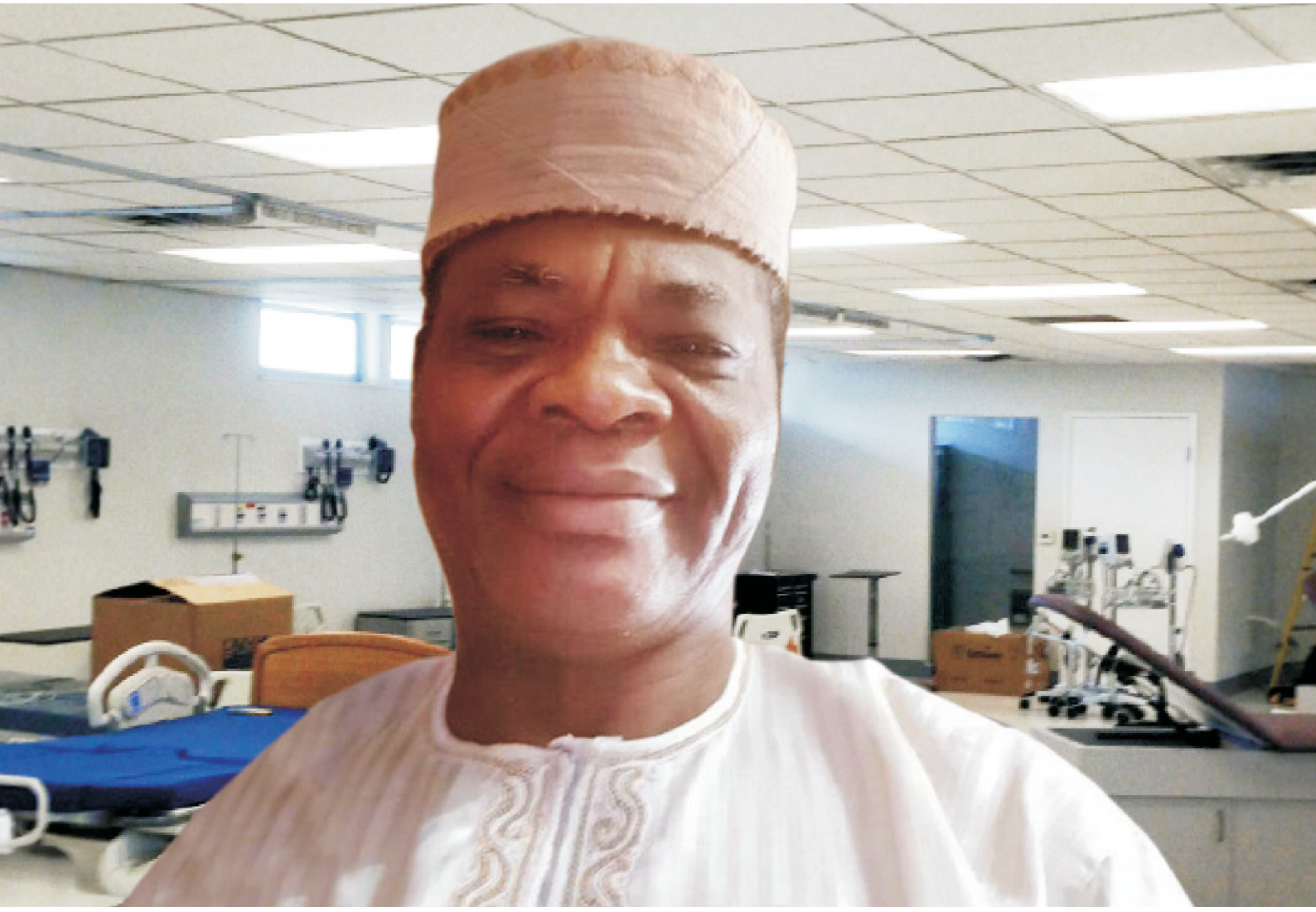
LAUTECH JOURNAL OF NURSING

VOL. 10, JANUARY, 2022 ISSN 2659-1405



PROF. M. O. LIASU
The Ag Vice Chancellor. LAUTECH, Ogbomoso

A Publication of the Faculty of Nursing Sciences,
College of Health Sciences,
Ladoke Akintola University of Technology, Ogbomoso, Nigeria

Impact Factor Value of 0.861 based on International Citation Report for year 2020/2021

10TH EDITION LAUTECH JOURNAL OF NURSING

A Publication of the Faculty of Nursing Sciences,
College of Health Sciences,
Ladoke Akintola University of Technology, Ogbomoso, Nigeria

VOLUME 10, JANUARY, 2022

ISSN 2659-1405

ISSN 2659-1405

VOLUME 10, JANUARY, 2022

Address:
Faculty of Nursing Sciences,
College of Health Sciences,
Ladoke Akintola University of Technology
P. M. B. 4000, Ogbomoso, Nigeria.
Tel: +2348033579737
Email: lautechjournalofnursing@gmail.com
Website: www.lautechjournalofnursing.org

Printed and published in Nigeria by
Estom Printers
Ibadan, Oyo State
Nigeria.
+2347030298365,
E-mail: durowojuthomas@gmail.com

EDITORIAL BOARD

EDITORIAL COMMENT

1. LAUTECH Journal of Nursing (LJN) has the goal of becoming the most widely cited Nursing Journal in West Africa with Impact Factor Value of 0.861 based on International Citation Report (ICR) for the year 2020-2021.
2. The LJN has the tripartite mission of:
   (a) Promoting a culture of excellence in Nursing Research.
   (b) Encouraging the exchange of profound and innovative ideas capable of generating creative practice in nursing research practise.
   (c) Disseminating information on nursing related development that are not usually easily available to academics and practitioners.
3. The Journal will accordingly encourage the publication of the following categories of papers.
   (a) Research papers that move away from orthodoxy and which really break new grounds in terms of methodology and findings.
   (b) Essays and issues papers that contribute to re-orienting received ideas, values and practices.
   (c) Documents emanating from national and international conferences, as well as from largescale research work that emerging trends and thinking in nursing related development.
4. LJN is published biannually in any area of nursing interest or relevant to needs of academics and practitioners.

In this volume, sixteen (16) manuscripts scale through the eye of the needle of the Editor-in Chief. The title of the papers in this edition are: Evaluation of Nurses' Actions and Opinion on Pain Assessment of Hospitalised Patients; Ultraviolet Radiation on Gunshot Wounds: Clinical Case Reports; Assessment of Knowledge and Compliance with Coronavirus Protocols Among Healthcare Professionals; Availability of Essential Components of Maternal Healthcare in Health Institutions; Factors Associated with Overweight and Obesity among Adolescents; Health-Seeking Behaviours, of Women Presenting with Advanced Stages of Breast Cancer: Sociocultural Beliefs and Practices on Placenta Disposal and Processing among Multiparous Women; Parental Control, Social Media Utilisation And Risky Sexual Behaviour Among Adolescents; Assessment of Nosocomial Infection Preventive Measures Utilized by Clinician Nurses in Intensive Care Unit; Alternative Medicine Use and its Perceived Effectiveness in Management of Hypertension; Assessment of Modern Contraceptives Uptake among Women of Reproductive Age; Community Health Extension Workers and Traditional Birth Attendants' Neonatal Resuscitation Practices of Babies Born with Asphyxia; Midwives' Current Screening Practice of Intimate Partner Violence among Pregnant Women in Northern Nigeria; Assessment of Cancer Patients' Quality of Life; Knowledge, Attitude and Practice of School Health Program among Secondary School Teachers and Traditional Birth Attendants' Knowledge of First-Aid Management and Skills of Selected Labour Emergencies in Ogbomosho, Oyo State, Nigeria: an Intervention Study.

