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RESIDENT DOCTORS' PERCEPTIONS OF AND BARRIERS TO HEALTH RESEARCH PARTICIPATION AT A TERTIARY HOSPITAL IN BAYELSA STATE, NIGERIA: A CROSS-SECTIONAL STUDY.

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ABSTRACT

BACKGROUND:

Research is fundamental and indispensable to the advancement of medicine and health. Global reports reveal a significant global divide, with developing countries having much lower health research outputs. This limits healthcare advancement and innovation. This study explored the perception and barriers to research participation among resident doctors in the Federal Medical Centre, Bayelsa. Nigeria.

METHODS:

A cross-sectional study of 80 resident doctors undergoing residency training was conducted. A validated tool, including an 18-item Likert scale tool and semi-structured questions that explored perceptions and barriers to health research participation was used to obtain information. Findings were summarized using tables and charts.

RESULTS

Mean age was 37.59 years (+4.56). Most resident doctors 71(88.8%) felt that Health research improves the resident doctor's critical appraisal skills. 40(50.0%) perceived Health research as difficult, and 55 (68.7%) felt Publication of research is frustrating. Across the research stages, the most difficult areas identified were Data analyses and interpretation 19 (23.8%). Only 1(1.3%) resident doctor had ever received a grant; two-thirds 53(66.2%) did not have a research mentor. The most common obstacles to research practice were lack of money 62 (77.5%), insufficient time 56 (70.5%) and limited availability of research mentors 52 (65.5%).

CONCLUSION:

Resident doctors generally value health research but face significant practical barriers like insufficient time, lack of technical training, and inadequate funding that limit engagement despite positive attitudes. This gap between perceived value and actual participation reflects structural and institutional shortcomings rather than a lack of motivation of their part. Structured interventions, including dedicated funding, mentorship, adequate research time, and targeted training, are needed to translate favorable attitudes into improved research output among resident doctors.

KEYWORDS:

Research, Resident Doctors, Publication, Perception, Barriers

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INTRODUCTION

Research is fundamental and indispensable to the advancement of medicine and healthcare. Across the various sub-disciplines of medicine and health in general, it is agreed that research and scholarly activity are essential to inform good practice and promote the development of better health systems and evidence-based policies[1].

Research in medical training provides immense value, which includes enhancing resident doctors' education, improving patient care quality, equipping them with analytical skills and enhancing critical thinking and leadership development among resident doctors [2]. Furthermore, participating in health research increases one's chance of obtaining certain training positions/opportunities, and attaining a successful academic career [3]. Now more than ever, due to disease globalization and the continued need to enhance the practice of evidence-based medicine, more demographic-specific research is required [4]. Indeed, the field of medicine is attuned keenly to the high value of research scholarship [5]. However, there is still a vast gap between the acknowledgement of the importance of medical research and its actual practice [6].

The process of any research project development progresses from conceptualization, proposal development, implementation, documentation of findings, drafting of the manuscript, and the culmination of the process is the publishing of the work in a journal, as a book, or in the form of a conference presentation [7], [8]. The research process is by no means an easy task, and each stage is faced with unique challenges that can hinder/militate against the practice of research among resident doctors.

The inability of physicians in training to actively participate in advancing the knowledge of disease prevention, diagnosis, treatment, and management through quality health research limits innovation in the low and middle-income countries (LMICs) [6]. They need to be involved in the processes that frame innovation, whether preventive, promotive, or curative. This involvement should be drawn from their collective contributions of scientific evidence and findings.

Global reports reveal a significant global divide, with developing countries having much lower health research outputs.[9] (WHO). Some studies have sought to identify the various factors that have resulted in low research turn-out among physicians in training [5], [10], [11], [12], [13]. Identified factors include lack of research mentors, gender, insufficient time, poor interest, lack of motivation and incentives, and poor research funding, among others.

Perception reflects how difficult or easy one feels about something. If one perceives an activity as being too difficult, one may be unlikely to participate in that activity. [14] Similarly, if one perceives an activity as being very easy or doable, this state of mind makes it more likely for the individual to engage in that activity. Studying the perceptions behind observed practices and behaviours sets the stage for influencing behaviour change [14].

