Improving Research in Orthopaedic Practice

presented at the

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NIGERIAN ORTHOPAEDIC ASSOCIATION
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NIGERIAN ORTHOPAEDIC ASSOCIATION
43rd Annual General Meeting And Scientific Conference
Calabar 2020
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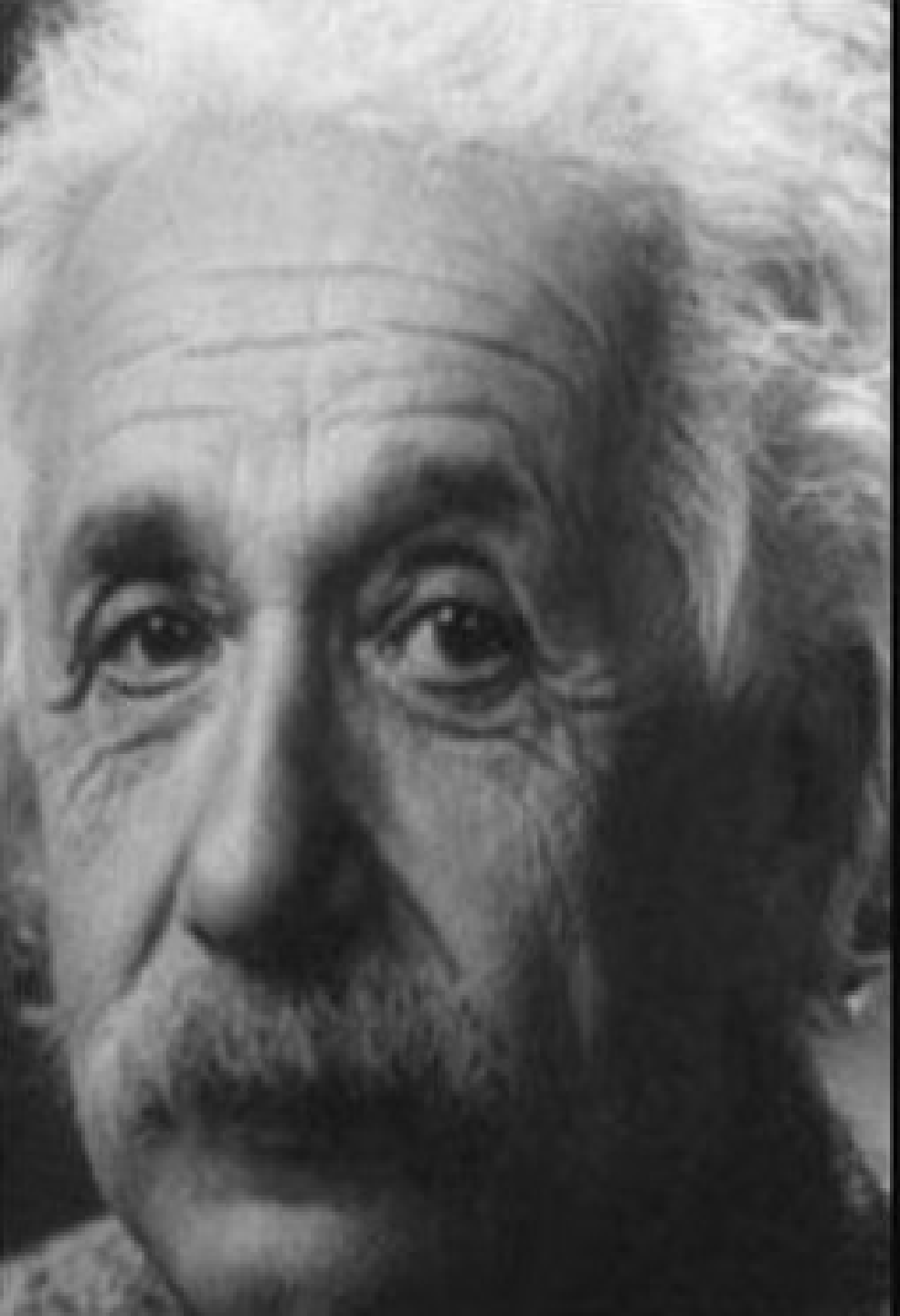
Kudos to the LOC for inviting me to give the talk

How Important is research?

"Prior to penicillin and medical research, death was an everyday occurrence. It was intimate."

- Katherine Dunn.

Definitions of Research



If we knew what it was we were doing, it would not be called research, would it?

— Albert Einstein —

AZ QUOTES

Definition of research

- Research in common parlance refers to a search for knowledge
- Research is a form of scientific investigation.

- Colloquial definition

Definition of Research

- “a **careful investigation** or **inquiry** specially through search for **new** facts in any branch of knowledge.”

- The Advanced Learner’s Dictionary of Current English, Oxford, 1952, p. 1069.

Definition of Research

- "**systematized** effort to gain **new** knowledge."

  L.V. Redman and A.V.H. Mory, *The Romance of Research*, 1923, p.10.

Definition of Research

- “the manipulation of things, concepts or symbols for the purpose of generalising to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art.”

The Encyclopaedia of Social Sciences, Vol. IX, MacMillan, 1930.

Definition of Research

- Research – combination of two words: **Re-** and **Search**.
  - **Re**: again
  - **Search**: to carefully look for someone or something.

- Research: careful study that is done to find and report **new** knowledge about something

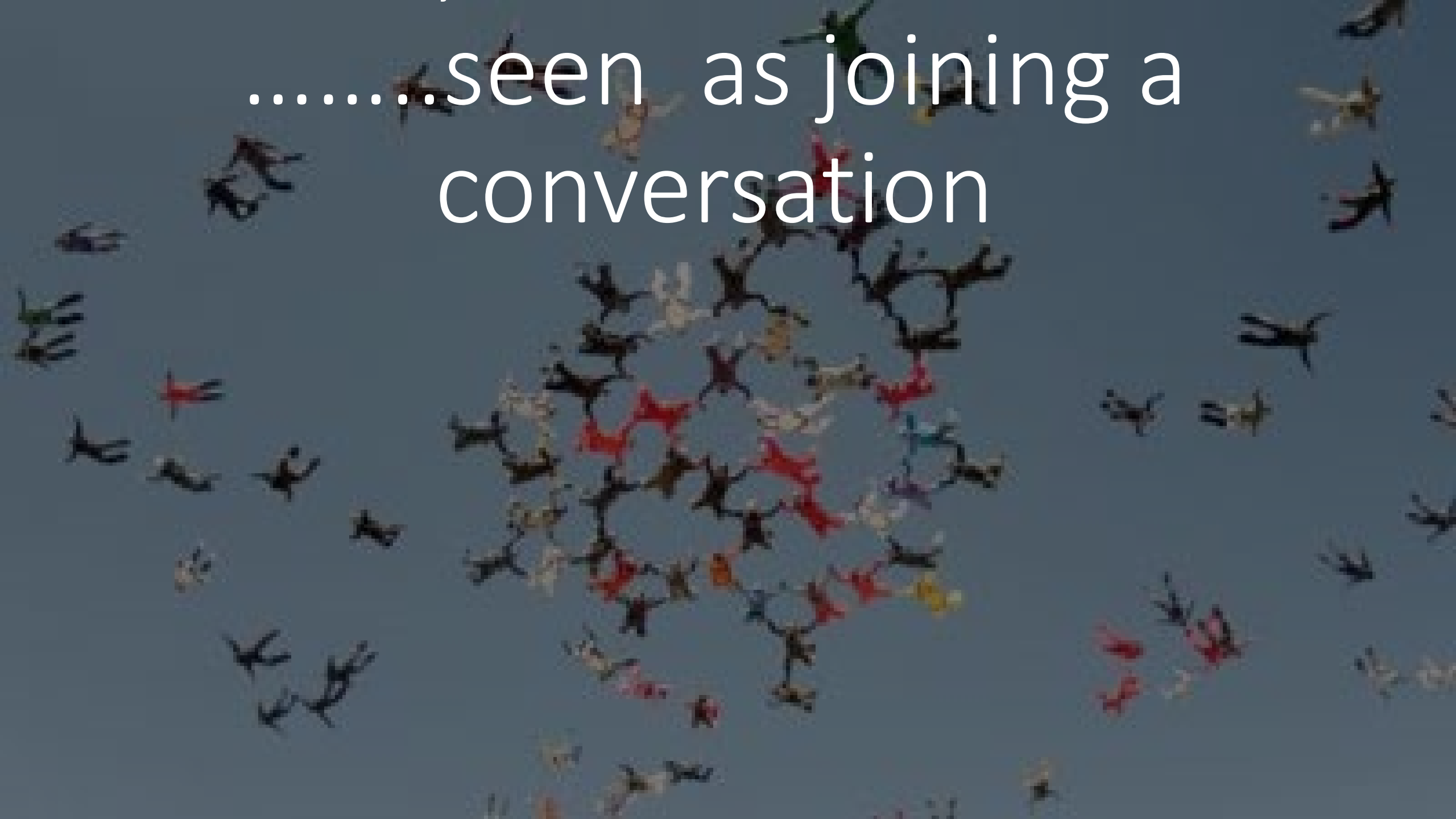
Merriam Webster Dictionary

Definition of Research

- *Research is thus an original contribution to the existing stock of knowledge making for its advancement. It is the pursuit of truth with the help of studies, observations, comparisons and experiments.*

Before Research….

- To contribute new knowledge, we must know what is already known.
- To know what is already known, we must do a literature review / search.
- **Review** – combination of two words: Re- and View
- **Re**: again
- **View**:
  - to look at (something) carefully;
  - to think about (someone or something) in a particular way.
- **Review**:
  - to look at or examine (something) carefully especially before making a decision or judgement;
  - to study or look at (something) **again**



……..seen as joining a conversation

Objectives of research

- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as *exploratory* or *formulative* research studies)

Objectives of research

To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as *descriptive* research studies)

Objectives of research

To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as *diagnostic* research studies)

Objectives of research

To test a hypothesis of a causal relationship between variables (such studies are known as *hypothesis-testing* research studies).

In short:

Research is vital for the progress of modern medicine and has created an ever-evolving medical world.


Alas not all
researches
are created
equal!

Many are simply false…….

"Simulations show that for most study designs and settings, it is more likely for a research claim to be false than true. Moreover, for many current scientific fields, claimed research findings may often be simply accurate measures of the prevailing bias."

> PLoS Med. 2005 Aug;2(8):e124. doi: 10.1371/journal.pmed.0020124. Epub 2005 Aug 30.

Why most published research findings are false

John P A Ioannidis [1]

Affiliations + expand

PMID: 16060722 PMCID: PMC1182327 DOI: 10.1371/journal.pmed.0020124

ree PMC article

FULL TEXT LINKS

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Many results cannot be replicated…….

"The rate of findings that have later been found to be wrong or exaggerated has been found to be **30 percent** for the topmost widely cited randomized, controlled trials in the world's highest-quality medical journals. For non-randomized trials that number rises to an astonishing five out of six."