EDITORIAL DESK

Welcome to LAUTECH Journal of Nursing!

LAUTECH Journal of Nursing focuses on but not limited to research findings in the different areas of nursing: Nursing Care, Nursing Education, Medical Surgical Nursing, Maternal and Child Health Nursing, Community Public Health Nursing, and Psychiatric/Mental Nursing. This journal is published to promote quality scholarly writing and hence instigating and generating vibrant discourse in the different areas of nursing. Apart from providing an outlet for publications of research findings, it offers opportunities for professionals and students to disseminate their views or position on topical issues and emerging theories within the scope of the journal. The Journal is peered reviewed by seasoned scholar. Six-three authors have contributed in one way or the other to the tenth edition of the journal.

In this regard, the journal welcomes articles from individuals and corporate organisations for the ninth edition. Interested contributors may forward copy of their manuscript; computer-typed in double line spacing, using Times New Roman 12 point font, with abstract not more than 250 words on a separate page. Manuscript should not be more than 15 pages and sent to doctoradeyemo@yahoo.com or lautechjournal@gmail.com.

Happy reading!!!

GUIDELINES FOR AUTHORS

Contributors to the journal are to respect its avowed principle of QUALITY in all its Ramifications and ensure that:

(a) Presentation of Manuscript

We require an electronic copy, doubled spaced and paginated. The file should be saved as a Word Document, do not use PDF. Ensure the manuscript you provide is double space throughout, including indented block quotes, excerpt, extract, references. The font should be Times New Roman 12 Points. **RESEARCH PAPERS** are technically and faultlessly designed, executed and reported

(b) **ESSAYS AND ISSUES PAPERS** are analytically sound, presenting solidly original ideas that can positively influence change in educational thoughts, research and practices.

(c) The manuscript, which should include title, abstract, text, tables, figures, where necessary, should be typewritten on A4 size paper with double-spacing and should not exceed 15 pages

(d) The abstract should not be more than 250 words

(e) Authors should use the latest APA manual of styles. Some examples are:

i. **Book**

Uba, J. E. (2007). Overcoming the hurdles of research projects, thesis, dissertation. Calabar, Nigeria, Ushie Printers.

ii. **Chapter in edited book**

(a) Simeon, O.L & Adewale, J.G. 2013. Student Extrinsic and Intrinsic Factors as Correlates of Technical and Vocational Education Enrolment in Osun State. A.O.U.Onuka. Eds. Esthom Graphic Prints, Nigeria. 286-296.

iii. **Chapter in edited book**

(b) Oluwaponmile G. A.& Adegbile J. A. 2013. The Concept of Individualization of Instruction and Christian Education. A. O. U.Onuka. Eds. Esthom Graphic Prints, Nigeria. 114-155.

iv. **Article from journal**

Halliday, M. A. K. (1961). Categories of the theory of grammar word, 17, 241-92. (**Note** No 'pp.' required for journal articles).

Millers, A. (2000). Choice and the relative pleasure of consequences. Psychological Bulletin 126.3:910-924.

Landro, M. (1999). Repeatability issues of 3-D VSP data. Geophysics 64:1673-1679.

____. 2001. Discrimination between Pressure and fluid saturation changes from time lapse seismic data. Geophysics 66:836-844.

v. **Article from magazine**

Kandel, E.R. and Squire, L.R. 2000. Neuroscience: breaking down scientific barriers tothe study of brain and mind. Science 290.Nov 10:113-1120.

Article from newspaper

(where the name of the author is neither given nor known, begins reference with "**Anon**")

Encyclopaedia article

Bergmann, P.G. 1993. Relativity. The new encyclopaedia Britannica. Chicago: Encyclopaedia Britannica, 501-508.

Patent

Fawole, I., Afolabi, N.O. and Ogunbodede, B.A. 1986, Description of cowpea cultivar: IFH101.NGVU-00-22,2000.

Unpublished theses, dissertation, projects and essays

Alaba, O.B. 2003. Balance of payment adjustment mechanisms in Nigeria. PhD. Thesis. Department of Economics. University of Ibadan. Xiv+183pp

E-journal article from the internet

VandenBos, G, Knapp, S. and Deo, J. 2001. Role of reference element in the selection of resources by psychology undergraduates. Journal of Bibliographic Research 5. 117- 123. Retrieved June. 13,2019, from http://jbr.org/article.html.

Organization/Government/Personal web page

U.S. General Accounting Office. Feb., 1997, Telemedicine: federal strategy is needed to guide investments. Publication No. GAO/NSAID/HEHS-97-67. Retrieved Sept. 15,2000, from http://www.access.gpo.gov/su_docs/aces 160.shtml? /gao/index.html.

Tables

1. A table should be typed with the minimum of horizontal rules. Vertical rules should be avoided.
2. Table should be referred to in the text as 'in Table 2' rather than 'in the following table or in the table above or below'.
3. All tables should have captions, source and notes are placed immediately below.

(f) Papers which should be written on only one side should be submitted in triplicate (hard copies)

(g) Papers are blind peer-reviewed, each paper attracts an assessment fee of #5000. 00 or $100.00.

(h) Neither the editor, nor the editorial board shall be liable for article(s) lost in transit.

(i) The editor and editorial board will not enter into correspondence with authors over rejected articles

(j) Those whose articles are accepted for publication will pay the sum of #40,000.00 and be informed as regards other commitments:

(k) Papers could be transmitted at any time for publication in any subsequent issue.

Manuscripts should be submitted electronically to the:

Editor in-chief, **Florence O. Adeyemo**, Department of Community Health Nursing, Faculty of Nursing Sciences, College of Health Sciences, Osogbo, Osun State, Ladoke Akintola University of Technology, Ogbomoso and copy the Editor, LAUTECH Journal of Nursing (LJN) using the following email addresses: doctoradeyemo@yahoo.com or lautechjournal@gmail.com

Copyright

1. Permission must be obtained if you want to quote at length from another author's work or use an illustration previously published. Please note that obtaining permissions can be a lengthy process and should therefore be initiated well before the final manuscript is submitted to Continuum. Please refer to copyright holder's website/information: they may have forms or templates for requesting permission. If they provide no specific information on submitting requests, a standard permission request letter is available from us and should be used when approaching the copyright holder.
2. Please be aware that permission must also be sought for images, text etc that is sourced from the internet. Copyright may belong to the website owner, or to the original creator. Do not assume that just because an item is on a website it is in the public domain - it may be that the website owner does not have the permission to use it.

If you have any questions about the preparation of your article at any stage, please do not hesitate to ask.