A study in 2018 amongst resident doctors in Nigeria shows that the majority of respondents had a positive perception of the importance of health research [15] while another study done in a specialist hospital in Ethiopia revealed that resident doctors also had positive feelings towards some various aspects of research [16].

There are very few publications on the perception of research amongst resident doctors as most studies report the participation and engagement of doctors in research [13], [16], [17]. There is a need to examine their perceived barriers to research practice while undergoing their residency training. Therefore, the focus of this study was to explore the perception and barriers to research participation among resident doctors in the Federal Medical Centre, Bayelsa. Nigeria.

MATERIALS AND METHODS:

Study design and setting

This was a hospital-based descriptive cross-sectional study conducted in the Federal Medical Centre, Yenagoa, a major tertiary hospital with about 450 beds. The hospital is the largest centre for training of resident doctors in Bayelsa State. The centre has accreditation to train resident doctors across specialties under the West African College of Surgeons (WACS) or West African College of Physicians (WACP) and National Postgraduate Medical College (NPMCN).

Study Area

This study was carried out in Federal Medical Centre, Bayelsa which is located in Yenagoa local government area (LGA) of Bayelsa State. Bayelsa is an oil-rich state sited in the South-south region of Nigeria. It lies at the heart of the Niger-delta region and is bound on the south and west by the Atlantic ocean, on the north by Delta State and on the east by Rivers State [18]. The major tribe is Ijaw although there is a rich mix of other tribes such as Yoruba, Hausa, Igbos, et cetera.

Christianity is the predominant religion amongst others such as Islam, traditionalism, et cetera.

Study population

The study population consisted of Resident doctors undergoing postgraduate medical training at the Federal Medical Centre, Yenagoa, Nigeria. A Resident doctor was defined as a medical graduate undergoing specialist training in a programme accredited by the National Postgraduate Medical College of Nigeria or the West African College of Physicians/Surgeons. Eligibility for inclusion required the provision of informed consent and a minimum of three months spent in the residency training programme. The residency training pool is not a static one as it is a transition period and resident doctors who complete the programme exit it as part of career development to become consultants.

Sample size determination and Sampling

This study employed a total population sampling method. At the time of the conduct of this study, there were about 108 resident doctors undergoing residency training. All Resident doctors meeting the inclusion criteria, as identified from the most current roster provided by the institution's Residency Training Office, were approached for recruitment. This was to ensure the representation of trainees across all medical and surgical subspecialties within the centre.

Data tool and collection

An adapted semi-structured, self-administered questionnaire adapted from similar studies [10], [15], [17] was used to obtain information. The study questionnaire comprised of the following sections:

Socio-demographic characteristics:

To obtain information on age, sex, marital status, and highest level of education. The options per question were stated for single option selections or to input the responses directly as in the case of 'Age'.

Resident doctors' background academic characteristics:

To obtain information such as their stage of residency training whether junior or senior, place of undergraduate medical training whether Nigeria or foreign, number of years since graduation from medical school, discipline of medicine whether surgical or medical, number of years in residency, and possession of other pre- MBBS and post- MBBS degrees. Furthermore, the resident doctors were required to indicate the specific additional degree obtained and to indicate the sub-specialty they are undergoing residency training programme in. The responses of categorical options stated. In addition, questions regarding the number of years post-graduation from medical school and of duration of residency training required the responses to be input directly.

Perception of Health research:

Perceptions of health research were assessed using an 18-item instrument with a 5-point Likert-like scale (1 = Strongly Disagree to 5 = Strongly Agree). The items evaluated several domains, including the perceived importance of health research, attitudes towards making research mandatory for residency training, perceived difficulty of conducting research, potential applications of research findings, and perceived barriers to research engagement and publication. Barriers to research practice: Information on barriers to research practice was collected through a series of questions regarding the availability of a research mentor and the frequency of reading scientific journals. Additionally, based on a review of the literature, a predefined list of potential barriers was presented. Participants were asked to select all applicable barriers in a multiple-response format and to subsequently identify the single most significant barrier.