Original Contribution

July 13, 2005

Contradicted and Initially Stronger Effects in Highly Cited Clinical Research

John P. A. Ioannidis, MD

» Author Affiliations | Article Information

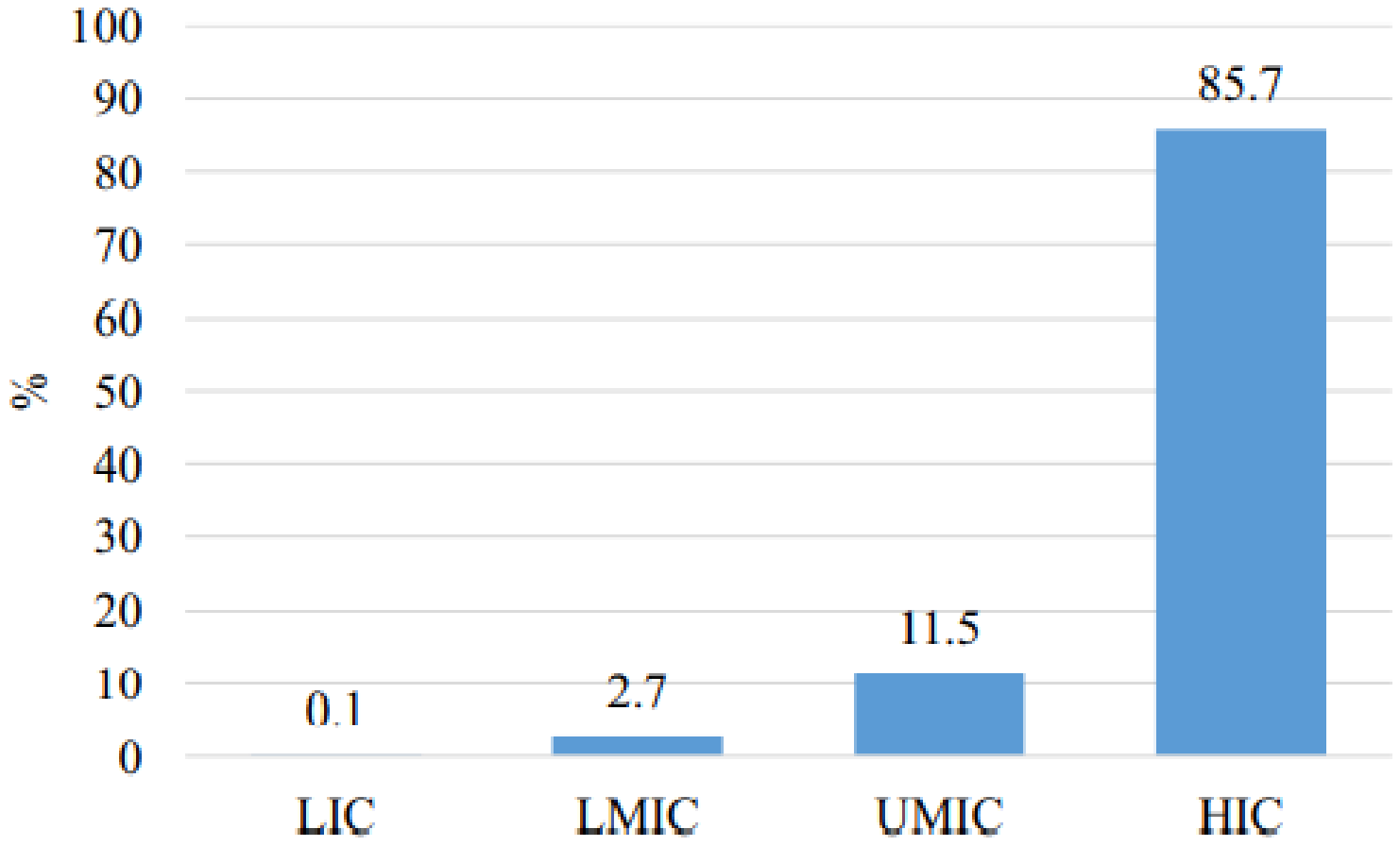
JAMA. 2005;294(2):218-228. doi:10.1001/jama.294.2.218

Most are not useful…….

"Observational studies often add more confusion rather than filling the information deficits [18,19]. Meta-analyses, decision analyses, and guidelines cannot really salvage the situation based on largely useless studies and may add their own problems and biases."


Continents
too are not
created
equal!

Percentage of orthopaedic publications according to country income level



31 454 articles published since 2007

Africa lags other continents!

"On the surface, you would see that despite comprising 12.5 percent of the world's population, Africa still accounts for less than 1 percent of global research output."

Elsevier Connect

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Africa generates less than 1% of the world's research; data analytics can change that

An in-depth analysis of the continent's research reveals promising developments – and strategies for continued improvement

By Charon Duermeijer, PhD, Mohamed Amir, and Lucia Schoombee March 22, 2018 6 mins

Elsevier Connect

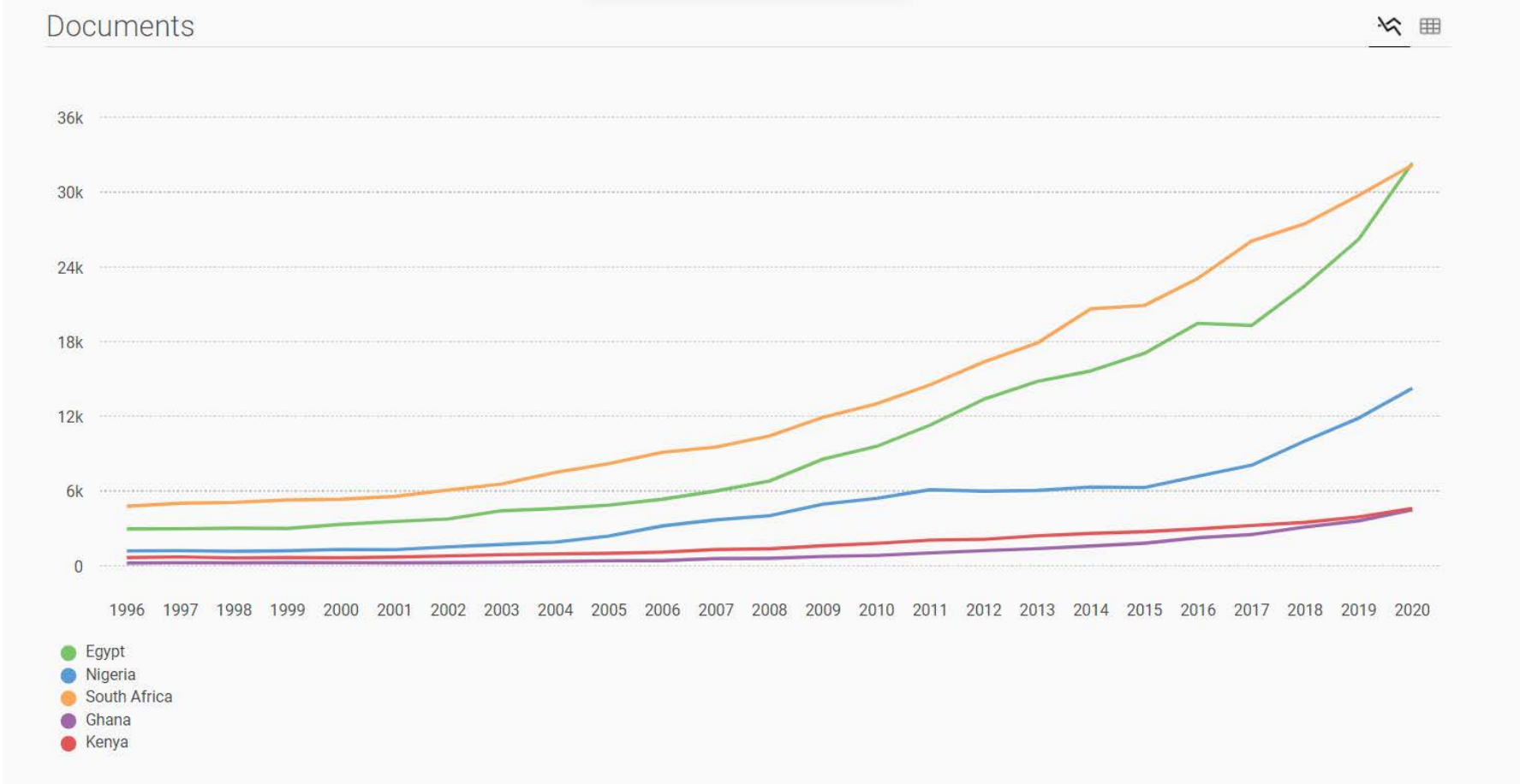
How can we improve medical research?

First, you must know how to measure research productivity

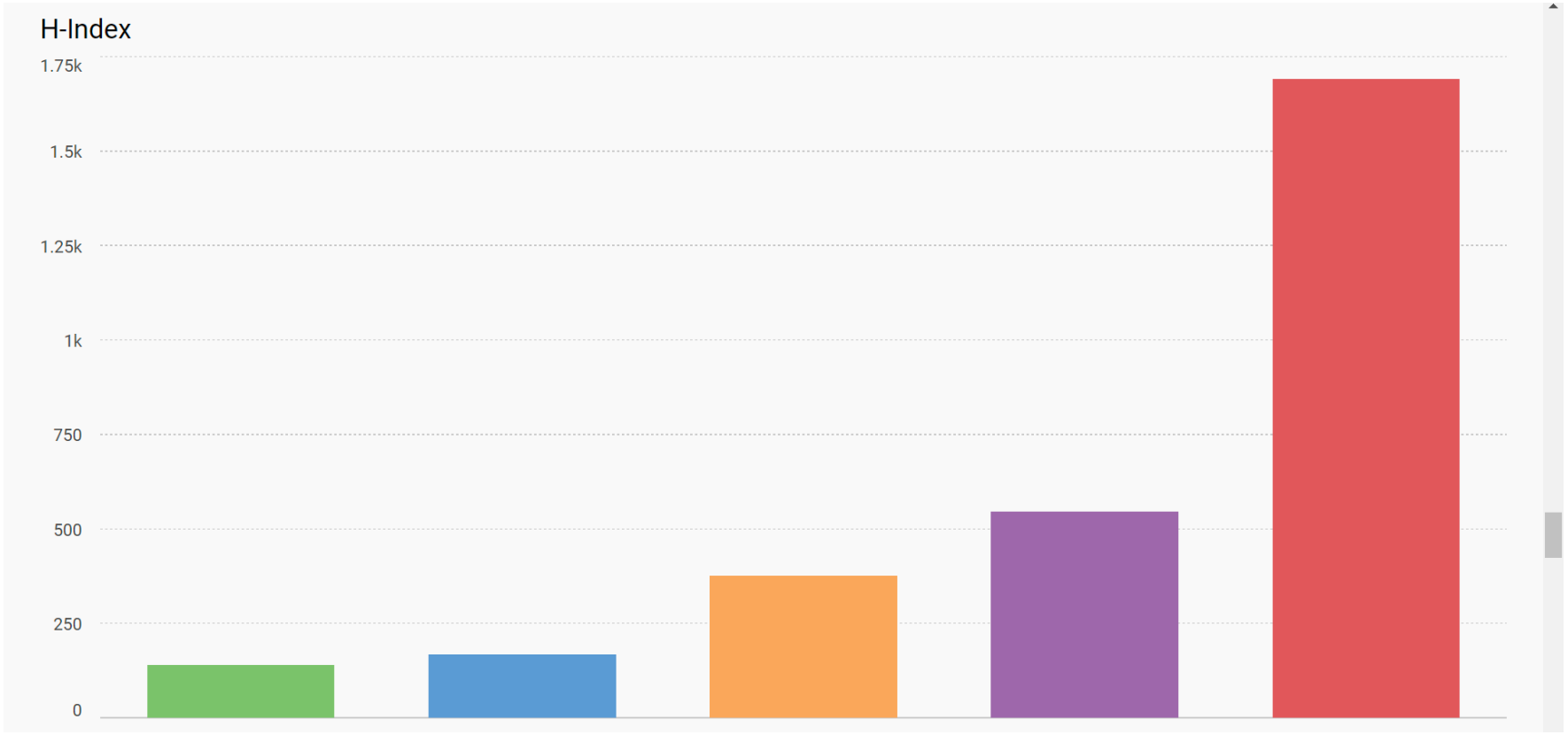
How do you measure Research Productivity?