Prof. Florence O. Adeyemo
The Editor-in-Chief
doctoradeyemo@yahoo.com or
lautechjournal@gmail.com

LIST OF CONTRIBUTORS

ADETUNMISE OLUSEYI OLAJIDE
Faculty of Nursing Science,
Ladoke Akintola University of Technology,
Ogbomoso, Oyo State, Nigeria.
Phone No: 08037287328.
Email: adetunmiseolajide@gmail.com

ADERONKE JULIENNA ADETUNJI
School of Nursing,
Lagos University Teaching Hospital,
Idi-Araba, Lagos
Phone No: 08033308938
Email: ronkeadetunji56@gmail.com

ADEYEMO FLORENCE O.
Department of Community/Public Health,
Faculty of Nursing Sciences,
Ladoke Akintola University of Technology,
Osogbo, Nigeria
doctoradeyemo@yahoo.com
+2348033579737

AGATHA OGUNKORODE
Department of Nursing Science,
College of Medicine & Health Sciences,
Afe Babalola University, Ado-Ekiti, Nigeria;
Phone No: 08065821012, +2349078129160
Email:ogunkorodeqo@abuad.edu.ng

AJAYI, ANTHONY
Department of Physiotherapy,
Ahmadu Bello University Teaching Hospital
Zaria, Nigeria
Phone No: +2348023639269
Email: ehichristo@yahoo.com

ANYEBE, EMMANUEL EJEMBI
Department of Nursing Sciences,
Faculty of Clinical Sciences,
University of Ilorin, Kwara State, Nigeria
Phone No: +2348036422771
Email: ejembianyebe@gmail.com;
anyebe.ee@unilorin.edu.ng;

AYISHETU U. MUSA-MALIKI
Department of Nursing Sciences,
Ahmadu Bello University, Zaria – Nigeria.
Email: aumusamaliki@abu.edu.ng,
aishaudu@yahoo.com
Phone Number: +234 7038159582
Twitter: @Ayi_1

BARAKAT BOLAJOKO
Department of Nursing Science,
College of Medicine and Health Sciences,
Afe Babalola University, Ado-Ekiti, Nigeria
Phone No: 08140551353
Email: ayooreoluwa@gmail.com

CHIKA C. H. ODIRA
Department of Nursing Science,
Nnamdi Azikiwe University Awka,
Anambra State, Nigeria
Email: chikachioma@gmail.com,
Phone No: +2347030615243

CHRISTIANA OLANREWAJU SOWUNMI;
Babcock University School of Nursing,
Ilishan Remo, Ogun State, Nigeria
lanresowunmi@hotmail.com
+2348023500321

CONSTANCE O. IZEKOR
School of Post Basic Nursing,
Irrua Specialist Teaching Hospital,
Irrua, Nigeria
Phone No: +234 8056461045
Email: constanceizekor@isth.com.ng

DALHAT SANI KHALID
Department of Nursing Science,
Faculty of Allied Health Sciences,
College of Medical Sciences,
Ahmadu Bello University Zaria, Nigeria
Phone No:07035385167
Email: dksanni@abu.edu.ng

DEBORAH TOLULOPE ESAN
Department of Nursing Science,
College of Medicine and Health Sciences,
Afe Babalola University, P.M.B. 5454,
Ado-Ekiti, Nigeria
esandt@abuad.edu.ng
+234(0)8062484864

DELIVERANCE BROTOBOR
Department of Nursing Science,
Ambrose Alli University, Ekpoma, Nigeria
deliverancebrotobor@gmail.com
+234 9055468987

EHWARIEME TIMOTHY A.
Department of Nursing Science,
School of Basic Medical Sciences,
University of Benin, Benin City,
Edo State, Nigeria
Phone No:08060696870
Email timy4real12@gmail.com

EDITH N. CHIEJINA
Department of Nursing Science,
Nnamdi Azikiwe University Awka,
Anambra State, Nigeria
Phone no: +2348037463279
Email:nkechichiejina@yahoo.com

EMMANUELA. OYEDELE
Department of Nursing Science,
College of Health Sciences,
University of Jos, Jos, Plateau State, Nigeria
Phone No: 08038266157
Email: Juliedad2003@yahoo.com

ESEOGHENE OGBURU
Department of Nursing Science,
College of Medicine and Health Sciences,
Afe Babalola University, Ado-Ekiti, Nigeria
Phone No:08103769157
Email: aniogburu13@gmail.com

EZEAKA PATIENCE
Nursing Services department,
Lagos University Teaching Hospital, Lagos
Phone No:08060627242
Email: ezeakafavour@gmail.com

F. ELIZABETH OJO
Department of Nursing,
College of Medicine and Health Sciences,
Afe Babalola University of Ado-Ekiti
Phone no: +2348034292020
Email: ojofe@abuad.edu.ng

FOLASHADE WINA
Department of Nursing Science,
University of Jos, Jos. Plateau State, Nigeria
Phone no: 08065308349
Email:fshabal2002@yahoo.com.

GAKNUNG BONJI
Department of Nursing Science,
University of Jos, Jos. Plateau State, Nigeria
Phone No: +2348033959627
Email bonjigaknung@gmail.com
gaknungb@unijos.edu.ng

GRACE O. DANIEL
Department of Nursing Science,
University of Jos, Jos. Plateau State, Nigeria
Phone no: +234 8036285950
Email:gracemola2002@yahoo.co.uk

I. D. OWOEYE

Department of Nursing,
College of Medicine and Health Sciences,
Afe Babalola University of Ado-Ekiti
Phone no: +2348034252290
Email: owoeyeid@abuad.edu

IDRIS ABDULRASHID DABAI

Department of Nursing Science,
Bayero University, Kano Nigeria
08063375818
idrizdabai@gmail.com

IRODI C. CANIS

Department of Nursing,
Igbinedion University, Okada, Edo State
Phone No: 08034901130.
Email: Irodicanis@yahoo.com

ISIBOR EWERE ANITA

Department of Nursing
University of Benin, Nigeria
Phone No:08085893875
Email ewere85@gmail.com

MERCY OLUFUNKE IWAOLA

Department of Nursing,
Babcock University Teaching Hospital,
Ilishan Remo, Ogun State, Nigeria
Phone No: 07036138033.
Email olufunkeiwalola@yahoo.com

MOHAMMED, ZULAIHA BALA.

Department of Physiotherapy,
Ahmadu Bello University Teaching Hospital
Zaria, Nigeria
Phone No: +2347035106155
Email zulybal27@gmail.com

NADYEN SHIKPUP JORDAN.

Department of Nursing Science,
University of Jos, Jos. Plateau State, Nigeria
Phone No: 070396424284.
Email nadyenshikpup@gmail.com

NDIE, E. C.

Department of Nursing Science,
National Open University of Nigeria,
Abuja Nigeria,
Plot 91 Cadastral Zone, Jabi, Abuja.
Phone No:07066789961.
Email: chubike05@yahoo.com

NZELUEAKA HELEN A.