Data were collected over 4 months. The study questionnaire was distributed electronically within each clinical department by first contacting the most senior (chief) resident, who facilitated its dissemination to peers via departmental platforms. Follow-up reminders were issued to enhance the response rate.

Validity /Reliability of Instrument

The study instrument was face-validated and content-validated by the two (2) supervisors who are experts in medical education research, who examined the items in the study instrument. The study instrument was pre-tested amongst 30 resident doctors in another academic hospital institution (Niger-Delta University Teaching Hospital) in Okolobiri, Bayelsa state.

Measurement of Variables

i. Perception of resident doctors to health research measured using an 18-item instrument on a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree). Some of these items include how enjoyable they found research, if research was perceived as difficult, whether research was considered important, whether research should be made compulsory, amongst others.

ii. Identified barriers of research practice/ engagement: The most common barriers to research practice were identified, % of resident doctors that ever-received training in health research methodology, % of resident doctors that ever received a research grant, % of resident doctors that ever had a research mentor, and areas of difficulty in the research implementation process.

Statistical Analysis

Data was analyzed using IBM SPSS Statistics for Windows, Version 25.0. The dataset was cleaned to identify and manage missing data. Descriptive statistics were computed; categorical variables were summarized as frequencies and percentages, while continuous variables were expressed as means and standard deviations. Inferential analyses, including cross-tabulations, were conducted.

The categorical variables of Sex, Marital status, Place of undergraduate training, Highest level of education was reported in a table presented as the frequency of 'Yes" and No' responses to the questions asked. Perceptions were measured using an 18-item instrument on a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree). For analytical clarity and due to limited response variation in the initial 5-point scale, responses were collapsed into a 3-point scale (Disagree, Neutral, Agree). Results for each item are presented as frequencies, percentages, and mean ± standard deviation. Each item was interpreted individually to elucidate specific perspectives; a composite perception score was not computed.

Challenges and barriers to research participation, including intent for future engagement, were analyzed using frequencies and proportions. Responses to binary (Yes/No) questions regarding specific barriers were tabulated. The major barriers to research engagement, as identified by the participants, are presented in a bar chart, ranked from the most to the least frequently reported. A separate bar chart illustrates the difficult areas within the research process, from conceptualization to publication.

Ethical Statement

Ethical clearance for this investigation was obtained from the Research Ethics Committee of the Federal Medical Centre, Bayelsa State (FMCY/ REC/ECC/2023/MARCH/561). Participation was entirely voluntary. Before data collection, the study's purpose and procedures were thoroughly explained to all potential participants, and written informed consent was secured. The confidentiality of respondents was protected; no personally identifiable information, such as names or addresses, was collected at any stage of the research.

RESULTS

Of the 108 residents listed at the time of data collection, 80 completed responses were obtained given a response rate of 74.1%. These were analysed, and the summary is presented below.\

Socio-demographic and academic characteristics. Table 1

The mean age was 37.5(+ 4.56) years. A slight majority were males 42 (52.5%), less than 40years 50 (62.5%) and married 68 (85.0%). Majority of respondents were senior resident doctors 48 (60.0%) and mostly in the Medicine specialty 55(68.8%). About two-thirds of resident doctors had graduated for over 10years from medical school 52 (65.0%).

Resident Doctors' Perception of Health Research (HR) (Table 2)

Regarding the statement that Health research practice among resident doctors would improve the care of patients, 4 (5.0%) of resident doctors were neutral. Regarding whether Participating in Health research should be made mandatory among resident doctors, a little above one-thirds 28 (35%) were neutral. When asked about their belief in whether Health research was difficult, half of resident doctors 40 (50.0%) agreed with this. The majority of respondents 71 (88.8%) agreed that participation in health research improves critical appraisal skills but also stated that Health research is expensive for resident doctors to fund by themselves 68 (85.0%).

When asked whether Lack of research training was a major barrier to research engagement amongst resident doctors, a greater majority of resident doctors, 65 (81.2%) agreed with this. Furthermore, a large proportion of resident doctors believe that 'Having a research mentor greatly facilitates research practice amongst resident doctors. Over half of resident doctors 55 (68.7%), also felt that Publication of research was frustrating.

