

An exploration of profile, perceptions, barriers, and predictors of research engagement among resident doctors: a report from CHARTING study

Martin Igbokwe, Oladimeji Adebayo¹, Oluwaseyi Ogunsuji², Gbenga Popoola³, Rereloluwa Babalola, Sebastine Oseghae Oiwoh⁴, Anuoluwapo Mojisola Makinde, Adebayo Makinde Adeniyi⁵, Kehinde Kanmodi⁶, Wasinda Francis Umar⁷, Ayanfe Omololu⁸, Ibiyemi Oduyemi⁹, Abdulmajid Ibrahim Yahya¹⁰, Aliyu Sokomba¹¹

Department of Surgery, Obafemi Awolowo University Teaching Hospital, Ile-Ife, ¹Department of Medicine, University College Hospital, Ibadan, ²Department of Community Dentistry and Periodontology, University College Hospital, Ibadan, ³Department of Psychiatry, Federal Teaching Hospital, Ido-Ekiti, ⁴Department of Internal Medicine, LAUTECH Teaching Hospital, Ogbomoso, ⁵Department of Community Medicine, Federal Teaching Hospital, Ido-Ekiti, ¹¹Department of Community Medicine, Ahmadu Bello University Teaching Hospital, Zaria, ⁶Kebbi Medical Centre, Birnin Kebbi, ⁷Department of Internal Medicine, Federal Medical Centre, Katsina, ⁸Department of Internal Medicine, Federal Medical Centre, Abeokuta, ⁹Department of Child Oral Health, University College Hospital, Ibadan, ¹⁰Department of Ear, Nose & Throat, Federal Teaching Hospital, Gombe, Nigeria

Abstract

Purpose/Aims: This research aimed to study the profile, perceptions, barriers, and predictors of Nigerian resident doctors' level of engagement in scientific research.

Methods: This study was a descriptive cross-sectional quantitative survey of 438 resident doctors in Nigeria. This study forms a part of the big CHARTING Study, the protocol of which was published in "Nigeria Journal of Medicine 2019;28:198-205."

Results: Three hundred and eighteen (72.8%) respondents were male and 119 (27.2%) were female. There were 229 (52.4%) registrars and 208 (47.6%) senior registrars, while residents in surgical versus nonsurgical specialties were 190 (44.5%) and 237 (55.5%), respectively. Three hundred and sixty-eight (85%) respondents had participated previously in research; 67 (15.6%) and 72 (16.6%) had their papers published in local or international journals, respectively; and only 46 (10.6%) had held first authorship positions in peer-reviewed journal publications. The significant barriers to research identified among them included lack of funding, lack of free time, inadequate training/knowledge on research methodology, and the onerous nature of clinical research. The independent predictor of previous engagement with research was years on current job ($P = 0.007$). This was similar to finding for the first authorship of a peer-reviewed article among the respondents ($P = 0.017$).

Conclusion: This study concludes that publication and grantsmanship rates were very low among the surveyed resident doctors, despite their high rate of engagement in research projects. There is a need for increased research capacity building among resident doctors in Nigeria.

Keywords: Academics, Nigeria, publication, research, resident doctors, workplace

Address for correspondence: Dr. Oladimeji Adebayo, Department of Medicine, University College Hospital, Ibadan, Nigeria.

E-mail: doctorladi@yahoo.com

Received: 24-05-20, **Revised:** 01-07-20, **Accepted:** 20-08-20, **Published:** 01-02-21.

Access this article online	
Quick Response Code:	Website: www.picronline.org
	DOI: 10.4103/picr.PICR_152_20

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Igbokwe M, Adebayo O, Ogunsuji O, Popoola G, Babalola R, Oiwoh SO, *et al.* An exploration of profile, perceptions, barriers, and predictors of research engagement among resident doctors: a report from CHARTING study. *Perspect Clin Res* 2022;13:106-13.