Department of Nursing Science,
School of Basic Medical Sciences,
University of Benin, Benin City,
Edo State, Nigeria.
Phone No:07068813915
Email: nzelueakah@gmail.com

OGUNLEYE O. R.
School of Nursing Ekiti State Teaching Hospital, Ado-Ekiti
+2347061825698
Oyinlolaogunleye12@gmail.com

OGWA, E. T.
Alex Ekwueme University Teaching Hospital Abakaliki
Phone No:08035074128
Email: favourogwa@yahoo.com

OKO-OSE, JOSEPHINE
Department of Nursing
University of Benin, Nigeria
joechiazor@yahoo.com
08034078785,

OLADAPO T. OKAREH
Department of Environmental Health Sciences,
Faculty of Public Health,
University of Ibadan, Ibadan
Phone No: 08057311182.
Email: dapsy2001@yahoo.co.uk

OLAOLORUNPO OLORUNFEMI
Department of Medical-Surgical Nursing,
Faculty of Basic Medical Science,
Federal University Oye-Ekiti,
Ekiti State, Nigeria
Phone: +2348034694675
Email:olaolorunfemi@yahoo.com
https://orcid.org/0000-0001-9525-8757

OLAWALE JINAID JUBRIL
Department of Physiotherapy,
Ahmadu Bello University Teaching Hospital
Zaria, Nigeria
Phone No: +2347035106155.
Email; jjolawale@yahoo.com

OLUBIYI BISOLA
Research Hub, Africa
The bunker 3 Atabara Street, off Cairo Street ,
Wuse 2, Abuja
Phone No:08038105402
Email: omotooke@gmail.com

OLUBIYI M. VINCENT
Department of Physiology,
College of Health Sciences,
Kogi State University, Ayingba, Kogi State
Phone No: 09031151038
Email: mavolubiyi@yahoo.com

OLUBIYI SIMEON KAYODE
Department of Nursing Sciences,
Faculty of Clinical Sciences,
College of Health Sciences,
University of Ilorin
Phone No: 08033617649
Email simeonolubiyi@gmail.com
olubiyiskunilorin.edu.ng

OLUBUNMI OLUWAKEMI YEJIDE
Department of Nursing,
National Open University of Nigeria,
Ado-Ekiti Study Centre
Phone No: 08169074178
Email: olubunmikemi3@gmail.com

OLUFAYOKE VICTORIA MIDE-ATOLANI
School of Nursing Ekiti State Teaching Hospital,
Ado-Ekiti
+2348068968892
mideatolanifayokemi@gmail.com

OLUWAFUNMILAYO ESTHER FADARE
Department of Nursing Science,
College of Medicine & Health Sciences,
Afe Babalola University, Ado-Ekiti, Nigeria;
07063545905
phadarephunmie@gmail.com

OLUWASEUN ENIOLA ADEGBILERO-IWARI
Department of Community Medicine,
College of Medicine & Health Sciences.
Afe Babalola University, Ado-Ekiti, Nigeria.
07060826910
Seuneniola01@gmail.com

OLUWASEYI ABIODUN AKPOR
Department of Nursing Science,
College of Medicine & Health Sciences,
Afe Babalola University, Ado-Ekiti, Nigeria;
Phone No: +234706851599.
akporoa@abuad.edu.ng

OLAWUYI VICTORIA FEHINTOLA
Department of Nursing,
National Open University of Nigeria,
Ado-Ekiti Study Centre
Phone No: 08139380475.
Email: fehintideraa@gmail.com

OMOROGBE CHRISTIE E.
Department of Nursing Science,
School of Basic Medical Sciences,
University of Benin, Benin City,
Edo State, Nigeria
Phone No: 08062304948.
Email: omorogbechristie@gmail.com

ONASOGAA. OLAYINKA
Department of Nursing Sciences,
Faculty of Clinical Sciences,
College of Health Sciences,
University of Ilorin
Phone No: 08064967578
Email yinka_onasoga@yahoo.

OPALUWA, SURAJO. AHMODU
Department of Medical Microbiology,
Ahmadu Bello University Teaching Hospital
Zaria, Nigeria
Phone No: +2348034516359
Email: ahmed_opaluwa@yahoo.co.uk

PATRICIA O. AKOWE
Primary Health Care Department,
Etsako East Local Government Area,
Agenebode, Edo State, Nigeria
Phone No: +234 9026339245
Email:patakowe@yahoo.com

PAULINE O. M. EZENDUKA
Department of Nursing Science,
Faculty of Health Sciences and Technology,
Nnamdi Azikiwe University Awka,
Anambra State, Nigeria
Email:poezendukap@gmail.com,
Email:+2348033476403

PETER UDEH ADA
Department of Nursing Science,
University of Jos, Jos. Plateau State. Nigeria
Phone No: 08039365746
Email:petersclevery@gmail.com

QUEEN STELLA OTAIGBE
Edo State School of Midwifery,
Benin City, Nigeria
Phone No: +234 7031841598
Email:otaigbeqs@gmail.com

RISIKAT IDOWU FADARE
Department of Nursing Science,
College of Medicine & Health Sciences,
Afe Babalola University, Ado-Ekiti, Nigeria;
08034679248
fadareri@abuad.edu.ng

SAROR, L. A.
Department of Nursing Services,
Ahmadu Bello University Teaching Hospital
Zaria, Nigeria
Phone No: +234 8028483240
Email; awasaror2@gmail.com

SALIHU ABDURRAHMAN KOMBO
Department of Nursing Science,
Faculty of Allied Health Sciences,
College of Medical Sciences,
Ahmadu Bello University Zaria, Nigeria
08061307902
aksalihu@abu.edu.ng

SERAH OSAMUDIAMEN BOLAJI-OSAGIE
Department of Nursing,
University of Benin, UNIBEN
Phone No: 07064938101
Email: princy_911

SINEGUGU E. DUMA
Department of Health and Rehabilitation Sciences,
University of Cape Town, South Africa.
Phone Number: +27 824492635
Email: dumas1@ukzn.ac.za

TOLULOPE FUNMILOLA OJO
Department of Public Health,
Afe Babalola University, Ado-Ekiti, Nigeria
ojotolulopef@abuad.edu.ng
08169195591

TRENG NAANFWANG. URBANUS
Department of Nursing Science,
University of Jos, Jos. Plateau State Nigeria.
Phone No: 08138250941
Email:trengurbanus@yahoo.com

UMAR N. J.
Department of Nursing Sciences,
Faculty of Clinical Sciences,
College of Health Sciences,
University of Ilorin
Phone No: 08065482425
Emailumaribna@gmail.com

YAHAYA HAMZA SANI
Department of Nursing Science,
Faculty of Allied Health Sciences,
College of Medical Sciences,
Ahmadu Bello University Zaria, Nigeria
+2347035385167
hamzayahaya@abu.edu.ng

YUSUF ABDURRASHID GAMBARI
Department of Nursing Sciences
Faculty of Clinical Sciences
College of Health Sciences
University of Ilorin, Ilorin, Kwara State
08072777457
yusufgambary@gmail.com

TABLE OF CONTENTS

ULTRAVIOLET RADIATION ON GUNSHOT WOUNDS: CLINICAL CASE REPORTS

ANYEBE, E. E.; AJAYI, A.; OPALUWA, S. A.; OLAWALE J.; MUHAMMED Z. B. & SAROR, L. A.

ABSTRACT

Wound care is benefitting from contemporary technological advancements one of which is the use of ultra violet therapy. This paper focuses on the use of ultra violet therapy. It seeks to ascertain the efficacy of Ultraviolet Radiation (UVR) in the healing of gunshot wounds in a tertiary health facility in Northwest Nigeria, with a view to stimulate more interest in an integrated approach to wound management in our care environment. The case summaries are two patients with gunshot injuries selected from a Female Orthopaedic Ward of the hospital. Antibiotics and wound dressing were applied initially to the wounds of both patients and results showed that the management was less effective. Following a consult sent to the Physiotherapy Unit of the hospital, after due assessment, an ultra-violet therapy was introduced using a cold quartz UV generator. This therapy was performed following some specific steps. The Minimal Erythemal Dose (MED) was performed on the 1st session to determine the dosage level, using an erythemometer. Baseline measurements of the wounds were taken and documented. Patient 1 and Patient 2 had 14 and 12 treatment sessions respectively over a 4-week period. The wound dimensions were subsequently measured every week for four weeks and properly documented. There was a gradual but significant decrease in the size of the wounds for both Patients 1 and 2 within four weeks of commencement of the therapy. Surrounding skin remained intact. It is therefore recommended that UV therapy in the treatment of gunshots wounds in our locality has great potential for wound management and this can be further explored. More studies should be conducted to establish its place in wound management in our health facility. Clinicians should collaborate in this area to improve wound care and research.