Barriers and future intent to engage in health research (Table 3, Figures 1 and 2)

When asked to identify as many barriers as possible to research they experienced, the most common barriers to research practice identified by resident doctors were 'lack of money' 62 (77.5%), 'insufficient time' 56 (70.5%) and 'limited availability of research mentors' 52 (65.5%) while the least common barrier identified was 'lack of interest' 19 (23.8%). Only one resident 1(1.3%) reported ever receiving a research grant.

Furthermore, a little less than half of resident doctors, 36 (45.0%) reported that they would pursue a research-related career post completion of their residency training programme.

When asked to identify a major barrier to their health research, the most common major barrier identified was 'insufficient time' 23 (28.8) while the least major barriers identified were 'lack of incentives' 2 (2.5%) and 'poor collaboration' 3 (3.8%). These are shown in Figure 1.

Across the various aspects of research, data analyses and interpretation' 19 (23.8%) was the most difficult area in health research identified followed by 'conducting literature review' 17(21.3%) and 'conceptualizing research' 15 (18.8%). Only one resident identified 'publication in a journal' 1 (1.3%) as the most difficult area of the research process as shown in Figure 2.

Table 1: Socio-demographic and academic characteristics.

Variables	Frequency N = 80	Percent %
Sex		
Male	42	52.5
Female	38	47.5
Age group		
<40years	50	62.5
>40 years	30	37.5
Marital Status		
Single	12	15.0
Married	68	85.0
Highest educational level		
MBBS	18	22.5
Post-MBBS degree	62	77.5
Residency phase		
Junior	32	40.0
Senior	48	60.0
Residency training specialty		
Faculty of Physicians+	55	68.8
Faculty of Surgeons++	25	31.3
Number of years since graduation from medical school		
≤10 years	28	35.0
≥10 years	52	65.0
Number of years in residency training		
≤ 6 years	47	58.7
≥ 6 years	33	41.3

+Community medicine, Internal Medicine, Family medicine, Paediatrics, Psychiatry
++Dentistry, Obstetrics & Gynaecology, ENT, Ophthalmology, Surgery

Table 2: Responses on Resident doctors' perception of Health

Items	Disagree N (%)	Neutral N (%)	Agree N (%)	Mean	SD
Health research practice among resident doctors will improve the care of patients	11 (13.8)	4 (5.0)	65 (81.3)	2.68	0.71
Participating in Health research should be made mandatory among resident doctors	14 (17.5)	28 (35.0)	38 (47.5)	2.30	0.75
Health research is difficult	24 (30.0)	16 (20.0)	40 (50.0)	2.20	0.88
Involvement in Health research is a must for career progress as a resident doctor	12 (15.0)	13 (16.3)	55 (68.7)	2.54	0.75
Resident doctors are not as involved in Health research as should be	7 (8.8)	7 (8.8)	66 (82.5)	2.74	0.61
Involvement in Health research by resident doctors will help to change health policy	6 (7.5)	10 (12.5)	64 (80.0)	2.73	0.60
Resident doctors' engagement in health research will provide a better understanding and management of diseases and health conditions	5 (6.2)	1 (1.3)	74 (92.5)	2.86	0.50
Health research engagement is enjoyable	7 (8.8)	36 (45.0)	37 (46.2)	2.38	0.64
Health research improves the resident doctors' critical appraisal skills	3 (3.7)	6 (7.5)	71 (88.8)	2.85	0.45
Health research is expensive for resident doctors to fund by themselves	5 (6.2)	7 (8.8)	68 (85.0)	2.79	0.54
The hospital institution does not prioritise health research among resident doctors	8 (10.0)	9 (11.2)	63 (78.8)	2.69	0.65
Health research engagement by resident doctors should be optional	22 (27.5)	25 (31.2)	33 (41.3)	2.14	0.82
More resident doctors would participate in health research if they accessed funds/ grants.	2 (2.5)	4 (5.0)	74 (92.5)	2.90	0.38
Health research should be made mandatory only for resident doctors who are academic inclined	43 (53.7)	17 (21.3)	20 (25.0)	1.71	0.85
Lack of research training is a major barrier to research engagement amongst resident doctors	4 (5.0)	11 (13.8)	65 (81.2)	2.76	0.53
Having a research mentor greatly facilitates research practice amongst resident doctors	2 (2.5)	1 (1.2)	77 (96.3)	2.94	0.33
Lack of allotted time for research engagement is a major barrier to research engagement amongst resident doctors	2 (2.5)	7 (8.8)	71 (88.8)	2.86	0.41
Publication of research is frustrating	14 (17.5)	11 (13.8)	55 (68.7)	2.51	0.78