INTRODUCTION

Research is a major driver of innovation and advancement in health care. It has served as the foundation for evidence-based medicine and thus it has defined the various approaches to modern health-care service delivery globally.^[1]

Engagement in research is a critical component of residency training for post-graduate doctors in Nigeria to this effect, and the West African College of Physicians/Surgeons and the National Postgraduate Medical College have made high-quality research a major pre-requisite for the successful completion of Nigerian postgraduate (a. k. a. residency) training programs.^[2] Research activities in postgraduate medical/dental training help in remodeling and guiding the thoughts of resident doctors via objective analysis and proper understanding of disease entities. This thus adds value to their knowledge and clinical skills and invariably enhances their problem-solving abilities which ultimately improve patient care.

Even though a research dissertation is one of the compulsory requirements for the attainment of a fellowship award from the postgraduate medical and dental colleges in Nigeria, resident doctors are still also expected to engage in other research activities and as well publish their research findings in reputable outlets. The rationale behind the aforementioned requirements is to enhance the training outcomes of resident doctors during the 4–8 years period of their residency training.^[3] However, the current level of involvement of resident doctors in Nigeria in research activities is very limited and worrisomely low for noncurricular participation.^[2]

Residency training in Nigeria is hinged on the tripod of clinical services, research, and training. Resident doctors embarking on these postgraduate medical/dental training programs are expected during training to acquire logical and analytic skills and knowledge in their specific fields of interest; thus, research participation is a very crucial component of their training.^[2] Research plays a pivotal role in postgraduate training as it emboldens critical appreciation, appraisal, and judgment, promotes both imagination and self-education, and as well enhances the acquisition of sound knowledge.

Only scanty literature exists on the research knowledge, attitudes, perception, and challenges among resident doctors in Nigeria.

Based on the above, this study was conducted with the objectives of exploring the profile and practices and also determining the barriers, perceptions, and predictors of participatory engagements in research among resident doctors in Nigeria.

METHODS

Study design and setting

This study was a descriptive cross-sectional quantitative survey of resident doctors in Nigeria which adopted the use of a structured self-administered questionnaire. This study was a part of the bigger CHARTING Study. The protocol of this study had been previously published.^[4]

Description of study participants in the Nigerian context

Resident doctor

A doctor undergoing postgraduate medical/dental training in any of the accredited postgraduate medical colleges in Nigeria. A resident doctor can be in any of these two categories: registrar and senior registrar.^[3]

Registrar

A resident doctor who is yet to pass the Part 1 fellowship/membership examination. It normally takes 2–3 years of residency training before a registrar can be eligible to sit for the part 1 fellowship examination.^[3]

Senior registrar

A resident doctor who has passed the Part 1 fellowship examination and is currently undergoing further residency training but is yet to pass the part 2 fellowship examination. It normally takes another 2–4 years of additional training before a senior registrar can be eligible to sit for the Part 2 fellowship examinations. A fellowship award is issued by the concerned postgraduate medical/dental college after a senior registrar has passed the Part 2 fellowship examination and as well satisfied other given criteria.^[3]

Study instrument

The data for this study were extracted from the CHARTING study instrument which was a structured paper questionnaire. Five sections (Sections A to E) were utilized: Section A obtained information about the sociodemographic characteristics (including age, gender, cadre, specialty type, and academic qualifications) of the participants; Section B obtained information about the participants' research practices; Section C obtained information about the factors influencing participants engagement in research; Section D obtained information about participants' perception of research; and Section E obtained information about participants' perceived barriers to engagement in research projects. Fifteen questions were on perception and were rated in Likert scale of 1–5 (1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, and 5 = strongly agree).

Selection criteria

The criteria for participants' selection include:

- i. Being a resident doctor registered under any of the two accredited postgraduate medical colleges in Nigeria

- ii. Being affiliated to any of the Nigerian training centers (i.e., teaching hospitals and medical centers) chosen as the study's catchment area, in accordance with the study protocol^[4]
- iii. Giving written informed consent to participate in the study.