Quantity	Impact	Quality	Importance
• Is the simplest of the measures. It concerns the number of publications or patents produced	• is a measure of the influence of a piece of research and is evaluated by means of the number of citations made to it by other scholars.	• Evaluated through expert value judgements, typically using peer review	• Similar to quality, but may not become clear until time has passed

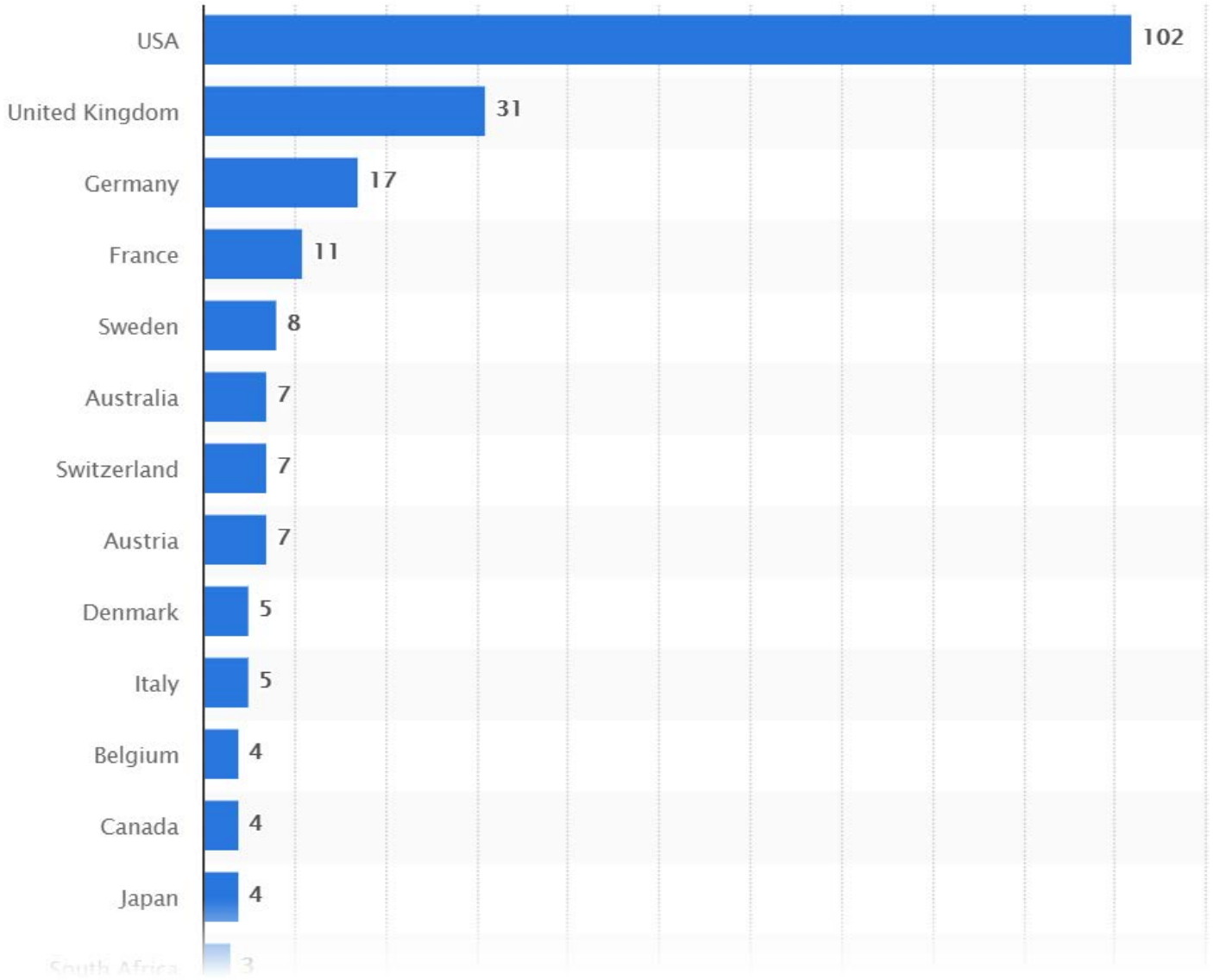
Quantity: Total Number of articles from selected countries in Africa



Research Impact: Country comparisons of H-Index



Research Importance/Quality: Countries with most Nobel Prizes in Medicine

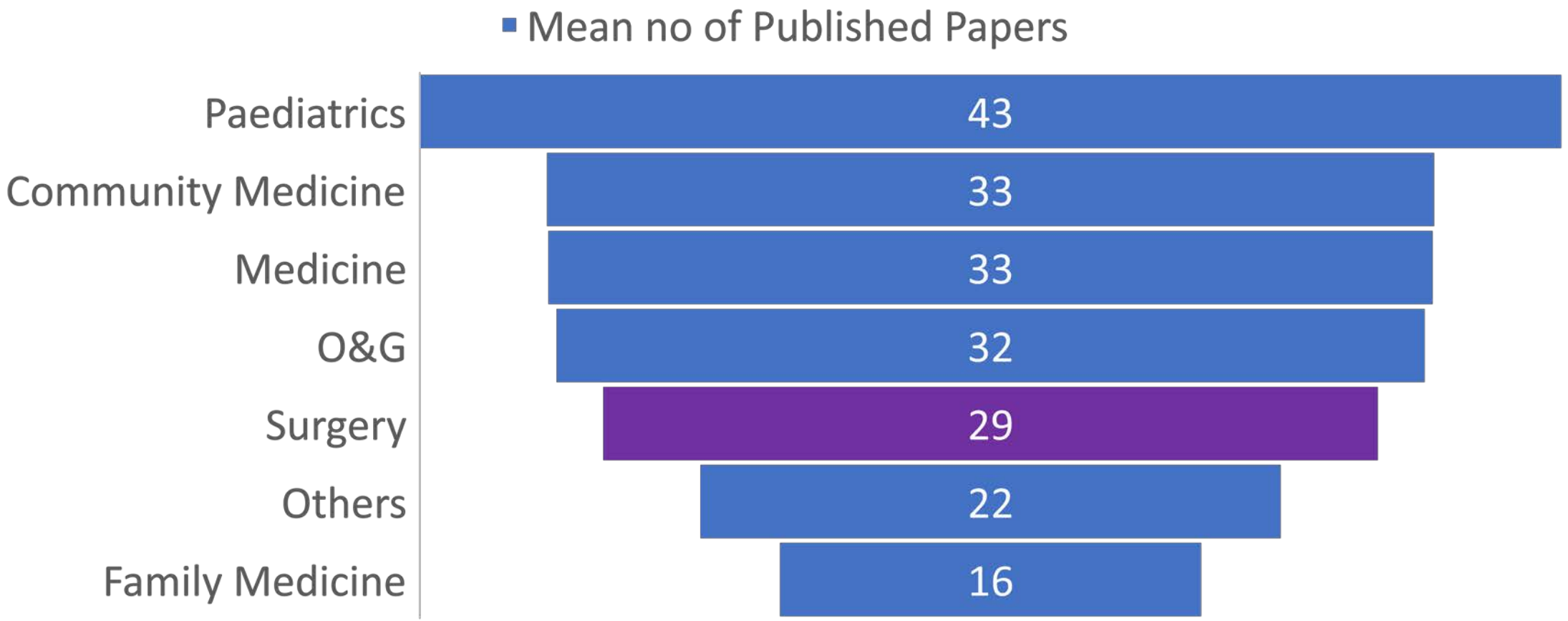


How can we improve the quality of medical research?

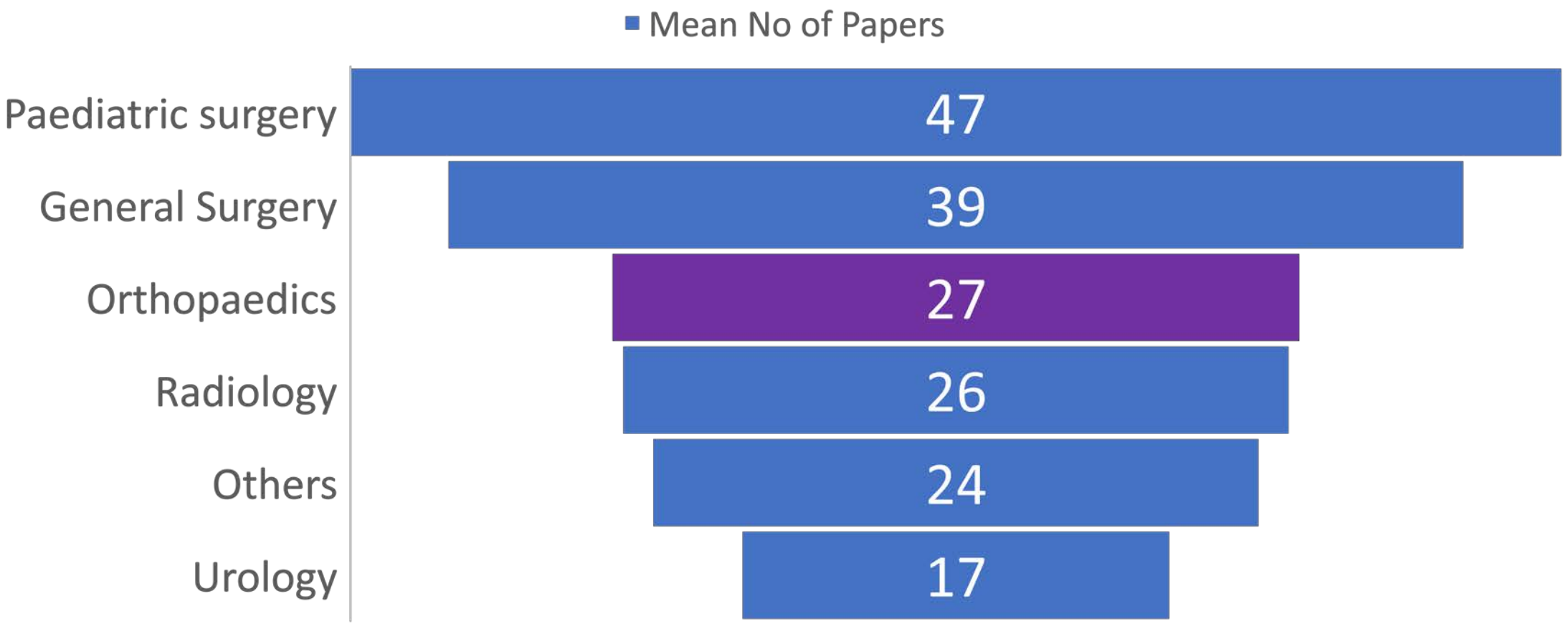
Secondly, you must know what the current situation is….

What’s the state of Orthopaedic research in Nigeria?

