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EVALUATION AND ANALYSIS OF MEDICAL RESEARCH; ADVANCING CURRENT AND EVIDENCE-BASED CLINICAL PRACTICE BY A RESIDENT DOCTOR'S MEDICAL JOURNAL

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ABSTRACT

Background: *Medical research drives most of the advancements in clinical practice and offers promising clues to the management of a wide range of clinical problems. The rapid advancement in medical research has created a dramatic increase in the number of studies that highlights the need for greater participation of physicians as well as patients.*

Method: *This was a retrospective longitudinal study it involved collating all the studies published in the Gazette of Medicine from inception in the December 2012 edition to the June 2021 edition. Data Collated include the number of articles published per year, the rank of the authors (Consultant, Resident Doctors, or both), and the specialties of medicine that contributed to publications. Data was collated using a Microsoft Excel spreadsheet, analyzed using Statistical Package for Social Sciences, and presented as frequencies, and proportions in tabular and descriptive forms.*

Results: *The Gazette of Medicine published 123 articles in the 10-year period, at the rate of 12.3 articles per year. Publications were high during the periods of 2013, 2015, and 2017, while it recorded the lowest in 2021. We*

published 50% of articles from consultant-resident doctor combinations, 34% from consultants alone, and 16% from resident doctors alone.

Conclusion: *There was a significant multispecialty contribution to the growth of medicine and healthcare, in line with the journal's mission to promote the practice of medicine, improve evidence-based patient care and disseminate ideas through research, as well as engage in healthcare advocacy and promote safe and standard patient care.*

Keywords: *Gazette of Medicine, Journal, Studies*

INTRODUCTION

Medical research is defined as an investigation related to the causes, diagnosis, treatment, control, or prevention of physical or mental diseases and impairments of humans and animals or related to the development of biomedical products, devices, or drugs¹. Medical research drives most of the advancements in clinical practice and offers promising clues to the management of a wide range of clinical problems. Furthermore, the outcomes of medical research have resulted in improved quality of life of people in the society in which they live^{1,2}.

Valid medical research protocols should have social values that can generate clinical knowledge and improves patient's well-being or health, without exposing the participants to some risks for no good reason or wasting resources^{2,3}. Furthermore, the study must be feasible, given the social, political, and cultural environment in which it is being conducted^{2,3}. In developing countries, clinical research drives most of the advancements in productivity and outcome in the healthcare system. A study reported that scientific research has been established as the prerequisite for human and societal development in medicine, with a strong correlation between the level of advancement of medical research and the standard of living⁴.

The rapid advancement in medical research has created a dramatic increase in the number of studies that highlights the need for greater participation of physicians as well as patients. Nevertheless, physicians face a variety of

barriers concerning participation in clinical research, some of which are organizational, research-based, or physician-related⁵. Medical research education is fundamental in the development of skills in research design and methodology among clinicians.

Medical research is included in the curriculum of residency training in Nigeria^{6,7}. Residency training is done in any of the acceptable and accredited health institutions in Nigeria or West Africa based on the recommendation of the respective Faculty Boards. A resident doctor in Nigeria is a fully registered medical practitioner with the Medical and Dental Council of Nigeria, undergoing further training in an accredited Institution by either the National Postgraduate Medical College of Nigeria (NPMCN), West African College of Surgeons (WACS) and or West African College of Physician (WACP). The trainee doctor is awarded a Fellowship in any respective specialty of interest after passing a 3-stage examination that involves Primary examination, Part I or Membership, and Part II or Fellowship examinations^{6,7}.

The primary examination serves as an entrance examination into residency training. On completion of the required clinical rotations, courses, and training, the resident doctor qualifies for Part I or the Membership examination of the respective Colleges. Success in the examination enables the resident doctor to commence the final phase of the residency training as a Senior Registrar. The senior registrar undergoes another stage of flexible specialized clinical rotation, courses, medical research, educational process, as well as management courses that

allows the resident doctor to cultivate the habit of systematic clinical problem solving, featuring observation, interpretation, deductive reasoning, and decision-making^{6, 7}. The research methodology courses and training help the resident doctor to identify a researchable problem, design a feasible methodology, conduct a study, assemble, analyze, and interpret the resulting data and discuss findings scientifically. Skills and knowledge on how to review relevant literature and apply this appropriately in interpreting their own clinical data or laboratory data are acquired. Furthermore, there are institutional periodic departmental research seminars for the resident doctor to present their project for discussion, and receive the criticism and guidance of their teachers and peers^{6, 7, 8}.