Keywords: Gunshot Wounds; Wound Management; Ultraviolet Therapy.

INTRODUCTION

Wound care is a major component of medical care, often managed by a team of health professionals such as nurses, doctors, and physical therapists (physiotherapists). In recent times, there have been many recent technological advances in wound care among which is the light-based technology comprising a wide range of modalities. Wounds of different types have benefitted from such innovations and collaboration. Wounds that are heavily infected can be managed with use of UVC, while low-level laser (or light) therapy and photodynamic therapy both have such wide applications in wound care (Gupta, *et al.,* 2013). Ultraviolet (UV) radiation (200–280? nm) has been directly applied to the wounded tissue to stimulate wound healing, restore skin homeostasis and selectively inactivate micro-organisms (Gupta, *et al.,* 2013). Several reports indicate the efficacy of the use of UVR in the treatment and management of different types of wounds and ulcers. For example, the effective use of UVR in managing varying degrees of pressure ulcers has been established in Nigeria and elsewhere (Onigbinde, *et al.,* 2010; Nussbaum, 2013).

In other infected wounds, evidence abounds on the effectiveness of UVR in their treatments. Recently, Yarboro, *et al.,* (2019) reports the effect of UVR-C irradiation in treating chronic wounds and found that radiation therapy is a useful adjuvant therapy for chronic wounds. They report healing in 62.1% of venous wounds, and 76.7% diabetic foot ulcers. The efficacy of UVR in treating burn wounds with sepsis has also been reported. Exposure of the wounds for 6 – 8 hours daily for 8 days to ultraviolet phototherapy results in improvement in wound healing and sepsis significantly (Aleema, *et al.,* 2014). The effect on sepsis has been associated with elimination of various micro-organisms infecting wounds. The antimicrobial efficacy of UVR against certain bacteria has also been documented. Existing studies (Thai, *et al.,* 2002; Gupta, *et al.,* 2013; Onigbinde, *et al.,* 2010; Kaleshtari, *et al.,* 2015)

have reported the effectiveness of UVR against methicin-resistant Staphylococcus aureus (MRSA) and Pseudomonas aeruginosa. Aleema, *et al.,* (2014) also reported its efficacy in burn wounds infected with MRSA.

The ultraviolet radiation has other application such as in the prevention of surgical site infections. Buonanno et al., (2013) observe using UVR (207mm) effectively for surgical site infections control. They found that UVR kills bacteria efficiently without any significant cytotoxic or mutagenic effect to humans.

The use of ultraviolet (UV) radiation in traumatic wounds such as gunshot wounds (GSWs) could be of immense benefits just like its use in many infected wounds. Gunshot wounds are caused by firearms, one of the most destructive and readily available weapons in modern society (Itodo, *et al,* 2015). Ogunlusi, *et al,* (2006) opines that the incident of civilian gunshot injuries and their ensuing fatalities have been on the increase worldwide, with the burden of firearms violence being borne more by the most productive segment of the society, that is, those aged between 16-45years (Odatuwa-Omagbemi, *et al,* 2013). Relative to other weapons, guns tend to be associated with greater long term physical sequel resulting in suffering, wound, and disfigurement disability as in the case of our two patients in these case reports. This makes GSWs quite life threatening especially when they are to the head, chest, abdomen and the spine (Ogunlusi, *et al,* 2006). These have led to grave complications such as hypovolemia, hemorrhagic shock, sepsis and paralysis/paresis (Onuminya, *et al*, 2005).

The most common sites of gunshot injuries are the extremities, usually accompanied by fractures and soft tissue damage, requiring debridement, sterile dressing and surgery usually closed by primary or secondary intention. In many situations, these modalities have not brought about effective wound healing in GSWs (Onuminya, *et al,* 2005), necessitating other interventions.

This study consists of observations made on two patients brought to the study setting whose wounds failed to heal after several weeks of care, despite daily wound dressing and antibiotic therapy. Following a consult sent to the Physiotherapy Unit of the hospital, an ultra-violet therapy was added to the wound. These case reports are therefore presented to disseminate findings on the effect of the UVR therapy in the healing of the gunshot wounds in a tertiary health facility in northwest Nigeria, with a viewing to stimulating more interest in this mode of wound management in our environment.

Objectives of the study

METHODOLOGY

Design: A quasi-experimental clinical case report, involving the use of UVR on gunshot wounds of two patients.

Setting: The two cases were obtained from the Female Orthopedic Ward of Ahmadu Bello University Teaching Hospital (ABUTH), Shika-Zaria, North-west Nigeria. ABUTH is a 500-bedded, federal-owned tertiary and a referral hospital where cases beyond the primary and secondary health facilities are being referred to for expert management. Located along the Zaria-Funtua road in Giwa Local Government Area of Kaduna State, North West Nigeria, the hospital is mandated to train all categories of healthcare professionals at all levels, provide diverse in- and out-patient specialised health services to all people from the catchment area and the Nigeria at large, and conduct clinical and health-related researches. Among the specialized services are the physiotherapy services where ultraviolet rays are used to treat a variety of disorders including wounds.

Participant selection: This clinical case report focused only purposively selected patients with gunshot injuries with the period of the study. The only two patients available for the period were all included for the study

Instruments for data collection: Ultraviolet therapy using A Cold Quartz UV generator with Minimal Erythemal Dose (MED), using an erythemometer.

Validity: The instrument has been validated for clinical use by the Physiotherapy Unit of the hospital

Reliability: It is reliability established by the Physiotherapy Unit of the hospital

A measuring tape was also used to determine size of wounds over the period of the therapy.

Procedure for data collection: The two participants were on antibiotics therapy, and patients' wounds were being dressed daily with honey but with little response. A consult was then sent to the Physiotherapy Unit, requesting for UV therapy. The Patients were then started on UV radiation therapy.

Patients gave their informed consents to the case reporting. The Head of Department had earlier given permission to undertake the case report, since some of the authors were part of the clinical service providers within the Department.

Patient 1

A 21-year old female patient admitted through Accident and Emergency Department of Ahmadu Bello University Teaching Hospital Zaria in December 2015. The patient was later transfered to the Female Orthopaedic Ward for comminuted fracture of the left radial bone associated with open wound on the left forearm secondary to gunshot to the left upper limb. The left upper limb was placed in an elbow cast and a sling. The initial measurement of the wound surface area was 14cm by 6.5cm on the posterior and 14cm by 3cm on the anterior aspect of the forearm (see Table 1).

Patient 2

An 18-year old female patient admitted through Accident and Emergency Department of Ahmadu Bello University Teaching Hospital Zaria in December 2015. Patient was later transferred to Female Orthopaedic Ward for comminuted fracture of the left tibal bone associated with open wound on the left leg secondary to gunshot. The left leg was placed in an above knee cast with a window on the anterior aspect of the leg. The initial measurement of the wound surface area was 15.4cm by 7.5cm (see Table 1).