Sampling and sample size

Multistage sampling was used to select participants, and this has been described in the previously published protocol.^[4]

The study's sample size was determined based on past findings. The prevalence of work-related stress as one of the barriers to research among physicians in developing countries ranges between 52.3% and 57.2%. The sample size, n , was determined using Leslie Kish formula: $N = z^2 pq/d^2$,^[5] where p is the prevalence, $q = 1-p$, $z =$ level of significance at 5% (using 95% confidence interval) = 1.96, $d = 0.05$ which is the level of precision ($P = 57.2\%$, $q = 0.428$, $z = 1.96$, $d = 0.05$), and $N = 376$. based on nonresponse rate of >15%, the sample size was increased to 438.

Data collection and analysis

This study was carried out within the period of 8 months (June 2019–January 2020) in which data collection, entry, and analysis was done. The data collection process adopted was in line with the study protocol. A total of 438 questionnaires which met up with the selection criteria were analyzed for the study.

Data analysis was done using SPSS statistical package 23 (SPSS Inc, IBM, Armonk, NY, USA). Continuous variables were summarized using arithmetic mean and standard deviation, whereas the categorical variables were summarized as proportions and frequencies.

Chi-square was used to test the association between the dependent and independent variables, whereas associations between their means were compared using ANOVA. The dependent variables were questions included in the questionnaire to explore the perception, barrier, and practices of medical research among resident doctors, whereas the independent variables were sociodemographic characteristics (e.g., age, gender, and marital status), year of graduation, qualification, year on the current position years of experience, and years since graduation among others.

Binary logistic regression (multivariable analysis) was done to determine the predictors of engaging in research and of ever being a first author of a peer-reviewed article. $P < 0.05$ was considered significant.

Ethical considerations

Ethical approval was obtained from the National Ethics Review Committee, Federal Ministry of Health before fieldwork was commenced in accordance with the National Code of Health Research Ethics Committee (NHREC) (NHREC Approval Number NHREC/01/01/2007-26/06/2019). Written informed consent was also sought and obtained from all consenting participants; hence, only those that were willing to participate in the study after knowing fully well the purpose of the study were recruited for the study. Furthermore, all participants' identities were kept with strict confidentiality.

RESULTS

Not all the 438 respondents responded to all the variables in the questionnaire; hence, the percentages used in the presentation of the study variables were based on the total number of respondents that responded to that particular variable.

Three hundred and eighteen (72.8%) were male and 119 (27.2%) were female, giving an approximated male-to-female ratio of 2.7:1. Two hundred and twenty-nine (52.4%) were registrars, and 362 (85.8%) had graduated from undergraduate medical/dental school at least six years ago. The mean (\pm SD) number of years spent by respondents after graduation from undergraduate medical/dental schools was 8.54 (\pm 2.99). Only 82 (18.8%) had an additional academic qualification, and the most common was master's degree (10.1%) [Table 1].

Majority (77.6%) of the respondents had average working hours of more than 40 h/week (self-reported). Also, majority (85.0%) of them had participated in a research work, 147 respondents (33.9%) had presented their research work in public forum, while only 46 (10.6%) had been a first author of a peer-reviewed article [Table 2]. Seventy-two (16.6%) and 67 (15.6%) of the respondents had published their research works in international and local journals, respectively. Only 10 (2.3%) and 9 (2.1%) respondents, respectively, were able to obtain grants from local and international agencies for their previous research or projects [Table 2].

The factors that positively predict resident doctors' involvement in research were having >8 years postgraduation experience and spending >4 years on the current job with ($P < 0.05$) [Table 3]. Also, having a master's degree, having >8 years postgraduation experience, and spending >4 years on the current job with were positive predictors of first authorship position in the scientific publications of the respondents ($P < 0.05$) [Table 4].

