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Preface

We would like to present, with great pleasure, the inaugural volume-8, Issue-8, August 2022, of a scholarly journal, *International Multispeciality Journal of Health*. This journal is part of the AD Publications series *in the field of Medical, Health and Pharmaceutical Research Development*, and is devoted to the gamut of Medical, Health and Pharmaceutical issues, from theoretical aspects to application-dependent studies and the validation of emerging technologies.

This journal was envisioned and founded to represent the growing needs of Medical, Health and Pharmaceutical as an emerging and increasingly vital field, now widely recognized as an integral part of scientific and technical statistics investigations. Its mission is to become a voice of the Medical, Health and Pharmaceutical community, addressing researchers and practitioners in below areas

Clinical Specialty and Super-specialty Medical Science:

It includes articles related to General Medicine, General Surgery, Gynecology & Obstetrics, Pediatrics, Anesthesia, Ophthalmology, Orthopedics, Otorhinolaryngology (ENT), Physical Medicine & Rehabilitation, Dermatology & Venereology, Psychiatry, Radio Diagnosis, Cardiology Medicine, Cardiothoracic Surgery, Neurology Medicine, Neurosurgery, Pediatric Surgery, Plastic Surgery, Gastroenterology, Gastrointestinal Surgery, Pulmonary Medicine, Immunology & Immunogenetics, Transfusion Medicine (Blood Bank), Hematology, Biomedical Engineering, Biophysics, Biostatistics, Biotechnology, Health Administration, Health Planning and Management, Hospital Management, Nephrology, Urology, Endocrinology, Reproductive Biology, Radiotherapy, Oncology and Geriatric Medicine.

Para-clinical Medical Science:

It includes articles related to Pathology, Microbiology, Forensic Medicine and Toxicology, Community Medicine and Pharmacology.

Basic Medical Science:

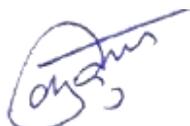
It includes articles related to Anatomy, Physiology and Biochemistry.

Spiritual Health Science:

It includes articles related to Yoga, Meditation, Pranayam and Chakra-healing.

Each article in this issue provides an example of a concrete industrial application or a case study of the presented methodology to amplify the impact of the contribution. We are very thankful to everybody within

that community who supported the idea of creating a new Research with *IMJ Health*. We are certain that this issue will be followed by many others, reporting new developments in the Medical, Health and Pharmaceutical Research Science field. This issue would not have been possible without the great support of the Reviewer, Editorial Board members and also with our Advisory Board Members, and we would like to express our sincere thanks to all of them. We would also like to express our gratitude to the editorial staff of AD Publications, who supported us at every stage of the project. It is our hope that this fine collection of articles will be a valuable resource for *IMJ Health* readers and will stimulate further research into the vibrant area of Medical, Health and Pharmaceutical Research.



Dr. Kusum Gaur
(Chief Editor)



Mr. Mukesh Arora
(Managing Editor)

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Dr. Kusum Gaur working as professor Community Medicine and member of Research Review Board of Sawai Man Singh Medical College, Jaipur (Raj) India.

She has awarded with WHO Fellowship for IEC at Bangkok. She has done management course from NIHFWS. She has published and present many research paper in India as well as abroad in the field of community medicine and medical education. She has developed Socio-economic Status Scale (Gaur's SES) and Spiritual Health Assessment Scale (SHAS). She is 1st author of a book entitled " Community Medicine: Practical Guide and Logbook.

Research Area: Community Medicine, Biostatistics, Epidemiology, Health and Hospital Management and Spiritual Health.

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Dr. I.D. Gupta

Dr. I. D. Gupta is Professor Psychiatry and working as additional Principal and Dean of student welfare in SMS Medical College, Jaipur.

He is recipient of Prof. Shiv Gautam oration award by Indian Psychiatric Society. He has done training in YMRS at Monte Carlo and BPRS at Singapore. He has been President Indian Psychiatric Society, Rajasthan State Branch. He is author of "Psycho Somatic Disorder" chapter in 1st edition post graduate text book of Psychiatry by Vyas and Ahuja. He has also worked with National Mental Health Programme and has a lot of publication.

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Dr. Lokendra Sharma

Dr. Lokendra Sharma is Associate Professor Pharmacology and working as Nodal officer of SMS Medical College, Jaipur.

He is recipient of WHO Fellowship award on Poison Patient Management at Vietnam. He is resource faculty for Experimental Toxicology and Basic Course for Medical Education. He is presented and published a lot of research articles at national and international level.

Research Area: PHARMACOLOGY

Dr. Anuradha Yadav

Dr. Anuradha Yadav is working as Professor Physiology, SMS Medical College, Jaipur (Rajsthan) India. She is a popular medical teacher and research scholar who had many publications in indexed journals.

Research Area: CVS & CNS physiology, Medical Education and Spiritual Health.

Dr. Rajeev Yadav

Dr. Rajeev Yadav is working as Associate Professor Community Medicine, SMS Medical College, Jaipur (Rajsthan) India. He is member of Research Review Board of the Institute.

He has authored a book entitled "Community Medicine: Practcal Guide and Logbook".

Research Area: His area of Interest are Epidemiology, Biostatistics and Spiritual Health.

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Research Area: Brachytherapy, Total Skin Electron Irradiation, Palliative Radiotherapy, Stereotactic & Conformal radiotherapy, Radiation Cell Biology, Cancer Genetics.

Dr. Praveen Mathur

Dr. Praveen Mathur is working as Professor- Pediatric Surgery and is recipient of Commonwealth Fellowship in Pediatric Laparoscopy from Uk and fellowship award in minimal access Surgery (FMAS). He has done Clinical observer ship in the Department of Pediatric Surgery, Johns Hopkins University, Baltimore, USA. (2008). He has presented and published a number of research articles at national and international level. He is reviewer of prestigious Journal of Pediatric Surgery (JPS) and World Journal of Gastroenterology, Journal of neonatal Surgery (JNS).

Research Area: Pediatric Surgery & Laparoscopy.

Dr. Lokendra Sharma

Dr. Lokendra Sharma is Associate Professor Pharmacology and working as Nodal officer of SMS Medical College, Jaipur.

He is recipient of WHO Fellowship award on Poison Patient Management at Vietnam. He is resource faculty for Experimental Toxicology and Basic Course for Medical Education. He is presented and published a lot of research articles at national and international level.

Research Area: PHARMACOLOGY.

Dr Rajeev Sharma (MS; FMAS; FIMSA;FCLS)

He is working as Professor, Department of Surgery, Government Medical College, Chandigarh, India. He has done FMAS, FIMSA and FCLS along with MS (Gen Surgery).

He has about 50 international and national publications to his credit. He has held various positions in the Association of Minimal Access Surgeons of India (AMASI) from time to time. He has also acted as instructor of various AMASI skill courses held at different places in India. He has established Surgical Technique learning centre at GMCH Chandigarh for imparting training to the budding surgeons in the field of minimal access surgery. He is also the reviewer in the subject in various journals.

Research Area: Minimal Access Surgery.

Dr Anshu Sharma (MS ANATOMY)

She is Presently working as assistant professor in the department of Anatomy, GMCH, Chandigarh. She has many publications in various national and international journals. She is executive member of Anatomical Society of India (ASI) and North Chapter of ASI. She is also a member of editorial board of Journal of Medical College Chandigarh.

Research Area: Congenital Malformation, Developmental Anatomy.

Dr. Rajeev Yadav

Dr. Rajeev Yadav is working as Associate Professor Community Medicine, SMS Medical College, Jaipur (Rajsthan) India. He is member of Research Review Board of the Institute.