Procedure:

A cold quartz UV generator was used. The Minimal Erythemal Dose (MED) was performed on the 1st session to determine the dosage level, using an erythemometer. The method of determining the MED involved the following steps:

1) The use of erythemometer that was cut in about ¾ inches of holes of various shapes about ¾ inches apart.
2) The area to be tested should not be previously exposed to UVR such as the inner part of the thigh or inner part of the arm
3) The erythemometer was taped to the area to be tested
4) The other part of the body was covered except the area where the erythemometer was placed.
5) The UVR lamp was positioned perpendicular to the exposed area about 2-3 inches away.
6) When the generator was ready, the 1st hole was turned on and exposed for 15seconds and then other holes at 15 seconds interval for a total of 60 seconds.
7) The generator/lamp was turned off when the 60 seconds was up.
8) The patients were instructed to check the area every 2 hours while awake.
9) The area which appeared first with the highest pink colour was recorded.
10) The 1st hole 60 seconds, 2nd 45seconds, 3rd 30 seconds and 4th 15 seconds

Dose: The minimal erythemal dose (MED) (E1) appears to be mildly pink and takes 6-8 hours to develop but just visible at about 24 hours/less. E2 DOSE (2.5 x MED) appears definite pink red that blanches on pressure. It takes 4-6 hours to develop and last for as long as 48 hours. E3 (5 x MED) appears very red and does not blanch on pressure. It takes 2-4 hours to develop and last for as long as 72 hours. E4 DOSE (10 x MED). It appears angry red and takes less than 2 hours to develop and last for up to a week (Sreeraj, n.d).

The E1 DOSE was used on both patients, Patient 1 was exposed for 60 seconds while Patient 2 was exposed for 45 seconds

The UVR therapy

Both patients were given a test dose prior to commencement of the treatment and minimal erythemal (MED) dose was determined. The MED used for both patients was the E1 dose. They were on alternate days of wound dressing and treatment of the wound area was carried out after exposure and cleaning of the wound area. For Patient 1, the wounds were exposed for 60 seconds while Patient 2 wound was exposed for 45 seconds.

Research question one

What is the perception of respondents about cervical screening?

As presented in Table 2, majority (72.9%) of respondents agree that maintaining only one sex partner may still warrant cervical screening. (89.2%) agree that maintaining good genital hygiene still need regular cervical screening. (76.8%) agree that subjecting self for cervical screening is not degrading and reduces self-worth and dignity of a woman. (70%) agree that cervical screening should be made compulsory for all female nurses and other female health workers. (49.6%) agree that their privacy is not encroached during the screening, (71.6%) agree that Nurses are at risk of cervical cancer because of their knowledge about it. (64%) agree that cervical screening is expensive and not affordable for nurses. (44%) disagree that a healthy woman without symptoms still need cervical screening. (45.6%) agree that most nurses are afraid of pain and discomfort associated with the screening, thus, may not be willing to go for it (82%) agree that most women be willing to go for cervical screening even if they have no symptoms indicating abnormalities. (76%) agree that uptake of cervical screening may not be necessary when there is no manifestation of symptoms. (87%) agree that regular cervical screening will help in the reduction of cervical cancer. The findings of this study conclude that respondents' perception (59%) about cervical screening is positive.

Table1: Results of the Wound Healing for Patients 1 and 2

Patient	Initial	1st Week	2nd Week	3rd Week	4th Week
1	Ant: 14cmx3cm Post: 14cmx8cm	10.8cmx2.7cm	8.7cmx2cm	7.5cmx1.5cm	6.2cmx1.0cm
2	15.4cmx7.5cm	12.5cmx5.8cm	13.5cmx8cm	12cmx5.9cm	11.0cmx3.8cm

Similarly, from Table 1, Patient 2, it is shown that the initial wound surface area of 15.4cm x 7.5cm reduced to 11.0cm x 3.8cm in four weeks. These decreases are shown in Figure 2.