Medical research fulfills the obligations of achieving results that will be useful in the context of solving health problems and realizing the research objectives while neither denying healthcare services that participants are otherwise entitled to. To become effective and competent, a resident doctor must be trained to interpret the literature, apply evidence to patient care and demonstrate competence in research methods during the period of training⁹. Both medical research and clinical medicine require a high level of efficiency, diligence, and effective teamwork, and resident doctors must be successful at both research and patient care to compete for fellowship training^{9, 10, 11}.

Gazette of Medicine Journal is a peer-reviewed medical journal of the Association of Resident Doctors, University of Port

Harcourt Teaching Hospital, Port Harcourt, Rivers State, Nigeria. This biannual journal was first published in December 2012 and since its inception, it's published every December and June. Gazette of Medicine Journal was established to enable and encourage resident doctors to participate in medical research, with the mission of promoting the practice of medicine, improving patient care, and disseminating ideas through research. Furthermore, through a range of educational and research publications, this journal engages in healthcare advocacy and promotes safe and standard patient care. Articles submitted to this journal are independently reviewed by two consultants in the respective specialty of medicine before being accepted for publication. Thus, this study aimed to determine the quantity of peer-reviewed scientific articles published by this resident doctor journal over the period of ten years, the specialties involved, assess the participation or productivity of the resident doctors and their trainers, as well as assess its effect in advancing evidence-based clinical practice.

METHODS

This was a retrospective longitudinal study which involved collating all the studies published in the Gazette of Medicine; a peer-reviewed medical journal of the Association of Resident Doctors, University of Port Harcourt Teaching Hospital in Nigeria from inception in December 2012 edition to June 2021 edition.

We collated information on the total number of articles published by the journal since its inception, the rank of the authors (Consultant, Resident Doctors, or both), and the specialties of medicine that contributed to publications. We also collated data on the number of articles published per year.

Data was collated using a Microsoft Excel spreadsheet and analyzed using Statistical Package for Social Sciences (SPSS) version 27.0 (IBM, Chicago, IL, USA). Data were presented as frequencies, and proportions in tabular and descriptive forms. Descriptive statistics were used to compare the variables like the number of articles published by the consultant and resident doctors or both.

RESULTS

Number of Published Articles based on Specialties of Medicine

Our analysis shows that the Gazette of Medicine published 123 articles in the last 10 years, at the rate of 12.3 articles per year. The distribution of specialties that contributed articles was highlighted in Figure 1 and Table I.

Annual Distribution of Publications

Our review shows that Gazette of Medicine Journal publications were high during the periods of 2013, 2015, and 2017, while it recorded the lowest in 2021 (see Figure 2).

Cadre of Authors

A comparison of the cadre of authors shows that the journal published research work more from the combination of consultants and residents as authors in 2012, 2013, 2016, 2018, 2019, and 2020. While those published by consultants alone as authors peaked in 2014, 2015, and 2017. The contribution of scientific articles from resident doctors alone was low except in 2017 when it peaked at 10. Publications from consultants alone, consultant-resident doctor combination, and resident doctors alone recorded their lowest in 2021 (see Figure 3).

Percentage of Returns from Authors

The comparison of the publications by resident doctors, consultant-resident doctor combination, and consultants alone shows that we published 50% of articles from consultant-resident doctor combination, 34% from consultants alone, and 16% from resident doctors alone (see Figure 4).