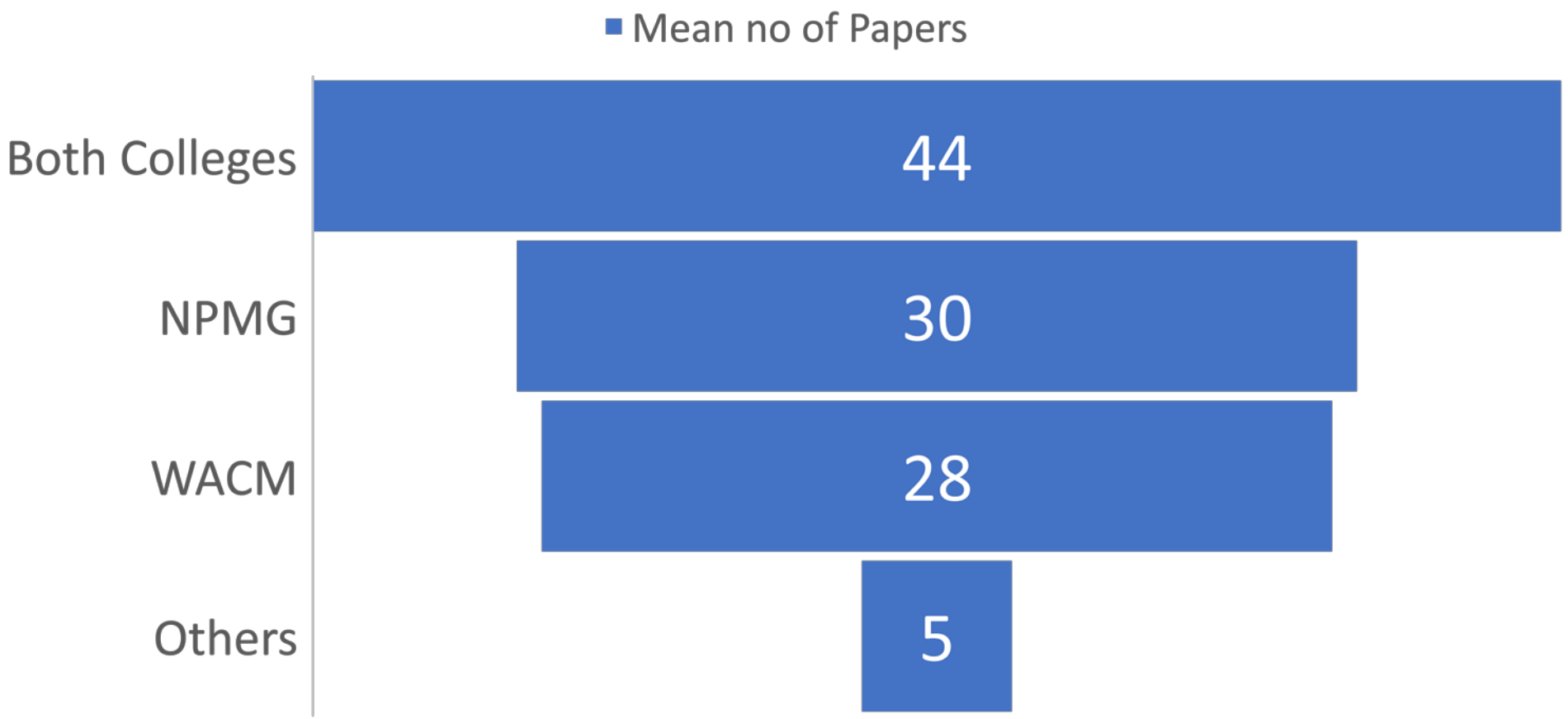
Comparing the academic output of different specialties in Nigeria:



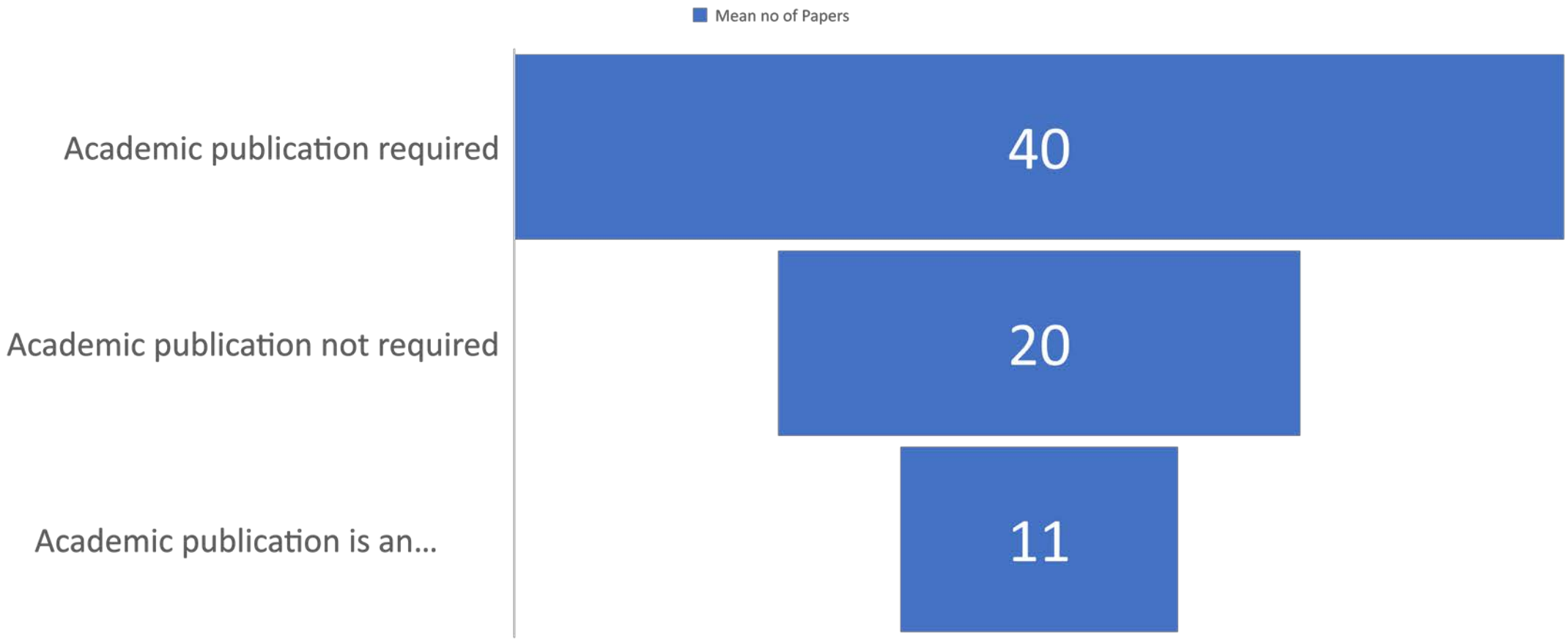
Comparing the academic output of different surgical subspecialties in Nigeria



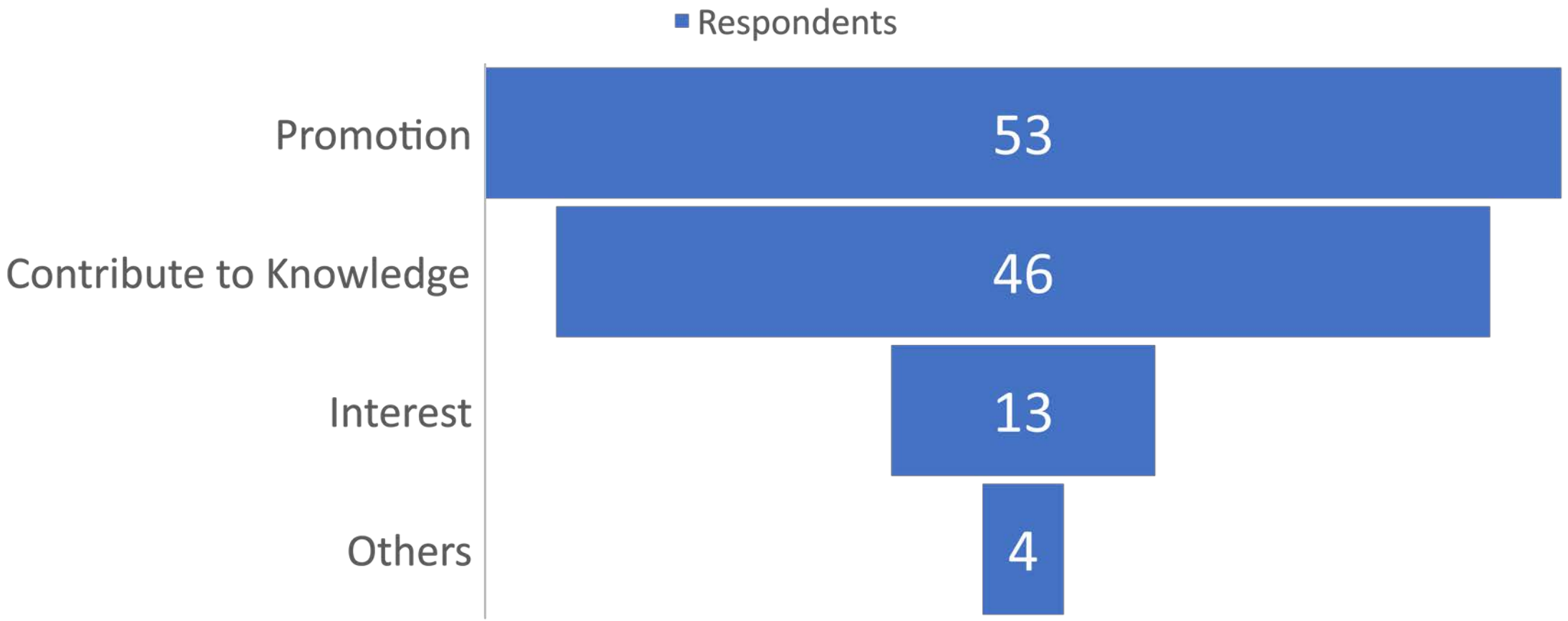
Effect of certificating college on research publications



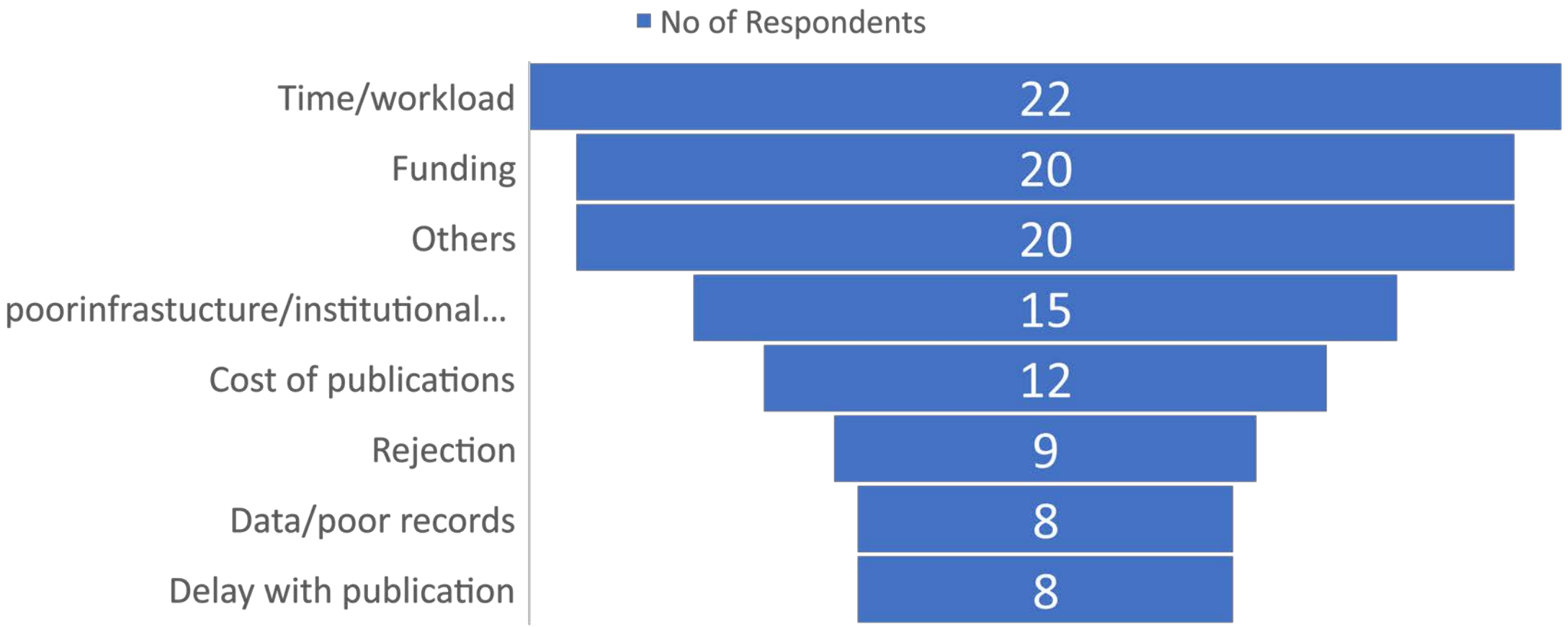
Academic Requirement for promotion Vs Mean number of Published Papers