He has authored a book entitled "Community Medicine: Practical Guide and Logbook".

Research Area: His areas of Interest are Epidemiology, Biostatistics and Spiritual Health.

Dr. Dilip Ramlakhyani

Dr. Dilip Ramlakhyani working as Associate professor Pathology and member of IT Committee of Sawai Man Singh Medical College, Jaipur (Raj) India. He has published many articles in indexed journals.

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He has gone abroad for many training courses and to present research papers. He had been chairman of Research Review Board of SMS Medical College, Jaipur. He is a great research scholar and had published book related to his faculty and had many publications in indexed journals.

Dr. Mahesh Sharma

Dr. Mahesh Sharma is a Principle specialist General Surgery in Rajasthan State Government, India. He has been PMO of district hospitals for more than 15 years. He has gone abroad as observer of many of training related to his speciality. He has published and present many research paper in India as well as abroad.

He has developed Spiritual Health Assessment Scale (SHAS) with Dr. Kusum Gaur.

Research Area: General Surgery, Health and Hospital management and Spiritual Health.

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Previously he has worked in BP Kiorala Institute of Medical Sciences, Nepal. He has visited CDC Atlántica for a Statistical workshop. He has been convener of MBBS and PG exams. He is a research scholar and had many publications in indexed journals.

Dr. Praveen Mathur

Dr. Praveen Mathur is working as Professor- Pediatric Surgery and is recipient of Commonwealth Fellowship in Pediatric Laparoscopy from Uk and fellowship award in minimal access Surgery (FMAS). He has done Clinical observer ship in the Department of Pediatric Surgery, Johns Hopkins University, Baltimore, USA. (2008). He has presented and published a number of research articles at national and international level. He is reviewer of prestigious Journal of Pediatric Surgery (JPS) and World Journal of Gastroenterology, Journal of neonatal Surgery (JNS).

Research Area: Pediatric Surgery & Laparoscopy.

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A evaluatory study to findout influence of self-made informatic booklet on knowledge and attitude of obstetrics practioner regarding selected obstetrics emergencies and their management of complications in third stage labour in Dr.kamlesh Tandon hospital and IVF center Agra (U. P)

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Abstract—

Problem Statement

To Evaluate the influence of self-made informatics booklet on knowledge and attitude of obstetric practioner regarding selected obstetric emergencies and their management of complication in third stage of labour, Dr.kamlesh tendon hospital,Agra (U.P)

Objectives

1. To assess the existing level of knowledge and attitude of obstetric practioner regarding selected obstetric emergencies and their management of complication in third stage of labour among nursing officers.
2. To find co-relation between the knowledge and attitude score of selected obstetric practioner and their management of complication in third stage of labour with selected demographic variable.

Research Hypothesis

HA1- There will be significant difference in knowledge and attitude score of obstetric practioner with regard to obstetric emergencies and their management of complication in third stage of labour.

H01- There will be no significant difference in knowledge and attitude score of obstetric practioner with regard to obstetric emergencies and their management of complication in third stage of labour.

HA3: There will be significant co- relation between knowledge and attitude score among obstetric practioner with regard to obstetric emergencies and their management of complication in third stage of labour.

H03: There will be significant co- relation between knowledge and attitude score among obstetric practioner with regard to obstetric emergencies and their management of complication in third stage of labour.

I. INTRODUCTION

India has the largest number of maternal deaths in the world, between 50,000 and 63,000 annually. Obstetric hemorrhage contributes to about 37% of maternal deaths in India. Under the National Rural Health Mission, the Government of India has taken several steps to improve maternal health. Three key efforts include encouraging delivery in institutions through monetary incentives from the Janani Suraksha Yojana program, supporting emergency obstetric care development, and training auxiliary nurse-midwives (ANMs) and nurses to gain competencies as SBAs. The National Rural Health Mission approach also includes the Reproductive and Child Health II program, which promises investments in emergency obstetric care provision, including training doctors in emergency skills, upgrading ANM skills, ensuring blood storage points in every district, and upgrading community health centers to meet national standards. It also supports demand-side financing to spur

utilization of services through incentives for assisted home deliveries, institutional deliveries, and caesarean sections PPH is one of the few obstetric complications for which an effective preventive intervention is available. The active management of the third stage of labor (AMTSL) is a package of interventions including administration of a uterotonic drug immediately following delivery, controlled cord traction, and fundal massage following delivery of the placenta. There may be changes to AMTSL policy and guidance in the near future, given recent research regarding controlled cord traction and the dynamic state of evidence regarding the full package of interventions. However, the World Health Organization (WHO) currently recommends AMTSL for PPH prevention in the presence of an SBA. There are nursing responsibilities that can significantly reduce the incidence of PPH; however, these duties were not carried out appropriately at the project site labor units. For example, routine inspection of the vagina and perineum to identify a genital laceration is essential because a sphincter laceration may go unnoticed by the obstetrician and may lead to PPH. Observation should include monitoring blood pressure and pulse, fundal tone and position, and vaginal blood loss every 15 minutes (Leduc et al., 2009). Blood loss is typically assessed by weighing all perineal pads hourly and evaluating the lochia for clotting. The labor and delivery nurses claimed they are performing these important roles; however, their actions have been insufficient in preventing PPH.

II. MATERIALS & METHODS

The researcher adopted a quantitative research approach where one group pre-test, post-test pre-experimental research design was used. A total 40 obstetric practioner were chosen through non-probability purposive sampling technique. These samples underwent inclusion sample criteria. The samples were collected from selected hospital of Moradabad utter Pradesh. The tools in the study include demographic variable, 40 items -structured knowledge questionnaire and lekerts scale for attitude questionnaire followed by self – made informatics booklet. The main study is carried out to observe

impact of self-Structured module on knowledge regarding obstetric emergencies of complication and their management of third stage of labour among nursing officers was observed. Further, it was followed by general system theory model and health belief model for competency.

2.1 Research Approach

Quantitative research approach

2.2 Research Design

Experimental design research

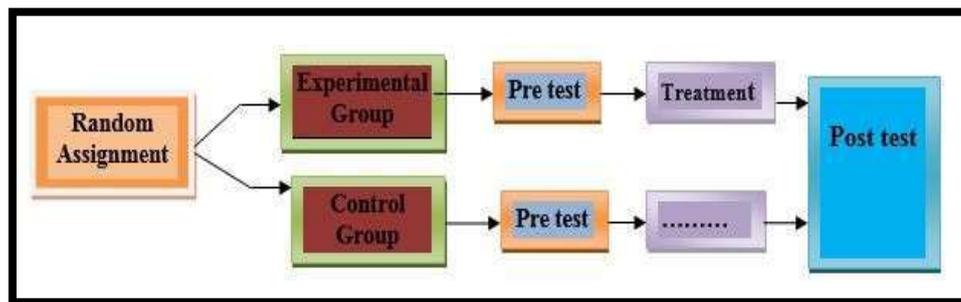


FIGURE 1: Schematic representation of one group pre-test, post-test experimental RESEARCH DESIGN

2.3 Research Setting

A formal permission to conduct the pilot study was obtained from Dr.kamlesh tendon hospital and IVF center,Agra. The data for pilot study was collected from obstetric practioner. A total of 40 (N=40.samples were selected as per the purposive sampling technique.

2.4 Target Population

The target population for this study was obstetric practioner working in hospital of Dr.kamlesh tendon hospital and IVF center,Agra (u.p)

2.5 Accessible Population

The accessible population for this study was the obstetric practitioner of selected hospital of Dr. Kamlesh Tendon Hospital and IVF center, Agra (U.P.)