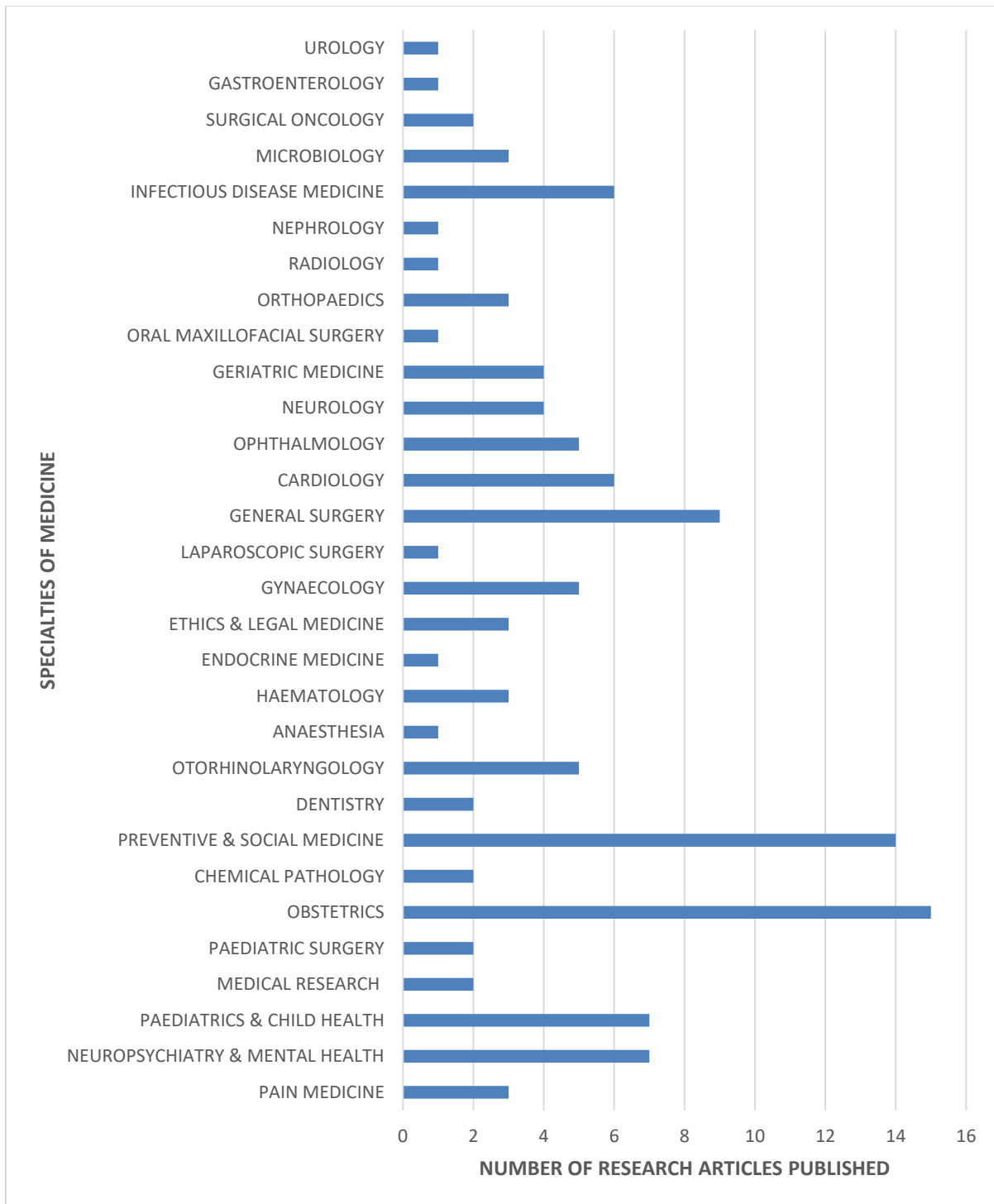


FIGURE 1 – DISTRIBUTION OF STUDIES PUBLISHED BASED ON SPECIALTIES

TABLE I – THE RATE OF PUBLICATION BY DIFFERENT SPECIALTIES PER ANNUM

DISCIPLINE	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL
PAIN	1	1	1	0	0	0	0	0	0	0	3
NEUROPSYCHIATRY & MENTAL HEALTH	2	0	0	2	1	0	0	1	1	0	7
PAEDIATRICS & CHILD HEALTH	1	1	1	1	0	1	1	0	1	0	7
MEDICAL RESEARCH	2	0	0	0	0	0	0	0	0	0	2
PAEDIATRIC SURGERY	1	1	0	0	0	0	0	0	0	0	2
OBSTETRICS	1	1	1	1	2	3	1	1	2	2	15
CHEMICAL PATHOLOGY	1	0	0	0	0	1	0	0	0	0	2
PREVENTIVE & SOCIAL MEDICINE	1	2	0	5	1	1	0	3	2	0	14
DENTISTRY	1	0	0	0	0	1	0	0	0	0	2
OTORHINOLARYNGOLOGY	2	0	1	2	1	0	0	0	0	0	5
ANAESTHESIA	0	1	0	0	0	0	0	0	0	0	1
HAEMATOLOGY	0	2	0	0	1	0	0	0	0	0	3