Table 1: Sociodemographic profile of respondents

Variables	n (%)
Age (n=393), mean±SD	35.3±4.4
Gender (n=437)	
Male	318 (72.8)
Female	119 (27.2)
Marital status (n=436)	
Single	90 (20.6)
Married	342 (78.4)
Divorced	4 (0.9)
Cadre (n=437)	
Registrar	229 (52.4)
Senior registrar	208 (47.6)
Type of specialty (n=427)	
Surgical related	190 (44.5)
Nonsurgical related	237 (55.5)
Number of years of graduation from medical school (n=422)	
≤5 years	60 (14.2)
6 years and above	362 (85.8)
Years of graduation from medical school (n=421)	
≤8 years	215 (51.1)
>8 years	206 (48.9)
Years on current job (n=410)	
≤4 years	256 (62.4)
>4 years	154 (37.6)
Additional educational qualifications (n=437)	
Masters	44 (10.1)
PhD	1 (0.2)
PGD	14 (3.2)
Others (diploma and certificate courses)	23 (5.3)
Masters (n=437)	
Yes	44 (10.1)
No	393 (89.9)
PhD (n=437)	
Yes	1 (0.2)
No	436 (99.8)

“n” Total number of respondents

Comparison between the male and female genders as well as among cadres of registrar and senior registrars showed no significant statistical difference as depicted in Tables 5 and 6.

DISCUSSION

The importance of research in evidence-based clinical practice cannot be overemphasized.^[1] Resident doctors are future research leaders, especially in clinical fields; it is therefore imperative that there is relevant information concerning research among residents. In the present study, roughly 9 out of every 10 surveyed resident doctors had participated in research work as at the time of this study.

In Nigeria, residency training requires undertaking a research thesis project in order to meet one of the fulfillments required for bagging a fellowship award from postgraduate medical/dental colleges in Nigeria. This requirement applies only to senior registrars as research thesis forms a major component of their Part 2 fellowship examination, unlike those in the registrar category where research thesis

Table 2: Work Characteristics and practice and experience regarding research

Variables	n (%)
Self-reported average hours worked per week (n=415)	
≤40 h	93 (22.4)
>40 h	322 (77.6)
Average call days a month (n=419)	
≤7 days	172 (41.1)
>7 days	247 (58.9)
Average hours of educational activities (n=401)	
≤7 h	257 (64.1)
>7 h	144 (35.9)
Average hours of research involvement (n=355)	
≤7 h	159 (44.8))
>7 h	196 (55.2)
Previous undergraduate research methodology training (n=430)	
Yes	255 (59.3)
No	175 (40.7)
Previous post-graduate research methodology training (n=431)	
Yes	221 (51.3)
No	210 (48.7)
Previous participation in any research work (n=433)	
Yes	368 (85.0)
No	65 (15.0)
Previous presentation of any research work anywhere (n=433)	
Yes	147 (33.9)
No	286 (66.1)
First authorship in a peer-reviewed journal publication (n=434)	
Yes	46 (10.6)
No	388 (89.4)
Published any of your research works in any local journal (n=430)	
Yes	67 (15.6)
No	363 (84.4)
Have you ever published any of your research work in any international journal? (n=433)	
Yes	72 (16.6)
No	361 (83.4)
Have you ever received any of your research or project grant from any local agency or body? (n=433)	
Yes	10 (2.3)
No	423 (97.7)
Have you ever received any of your research or project grant from any international agency or body? (n=433)	
Yes	9 (2.1)
No	424 (97.9)
Will you carry out research after residency? (n=434)	
Yes	351 (80.9)
No	8 (1.8)
Undecided	75 (17.3)
Do you think your future research plans will help you in your career? (n=429)	
Yes	378 (88.3)
No	3 (0.7)
Undecided	47 (11.0)

n: Total number of respondents per category

submission is not a component required for the eligibility toward Part 1 examination. However, it is very laudable that most of the respondents had some experience in research, despite the fact that over 50% of them were registrars and registrars are not usually required by postgraduate medical