Motivation for publishing among Nigerian Specialists

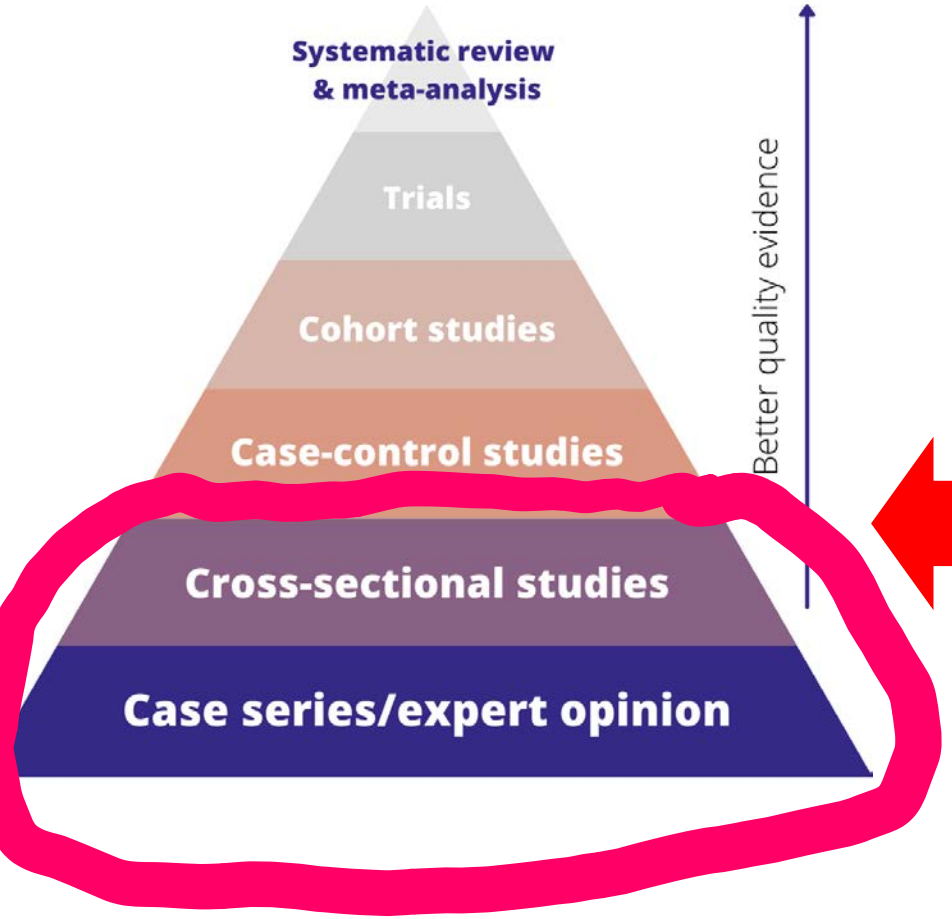


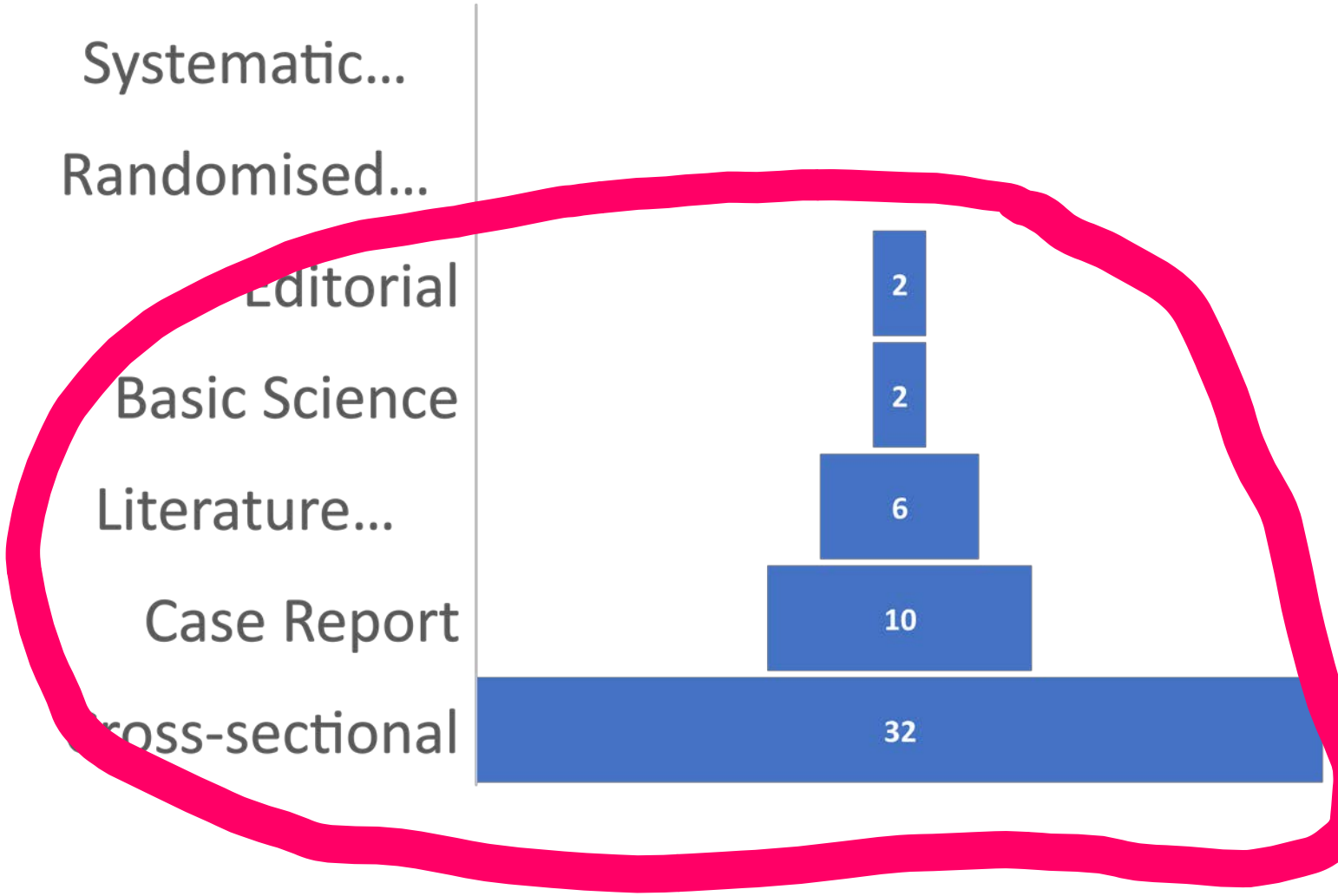
Barriers to Publication among Nigerian specialists



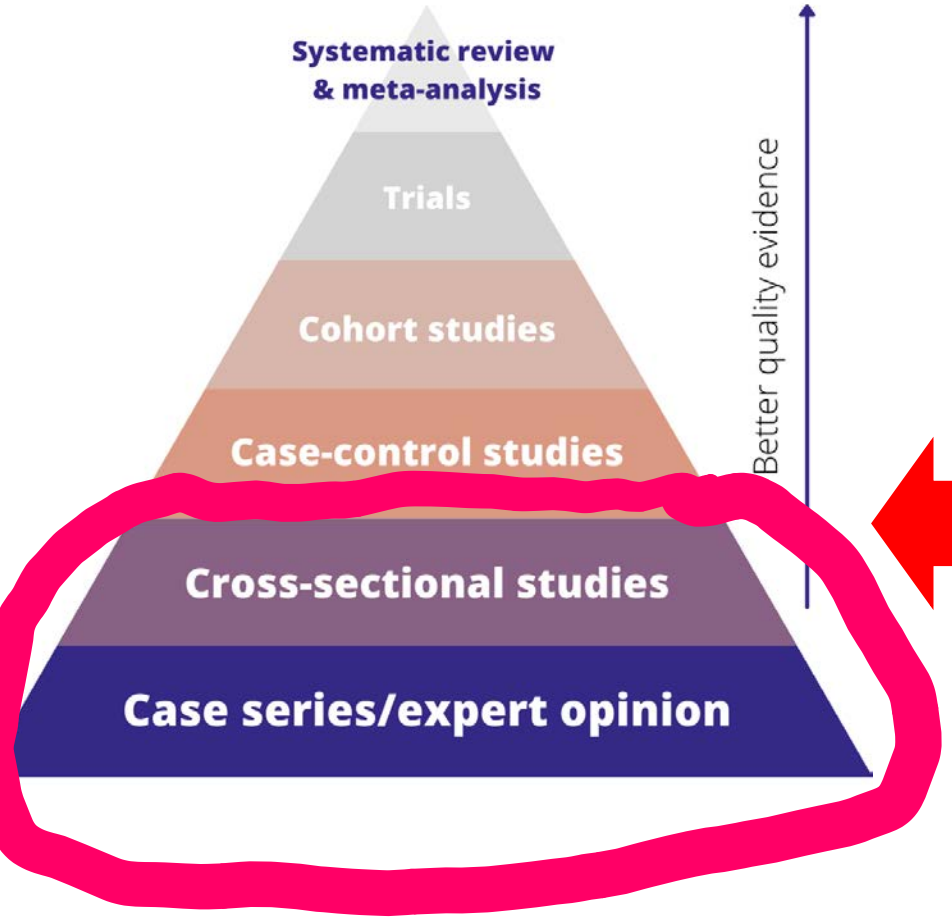
How has these barriers affected orthopaedic research?