N=80; D= Disagree; N= Neutral; A=Agree; SD=Standard deviation

Table 3: Barriers and future intent to engage in health research

Variables	Frequency (N)	Percent (%)
Identified barriers to Research practice		
Lack of money	62	77.5
Insufficient time	56	70.5
Limited availability of research mentors	52	65.5
Lack of technical skill/training	44	55.0
Poor collaboration	42	52.5
Lack of incentives	42	52.5
Lack of research opportunities	32	40.0
Lack of interest	19	23.8
Ever received a Research grant		
Yes	1	1.3
No	79	98.8
Intent to pursue a Research-related career post-residency		
Yes	36	45.0
Undecided	33	41.3
No	11	13.8

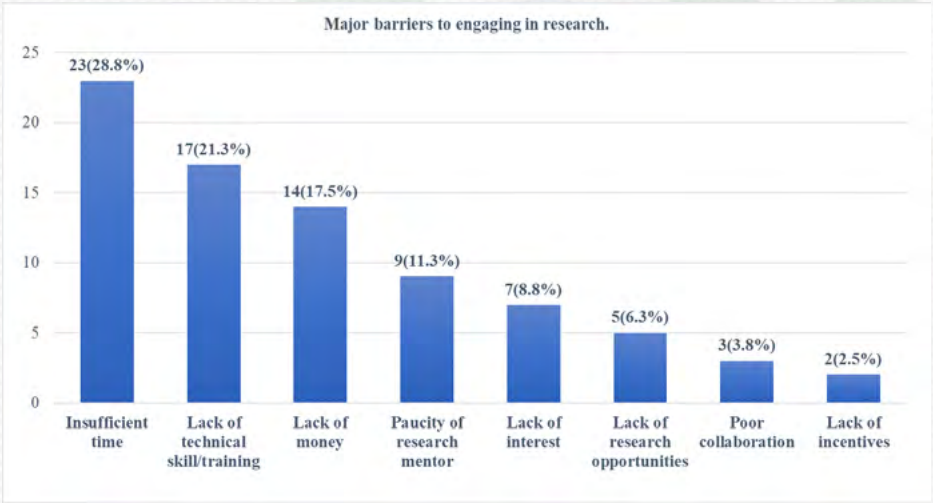

Figure 1: Major Barriers to Health Research Engagement among Resident Doctors.

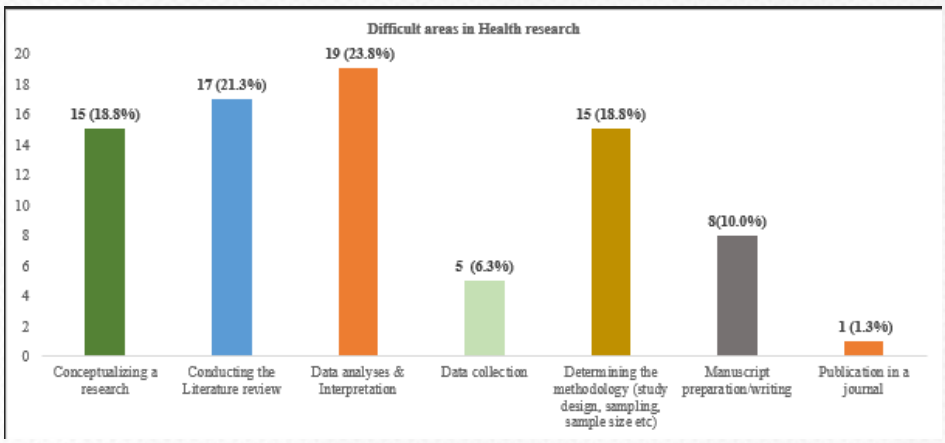

Figure 2: Areas of Difficulty Encountered during Health Research.