Table 3: Predictors of respondents' engagements in research

Variables	Bivariate analysis					Multivariate analysis			
	Ever participated in any research work		Odds ratio	95% CI	P	B	Adjusted odd ratio	95% CI	P
	Yes (%)	No (%)							
Marital status (n=432)			1.168	0.622–2.194	0.629				
Married	292 (85.4)	50 (14.6)							
Not married									
Years of graduation (n=418)									
<5 years	47 (79.7)	12 (20.3)	0.649	0.322–0.811	0.222				
>5 years	308 (85.8)	51 (14.2)							
Years of graduation (n=417)									
<8 years	169 (80.1)	42 (19.9)	0.457	0.260–0.803	0.006*	0.166	1.180	0.603–2.311	0.629
>8 years	185 (89.8)	21 (10.2)							
Years on the current job (n=406)									
<4 years	204 (81.0)	48 (19.0)	0.327	0.164–0.809	0.001*	1.124	3.079	1.351–7.017	0.007*
>4 years	143 (92.9)	11 (7.1)							
Masters (n=434)									
Yes	38 (88.4)	5 (11.6)	1.382	0.523–3.653	0.513				
No	330 (84.6)	60 (15.4)							
PhD qualification (n=433)									
Yes	1 (100.0)	0 (0.0)	1.177	1.131–1.225	1.000 ^F				
No	367 (85.0)	65 (15.0)							
Resident duty hours (n=411)									
<40 h	72 (78.3)	20 (21.7)	0.561	0.311–1.012	0.053				
>40 h	276 (86.5)	43 (13.5)							
Call days per month (n=415)									
<7 days	142 (83.5)	28 (16.5)	0.902	0.528–1.541	0.706				
>7 days	208 (84.9)	37 (15.1)							
Educational activities (n=399)									
<7 h	222 (86.4)	35 (13.6)	1.226	0.692–2.171	0.484				
>7 h	119 (83.8)	23 (16.2)							
Duration of research involvement (n=352)									
<7 h	134 (84.8)	24 (15.2)	0.788	0.429–1.450	0.443				
>7 h	170 (87.6)	24 (12.4)							
Age (n=389)									
<30 years	297 (84.6)	54 (15.4)	0.647	0.221–1.887	0.424				
>30 years	34 (89.5)	4 (10.5)							

* $\chi^2=7.66$, *0.006 $\chi^2=10.91$, *0.001, n: Total number of respondents per category, CI: Confidence interval

colleges in Nigeria to undertake a major research project at that stage of their training.^[3] With this relatively large percentage of these respondents having history of participation in research, it is suggested that more studies should be conducted to assess the depth of knowledge of resident doctors in Nigeria on clinical research methodology, because high rate of participation in research projects does not necessarily translates to deep understanding of research methodology.

We found in this study that only 33.9% of the respondents had presented their research works in various public fora; this observed rate was lower than those reported among Indian (44%) and Pakistani (51.7%) resident doctors.^[6,7]

Furthermore, a small fraction of the surveyed resident doctors had been able to publish their research articles in international (16.6%) and local (15.6%) journals; our observed rates are similar to the that reported, by Satav and Wankhede, in an Indian study but was lower than that reported by

Sumi *et al.* among Japanese resident doctors.^[6,7] These key research-related activities are important indicators of their research outputs or perhaps an excellent reflection of their contribution to scholarship. This implies that a significant population of Nigerian resident doctors may commence their postresidency careers with their thesis as the only research output. Most (92.6%) of the respondents in this present study considered lack of financial support, or funding, as a challenging factor when it comes to conducting research. This implies that most of them do not have access to research grants which help defray expenses of rigorous research project.

Multivariate analysis showed that more than 4 years on the current job was associated with increased interest in research. This would mean that more years on the residency program increase their chances of publishing. Additional qualifications, however, did not have any significant impact in research probably due to the small proportion of those who had such degree.

