity of the blood flow is decreased.

87) Physiologic splitting of the second heart sound occurs BECAUSE aortic valve closure slightly exceeds that of the pulmonary valve closure during inspiration.

88) Tubuloglomerular feedback helps to maintain a constant arterial blood pressure BECAUSE it minimizes changes in glomerular filtration rate.

89) A primary loss of NaCl usually results in hyposmotic dehydration BECAUSE the glomerular capillary membrane is less permeable to anionic substances.

90) Ionic composition of interstitial fluid and plasma are similar BECAUSE they are separated by a capillary membrane which is highly permeable.

91) Tubular fluid delivered to the distal tubule is dilute BECAUSE reabsorption of Na in the thick ascending limb of the LOH is not coupled to water reabsorption.

92) Bicarbonate buffer is the most effective buffer system in the body BECAUSE it is the only buffer system whose components are easily regulated.

93) In haemodynamics blood flow becomes turbulent BECAUSE Reynolds number is about 2000.

94) 90% of potassium is reabsorbed in the DCT BECAUSE the lining cells have a high affinity for potassium.

95) Sympathetic stimulation increases blood flow BECAUSE of vasoconstriction.

96) The grey matter receives three times blood supply as the white matter BECAUSE the grey cells expend more energy.

97) Hyperaldosteronism may predispose to oedema BECAUSE water reabsorption is increased.

98) Murmurs are heard in anaemic patients BECAUSE blood flow is increased.

99) Constipation is a feature of Hirschsprung's disease BECAUSE malabsorption occurs.

100) Hepatomegaly occurs in heart failure BECAUSE venous congestion causes oedema.

101) Electrical activity of the heart can be measured on the ECG because the body is a volume conductor.

SECTION B

- 51.E 59.B
- 52.B 60.E
- 53.C 61.A
- 54.D 62.D
- 55.A 63.E
- 56.D 64.C
- 57.C 65.B
- 58.A

SECTION C

	A	B	C	D	E
66.	F	F	T	F	T
67.	T	T	F	T	F
68.	T	T	T	T	T
69.	T	F	F	T	F
70.	T	T	F	T	F
71.	T	F	T	F	F
72.	T	F	F	F	T
73.	T	F	T	F	T
74.	T	T	F	F	T
75.	T	T	F	T	F
76.	T	F	T	T	F
77.	T	T	T	F	F
78.	F	T	F	F	F
79.	T	F	F	F	F

	A	B	C	D	E
80.	T	T	T	F	F
81.	T	F	T	F	F
82.	F	F	F	T	T
83.	T	T	T	F	T
84.	F	T	T	F	T
85.	T	T	F	T	T

SECTION D

- 86.E 95.E
- 87.A 96.A
- 88.A 97.A
- 89.B 98.A
- 90.E 99.B
- 91.A 100.A
- 92.A 101.A
- 93.C
- 94.E

ANSWERS (PHYSIOLOGY PRETEST FOR 011 CLASS)

Date 3<sup>rd</sup> Nov. 2007.

SECTION A

- 1.E 11.C 21.B 31.E 41.E
- 2.A 12.A 22.A 32.A 42.B
- 3.D 13.B 23.E 33.A 43.D
- 4.D 14.E 24.C 34.C 44.incomplete option
- 5.E 15.E 25.E 35.E 45.D
- 6.E 16.C 26.E 36.A 46.A
- 7.A 17.D 27.E 37.D 47.no question
- 8.E 18.E 28.B 38.B 48.A
- 9.B 19.E 29.A 39.C 49.E
- 10.C 20.E 30.B 40.E 50.D

QUESTIONS

Instruction: Choose the correct options for each question.