DISCUSSION

This research was conducted among resident doctors undergoing residency training in Federal Medical Centre, Bayelsa State Nigeria. This study provides some useful insights into how resident doctors perceive health research to include its importance, its practice and the barriers of health research practice and engagement. It was revealed in this study that majority of resident doctors believe that practicing health research will improve the care of their patients and can help influence policy change as well as improve their critical appraisal skills. Other studies [11], [16], [19] also show the positive assertion by doctors as they believe the findings from research will provide very useful contributions in healthcare. Thus, it reflects that the prioritization of health research is held by resident doctors. However, it was also observed that about 20% of resident doctors were neutral or disagreed with the statement that their involvement in health research could change policy. This has significant implications as it could explain the apathy and unwillingness to be involved in research since they do not see what value it would add to drive change and decision making. It highlights an area that needs to be addressed.

However, this study also revealed the perception of health research practice and engagement as being difficult, frustrating and this was a belief held by 1 in every 2 resident doctors surveyed in this study. This was also reported in a study in Australia [17] that showed that this negative perception about health research could be a barrier to engagement in research. This may be the reason why, in our study, about a third of resident doctors agreed with the statement that health research should not be made mandatory for resident doctors. Interestingly, this finding contrasted with that of a nationwide study amongst resident doctors that showed that almost all the respondents opined that health research should be made compulsory for all resident doctors. [15], [19] The findings from this case study therefore highlight a salient gap between knowing that something is useful and yet expressing a reservation for it being made mandatory and being unwilling to engage in it and requires targeted institutional efforts be made to uncover the reasons and possibly address them. For instance, majority of resident doctors in our study agree with the statement that health research is not prioritized by its management and agree that if funds were provided, and the management addressed other barriers such as lack of training, lack of allotted time, amongst others, their participation in research would be improved. Thus, this highlights an area for possible action or intervention to create an enabling environment to promote engagement in research.

When asked about the major barriers faced in health research engagement, the most reported barrier in this study was 'lack of money, ' and this was followed by 'insufficient time' and 'limited availability of research mentors. This contrasted with findings from a study conducted in Boston among resident doctors, where time was identified as the major research engagement barrier [5]. However, the findings of our study were similar to the top 3 identified barriers to research engagement among early career physicians as reported in a multi-centre study by [15], [19] who found that lack of time dedicated to research, limited mentoring and limited availability of funds were the most commonly identified barriers. Given competing financial needs and priorities, including the cost of the compulsory research required for career progression, it is unsurprising that limited access to funds restricts resident doctors' ability to conduct research. This is further corroborated by the finding in this study that only 1 resident had accessed a research grant. Being awarded a research grant provides some financial buffer to enable the conduct of research. Therefore, the non-availability of research grants may also lead to a further loss of interest in pursuing research if individuals must spend out of pocket to fund their research. This was reported in a study among medical doctors that showed that 96.6% had personally funded their research [20]. Furthermore, the residency training period is very intensive, combining both academic and clinical duties. Thus, with the busy time schedules, ongoing emigration of health professionals leading to short staffing of healthcare facilities [21], it is not surprising that the resident doctor is burnt out and has very little time to conceptualize and implement research projects. . In addition, the lack of mentors is also a very valid challenge with implications for the conduct of future research. If the practice of research amongst resident doctors is low, this pattern is likely to persist: as these doctors' become consultants and trainers, they will be poorly equipped to pass on the necessary research knowledge and skills to the

next generation. Furthermore, with the massive emigration of trainers from the country, there is a depletion of required personnel to provide the necessary mentorship needed to hone and develop research engagement. Another barrier identified was the limited availability of research opportunities and this was identified as a major barrier by half of the respondents in this study. This contrasts responses by resident doctors in Cameroon who attested to having ample research opportunities thus further emphasizing the impact of different context and priorities [13]. This barrier highlights an institutional gap that would need to be further explored in depth and thorough investigation. It is expected that institutions will attract and engage platforms for collaborative research thus providing the resident doctors with the needed platform to conduct innovative research. These platforms can be sponsored in part or full.