2.6 Sample

obstetric practitioner working in selected hospital

2.6.1 Sampling Technique

Non-probability Purposive Sampling technique

2.6.2 Sample Size

40

2.6.3 Independent Variable

self-made informative booklet regarding obstetric emergencies management in complication of third stage management

2.6.4 Dependent Variable

In this study, dependent variables are;

- 1) Knowledge of obstetric practitioner regarding obstetric emergencies management in complication of third stage management.
- 2) Attitude of obstetric practitioner regarding obstetric emergencies management in complication of third stage management.

2.7 Socio-Demographic Variables:

Socio-demographic variables are the characteristics and attributes of the study objects that may interfere with the findings of the study. In the present study, the socio-demographic variables include Age, Gender, Religion, Education, Exposure during clinical postings, sources of information regarding obstetric emergencies management in complication of third stage management.

2.8 General System Theory Model

A conceptual framework for the present study is based on general system theory with input, process, output and feedback. It serves as a model for viewing people as interacting with the environment. The theory was developed by Ludwig Von Bertalanffy in 1968.

He felt that there was a need for a single theory to guide research in several disciplines since he saw striking parallels between them. His hunch was that if multiple disciplines focused their research and theory development efforts, they would be able to identify laws and principles which would apply to many systems. This would allow scholars and scientists to make sense of system characteristics such as wholeness, differentiation, order, equality, progression and others.

According to this theory, a system is a group of elements that interact with one another in order to achieve the goal. An individual is a system because he or she receives input from the environment. Elements of the input are processed and it provides an output. All living systems are open. There is a continuous exchange of matter, energy and information. The system is cyclical in nature and continuous to be as long as the four parts- input, process, output and feedback- keep interacting with each other. If there are any changes in any of the parts, there will be alterations in all parts. Feedback within the system or from the environment provides information which helps the system to determine its effectiveness.

2.8.1 Input

In the general system's theory, input is the term for movement of matter, energy or information from the environment. In the present study, the inputs are the structured knowledge questionnaire & perception checklist (perception scale) on catheter-related obstetric emergencies management of complication.

2.8.2 Process

The processes used by the system to convert raw materials or energy from the environment into products that are used either by the system itself or the environment. Process for the present study carried out in phase as detailed below.

Phase – I: Investigator applied the structured knowledge questionnaire & Attitude checklist on obstetric emergencies management of complication and identified the level of knowledge & Attitude level among nursing officers. Applied posttest 5 days later by using the same questionnaire& Attitude checklist.

2.8.3 Output

It refers to energy matter or information disposed by the system as a result of its process. In the present study it refers to the level of knowledge & level of Attitude among nursing officers and the effectiveness of self –made informatic booklet on obstetric emergencies management of complication in assessing the nursing officers performance with a difference in scores from conventional method of evaluation.

2.8.4 Feedback

It is the process that enables a system to regulate itself and provides information about the system output and its feedback as input. In the present study, the feedback can be initiated after estimating output when there is a low score in the nursing officers knowledge& Attitude. They may be placed once again in the circuit to improve their knowledge & Attitude.

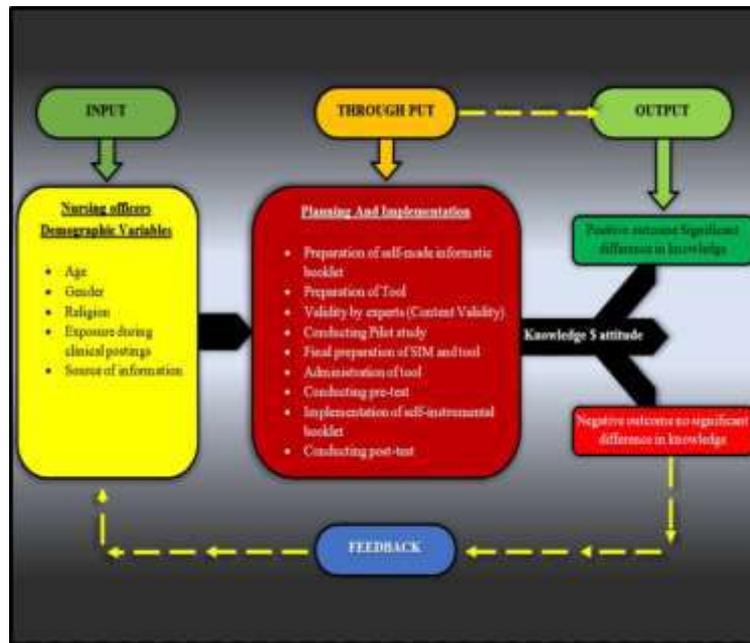


FIGURE 2: General system theory

III. RESULT

		Age	Gender	Religion	Exposure of clinical posting	Sources of information
N	Valid	40	40	40	40	40
	Missing	27	27	27	27	27
Mean		2.4250	1.6250	1.8750	.6000	2.4750
Std. Error of Mean		.15968	.07752	.16866	.07845	.13862
Median		2.0000	2.0000	1.5000	1.0000	2.0000
Mode		2.00	2.00	1.00	1.00	2.00
Std. Deviation		1.00989	.49029	1.06669	.49614	.87669
Variance		1.020	.240	1.138	.246	.769
Skewness		.137	-.537	.928	-.424	.320
Std. Error of Skewness		.374	.374	.374	.374	.374
Range		3.00	1.00	3.00	1.00	3.00
Minimum		1.00	1.00	1.00	0.00	1.00
Sum		97.00	65.00	75.00	24.00	99.00

		Pretest knowledge of obstetric emergencies	Pre test knowledge postpartum hemorrhage	Pretest knowledge of rupter of uterus	Pretest knowledge of inversion of uterus	Pretest knowledge of third stage management	Posttest knowledge of obstetric emergencies	Post test knowledge postpartum hemorrhage	Post test knowledge rupter of uterus	Post test knowledge of inversion of uterus	Posttest knowledge of third stage management
N	valid	40	40	40	40	40	40	40	40	40	40
	missing	27	27	27	27	27	27	27	27	27	27
mean		1.3000	7.7250	4.9250	5.8250	6.9000	1.3250	8.0250	4.8250	6.9500	9.0500
Std.error of mean		.12506	.24804	.18393	.25792	.32185	.12602	.19770	.21149	.19265	.21469
median		1.5000	8.0000	5.0000	5.5000	7.0000	2.0000	8.0000	5.0000	7.0000	9.0000
mode		2.00	7.00	5.00	5.00	7.00	2.00	8.00	5.00	7.00	10.00
Std.deviation		.79097	1.56872	1.16327	1.63123	2.03558	.79703	1.25038	1.33757	1.21845	1.35779
variance		.626	2.461	1.353	1.353	4.144	.635	1.563	1.789	1.485	1.844
Range		2.00	6.00	6.00	7.00	9.00	2.00	5.00	6.00	4.00	5.00
minimum		00	4.00	1.00	2.00	2.00	2.00	5.00	1.00	5.00	6.00
sum		52.00	309.00	197.00	233.00	276.00	53.00	321.00	193.00	278.00	362.00