Table 4: Predictors of ever being a first author of a peer-reviewed article among the respondents

Variables	Ever been the first author of a peer-reviewed article		Odd ratio	95% CI	P	B	Adjusted odd ratio	95% CI	P
	Yes (%)	No (%)							
	Marital status (n=433)								
Married	38 (11.1)	305 (88.9)							
Not married	8 (8.9)	82 (91.1)							
Years of graduation (n=419)									
<5 years	4 (6.8)	55 (93.2)	0.551	0.190–1.597	0.266				
>5 years	42 (11.7)	318 (88.3)							
Year of graduation (n=418)									
<8 years	11 (5.2)	201 (94.8)	0.267	0.132–0.542	<0.001*	0.889	2.432	0.709–8.343	0.158
>8 years	35 (17.0)	171 (83.0)							
Years on the current job (n=408)									
<4 years	14 (5.5)	239 (94.5)	0.232	0.119–0.453	<0.001*	1.280	3.597	1.253–10.329	0.017*
>4 years	31 (20.1)	123 (79.9)							
Masters (n=434)									
Yes	14 (32.6)	29 (67.4)	5.416	2.602–11.275	<0.0001* ^F	-20.264	0.000		1.000
No	32 (8.2)	359 (91.8)							
PhD (n=435)									
Yes	0 (0.0)	1 (100.0)	1.119*	1.083–1.156	1.000 ^F				
No	46 (10.6)	387 (89.4)							
Number of spouses (n=304)									
Monogamous	39 (11.5)	301 (88.5)							
Resident duty (n=412)									
<40 h	14 (15.2)	78 (84.8)	1.615	0.822–3.176	0.161				
>40 h	32 (10.0)	288 (90.0)							
Call days per month (n=416)									
<7 days	19 (11.2)	151 (88.8)	1.021	0.548–1.902	0.949				
>7 days	27 (11.0)	219 (89.0)							
Educational activities (n=400)									
<7 h	21 (8.2)	236 (91.8)	0.581	0.301–1.121	0.102				
>7 h	19 (13.3)	124 (86.7)							
Duration of research involvement (n=353)									
<7 h	16 (10.1)	143 (89.9)	0.793	0.405–1.550	0.496				
>7 h	24 (12.4)	170 (87.6)							
Age (n=390)									
<30 years	35 (9.9)	317 (90.1)	0.489	0.201–1.192	0.161 ^F				
>30 years	7 (18.4)	31 (81.6)							

n: Total number of respondents per category, CI: Confidence interval. $\chi^2=28.29$, * <0.0001

Table 5: Gender difference in perception toward research among the respondents

Variables on perception	Male		Female		P
	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	
RD should be more involved in medical research	4.63±0.85	5.00 (0.00)	4.62±0.71	5.00 (1.00)	0.899
Training in medical research should be made compulsory among RD	4.39±0.97	5.00 (1.00)	4.44±0.72	5.00 (1.00)	0.627
Medical research will promote Resident Doctors' appraisal skills	4.46±0.88	5.00 (1.00)	4.36±0.67	4.00 (1.00)	0.292
Medical research among Resident Doctors will improve patient's care	4.37±0.89	5.00 (1.00)	4.28±0.79	4.00 (1.00)	0.340
Medical research among RD will provide a better understanding of disease	4.41±0.89	5.00 (1.00)	4.38±0.65	4.00 (1.00)	0.755
Medical research among RD will help in changing health policies	4.36±0.95	5.00 (1.00)	4.43±0.63	4.50 (1.00)	0.437
Research will enhance your career	4.70±2.98	5.00 (1.00)	4.55±0.69	5.00 (1.00)	0.579
Medical research is difficult	2.86±1.16	3.00 (2.00)	2.87±1.09	3.00 (2.00)	0.912
Lack of knowledge about medical research	4.34±4.60	4.00 (0.00)	3.84±0.92	4.00 (0.00)	0.236
Lack of training about medical research	4.53±4.34	4.00 (1.00)	4.18±0.75	4.00 (1.00)	0.391
Lack of research methodology	4.35±2.39	4.00 (1.00)	4.25±0.86	4.00 (1.00)	0.648
Lack of time to engage in medical research	4.28±2.41	4.00 (1.00)	4.28±0.82	4.00 (1.00)	0.999
Lack of financial support or funding for research	4.40±0.83	5.00 (1.00)	4.43±0.74	5.00 (1.00)	0.714
Lack of facility for medical research	4.22±0.93	4.00 (1.00)	4.29±0.94	5.00 (1.00)	0.529
Will you carry out research after residency	1.28±0.69	1.00 (0.00)	1.58±0.90	1.00 (2.00)	<0.001
Do you think your future research plans will help you in your career	1.23±0.63	1.00 (0.00)	1.22±0.63	1.00 (0.00)	0.929