Note: There may be one or more correct answer eg

Which of the following represents an abnormal karyotype

T A.44XX

FB. 46XX

FC. 23X, in a germ cell

FD. 23Y, in a germ cell

TE.47XXYMORBID ANATOMY

- 1) Atrophy of the testis may be due to
  - A. Hypopituitarism
  - B. Prolonged oestrogen administration
  - C. Prolonged testosterone administration
  - D. Mumps orchitis
  - E. Frequent medical examination
  
- 2) The following are malignant conditions except
  - A. Hodgkin's disease
  - B. Immature teratoma
  - C. Brunner's tumour
  - D. Lymphoma
  - E. Paget's disease of the breast
  
- 3) The cause of death most directly related to malignant hypertension include which one of the following
  - A. Hepatorenal failure
  - B. Acute right ventricular failure
  - C. Severe cerebral edema with tonsillar herniation
  - D. Liver cirrhosis from severe atherosclerosis
  - E. Ruptured berry aneurysm
  
- 4) Examples of diseases with granulomatous inflammation
  - A. Cat scratch disease
  - B. Leprosy
  - C. Syphilis
  - D. Bronchial asthma
  - E. Urticaria
  
- 5) Malaria
  - A. Plasmodium falciparum causes the most severe disease
  - B. Mosquitoes transmit merozoites to man when they bite
  - C. A mosquito feeding on an infected host ingests the sporozoites
  - D. The lifecycle of the parasite in man consists of an exoerythrocytic phase
  - E. Patients with severe *P. falciparum* malaria have few circulating parasites
  
- 6) HIV
  - A. Aetiologic agent of AIDS
  - B. It is a retrovirus
  - C. It is a DNA virus
  - D. Replicates using reverse transcriptase
  - E. GP 120 and GP 41 are essential for HIV infection
  
- 7) Structure of HIV viron
  - A. Protein p24
  - B. Integrase
  - C. GAD gene
  - D. Proteases
  - E. None of the above
  
- 8) Features of Down syndrome include
  - A. Malar rash
  - B. Cleft palate
  - C. Congenital heart defects
  - D. Psoriasis
  - E. Male sterility
  
- 9) Possible sequelae of inflammation include the following except
  - A. Resolution
  - B. Healing
  - C. Suppuration\
  - D. Tumour carcinogenesis
  - E. Chronic inflammation
  
- 10) The following are normal karyotypes
  - A. 44XY
  - B. 46XY
  - C. 44XX
  - D. 48XX
  - E. 46XX
  
- 11) An embolus may be made up of the following
  - A. Gas
  - B. Amniotic fluid
  - C. Fat
  - D. Thrombus
  - E. Tumour fragment
  
- 12) Organ changes in malignant hypertension include
  - A. Proliferative endarteritis
  - B. Papilloedema of the retina
  - C. Fibrinoid necrosis of small vessels
  - D. Moderately reduced finely granular kidneys
  - E. Red cell fragmentation

- 13) Cardinal signs of acute inflammation include which of these?
- Neutrophil emigration
  - Increased vascular permeability
  - Necrosis
  - Pain
  - Trauma
- 14) In sarcoidosis, the following cells are present in the microscopic lesions except
- Epithelioid cells
  - Langerhans giant cells
  - Lymphocytes
  - Plasma cells
  - Asteroid
- 15) A 45-year-old female has an enlarged lymph node that on biopsy reveals a metastatic neoplasm. Which of the following is the most likely primary neoplasm?
- Cerebral glioma
  - Serous cystadenocarcinoma of ovary
  - Fibroadenoma of the breast
  - Liposarcoma of retroperitoneum
  - Laryngeal papilloma
- 16) Of the following characteristics of neoplasms, which implies the best prognosis
- Increased expression of laminin receptors
  - Increased cathepsin expression
  - Decreased apoptosis
  - Decreased doubling time
  - Decreased nuclear /cytoplasmic ratio
- 17) Which of the following are not acceptable characteristics of granuloma
- Composed of epithelioid cells
  - Contains giant cells
  - Composed of a mixture of chronic inflammatory cells
  - Composed of polymorphs and cellular debris
  - Composed of epithelial and neural cells
- 18) Features of nephrotic syndrome include
- Hypertension
  - Dysuria
  - Peri orbital oedema
  - Hypo albuminemia
  - Massive proteinuria
- 19) Epstein Barr Virus is involved in the pathogenesis of
- Hodgkin's lymphoma
  - Burkitt's lymphoma
  - Nasopharyngeal carcinoma
  - Cervical carcinoma
  - T cell lymphoma
- 20) Carcinoma of the breast
- May be hormone dependent
  - Has a higher incidence in multiparous women
  - Usually arises from ductal epithelium
  - Rarely metastasizes to bone
  - Is more common in the lower inner quadrant of the breast



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