ENDOCRINE MEDICINE	0	1	0	0	0	0	0	0	0	0	1
ETHICS & LEGAL MEDICINE	0	1	2	0	0	0	0	0	0	0	3
GYNAECOLOGICAL	0	1	1	0	1	1	1	0	0	0	5
LAPAROSCOPIC SURGERY	0	1	0	0	0	0	0	0	0	0	1

GENERAL SURGERY	0	2	2	3	1	0	0	0	0	1	9
CARDIOLOGY	0	1	1	0	2	1	1	0	0	0	6
OPHTHALMOLOGY	0	1	0	0	0	0	2	2	0	0	5
NEUROLOGY	0	0	1	0	1	0	1	0	1	0	4
GERIATRIC MEDICINE	0	0	1	1	0	0	1	0	0	1	4
ORAL MAXILLOFACIAL SURGERY	0	0	1	0	0	0	0	0	0	0	1
ORTHOPAEDICS	0	0	0	1	1	0	1	0	0	0	3
RADIOLOGY	0	0	0	1	0	0	0	0	0	0	1
NEPHROLOGY	0	0	0	0	0	1	0	0	0	0	1
INFECTIOUS DISEASE MEDICINE	1	0	0	0	1	3	0	2	0	0	6
MICROBIOLOGY	0	0	0	0	0	2	0	0	1	0	3
SURGICAL ONCOLOGY	0	0	0	0	0	1	0	0	1	0	2
GASTROENTEROLOGY	0	0	0	0	0	1	0	0	0	0	1
UROLOGY	0	0	0	0	0	0	0	0	0	1	1
TOTAL	14	17	13	17	13	17	9	9	9	5	123