This study is one of the very few studies that explored areas of difficulty faced by resident doctors in the conduct of research. It was observed that data analyses and its interpretation was identified as the most difficult area in health research, and this was corroborated by the report that lack of technical training was the second major barrier identified by resident doctors when asked to identify a single option. Although a greater majority of respondents had undergone health research methodology training, there may be a need to have training specific to data analyses to address this barrier.

Beyond individual-level barriers, respondents also identified institutional challenges including the disconnect between the workplace and the lack of research learning curriculum. Therefore, many junior doctors struggle to develop their research capacity as they often find it difficult to connect research engagement and participation with their routine daily practice [17], [22]. A study amongst physicians in Cameroon showed that the most common barrier to the conduct of research was the difficulty faced in obtaining ethical authorization for data collection, in addition to funding limitations and lack of a research team [13].

Lack of time and poor funding have been reported across both developed and developing countries as a major barrier [5], [10], [17], [23]. In addition, funding issues have also been identified and the cost of scholarly activity amongst resident doctors were identified as research barrier in a study of a residency study program in America and it was reported that resident doctors incurred significant costs in the pursuit of scholarly activity. Inadequate funding support was found to be very high in Nigeria [19]. Another study in Boston USA on 90 resident doctors identified that 'finding a mentor' was the most commonly stated barrier to research participation, while 'time' was the second most frequent barrier [5]. The lack of a research mentor was also reported in South Africa [22] and in South-east Nigeria [10].

This study was not without its limitations. This study examined the experiences of the resident doctors regarding the barriers they faced in research practice. A broader perspective, such as the perspectives of the trainers in the facility, would have provided invaluable insight if examined. However, given the constraints of resources, this could not be done. Despite this, the findings from this study provide relevant background for such further studies to be conducted. Another limitation was that this was a single institution research study, and its findings cannot be applicable to all resident doctors' experience across their various training centres in the country or even globally. However, it does provide invaluable insight that can guide the hospital to evaluate the effectiveness of its training programme and thus, shape decision making in the study centre.

Similarly, the findings from this study were based on self-reports, which could have been biased by recall bias, individual limitations, and varying perspectives. In addition to providing an in-depth understanding of the experience amongst resident doctors, it would have been useful to have a qualitative aspect to this research work. This would allow for the beliefs to be examined and understood further. However, this study provides very useful insights to design a follow-up and robust qualitative study. Overall, the findings from this study provide very useful knowledge that can influence and drive decisions for improved research engagement and practice by resident doctors.

CONCLUSION

This study demonstrates that resident doctors hold varied perceptions of health research: most acknowledge its value and importance, yet a notable proportion still regard it as difficult, frustrating, and

costly to undertake. The principal barriers identified were insufficient time, lack of technical training, and lack of money.

These findings indicate that valuing research is not, on its own, sufficient to drive engagement; resident doctors who recognize its importance may still disengage from a practice they consider too difficult or under-resourced to pursue. This gap between perceived value and felt capability points to structural and institutional shortcomings including inadequate funding, mentorship, and protected time rather than to a simple lack of motivation among resident doctors.

Residency training programmes should implement structured, systematic interventions, including dedicated research funding, access to research mentors, protected research time, and targeted training in data analysis, in order to lower the practical barriers to research engagement and convert positive attitudes into actual scholarly output.

Future studies should adopt a multi-institutional and, where possible, qualitative design, and should capture the perspectives of trainers and programme administrators, to better understand and address the institutional drivers of low research engagement among resident doctors.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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AUTHOR CONTRIBUTIONS

Conceptualization: MUI, FHB, JAI; Data collection & Formal analysis: MUI & AHC, Writing, review & editing: MUI, RSU, AHC, FHB, JAI. All Authors approved the final draft.

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