		Pretest attitude of obstetric emergencies	Pre test attitude postpartum hemorrhage	Pretest attitude of rupter of uterus	Pretest attitude of inversion of uterus	Pretest attitude of third stage management	Posttest attitude of obstetric emergencies	Post test attitude postpartum hemorrhage	Post test attitude of rupter of uterus	Post test attitude of inversion of uterus	Posttest attitude of third stage management
N	valid	40	40	40	40	40	40	40	40	40	40
	missing	27	27	27	27	27	27	27	27	27	27
mean		15.3750	25.6000	11.1000	14.0500	44.1500	16.2000	28.5750	4.8250	6.9500	9.0500
Std.error of mean		.57922	.78838	.48806	.60864	1.05341	.41169	.52853	.21149	.19265	.21469
median		16.5000	25.0000	12.0000	15.0000	43.5000	16.5000	29.0000	6.0000	7.0000	9.0000
mode		18.00	25.00	13.00	15.00	41.00	18.00	28.00	6.00	7.00	10.00
Std.deviation		3.66331	4.98613	3.08678	3.84941	6.66237	2.60374	3.34271	1.33757	1.21845	1.35779
variance		13.420	24.862	9.528	14.818	44.387	6.779	1.789	1.854	1.485	1.844
Range		13.00	19.00	12.00	13.00	23.00	9.00	6.00	6.00	4.00	5.00
minimum		7.00	14.00	3.00	7.00	33.00	11.00	1.00	1.00	5.00	6.00
sum		615.00	1024.00	444.00	562.00	1766.00	648.00	200.00	223.00	278.00	362.00

CORRELATION TABLE

		pre test knowledg eopostp artumhe morrahg e	pre test knowledg eobster icsemer gerencies	pre test knowledg erupter ofuterus	pre test knowledg eiversion ofuteru s	pre test knowledg ethirdst ageofma nagement	postkno wledgeo bsterics emergen cies	posttestk nowledg eopostp artumhe morrahg e	posttestk nowledg erupture ofuterus	posttestk nowledg eiversion ofuteru s	posttestk nowledg ethirdsta geofman gement
postpart umhemor rahage	Pearson Correlati on Sig. (2- tailed)	1	-.490**	.312	.281	.433*	-.542**	.749	.013	.060	.043
			.001	.050	.079	.005	.000	.936	.714	.793	
	N	40	40	40	40	40	40	40	40	40	40
obsteric semerge ncies	Pearson Correlati on Sig. (2- tailed)	-.490**	1	-.170	-.117	-.220	.899**	-.474**	.002	-.011	-.181
		.001		.294	.471	.173	.000	.002	.988	.948	.262
	N	40	40	40	40	40	40	40	40	40	40
rupterofu terus	Pearson Correlati on Sig. (2- tailed)	.312	-.170	1	-.169	.322*	-.111	.160	.618**	-.292	.262
		.050	.294		.296	.043	.494	.324	.000	.067	.102
	N	40	40	40	40	40	40	40	40	40	40
iversiono futerus	Pearson Correlati on Sig. (2- tailed)	.281	-.117	-.169	1	.172	-.212	.266	-.167	.370*	-.204
		.079	.471	.296		.288	.190	.097	.303	.019	.206
	N	40	40	40	40	40	40	40	40	40	40
thirdstag eofmana gement	Pearson Correlati on Sig. (2- tailed)	.433**	-.220	.322*	.172	1	-.185	.454**	.154	-.085	-.104
		.005	.173	.043	.288		.253	.003	.344	.603	.523
	N	40	40	40	40	40	40	40	40	40	40
attitudo bsterics emergen cies	Pearson Correlati on Sig. (2- tailed)	-.173	.235	-.120	.058	-.356**	.188	-.271	.113	-.042	.048
		.284	.145	.462	.720	.024	.252	.091	.487	.799	.770
	N	40	40	40	40	40	40	40	40	40	40
attitudo postpartu mhemor rahage	Pearson Correlati on Sig. (2- tailed)	-.047	-.105	-.116	.193	.254	-.012	.203	.028	.081	.155
		.772	.518	.477	.233	.114	.943	.209	.865	.619	.341
	N	40	40	40	40	40	40	40	40	40	40
attituder uptureof uterus	Pearson Correlati on Sig. (2- tailed)	-.158	-.107	-.055	.019	-.015	-.045	.092	-.045	.240	-.099
		.329	.511	.736	.908	.928	.784	.571	.781	.136	.543
	N	40	40	40	40	40	40	40	40	40	40
attitudo iversionof uterus	Pearson Correlati on Sig. (2- tailed)	-.104	-.047	.230	-.239	-.062	-.047	-.096	.012	-.311	-.030
		.524	.773	.154	.137	.706	.772	.555	.943	.051	.855
	N	40	40	40	40	40	40	40	40	40	40
attitudo irdstage ofmanag ement	Pearson Correlati on Sig. (2- tailed)	.205	-.096	.114	-.125	-.052	-.154	.157	.144	-.021	.025
		.204	.554	.484	.442	.751	.342	.335	.375	.897	.880
	N	40	40	40	40	40	40	40	40	40	40
postkno wledgeo bsterics emergen cies	Pearson Correlati on Sig. (2- tailed)	-.542**	.899**	-.111	-.212	-.185	1	-.446**	.151	-.009	-.134
		.000	.000	.494	.190	.253		.004	.353	.955	.410
	N	40	40	40	40	40	40	40	40	40	40
posttestk nowledg eopostp artumhe morrahg e	Pearson Correlati on Sig. (2- tailed)	.749**	-.474**	.160	.266	.454**	-.446**	1	.003	.203	.060
		.000	.002	.324	.097	.003	.004		.987	.209	.715
	N	40	40	40	40	40	40	40	40	40	40
posttestk nowledg erupture ofuterus	Pearson Correlati on Sig. (2- tailed)	.013	.002	.618**	-.167	.154	.151	.003	1	-.179	.188
		.936	.988	.000	.303	.344	.353	.987		.270	.244
	N	40	40	40	40	40	40	40	40	40	40
posttestk nowledg eiversion ofuteru s	Pearson Correlati on Sig. (2- tailed)	.060	-.011	-.292	.370*	-.085	-.009	.203	-.179	1	-.014
		.714	.948	.067	.019	.603	.955	.209	.270		.932
	N	40	40	40	40	40	40	40	40	40	40
posttestk nowledg ethirdsta geofman gement	Pearson Correlati on Sig. (2- tailed)	.043	-.181	.262	-.204	.104	-.134	.060	.188	-.014	1
		.793	.262	.102	.206	.523	.410	.715	.244	.932	
	N	40	40	40	40	40	40	40	40	40	40
posttest attitudo bsterics emergen cies	Pearson Correlati on Sig. (2- tailed)	-.124	.144	-.113	.057	-.330*	.091	-.246	.099	.019	.048
		.445	.374	.486	.728	.038	.575	.126	.545	.905	.769
	N	40	40	40	40	40	40	40	40	40	40
posttest attitudo postpartu mhemor rahage	Pearson Correlati on Sig. (2- tailed)	.060	-.174	-.134	.235	.246	-.120	.199	-.218	.253	.146
		.712	.284	.411	.144	.126	.461	.219	.177	.116	.369
	N	40	40	40	40	40	40	40	40	40	40
posttest attituder uptureof uterus	Pearson Correlati on Sig. (2- tailed)	-.052	-.067	.001	.076	.049	-.020	.196	-.017	.362	-.100
		.748	.683	.996	.639	.765	.901	.226	.918	.022	.541
	N	40	40	40	40	40	40	40	40	40	40
posttest attitudo iversionof uterus	Pearson Correlati on Sig. (2- tailed)	-.049	.013	.075	-.095	-.022	.054	-.073	.060	-.013	.103
		.766	.939	.645	.559	.893	.742	.655	.714	.935	.527
	N	40	40	40	40	40	40	40	40	40	40
posttest attitudo irdstage ofmanag ement	Pearson Correlati on Sig. (2- tailed)	.068	.223	-.093	-.135	.161	.251	.019	-.016	-.053	-.211
		.676	.167	.568	.407	.322	.118	.908	.924	.747	.191
	N	40	40	40	40	40	40	40	40	40	40

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed).