SD: Standard deviation, IQR: Interquartile range, RD: Resident doctors

With regard to first authorship in a paper, doctors who had spent >4 years on the current job were more likely to have

been first authors in a research paper. The reason why those respondents with the aforementioned attributes are more

Table 6: Differences in perception of respondents toward research, based on cadre

Variables	Registrar		Senior registrar		P
	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	
RD should be more involved in Medical Research	4.68±0.65	5.00 (1.00)	4.59±0.93	5.00 (0.00)	0.383
Training in medical research should be made compulsory among RD	4.40±0.81	5.00 (1.00)	4.41±1.01	5.00 (1.00)	0.939
Medical research will promote RD's appraisal skills	4.37±0.75	5.00 (1.00)	4.39±0.95	5.00 (1.00)	0.358
Medical research among RD will improve patient's care	4.38±0.74	4.00 (1.00)	4.29±0.98	5.00 (1.00)	0.279
Medical research among RD will provide a better understanding of disease	4.47±0.71	5.00 (1.00)	4.33±0.95	5.00 (1.00)	0.068
Medical research among RD will help in changing health policies	4.45±0.79	5.00 (1.00)	4.30±0.96	5.00 (1.00)	0.078
Research will enhance your career	4.83±3.45	5.00 (1.00)	4.48±0.95	5.00 (1.00)	0.161
Medical research is difficult	2.81±1.09	3.00 (2.00)	2.92±1.20	3.00 (2.00)	0.314
Lack of knowledge about medical research	4.13±3.88	4.00 (0.00)	4.29±4.05	4.00 (0.00)	0.660
Lack of training about medical research	4.29±2.75	4.00 (1.00)	4.59±4.57	4.00 (1.00)	0.409
Lack of research methodology	4.15±0.82	4.00 (1.00)	4.51±2.89	4.00 (1.00)	0.073
Lack of time to engage in medical research	4.41±2.75	4.00 (1.00)	4.14±0.96	4.00 (1.00)	0.189
Lack of financial support or funding for research	4.45±0.74	5.00 (1.00)	4.35±0.87	5.00 (1.00)	0.192
Lack of facility for medical research	4.28±0.89	4.00 (1.00)	4.20±0.98	4.00 (1.00)	0.364
Will you carry out research after residency	1.37±0.78	1.00 (0.00)	1.36±0.78	1.00 (0.00)	0.864
Do you think your future research plans will help you in your career	1.22±0.62	1.00 (0.00)	1.24±0.64	1.00 (0.00)	0.786

SD: Standard deviation, IQR: Interquartile range, RD: Resident doctors

likely to hold first authorship positions in published papers is most probably due to the simple fact they are current in the residency training program, which is essentially in tertiary health institutions where senior doctors or faculty are likely to join residents in coauthorship of articles.

Many of our survey respondents were of the belief that training in medical research should be compulsory at all levels of residency training. This is a good opinion that needs to be considered by all stakeholders involved in the residency training program. Furthermore, research had shown that there are limited time, technical skills, and other resources needed for medical research among resident doctors in developing countries, including Nigeria.^[8-11] For instance, some resident doctors in Nigeria had been found to demonstrate poor level of knowledge of biostatistics.^[9] Another study in Pakistan showed inadequate knowledge of research among Residents Doctors studied.^[12]