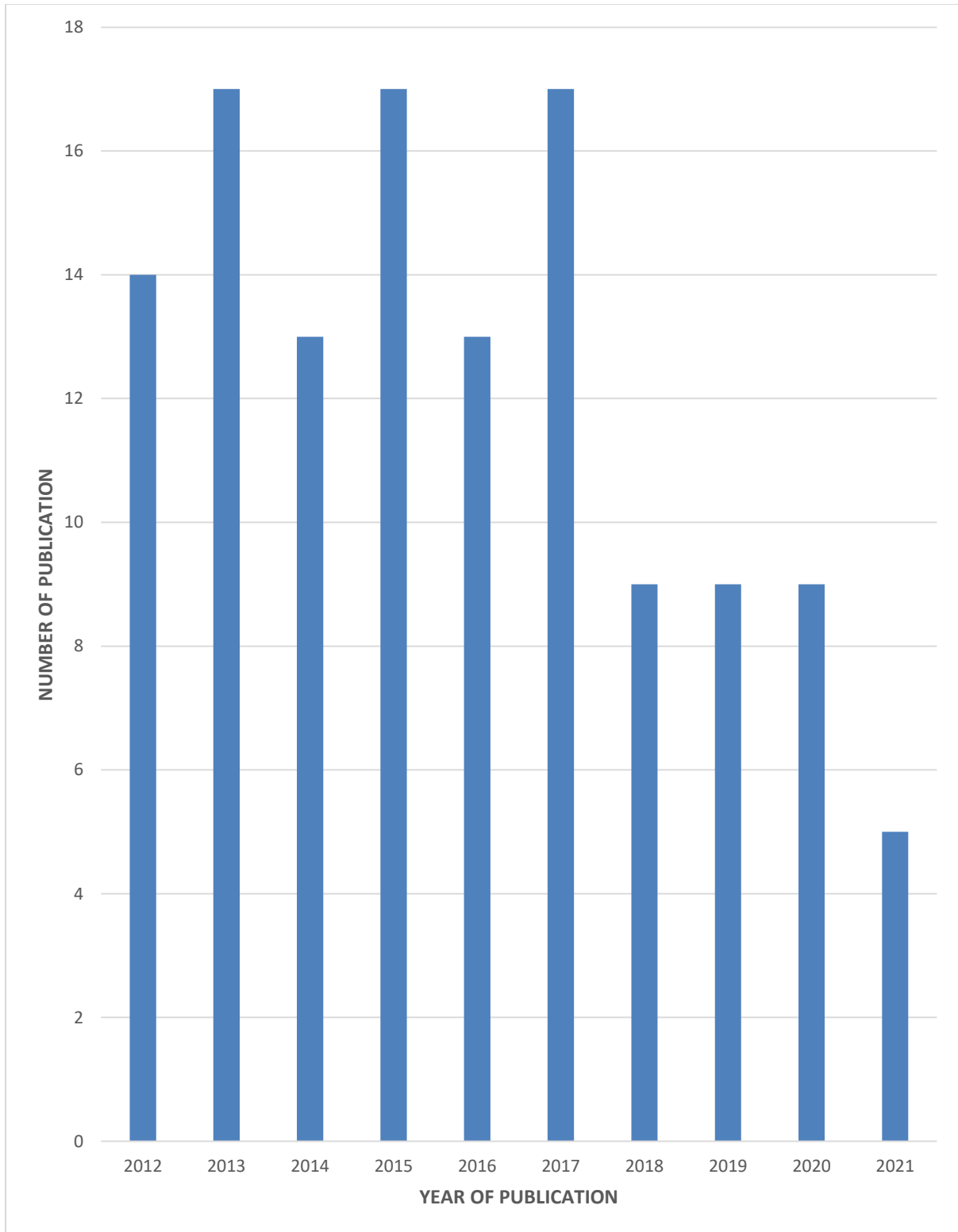


FIGURE 2 – DISTRIBUTION OF RESEARCH PUBLISHED PER ANNUM

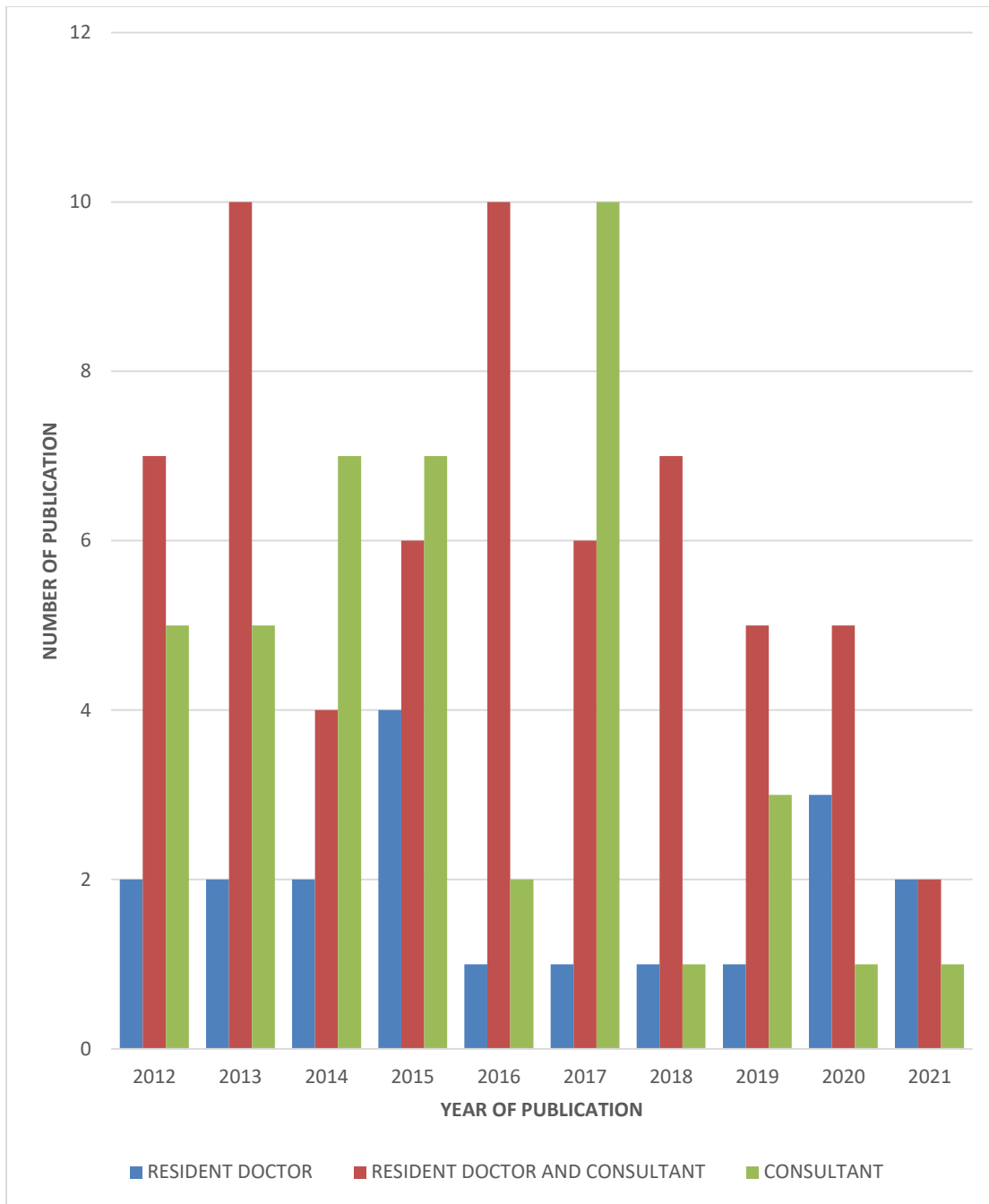


FIGURE 3 – COMPARISON OF THE PUBLICATION BY RESIDENT DOCTORS ALONE, RESIDENT DOCTORS-CONSULTANTS COMBINATION, AND CONSULTANTS ALONE OVER TEN YEARS OF PUBLISHING.