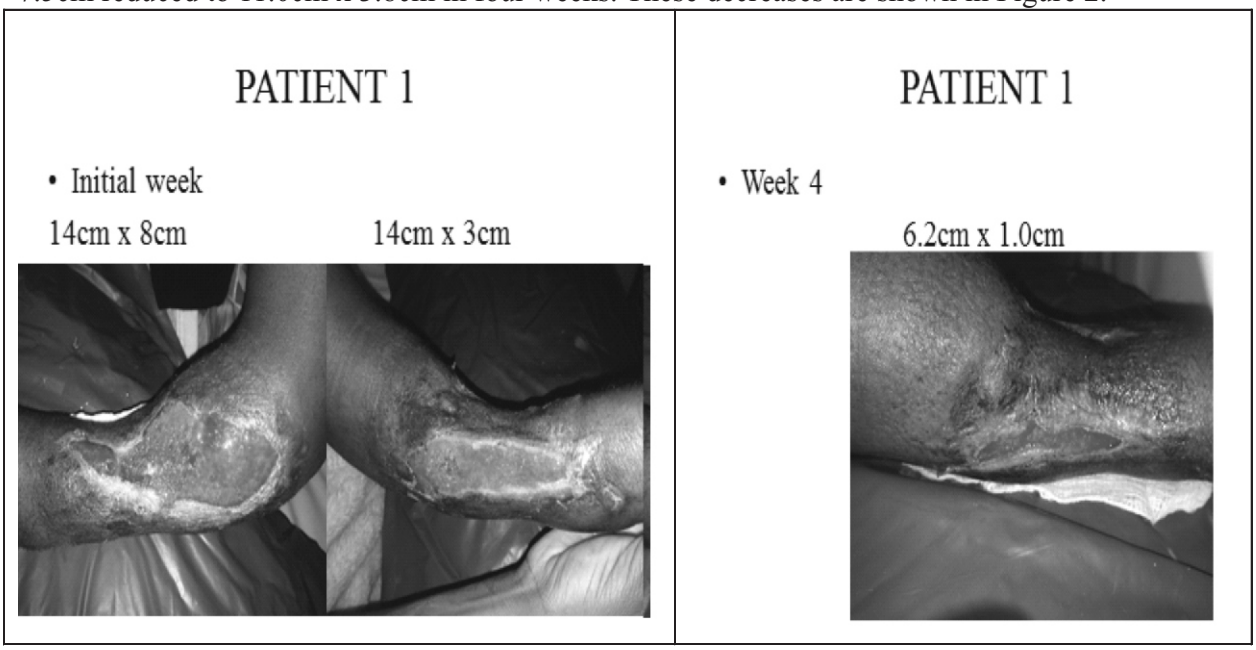


Fig. 1: Patient 1 wounds at commencement and 4 weeks later

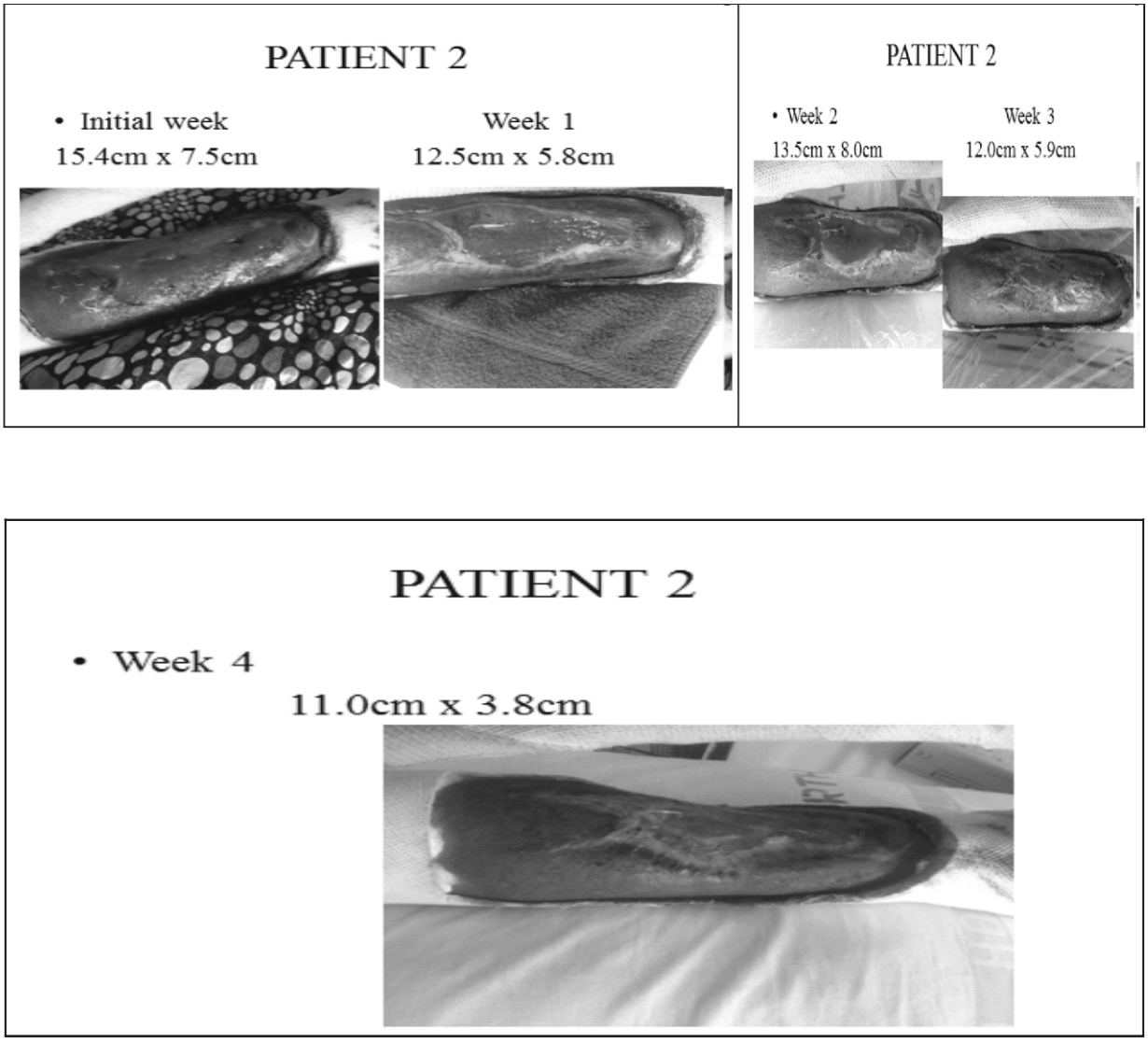


Fig. 1: Patient 2 wounds at commencement to 4 weeks (Weeks 1-4)

DISCUSSION OF FINDINGS

This study shows the effectiveness of ultraviolet radiation (UVR) on gunshot wounds: clinical case reports in a tertiary health facility in Northwest Nigeria. Two patients were selected for this study from female orthpaedic ward. The initial therapeutic regimens used for the treatment of gunshot wounds on these participants are wound dressing with honey and antibiotics. Findings reveals that the initial therapeutic regimen used on the participants is less effective.

An ultra-violet therapy was introduced using a cold quartz UV generator. This therapy was performed following some specific steps. The Minimal Erythemal Dose (MED) was performed on the 1st session to determine the dosage level, using an erythemometer. Baseline measurements of the wounds were taken and documented. Patient 1 and Patient 2 had 14 and 12 treatment sessions respectively over a 4-week period. The wound dimensions were subsequently measured every week for four weeks and these were also noted. There was a gradual but significant decrease in the size of the wounds for both Patients 1 and 2 within four weeks of commencement of the therapy. Surrounding skin remained intact.

The result of this experiment shows that the wound of Patient 1 and 2 have healed significantly after four

weeks of UVR This study is in line with previous studies by Onigbinde *et al.,* 2010; Nussbaum, *et al.,* 2013; Yarboro, *et al.,* 2019 who confirm the efficacy of UVR in pressure ulcers and chronic wounds, including venous and diabetic foot ulcers. As reported by Onigbinde *et al.,* 2010 (also in Nigeria for pressure ulcers), gunshot wounds reduce in surface area and wound volume with the application of UVR. This study reveals that gunshot wounds heal significantly in four weeks (about 30 days) in term of the duration of treatment. This study supports Yarboro et al (2019) who report an average of 45 days (range 4 – 260 days) while using UVR to successfully treat venous, diabetic foot and traumatic wounds including chronic ulcers. Although no previous study is accessed during the literature review on gunshot wounds, but Parrish (2002) and Gupta, *et al.,* (2013) observe that UVR wound healing and antimicrobial effects appear to have similar biological explanations. To promote wound healing, UVR is absorbed by extracellular fluids components and capillaries which promotes endothelial cell proliferation and induce expression of vascular endothelial growth factor (VEGF) Guo and DiPietro, (2010) and Feily, (2016) report that UVR initiates proliferation and maturation involving erythema, epidermal hyperplasia, increase blood flow in microcirculation and bactericidal effect.

Result of this study also reveals that the dose of the UVR used on the two participants did not show any damage to the skin. This study concur with Buonanno, et al. (2013) who observe that Ultraviolet (UV) radiation (200–280? nm) has been directly applied to the wounded tissue to stimulate wound healing, restore skin homeostasis and selectively inactivate micro-organisms (Gupta, *et al.,* 2013). This study does not support Feily (2016) who believe that the safety profile of UVR has been an issue of caution. This study also is not in agreement with Kaleshtari, et al., (2015), in carrying out the therapy on patients, the doses (wavelength) are carefully measured against the time of exposure, energy emitted, and other precautions. The two patients heal up without any damage to their skin and at the two weeks after discharge follow up, both are observe to be doing well.

The gunshot wounds of two patients presented in this study heal significantly after four weeks of UVR. This occurrs after several other therapeutic regimens have failed. Previous studies have confirmed the efficacy of UVR in pressure ulcers and chronic wounds, including venous and diabetic foot ulcers (Onigbinde *et al.,* 2010; Nussbaum, *et al.,* 2013; Yarboro, *et al.,* 2019).

In term of the duration of treatment, the gunshot wounds significantly heal in four weeks (about 30 days). In chronic ulcers, Yarboro et al (2019) reported an average of 45 days (range 4 – 260 days) while using UVR to successfully treat venous, diabetic foot and traumatic wounds. Our stuy observes that gunshot wounds, its wound healing and antimicrobial effects appear to have similar biological explanations. To promote wound healing, UVR is absorbed by extracellular fluids components and capillaries which promotes endothelial cell proliferation and induce expression of vascular endothelial growth factor (VEGF) (Parrish, 2002; Gupta, *et al.,* 2013). This initiates to proliferation and maturation involving erythema, epidermal hyperplasia, increased blood flow in microcirculation and bactericidal effect (Guo and DiPietro, 2010; Feily, 2016).