Study analysed by Pearson formula and finding showing

Co-relation coefficient (r) pre-test of knowledge and attitude were significantly co-related to each other at the 0.05 level (2tailed)

Co-relation coefficient (r) post-test of knowledge and attitude were significantly co-related to each other at the 0.05 level (2tailed)

IV. CONCLUSION

Analytically analysis indicated that that obstetric practioner had experienced majorly improved awareness about effective management of third stage of labour after directing of self-made informatic booklet on effective management of third stage of labour as compared to preexisted awareness (pretest) about effective management of third stage of labour. Henceforth, this is clearly reflected effectiveness of self-made informatic booklet amid obstetric practioner with effective management of third stage of labour. self-made information booklet was shown to be successful programme in enhancing cognition & attitude toward effective management of third stage of labour amid chosen obstetric practioner, according to results of study. As result, statistical agreement revealed that self-made informatic booklet was favored as effective conservative programme for enhancing nursing officers' cognition and attitude toward effective management of third stage of labour.

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Effect of Processing Methods on the Nutritive Value of Ugba (*Pentaclethra Macrophylla* Benth)

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Abstract— “Ugba”, an indigenous Nigerian fermented food condiment is rich in protein, dietary fibre and minerals. Traditional processing method reduces the level of nutrients and minerals in the processed Ugba after long boiling. This study was therefore undertaken to determine the effects of processing methods on nutritional composition of Ugba. The control sample (Cl) was compared with the samples processed with Potash (Ps), Unripe Paw Paw (Pw1), Dry ashed Plantain peels (Pp2), Dry ashed Palm waste (Ag1) and Oil palm waste Og1. The isolation of microorganisms and determination of viable counts were achieved by culture methods and two of the isolated organisms were identified using Molecular studies. Mineral composition of all the samples was determined using the Atomic Absorption Spectrophotometric method. Proximate analyses of raw and processed samples were also evaluated following the official methods of Association of Official Analytical Chemists. The shelf life study of Ugba, was also done using different preservation treatments which include Sun drying, Oven drying, Refrigeration and Freezing. Organoleptic evaluation test was carried out for the processed samples using a 9-point Hedonic scale analysis on a 27- member panel. The data was statistically analysed using one way analysis of variance (ANOVA). The microorganisms isolated from Ugba sample were noted as to ascertain the organisms involved in fermentation. They include *Bacillus subtilis*, *Bacillus licheniformis*, *Micrococcus varians*, *Enterobacter asburiae* and *Escherichia coli*. The result of the total viable counts in (cfu/ml) were 2.79×10^9 , 2.60×10^9 , 2.68×10^9 , 2.61×10^9 , 2.5×10^9 and 1.97×10^9 for samples Cl, Ps, Pw1, Pp2, Ag1 and Og1 respectively after 72 hours fermentation. The result of the Proximate analysis showed an increase in protein, moisture and ash content and a decrease in carbohydrate, crude fat and crude fibre for the samples at 72 hours of fermentation. Mineral composition result showed that Sample Ag1 had the highest amount of calcium (33.422 mg/100g) and zinc (2.44 mg/100g) while sample Ps had a little trace of lead (0.003 mg/100g) at 72 hours fermentation. An increase in pH and temperature during fermentation were recorded for all the samples. At the end of the preservation period, the oven dried Ugba was able to retain some amount of microorganisms that can be used as starter culture and was the best preservation method recorded. The result from sensory assessment showed that the sample processed with Ash Ngu (Ag1) was most preferred followed by sample Ps in terms of overall acceptability. The results of this study showed that sample Ag1 was most preferred by the panellist and also had the highest amount of protein and calcium which is highly desired to supplement the nutritional requirement of the populace.

Keywords— Processing Method, Nutritive Value, Ugba.

I. INTRODUCTION

“Ugba” an importance dense fermented product of African Oil bean seed constitute one of the commonest fermented leguminous foods eaten in the south eastern Nigeria. Ugba has assumed an essential delicacy among Nigerians. This has earned it the popular name “African salad”. It can be garnished with pieces of cooked stock fish (Ugba and Okpoloko). The normal fermentation of the seed which currently is still carried out at house-hold level makes the product nutritive, appetizing and safe (Enujiugha *et al.*, 2002).

The oil content in the seed comprises oleic acid and linoleic acid together with crude protein made up of the 20 important amino acids. The increased concentration of essential amino acids makes the seed a possible source of protein and condiment (Ach inewhu, 2002).

The processing of Ugba comprises sorting of the seeds, washing, boiling, dehulling, slicing and reboiling for removal of the unpleasant taste. The processed Ugba are covered in leaves and left to ferment for 3 days (Njoku and Okemadu, 2009). Ugba processing similar to other native fermented foodstuffs conventionally depend on natural fermentation commenced by normal microorganisms that are inherent on raw materials, processing utensils, hands of producers and from the local atmosphere as indigenous starters (Jespersen *et al.*, 2004).

Several studies have been done on Ugba which comprise nutrients and other biochemical changes in Ugba associated with microorganisms during fermentation (Kolawole and Okonkwo, 2005, Njoku and Okemadu, 2009). The chief fermenting microbe has been known to be *Bacillus sp.*, others include *Lactobacillus plantarum*, *Staphylococcus sp.*, *Leuconostoc mesenteroides*, *Micrococcus sp.*, *Streptococcus lactis*, *Enterobacter sp* *Proteus sp.* and *Escherichia coli*. Some researchers have also isolated the yeast *Candida tropicalis* and *Geotrichum candidum* during fermentation (Ejiofor *et al.*, 2007).

African oil bean seed have been found to contain several nutrients and minerals including calcium, magnesium potassium, phosphorous, zinc, sodium, manganese, iron, and copper which are reduced considerably with long and unrestrained processing methods. Ugba fermentation, like most fermented foods, is produced and marketed on a small scale, most especially by rural dwellers that are unable to apply improved methods. There is the need to immediately find ways to improve this problem. The raw unfermented seeds of *Pentaclethra macroplyhlla* are uneatable and its regular processing technique is burdensome and decreases the mineral and nutritional value of the seed. Applying diverse processing procedures will decrease the fermentation period and make the process less tiresome while attaining an improved quality product. Ugba can serve as a replacement for meat for the poor and can decrease protein-calorie malnutrition and important fatty acid insufficiencies (Oguntoyinbo *et al.*, 2010).

II. MATERIALS AND METHODS

2.1 Sample collection and processing

Samples of African oil bean seeds were obtained from Eke Nibo Market in Anambra State, Nigeria and identified in the Department of Botany in Nnamdi Azikiwe University (NAU), Awka. The Ugba was produced in the Department of Applied Microbiology and Brewing, NAU laboratory using the traditional method. The seeds were divided into 6 portions – one portion was processed using the traditional processing method according to Njoku and Okemadu (2009) while portion 2-6 were processed with some modification which involve addition of Potash (Ps), Unripe Paw Paw (Pw1), Dry ashed Plantain peels (Pp2), Dry ashed Palm waste (Ag1) and Oil palm waste Og1 to the traditional processing method. The first portion was first boiled for 6hrs, shredded and re-boiled for 3hrs. It was washed, drained and steeped in cold water for 10hrs after which the de-bittered cooked shreds were wrapped and allowed to ferment for 72hrs. For the portion 2-6, it followed the same methods except for the processing duration that were 2 hrs, 45mins and 5hrs respectively.