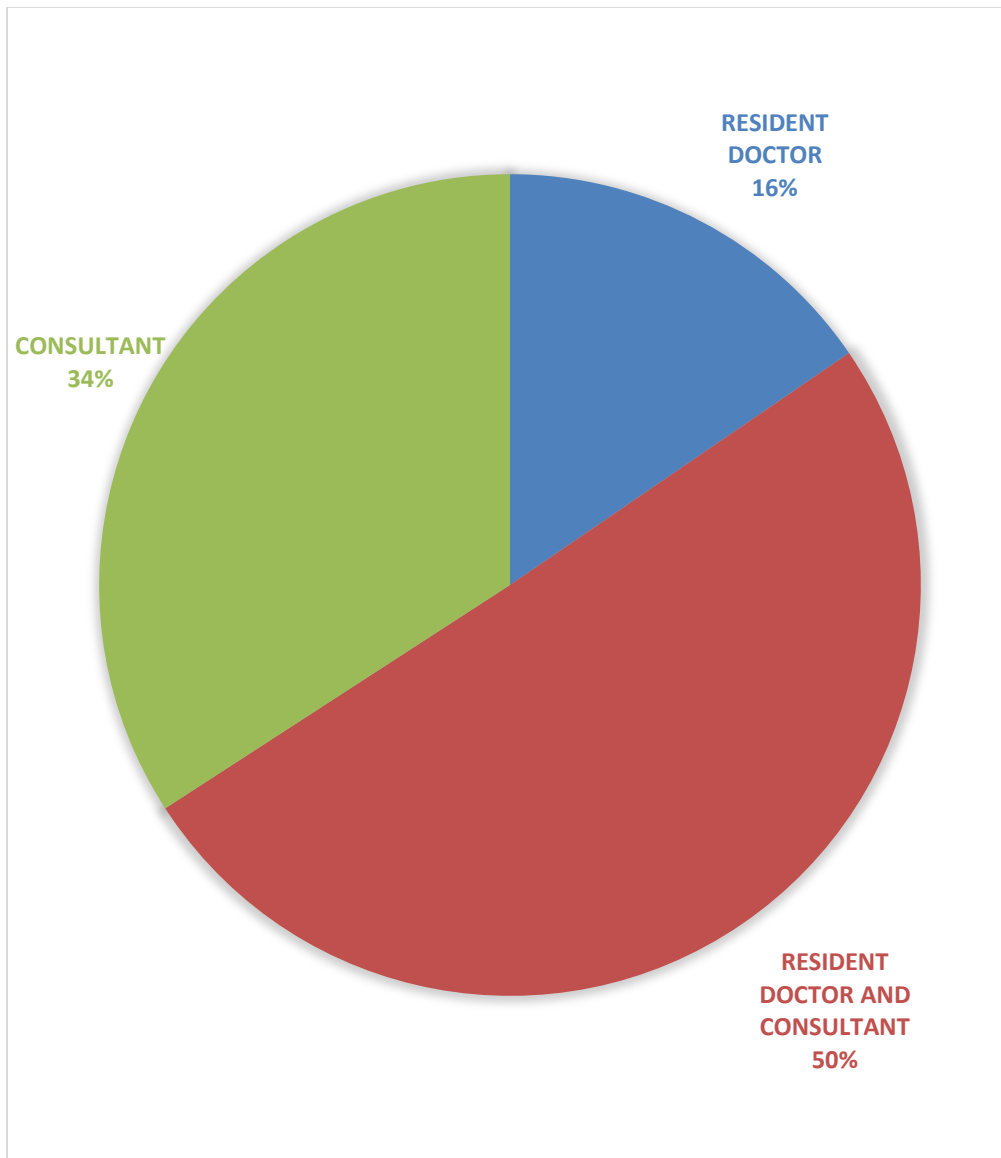


FIGURE 4 – DISTRIBUTION OF THE TOTAL PUBLICATION RETURNS FROM RESIDENT DOCTORS ALONE, RESIDENT DOCTORS-CONSULTANTS COMBINATION, AND CONSULTANTS ALONE.

DISCUSSION

This evaluation and analytical study showed that the Gazette of Medicine, a peer-reviewed medical journal, pioneered by resident doctors in the Southern part of Nigeria, published 123

scientific articles at the rate of 12.3 per annum in the past 10 years and it had the participation of resident doctors and consultants as authors. This is quite commendable for a medical journal in a low-income country, a region of the world with

limited capacity strengthening for medical research and healthcare.

Capacity strengthening for medical research remains the focus for health care development, but this initiative is highly limited in Low and Middle-Income Countries. A study reported that at present, medical research capacity is disproportionately located in the Western and developed countries based on analysis of authorship trends. It was established that 92% of articles addressing interventions in developing countries are published by authors who live in developed countries¹². Another study noted that the current capacity for conducting health research in many developing countries remains limited and this undermines the transformation of health systems into sustainable entities within global communities of scientific knowledge generation able to address both global and local health challenges¹³. There are soaring health problems like infectious, perinatal, and nutritional disorders, with the incidence dominating in children. Children are more vulnerable to disease and death than adults in resource-limited countries, compared with industrialized nations, and children constitute a much larger proportion of the population in these countries because of the increased birth rate^{14,15}. These challenges also differentiate the research done in resource-limited areas from that conducted in more affluent settings.

Clinical research involves advancing current medical knowledge by continually developing and testing new ideas about diseases, products, procedures, and strategies. Emerging evidence suggests that research

positions embedded within healthcare settings can influence both individuals and teams in research participation^{15,16}. Our analysis shows that some of the publications were done by either consultants or resident doctors. Nevertheless, most of the articles we published were studies done by a combination of consultants and resident doctors. This could explain the trainer mentorship of the trainee postgraduate doctor both in medical research and clinical practice. Clinical mentorship has the benefits of enhancing biomedical research as observed in this study. Choi and colleagues¹⁷ reported that mentorship plays a critical role in the training and career development of physicians and scientists. It is central to academic medicine and its missions. During the training of medical students, residents, and fellows, they gain valuable as researchers by working with their trainers as investigators. They also learn clinical skills by observing their mentors, discussing clinical cases, and refining techniques under their guidance. In addition, other studies have documented the positive impact of mentorship on research productivity, academic promotion, faculty retention, and career satisfaction^{18,19}.