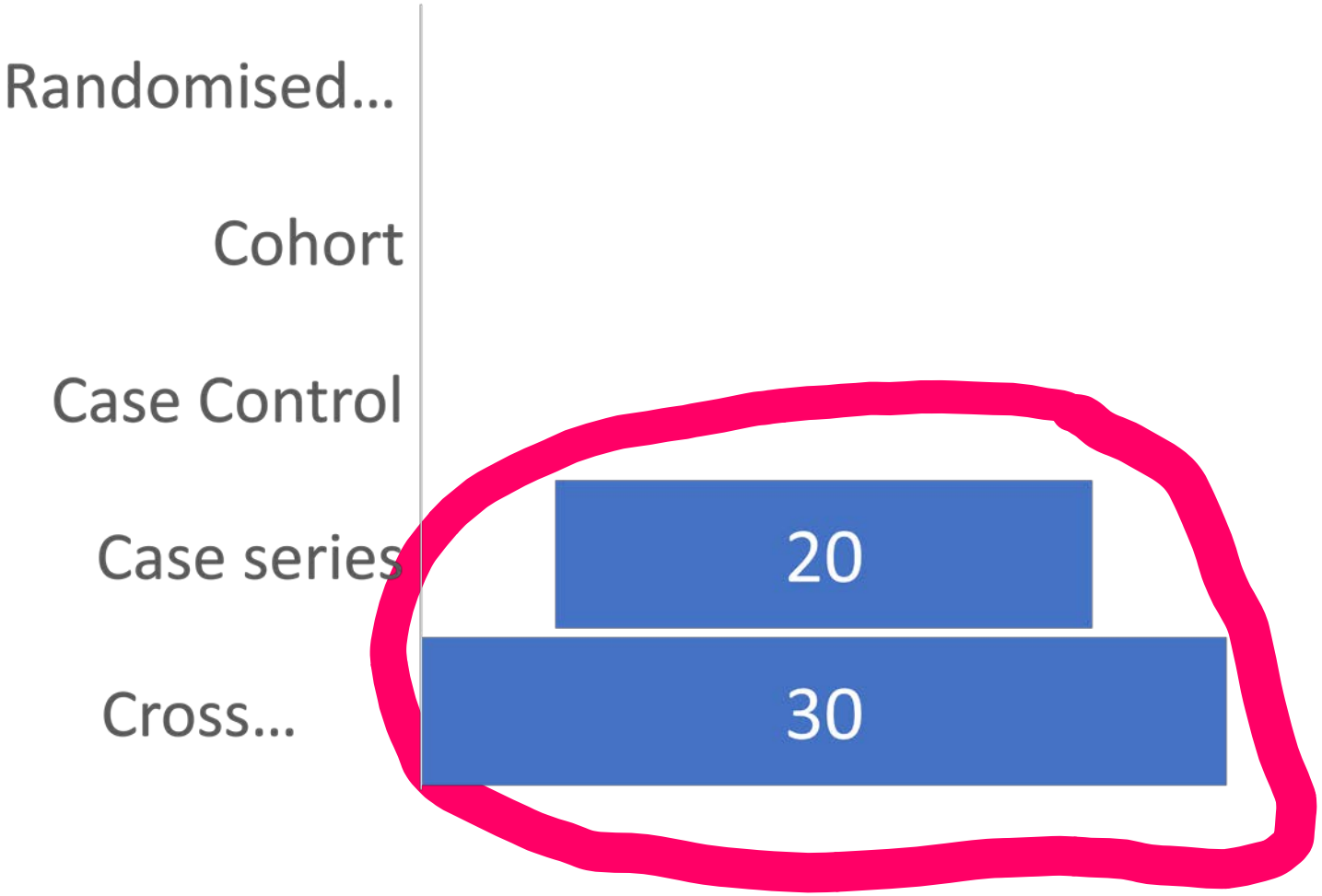
What is the quality of publication of orthopaedic research output in Nigeria: Glimpses from the NJOT





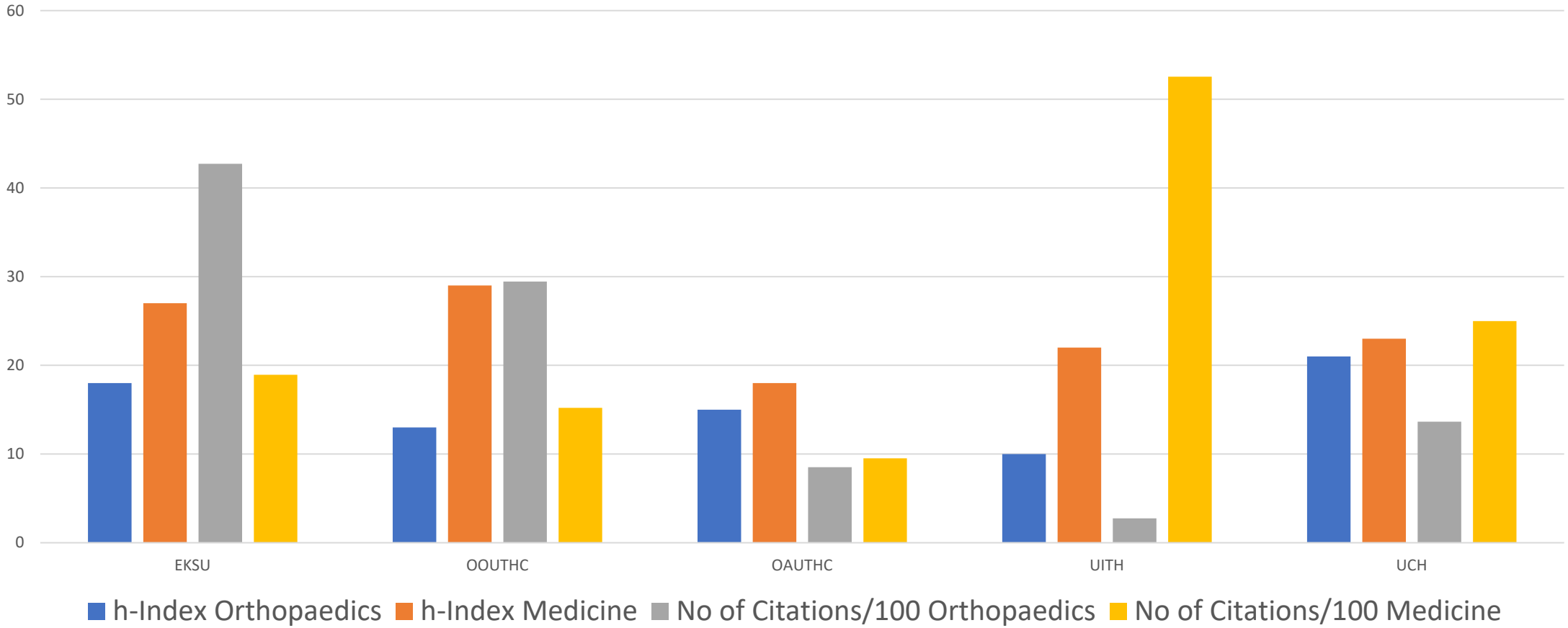
What about the spectrum of presentations at this Conference (Calabar 2021)






Not too good?

HR index of some authors in orthopaedics compared to some other subspecialties in Nigeria….



Number of citations has been divided by 100 for the h-index to be visible.

Bottom Line: Orthopaedic research in Nigeria can be better

How can we improve research output among Nigerian orthopaedic surgeons?

Who are the stakeholders?

i. Government
ii. Hospitals
iii. Training Colleges
iv. Nigerian Orthopaedic Association
v. Departments/Units in the hospitals
vi. Nigerian Journal of Orthopaedics and Trauma
vii. Individuals

Role of Government

Funding

- TETFUND: Research should get more
- TETFUND: Greater transparency is needed
- TETFUND: Publishing in high impact journals should be encouraged

INSTITUTION BASED RESEARCH INTERVENTION (IBR)AS AT DECEMBER 2018		
BENEFICIARY	**NO. SPONSORED**	**DISBURSEMENT**
COLLEGES OF EDUCATION	348	256,093,647.71
POLYTECHNICS	549	418,602,987.82
UNIVERSITIES	733	626,908,231.30
TOTAL	**1,630**	**1,271,302,200.21**

We disbursed N134 billion to tertiary institutions in 2018 — TETFund

By Kunle Sanni — January 5, 2019 2 min read

Percent allocated to research = 0.9%

Role of Government

Standardization of Promotion

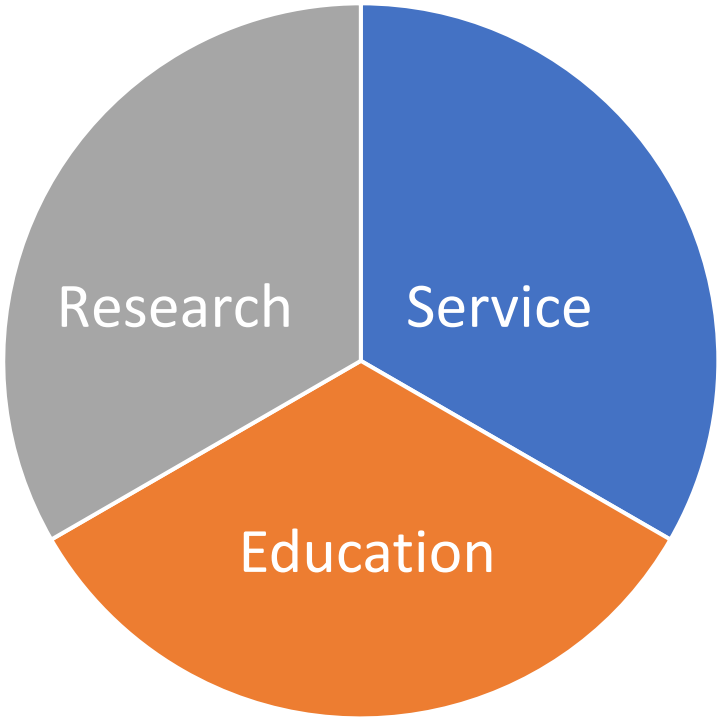
- A national standard for promotion should be implemented in the universities and teaching hospitals
- The current emphasis on quantity should be improved upon.
- Emphasis quality as well!

Reward Excellence

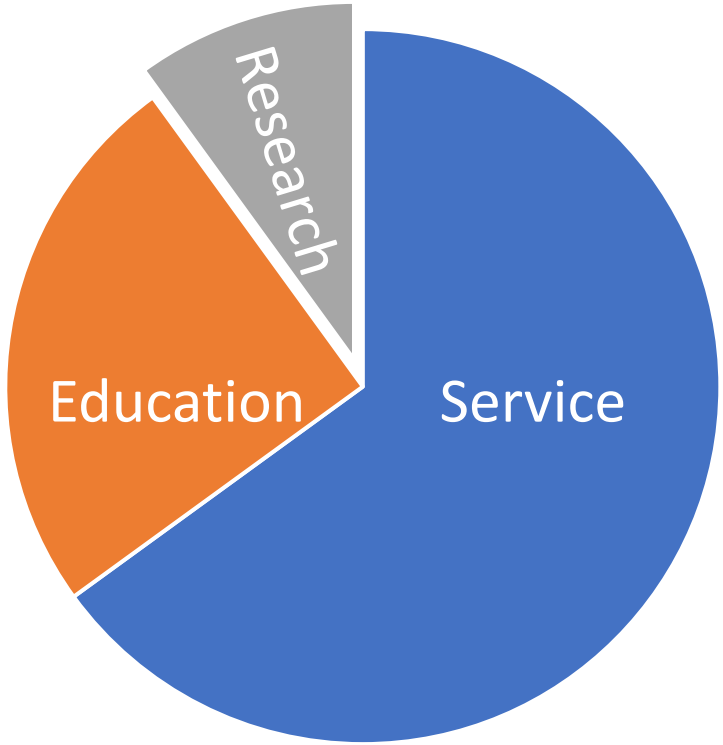
- Rewards for publishing high quality articles should be introduced.
- Let’s try the South African model!

Role of Hospitals: the three pillars

Ideal



Reality



Role of Hospitals: What hospitals should do

Orthopaedic hospitals must see research as a vital part of their services.

Research Publications should be a part of the promotion criteria in hospitals

Orthopaedic Hospitals should introduce research weeks to showcase research activities in the hospitals. A reward system should be introduced.