2.2 Isolation of Microorganisms.

The unfermented sample (0hr) and those fermented (24hrs, 48hrs and 72hrs) were grounded in a sterile porcelain mortar. Six fold serial dilutions were used for the isolation of microorganisms using 1gram samples from each day of the fermentation. Nutrient agar was used in plating via pour plate method. Plates were incubated at 37°C for 24hrs. Representative colonies were differentiated on the basis of morphology and colour and then sub-cultured to obtain pure cultures by repeated streaking. Microorganisms were isolated at zero hour and subsequently after every 24 hours. Colonies were counted from the different mixed culture plates and representative colonies were sub-cultured.

2.3 Characterization of Bacterial Isolates

This was done by carrying out colonial morphology (which includes shape of colony, elevation of colony, edge of colony and pigmentation). The purified cultures were identified using biochemical method according to Bergey's manual of Determinative Bacteriology (Buschanan and Gibbons, 2010). The biochemical tests carried out include Gram staining, Sugar fermentation tests, Catalase test, Coagulase, Indole, Citrate, Oxidase, Methyl red, Voges proskauer and Motility.

2.4 Determination of pH and Temperature of Unfermented and Fermented African oil bean samples.

The pH of the samples was determined using a digital pH meter (Jenway, model 3510). It was repeated respectively for 24hrs, 48hrs and 72hrs. The temperature of the sample was determined by inserting a sterile thermometer (wiped with alcohol) into each of the sample on each day of fermentation. The mercury-in-glass thermometer was used. This process was repeated for 24hrs, 48hrs and 72hrs.

2.5 Proximate analysis

The six samples were analysed for moisture, crude protein, crude lipid, crude fibre and ash using standard methods of Association of official analytical chemists (AOAC, 2005). The carbohydrate content was obtained by difference. 5 grams each of the labelled samples were used for each determination. The moisture content of the samples was determined by air oven method at 110°C. The crude protein was determined by micro-kjeldahl method.

2.6 Mineral composition

Potassium and sodium were determined by digesting the ash of the samples with perchloric acid and nitric acid and then taking the readings on Jenway digital flame photometer/spectronic. Calcium and zinc were determined spectrophotometrically.

2.7 Preservation of Ugba

The preservation methods used were freezing, refrigeration, oven drying and sun drying.

2.8 Organoleptic analysis of Ugba samples.

The quality parameters of *Ugba* evaluated were colour, aroma/flavour, taste, texture and overall acceptability using a 9- point hedonic scale.

2.9 Statistical Analysis

The data obtained from the organoleptic analysis were subjected to statistical analysis using the one way ANOVA. P-values < 0.05 were considered statistically significant while P-values > 0.05 indicates that there is no significant difference between the *Ugba* samples (American Society of Brewing Chemists, 1987).

III. RESULTS

The varieties of microorganisms present during the fermentation were responsible for the uncontrolled fermentation of Ugba to give its characteristic Ugba smell and colour change. Five organisms isolated from the samples were *Bacillus subtilis*, *Bacillus licheniformis*, *Micrococcus varians*, *Enterobacter asburiae* and *Escherichia coli*. However *Bacillus subtilis* and *Bacillus licheniformis* were able to survive the fermentation conditions and were recovered at the end of fermentation.

Table 1a gives the results of the total viable counts (cfu/ml) of the six samples Cl, Ps, Pw1, Pp2, Ag1, and Og1 during the 72 hours fermentation period.

At the end of the 72 hours fermentation period, the total viable counts (TVC) were 2.79×10^9 (cfu/g), 2.60×10^9 (cfu/g), 2.68×10^9 (cfu/g), 2.61×10^9 (cfu/g), 2.5×10^9 (cfu/g) and 1.97×10^9 (cfu/g) for samples Cl, Ps, Pw1, Pp2, Ag1 and Og1 respectively. There was gradual increase in the total viable counts from the initial to the end of the fermentation period for all the samples.

There was a significant increase ($p > 0.05$) in TVC as the fermentation period increased in all the six samples. At 0 hour fermentation period, Sample Cl had the highest total viable count with 1.73×10^9 (cfu/g) and Pp2 had the least with 1.23×10^9 (cfu/g). At 72 hours of fermentation, Sample Ps still maintained the highest value of 2.79×10^9 (cfu/g) while sample Og1 had the least value of 1.97×10^9 (cfu/g).

TABLE 1A
CHANGES IN TOTAL VIABLE COUNT (TVC) OF *UGBA* DURING FERMENTATION

Samples	(cfu/g)			
	0hr	24hrs	48hrs	72hrs
Cl	1.73×10^9	2.2×10^9	2.41×10^9	2.79×10^9
Ps	1.25×10^9	1.68×10^9	2.05×10^9	2.6×10^9
Pw1	1.0×10^9	1.47×10^9	2.28×10^9	2.68×10^9
Pp2	1.23×10^9	1.30×10^9	2.11×10^9	2.61×10^9
Ag1	1.2×10^9	1.39×10^9	2.0×10^9	2.5×10^9
Og1	1.11×10^9	1.62×10^9	1.32×10^9	1.97×10^9

There was a significant increase in pH of the Ugba samples as the period of fermentation increased (Fig 2a). The range of pH for the naturally fermented Ugba is between 6.4 and 8.1. As fermentation progressed, there was a rise in temperature from 29°C – 33°C in naturally fermented samples.

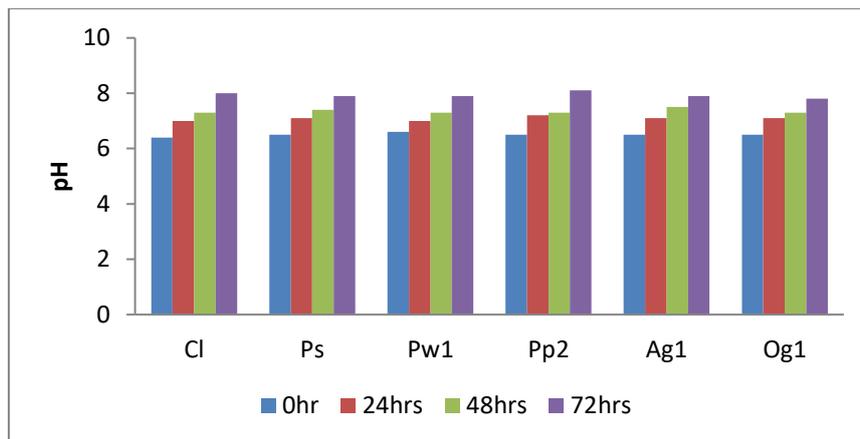


FIGURE 2 a: Changes in pH during the natural fermentation of Ugba.