The postgraduate medical colleges in Nigeria and West Africa recommend active participation and proficiency in clinical research and training for the resident doctors to enable them to qualify as clinicians, educators, and researchers at the end of their residency^{6,7}. Studies have shown that research is an important component of graduate medical education training, and it requires the active participation of the postgraduate trainee physician^{20,21}. However, it remains unknown

whether research productivity among resident physicians is related to broad measures of their clinical performance during residency training.

Although our study did not evaluate the relationship between research productivity among resident physicians, nor correlate research skills with clinical performance during residency training, we observed that the studies published by resident doctors alone were very low, and they constituted only 16% of the total research published by Gazette of Medicine Journal over the period of 10 years. Another study conducted by Pawar et al²² noted that only 4% of resident doctors had published articles during their training. The low participation of resident doctors in medical research could be due to lack of time, inadequate guidance from teaching staff, and poor or absence of financial research support. A study conducted in India found that a busy clinical training schedule was an obstacle for research for 74% and a lack of financial assistance for 40% of the resident doctors²². Studies conducted in Nigeria noted that some factors like poor research knowledge and mentorship, inadequate funding, institutional support, and the high burden of burnout during residency training affect medical research^{23, 24}. But different studies that were carried out in Canada and Pakistan showed a contrasting report, that a majority of time in residency should be spent learning the clinical skills of their specialty instead of medical research^{25, 26}. Nevertheless, every doctor should strive to contribute to the generation of evidence by conducting research. Medical research enables the resident doctor to be a good clinician and

improve patient care, critical appraisal, and clinical reasoning.

Patient care is the primary responsibility of the clinicians and it requires that the physician care for the patient by giving the best available treatment. Physicians must be up to date with their medical knowledge and training to enable them to provide effective and evidence-based treatments to their patients. This is often achieved by engaging in research and reading the ones performed by other researchers. It has been reported that evidence-based medicine has contributed significantly to the practice of medicine and the advancement of medical science²⁷. Clinical research also plays a vital role in strengthening and advancing the healthcare system. We published scientific articles from different specialties of medicine. The published articles from different specialties of medicine reflected our mission to promote the practice of medicine, improve evidence-based patient care and disseminate ideas through research. Furthermore, through a range of educational and research publications, our journal engages in healthcare advocacy and promotes safe and standard patient care, thus developing the healthcare system.

Locally led health research in developing countries is crucial in overcoming global health challenges. The 1990 Commission on Health Research for Development stated that reinforcing medical research capacity in developing countries is one of the most powerful, cost-effective, and sustainable means of advancing health and development¹³. Global Forum for Health Research reported that, at the turn of the

millennium, Low and Middle-income countries accounted for 85% of the world's population, and 92% of the global disease burden, but only 10% of global funding for health research was devoted to addressing these persistent health challenges. The recognition of this '10/90' gap led to renewed calls for health research capacity development in Low and Middle-Income countries and further investment²⁸. Hatfield and co-economists reported that medical research can have a tremendous impact on human health and longevity, and this can result in increased productivity of the population, thus contributing greatly to the national economy²⁹.

The Gazette of Medicine is widely distributed, and it is assessable online as a medical journal with multidisciplinary publications. In recent times, it has been observed that the advances in health information technology are enabling a transformation in health research that was not feasible in the past, thus leading to new insights regarding health and disease. As reported by the National Committee on Vital and Health Statistics, "Clinically rich information is now readily available, in a format that can be electronically exchanged throughout the health and health care continuum. Hence, the information derived can be used for quality of healthcare and residency training improvement, public health, and research, and can significantly contribute to improvements in health and healthcare for individuals and populations³⁰.

CONCLUSION

This study showed that a peer-reviewed medical journal pioneered by resident doctors

in the southern part of Nigeria made a multispecialty contribution to the growth of medicine and healthcare, in line with the journal's mission to promote the practice of medicine, improve evidence-based patient care and disseminate ideas through research, as well as engage in healthcare advocacy and promote safe and standard patient care. However, the contribution from the resident doctors over the period of ten years of publication was limited, thus, we encourage more participation of resident doctors in medical research, as this has been found to improve critical case appraisal and evidence-based clinical judgment and patient care.

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