Ethical Committees

Role of Hospitals II: What Hospitals should do

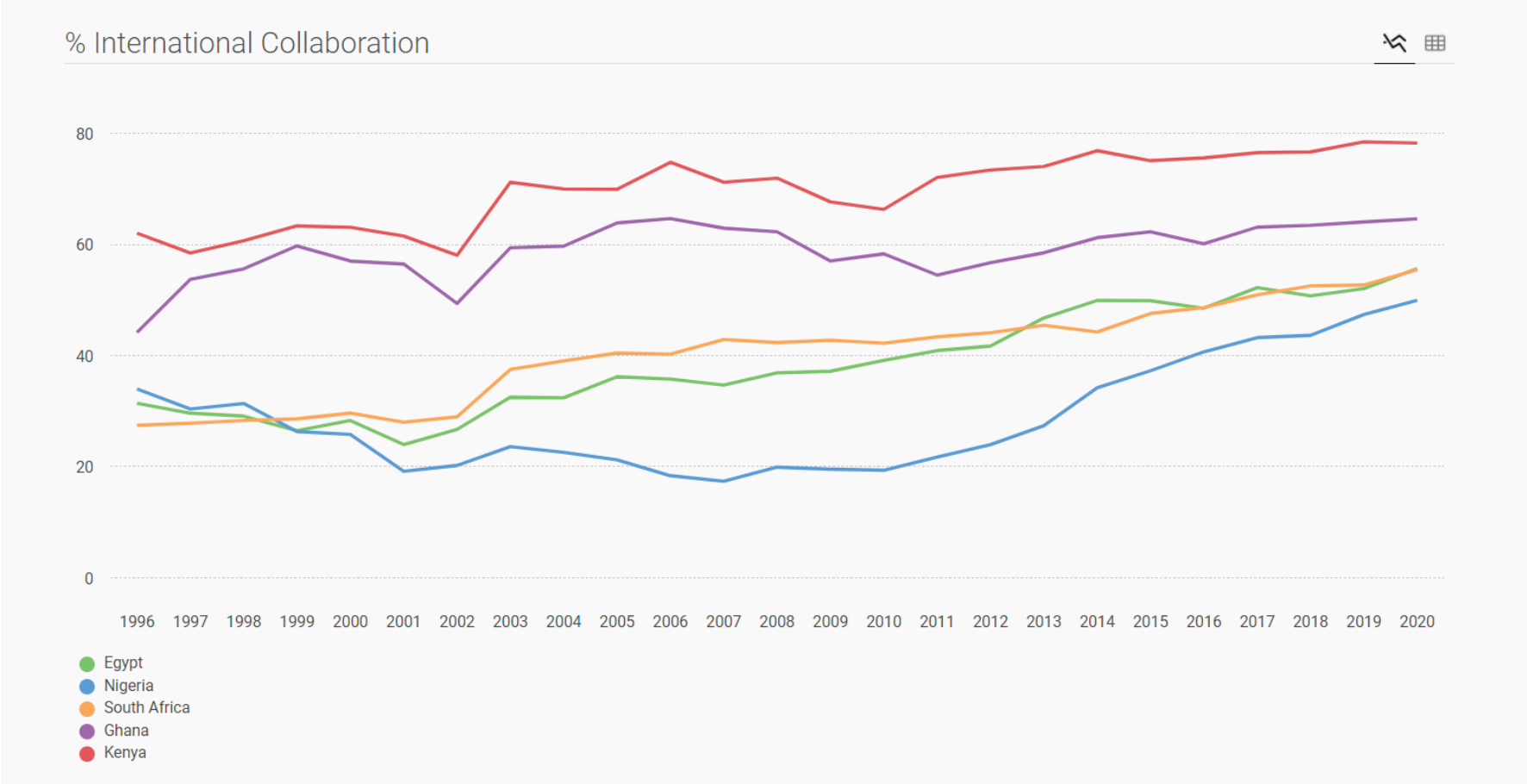
Hospital research committees: Co-ordinate departmental committees, provide information and support to apply for grants

Introduce mentorship programmes, organize workshops for research and grant writing, provide panel reviews as clearing house for grant proposals

Employ competent statisticians to help researchers with statistics

Institutional Collaborations (See next slide)

International Collaborations in selected countries in Africa



Role of the Postgraduate Colleges

Role of the Postgraduate Colleges

On Part II Thesis

- Assessment of proposals should be standardized
- Previous thesis should be made available online
- Supervisors and reviewers themselves need to be periodically and trained

Research training for resident doctors

- Registrars should have dedicated study and research time
- Mandatory attendance and presentation of papers at conferences

Role of Postgraduate Colleges

- Candidates should not be limited to their hospital in choosing supervisors for their projects
- **TOT**: Supervisors must be trained in mentoring/supervision before becoming eligible.
- Inter-institutional mentorship program can be based on the WHO MENTOR-VIP program

Role of Departments/Units of Orthopaedic Surgery in Teaching Hospitals

1

Introduce mentorship programs

2

Research Committees:

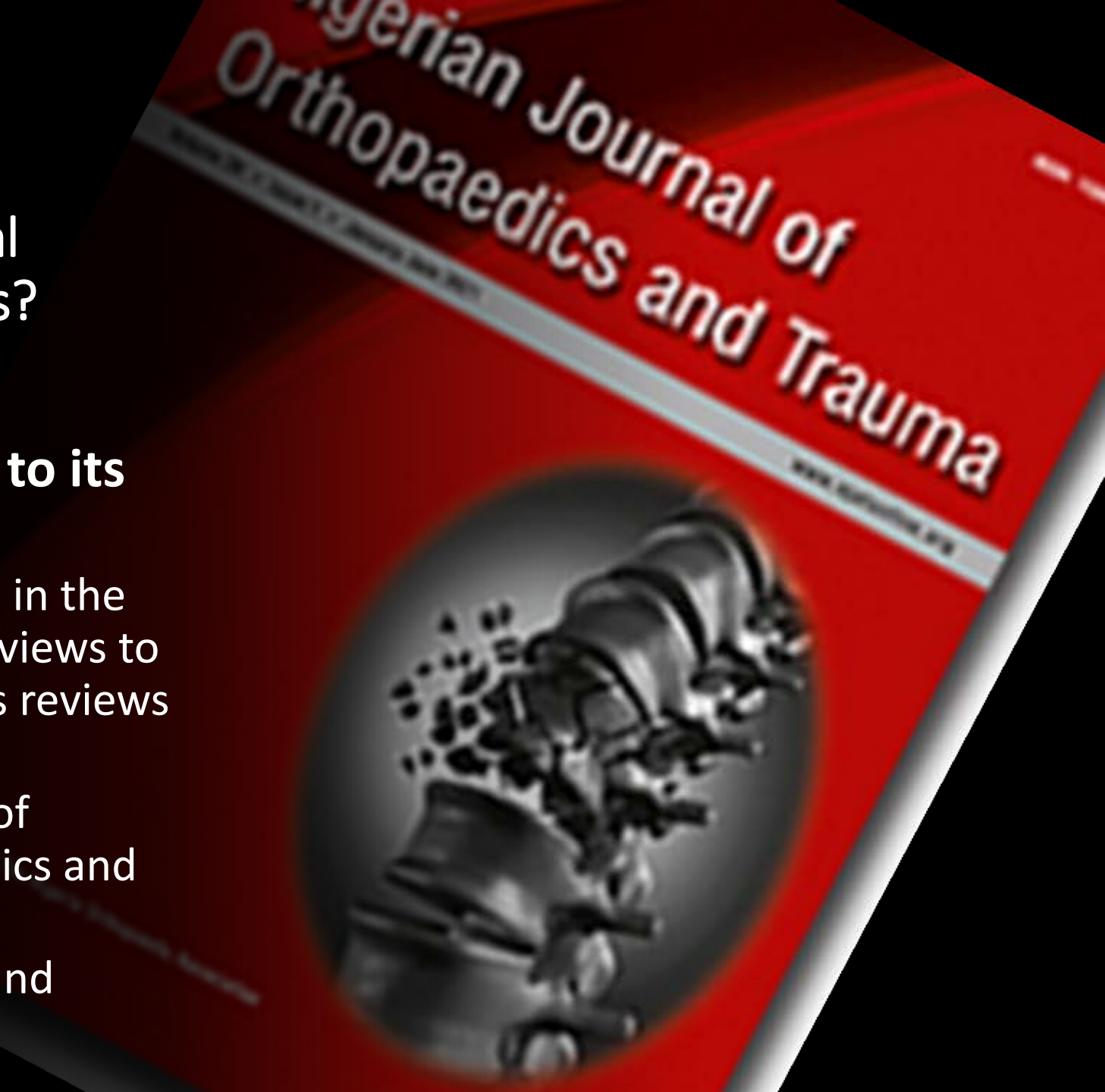
- The committee provides members of the department with information and support to apply for both internal and external research funding.
- Should also foster links with departments in other hospitals

3

Research week or day to highlighting the activities of its consultants and residents.

Role of Nigerian Journal of Orthopaedics and Trauma: How can the journal improve research in orthopaedics?

Role of NJOT: How can the journal improve research in orthopaedics?



1. By providing training in research to its readers and reviewers:

- Senior Registrars could be mentored in the review peer-process by assigning reviews to them along with seasoned reviewers reviews and following up on their responses.
- Organize training in several aspects of research especially statistics and ethics and academic writing
- Have webpages devoted to writing and research training.

Role of NJOT: How can the journal improve research in orthopaedics?

2. Updating Instruction to Authors for best practices in scientific reporting

- Less reliance on p-value
- Authors should report effect size and confidence intervals
- Authors should be required to comply with guidelines on reporting medical research such as PRISMA, CONSORT, STROBE etc.
- Reviewers should also have guidelines to guide them through the review process.
- Encourage authors to make their data available

		for abstracts [21,31])
Introduction		
Background and objectives	2a	Scientific background and explanation of rationale
	2b	Specific objectives or hypotheses
Methods		
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons
Participants	4a	Eligibility criteria for participants
	4b	Settings and locations where the data were collected
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed
	6b	Any changes to trial outcomes after the trial commenced, with reasons
Sample size	7a	How sample size was determined
	7b	When applicable, explanation of any interim analyses and stopping guidelines
Randomisation:		
Sequence generation	8a	Method used to generate the random allocation sequence
	8b	Type of randomisation; details of any restriction (such as blocking and block size)
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how
	11b	If relevant, description of the similarity of interventions
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses
Results		
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome
	13b	For each group, losses and exclusions after randomisation, together with reasons
Recruitment	14a	Dates defining the periods of recruitment and follow-up
	14b	Why the trial ended or was stopped
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms [28])
Discussion		
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses
Generalisability	21	Generalisability (external validity, applicability) of the trial findings
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence
Other information		
Registration	23	Registration number and name of trial registry
Protocol	24	Where the full trial protocol can be accessed, if available
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders