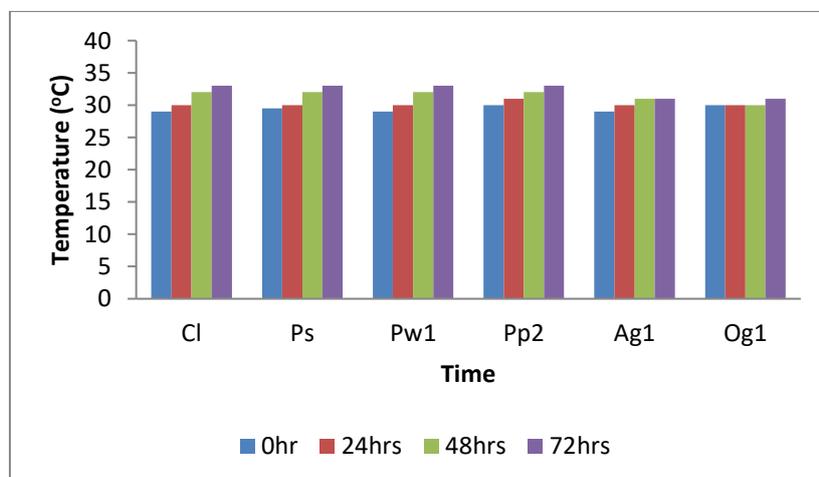


FIGURE 2b: Temperature changes during the natural fermentation of Ugba sample

3.1 Proximate Analysis

The results of proximate composition of the raw and processed Ugba are shown in Table 3a and 3b respectively. All the processed samples of Ugba were high in protein, ash and moisture content, moderate in crude fibre but low in carbohydrate and crude fat. Sample Ag1 had highest value of crude protein (24.15%) ash (3.9%) and crude fat (28.30%) while Og1 had the highest value of crude fibre (3.46%) and carbohydrate (11.62), as well as Pp2 with the highest value of moisture at 42.64% with no significant difference in all the nutrient values ($p>0.05$). Cooking and dehulling led to increase in the protein, ash and moisture content of the samples but with significant reduction in their carbohydrate, crude fat and crude fibre content. Processing of the African oil bean seed using the traditional method (that involves long cooking period) to Ugba led to significant decrease in proximate composition of the sample. However, processing reduced the carbohydrate and crude fat of the products compared with the raw and processed samples.

TABLE 3A
PROXIMATE ANALYSIS OF RAW AFRICAN OIL BEAN SEED.

Component	Composition(%)
Moisture	25.32
Ash	2.4
Crude protein	22.32
Crude fibre	2.13
Crude fat	33.98
Carbohydrate	13.85

From the result of the proximate composition of Ugba processed using different cooking condition, the sample cooked with Ag1 had the highest protein content, ash and crude fat.

TABLE 3B
PROXIMATE ANALYSIS OF UGBA PROCESSED USING DIFFERENT COOKING CONDITION.

Component	Percentage (%)					
	Cl	Ps	Pw1	Pp2	Ag1	Og1
Moisture	40.70	30.78	31.72	29.14	29.64	31.46
Ash	3.25	3.20	2.65	2.66	3.91	2.76
Crude protein	23.45	19.6	18.20	16.8	24.15	22.4
Crude fibre	1.22	3.10	2.61	3.16	3.15	3.46
Crude fat	20.31	27.62	27.29	25.92	28.30	28.22
Carbohydrate	11.07	9.70	11.53	8.82	5.43	11.62

3.2 Mineral Composition

The mineral composition of the raw and processed Ugba are shown in Table 4a, 4b and 4c. The raw samples were very high in calcium and sodium but low in zinc and no trace of lead. Processing the seed to Ugba using the traditional method led to significant decrease in potassium and calcium content of sample Cl, with significant increase in sodium and zinc content. Addition of potash and Ash ngu significantly increased the mineral content of Ugba (sample Ps and Ag1) compared with the control sample (sample Cl).

TABLE 4A
MINERAL COMPOSITION OF RAW AFRICAN OIL BEAN SEED.

Component	Composition(%)
Zinc	0.978
Calcium	27.3
Lead	0
Sodium	8.49
Potassium	1.27

TABLE 4B
MINERAL COMPOSITION OF PROCESSED UGBA SLICES BEFORE FERMENTATION (0 HR).

(Samples µg/ml)	Ag1	Pw1	Pp2	Og1	Ps	Cl
Zinc	0.421	0.436	0.622	0.395	3.304	0.395
Calcium	30.868	30.724	28.802	28.892	21.117	9.538
Lead	-	-	-	-	0.001	-
Sodium	11.349	12.705	8.753	8.782	4.209	9.10
Potassium	2.832	1.867	1.945	2.673	3.276	1.758

TABLE 4C
MINERAL COMPOSITION OF UGBA SLICES AFTER 72 HOURS OF FERMENTATION

(Samples µg/ml)	Ag1	Pw1	Pp2	Og1	Ps	Cl
Zinc	2.44	1.76	0.98	1.82	1.32	1.82
Calcium	33.422	31.11	11.77	10.43	21.37	10.43
Lead	-	-	-	-	0.003	-
Sodium	7.100	17.101	9.100	9.28	17.20	7.024
Potassium	2.832	1.921	2.23	4.42	5.628	1.103

3.3 Preservation of Ugba

Table 5a shows the result of the pH changes observed in Ugba preserved for 24 weeks using different preservation treatments. The pH increased significantly (6.53 – 7.46) as the storage period increased for all the treatments (Table 5a). There was a reduction in microbial count (3.7×10^6 – 1.7×10^6 cfu/g) of all the samples after 24 weeks storage period. The highest microbial count after 24 weeks was with the refrigerated Ugba which had 2.6×10^6 cfu/g while the least of 1.7×10^6 cfu/g was observed with oven dried Ugba (Table 5b).

TABLE 5A
CHANGES IN PH OF UGBA DURING STORAGE PERIOD

Preservation period	(weeks)					
Sun drying	4	8	12	16	20	24
Oven drying	7.01	7.02	7.06	7.10	7.13	7.19
Refrigeration	7.05	-	-	-	-	-
Freezing	7.03	7.18	7.28	-	-	-

TABLE 5B
MICROBIAL COUNT (Cfu/ml) OF UGBA DURING STORAGE PERIOD

Preservation period	(weeks)					
	Sun drying	3.6	3.0	2.6	2.4	2.3
Oven drying	3.7	3.2	2.5	2.4	2.1	1.9
Refrigeration	3.7	-	-	-	-	-
Freezing	3.7	3.4	3.3	-	-	-

3.4 Organoleptic Evaluation

Table 6 shows the results of organoleptic evaluation of the Ugba samples. The data were analysed using one way analysis of variance. Duncan partitioning of the mean values of likes and dislikes shows that there was a significant ($P \leq 0.05$) difference in the level of likeness of Ag1, Ps and Cl as against Og1 and Pp2. The percentage level of acceptance was highest for Ag1 at 59% and lowest for Pp2 at 22%. The mean value of the samples Cl, Ps, Pw1, Pp2, Ag1 and Og1 in terms of colour, taste, texture and taste showed that sample Ag1 was 'liked very much' and highly preferred by the panellists.

TABLE 6
ORGANOLEPTIC ANALYSIS ON PROCESSED UGBA SAMPLES

(Samples $\mu\text{g/ml}$)	Ag1	Ps	Pp2	Og1	Pw1	Cl	Total
Observation N	27	27	27	27	27	27	162
Sum Σx_i	203	192	133	166	180	186	1060
Mean \bar{x}	7.5185	7.1111	4.9259	6.1481	6.6667	6.8889	6.5432

IV. DISCUSSION

Studying the time spent in cooking the *Ugba*, the samples cooked with Ps, Pw1, Pp2, Ag1, and Og1 had the shortest time as against the sample Cl that took long cooking hours. Sample Ag1 had the best colour and taste after the period of fermentation making it the highest acceptable *Ugba* with improved taste and aroma considering the cooking time.

Since the bean seeds were boiled for hours before fermentation, the microorganisms involved in the fermentation could not have originated from the beans. The bacteria involved in the fermentation probably were introduced through air, water, utensils and leaves used in wrapping or by handling during the preparatory stage.