UVR activity, after a few days, increases the rate of synthesis of DNA, RNA and proteins that contribute in skin thickening as a late phase response and also bacterial cell inactivation (Thai, et al., 2002; Gupta, *et al.,* 2013). It also enhances granulation tissue formation by release of prostaglandin (PG-E) and histamine (Gupta, *et al.,* 2013). The release of these mediators usually leads to early repair in the dermis and delay erythema response for a few hours which decrease a little (Feily, 2016).

The dose of the UVR used on the two patients did not result in any damage to the skin. The safety profile of UVR has been an issue of caution (Feily, 2016). Phototherapy UV irradiation effectiveness has been reported to depend on many factors such as the chosen irradiation parameters with maximal effective wavelength and lowest irradiation level (Feily, 2016). UVR (207mm) has been reported to kills bacteria efficiently without being cytotoxic or mutagenic (Buonanno, et al., 2013. Ultraviolet (UV) radiation (200–280? nm) has been directly applied to the wounded tissue to stimulate wound healing, restore skin homeostasis and selectively inactivate micro-organisms (Gupta, *et al.,* 2013).

As cautioned by Kaleshtari, et al., (2015), in carrying out the therapy on patients, the doses (wavelength) are carefully measured against the time of exposure, energy emitted, and other precautions. The two patients' wounds heal up without any damage to skin and at the two weeks after discharge follow up, both are doing well.

CONCLUSION AND RECOMMENDATIONS

The gunshot wounds of both patients heal significantly after four weeks of ultraviolent radiation therapy. This study contributes to the body of evidence on the efficacy of ultraviolet ray therapy in wound care. Previous evidences abound on its efficacy on pressure sore treatment. Results from this study show the effectiveness of UVR in healing process with good tissue granulation and perfusion in wounds resulting from gunshots. Thus, the current report shows that the efficacy of UV therapy can be extended to the treatment of gunshots wounds in our locality.

Based on the results of these case reports, it is recommended that:

1. More studies should be conducted to establish the place of UVR in wound management.
2. The need for clinicians (nurses, physical therapist, surgeons and physicians) to collaborate in both wound care and research in this area is paramount.

LIMITATIONS

The few patients included in this non-randomized, and non-experimental study make generalization of findings difficult. The study however has the potential to stimulate further widespread study of this therapy in the overall management of gunshots and other traumatic wounds as an adjuvant therapy.

REFERENCES

Aleema, N.A., Aslama, M., Zahida, M.F., Rahman, A.J. and Rehman, F.U. (2014). Treatment of Burn Wound Infection using Ultraviolet Light. *Journal of the American College of Chemical Wound Specialists.* 5:19-22

Blaudschun, R., Sunderko¨ Tter, C., Brenneisen, P., Hinrichs, R., Peters, T., Schneider L., Razi-wolf, Z., Hunzelmann, N. and Scharffetter Kochanek, K. (2002). Vascular Endothelial Growth Factor Causally Contributes To The Angiogenic Response Upon Ultraviolet B Irradiation In Vivo.*Br J Dermatol*; 146:581.

Buonanno M, Randers-Pehrson G, Bigelow AW, Trivedi S, Lowy FD, et al. (2013) 207-nm UV Light - A Promising Tool for Safe Low-Cost Reduction of Surgical Site Infections. I: In Vitro Studies. *PLoS ONE* 8(10): e76968. doi:10.1371/journal.pone.0076968

Feily, A., Moeineddin, F. and Shadi, M. (2016). Physical Modalities in the management of Wound(s) in Wound Healing – New Insights into Ancient Challenges, in Web of Science. http://dx.doi.org/10.5772/64340 (accessed 20 Feb, 2020)

Guo, S. and L.A. (2010). Wound Healing and Tissue Regeneration. *J Dent Res* 89(3):219-229,

Gupta, A., Avci, P., Dai, T., Huang, Y.Y. and Hamblin, M.R. (2013). Ultraviolet Radiation in Wound Care: Sterilization and Stimulation. Advances in Wound Care; 2(8): 422 -437. doi: 10.1089/wound.2012.0366

Itodo, C.E.,Williams, T.Y., Chukwukadibia, N.A., Ndubuisi, O.C.O., David, O.O., Daniel, D.M. (2015). The Pattern of Civilian Gunshot Injuries at a University Hospital in North Central Nigeria. *IOSR Journal of Dental and Medical Sciences* (IOSR-JDMS) 14(2); 87-90.

Kaleshtari, M.H., Ciobanu, I., Bighea, A., Popa, F. and Berteanu, M. (2015). Ultraviolet Radiation Therapy in Wound Healing – an Orientation paper. *Jurnal of Translational Medicien and Research.* 20(2). 89-93

Nussbaum, E.L., Flett, H., Hitzig, S.L., McGillivray, C., Leber, D., Merris, H., Jing, F. (2013). Ultraviolet-C Irradiation in the Management of Pressure Ulcers in People with Spinal Cord Injury: A randomized Placebo-Controlled Trial. *Archives of Physical Medicine and Rehabilitation.* 94: 650-659

Odatuwa-Omagbemi D.O. and Adiki O.T. (2013). Extremity Gunshot Injuries. *The Nigerian Health Journal,* (13)2.

Ogunlusi, J.D., Oginni, L.M., Ikem, I.C., Olasinde, A.A. Hamilton, O.G. Akinbolagbe,

A. M. and Temitope, M. (2006). Gunshot Injuries In A Nigerian Hospital. *Nigerian Journal of Orthopaedics and Trauma*: 5(2):34 – 37.

Onigbinde, A.I., Olafimihan, K.F., Ojoawo, A., Adedoyin, R.A., Omiyale, and Mothabeng, J. (2010). The effect of Ultraviolet Radiation (Type B) on Decubitus Ulcers. *The Internet Journal of Allied health Sciences and Practice* 8(1): http://ijahsp.nova.edu vol 8 no 1 ISSN 540-580X (accessed 20 Feb, 2020)

Onuminya, J.E. and Ohwowhiagbese, E. (2005). Pattern of civilian gunshot injuries in Irrua, Nigeria. *SAJS*. 43(4): 170-172.

Parrish J.A. (1983). *Biochemistry and Physiology of the Skin*. New York: Oxford University Press, p. 713. Sreeraj, S R. (n.d.). Ultraviolet Radiation. https://www.slideshare.net/mobile/sreerajsr/ultravoilet radiation-17108866.

Thai, T.P., Houghton, P.E., Campbell, K.E., and Woodbury, M.G. (2002). Ultraviolent Light C in the Treatment of Chronic Wounds with MRSA: a Case Study. *Ostomy Wound management.* 48(11): 52-60

Yarboro, D., Miller, A. and Smith, R. (2019). The effects of Ultraviolet C irradiation in the Treatment of Chronic Wounds: A Retrospective Descriptive Study. *Wound Management and Prevention.* 65(7): 16-22


LADOKE AKINTOLA UNIVERSITY OF
TECHNOLOGY OGBOMOSO
EXCELLENCE
INTEGRITY
SERVICE