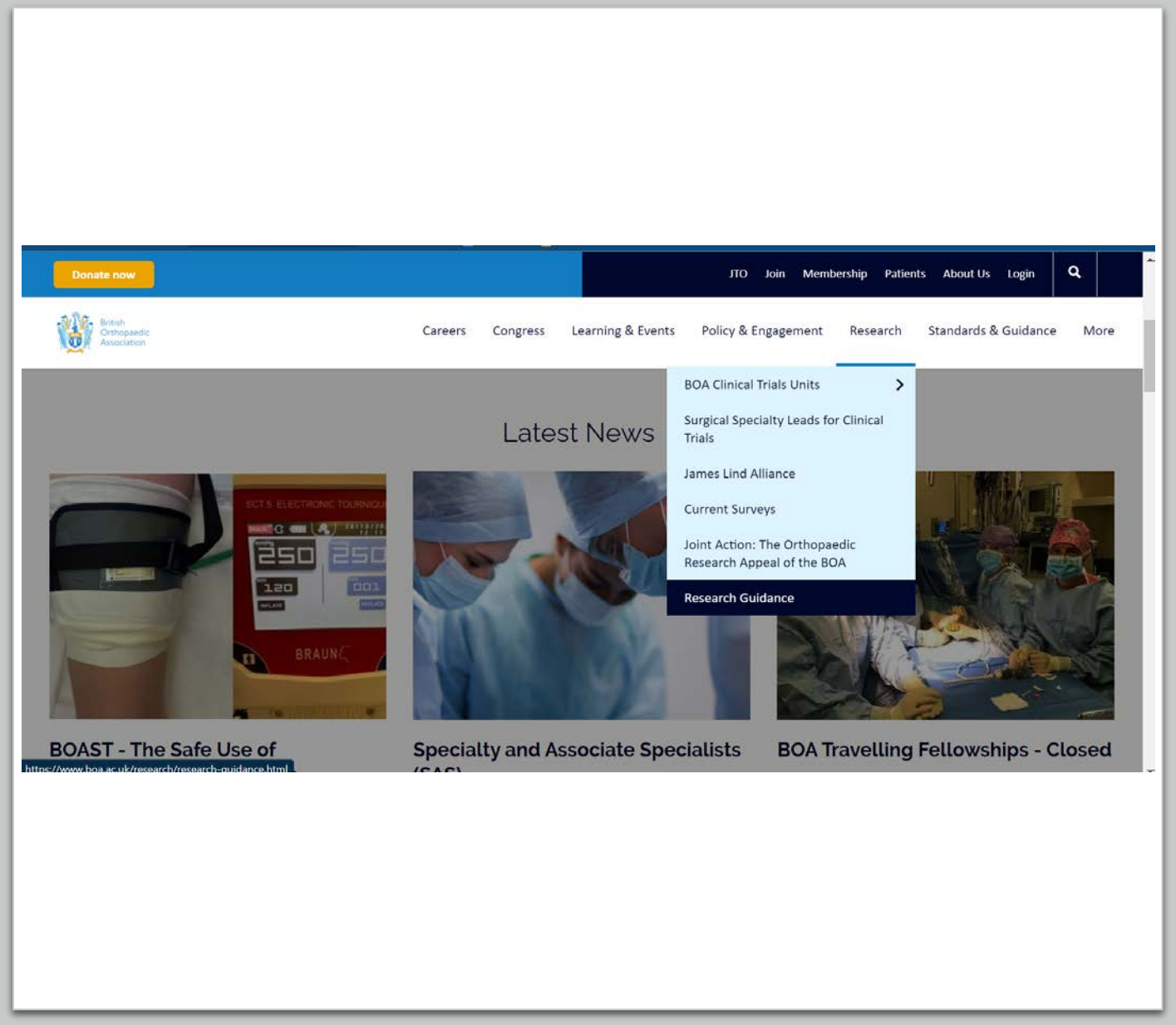
*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration [13] for important clarifications on all the items. If

Role of the Nigerian Orthopaedic Association

- Advocacy, advocacy, advocacy.
- Sharing best practices across institutions to ensure that all orthopedic surgeons have adequate support.
- Greater emphasis on the scientific aspect of the AGM/Scientific conference
  - Student sessions
  - Dedicated resident sections
  - Prizes for best presentations

Role of the Nigerian Orthopaedic Association

- Setting up Research and Education committees to establish/introduce standards of research/practice.
- Country-wide mentorship program
- Have a dedicated website/webpage to guide research activities across the country



Role of Individuals

Train Yourself

- Research methodology
- Academic writing
- Statistics
- Find a mentor

Role of Individuals

Identify sources of research topics

- Get familiar with PubMed, Google Scholar and other medical databases and repositories
- Attend conferences
- Be inquisitive in your work. Let your imagination fly
- Review for journals

Role of Individuals

Learn how to turn ideas into research

- See my presentation on turning ideas into research

Role of Individuals

Look for Collaborators

- This will both enhance the quality and quantity of your research
- Easiest way is through networking at conferences

Role of Individuals

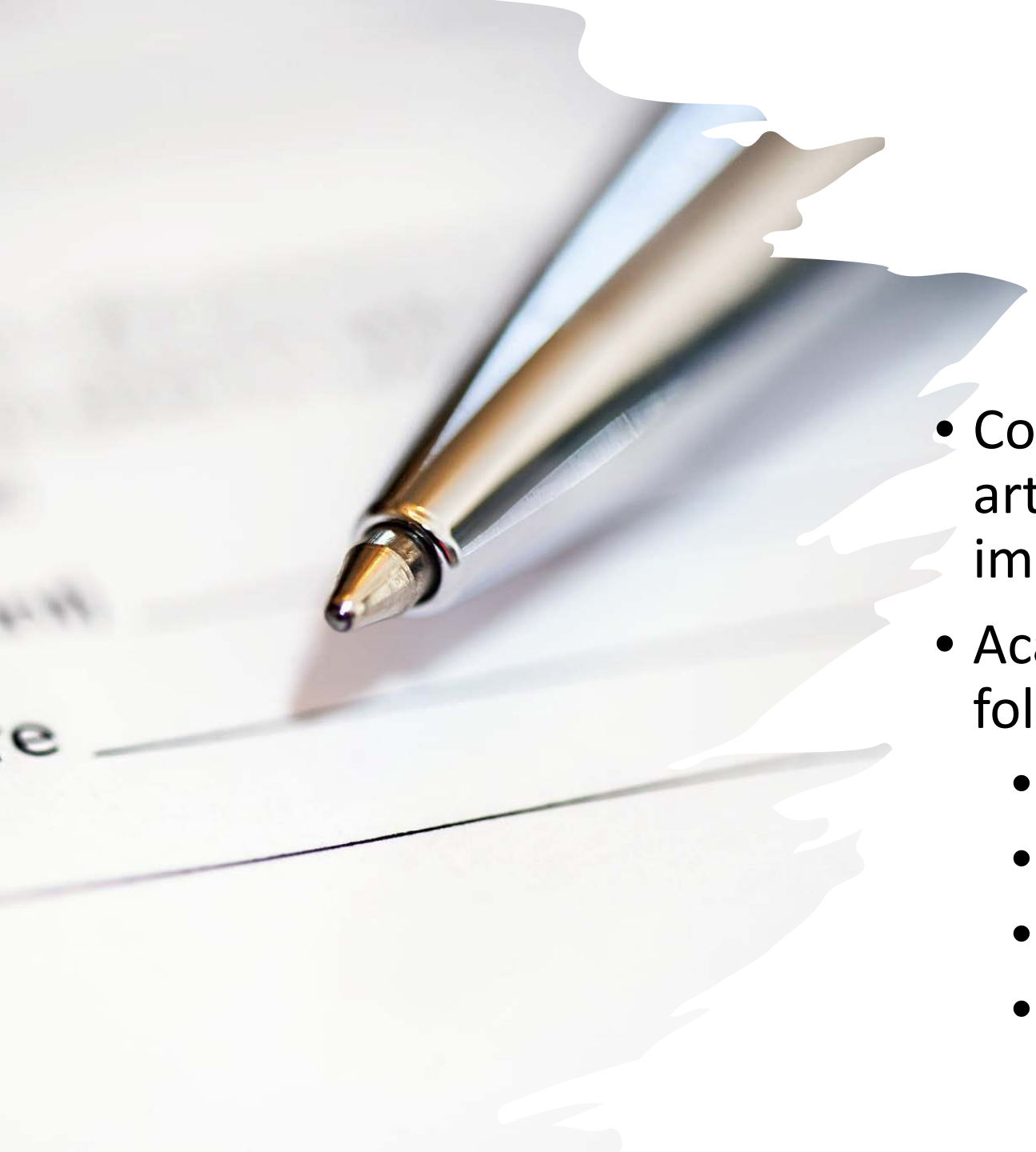
Generate Ideas

- Be creative
- Be inquisitive

Role of Individuals

Find Time to do Research

- Never sleep until you do a research related activity in a day

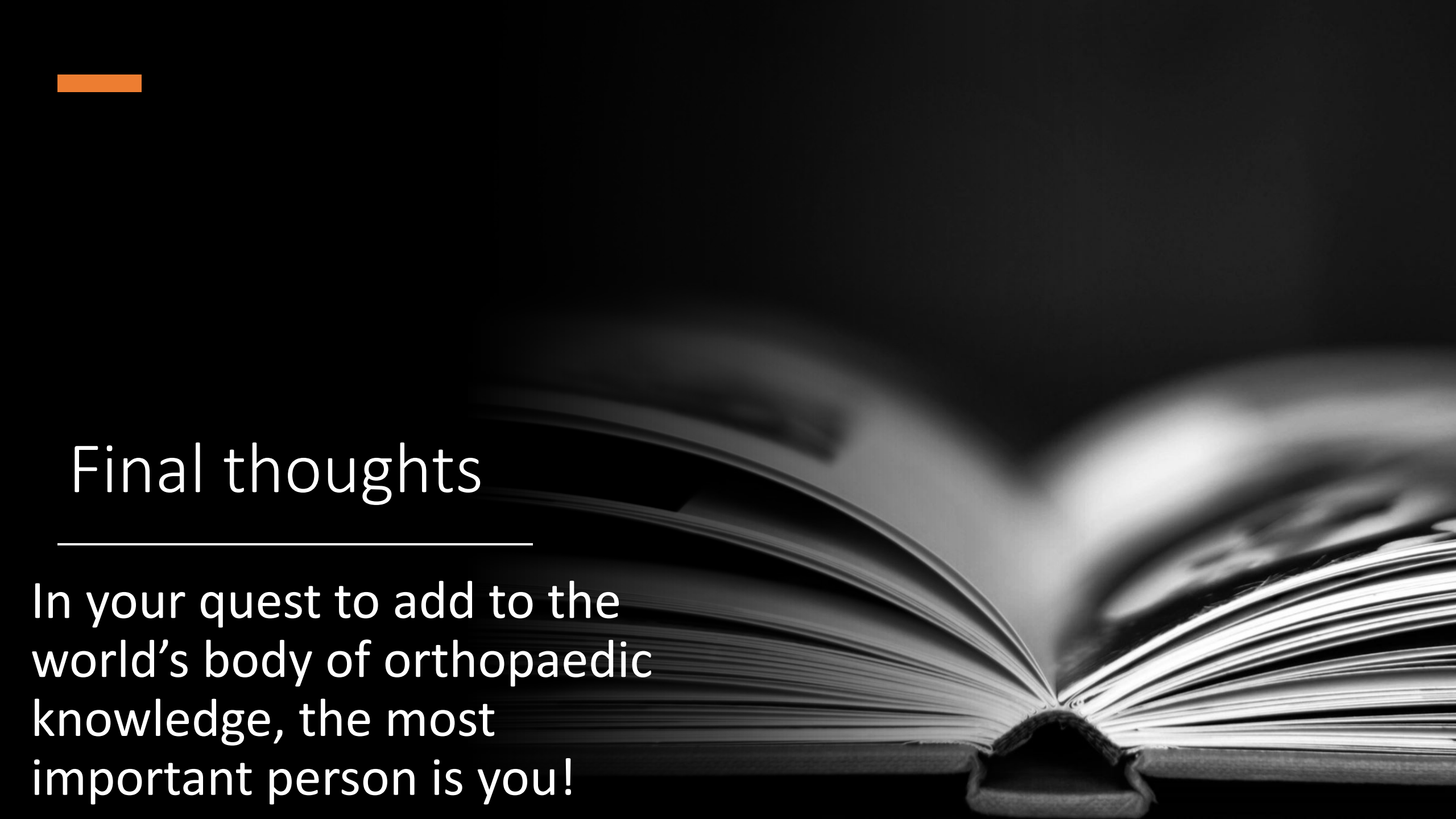


Unclassified

- Consider new methods of assessing articles/academics not solely based on impact factors.
- Academics might be judged on the following as well:
  - Methodological rigor
  - Full dissemination of their research
  - Quality of their reports,
  - Reproducibility of their findings.

Final thoughts

In your quest to add to the world’s body of orthopaedic knowledge, the most important person is you!



"Don’t say you don’t have enough time. You have exactly the same number of hours per day that were given to Helen Keller, Pasteur, Michelangelo, Mother Teresa, Leonardo da Vinci, Thomas Jefferson, and Albert Einstein."

- H. Jackson Brown Jr.

Thank You for Your Time

To ask questions, please join the forum at www.oluwadiya.com