Since protein hydrolysis is the major biochemical change in *Ugba* fermentation (Oyeyiola, 2001), it can be assumed that *Bacillus* sp are the main fermenting organisms. They were found to persist until the end of the fermentation (Obeta, 2003) and their number increased throughout the period of fermentation.

Escherichia coli and *Enterobacter asburiae* were also found to be present only in 1 sample (Cl) at the beginning of fermentation but disappeared after 24 hours of fermentation. *E. coli* though fermentative and found in the air and soil has been isolated from some fermentation (Ogunshe *et al.*, 2007). The rise in pH which occurred during fermentation could be attributed to the increased production of ammonia during the fermentation due to protein hydrolysis and deaminase activity as was reported for some other fermenting protein foods such as Natto, Koji, Iru, Okpehe, Kawal and Soumbala (Ouoba *et al.*, 2007). The increase in pH would encourage the growth of *Bacillus* sp which have been found to grow well at pH 7.8 to 8.0 (Odunfa and Oyeyiola, 2005). The rise in temperature indicated that *Ugba* fermentation is exothermic. The initial increase in temperature has been attributed to the intense metabolic activities of the microorganisms (period of maximal metabolic activity) and represent the most active and important period of the fermentation. From the proximate analysis result obtained, it has been shown that crude protein content of African oil bean seed in the cooked and fermented form have enough nutrients to satisfy protein requirement of population in the developing countries that rely much on starchy staples. The highest content of protein (24.15) was recorded for sample Ag1 and the lowest (16.8) in sample Pp2. The increase in crude protein is in agreement with the work of Campbell-Platt (2000) where the crude protein of dawadawa increased. They attributed this to the organism *Bacillus subtilis* and *Bacillus licheniformis* associated with the fermentation. The progressive decrease in crude fat during the fermentation for all the samples is desirable because fat was broken down into simpler substances which will enhance the digestibility of the product in human

body. The decrease in fat has been reported by Odunfa (2005) to be desirable, since high amounts of fatty acids in foods can cause rancidity thereby making the food taste sour.

The ash content observed is an indication that *Ugba* samples are rich in minerals. The adjuncted samples had higher ash content with sample Ag1 (3.91) and Pw1 the lowest (2.65) which is an indication that this improved *Ugba* are highly rich in minerals.

For the preservation of *Ugba*, the pH increased slightly during the storage period although the pH of the treated samples was lower than fresh *Ugba*. The lower pH obtained was due to the different preservation treatments carried out on the samples. Evaporation of ammonia during drying results in decrease in pH (Parkouda *et al.*, 2008). The lowest microbial count obtained for the oven dried was because drying helps to dehydrate both the food and microorganisms. It also helped to concentrate the soluble ingredients in *Ugba*, and these high concentrates prevented the growth of microorganism.

V. CONCLUSION

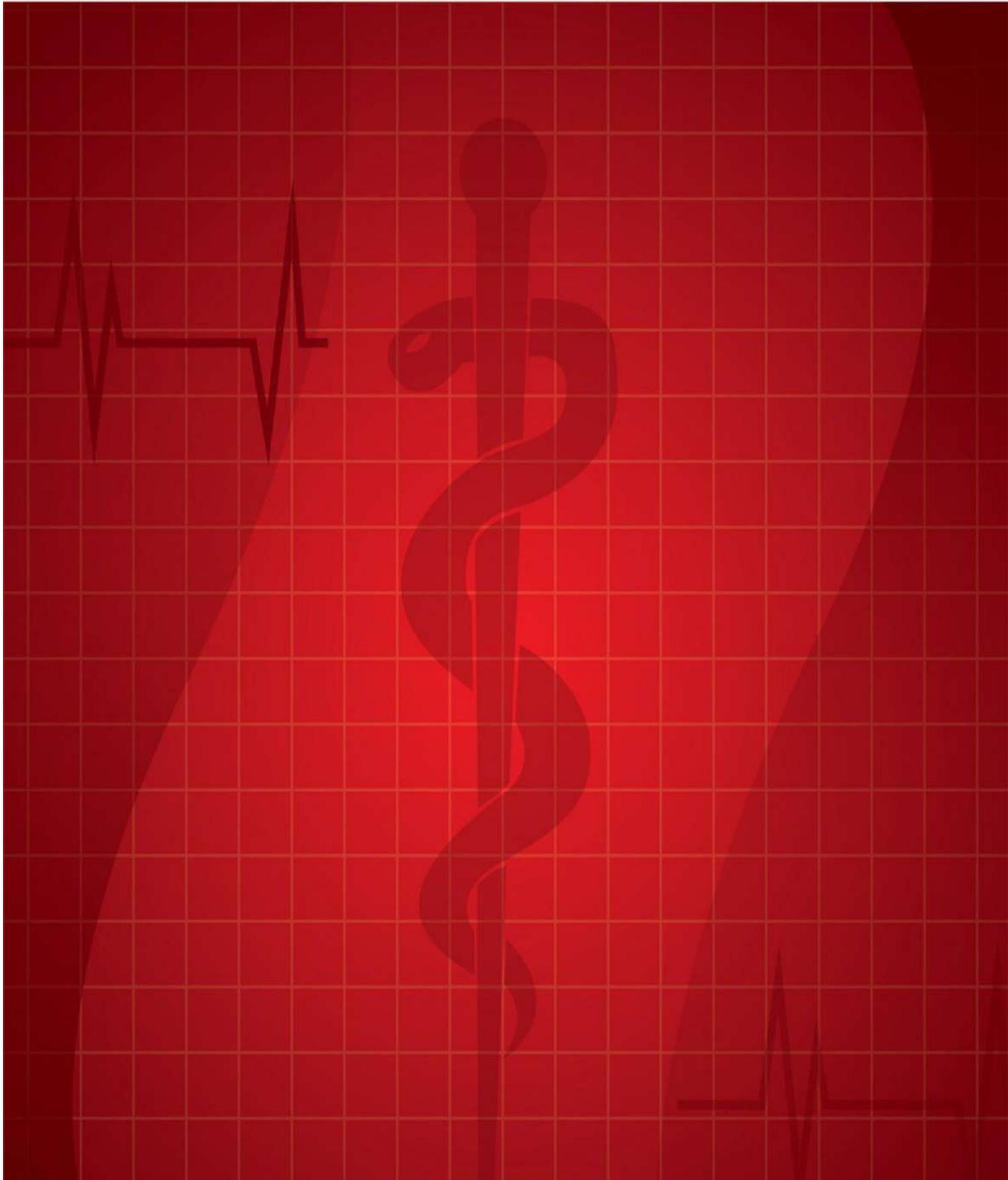
In a bid to reduce the time spent in *Ugba* production, the sample processed with Ag1 was found to be the best and had the best taste, flavor, aroma, texture and nutritional composition. The microorganisms responsible for *Ugba* fermentation were bacteria: *Bacillus subtilis*, *Bacillus licheniformis*, and *Micrococcus varians*. Sensory evaluation results showed that the *Ugba* sample produced by cooking with Ag1 was generally liked by panelists in all parameters tested. This implied that the sample was “overall best”. A total of 5 minerals were found in *Ugba* sample; Sodium, Potassium and Calcium were abundant in the “overall best” sample with no trace of Lead. While the sample Ps (*Ugba* cooked with potash) which however was moderately liked by panelists because of its characteristic *Ugba* aroma had traces of lead in its mineral analysis.

It was therefore concluded that since long boiling cause loss of some essential nutrients, wastes time, energy and resources, the introduction of Ag1 to African oil bean seed production improves its flavor, taste and aroma and fermentation brings about the best acceptable *Ugba* in terms of nutritional composition.

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