Comparing the gender disparity in perception and practice of research among resident doctors in this study, there exists no significant difference in many parameters except that females hope to continue with research following completion of their residency program. The explanation for this pattern is that in Nigeria like many part of the world, medicine is a male-dominated field and females may have the perceived need to work a lot harder in order to make a mark in the ever competitive industry and to remain relevant. Research achievement is a potential distinguishing career feature that keeps one's relevance, more especially in academic arena. In Chennai, Chellaiyan *et al.* found that there was no gender difference in the research practices among medical students which was similar to the findings by Soubhanneyaz *et al.* in Saudi Arabia.^[13,14] Soubhanneyaz

et al., however, noted that males were more likely to be engaged in proposal writing than females.^[14]

This study did not reveal any significant differences between the perceptions and practice of research among the participating registrars and senior registrars. Both groups agreed equivocally on the need for training on medical research and the overall importance of research to their careers. The compulsory nature of dissertation writing before acquisition of the fellowship degree in the residency training programs may have played a major role in this; hence, all residents are aware of the need to have in-depth knowledge on the principles and practice of medical research for their careers.

More effort needs to be done by the relevant stakeholders to ensure residents doctors are involved in research activities in early stage of their career. This can be attained by provision of more funding, quality mentorship, initiation and promotion of research reward schemes, and support publication fee for articles where resident doctors are first authors.

Some of the limitations to this study include the context of "research," as used in this study, as research includes various types of work including baseline surveys, clinical trials, narratives, systematic review, and others. Also, the types of research writings (such as editorial, commentary, letter to the editor, review article, systematic review, and others) which the respondents contributed to were not highlighted in this study.

However, it is recommended that the interest of resident doctors in Nigeria should be sustained in research activities while funding should be provided for research activities by all levels of governments and also the training institutions.

CONCLUSION

This study concludes that publication and grantsmanship rates were very low among the surveyed resident doctors, despite their history of high rate of engagement in research projects. Thus, there is a need to support research capacity building among resident doctors in Nigeria. The government at all levels, the training institutions, and as well the trainees (i.e., resident doctors) are stakeholders that should come together and developed workable strategies that will strengthen research capacities of resident doctors in Nigeria.

Acknowledgment

We like to acknowledge the National Executive Council of Nigerian Association of Resident Doctors (NARD) and the Advisors of the Research and Statistics Committee/ Research Collaboration Network of the NARD and our research assistants: Miss Iyanu Adufe and Miss Tobi Akande.

Financial support and sponsorship

National Association of Resident Doctors of Nigeria.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Ghooi RB. Trials and tribulations of clinical research teaching and training. *Perspect Clin Res* 2010;1:139-42.
- Jeje EA, Elebute OA, Mofikoya BO, Ogunjimi MA, Alabi TO, Ekekezie OO. Research experience of resident doctors who attended research methodology courses of the National Postgraduate Medical College of Nigeria. *Niger Postgrad Med J* 2017;24:31-6.
- Adebayo O, Fagbule OF, Omololu A, Ibrahim YA, Isibor E, Olaopa O, *et al.* We are NARD we are Early Career Doctors. Abuja: National Association of Resident Doctors of Nigeria; 2019.
- Kanmodi K, Ekundayo O, Adebayo O, Efuntoye O, Ogunsuji O, Ibiyo M, *et al.* Challenges of residency training and early career doctors in Nigeria study (CHARTING STUDY): A protocol paper. *Niger J Med* 2019;28:198-205.
- Kish L. *Statistical Design for Research*. Vol.83: John Wiley & Sons; 2004.
- Satav PJ, Wankhede UN. Knowledge, attitude, and practice of resident doctors about medical research in BJ medical college, Pune, Maharashtra. *Int J Reprod Contracept Obstet Gynecol* 2017;6:2969-72.
- Sabzwari S, Kauser S, Khuwaja AK. Experiences, attitudes and barriers towards research amongst junior faculty of Pakistani medical universities. *BMC Med Educ* 2009;9:68.
- Sumi E, Murayama T, Yokode M. A survey of attitudes toward clinical research among physicians at Kyoto University Hospital. *BMC Med Educ* 2009;9:75.
- Okoro PE, Karibi EN. Knowledge and use of biostatistics among resident and junior doctors at the University of Port Harcourt Teaching Hospital, Port Harcourt. *Niger J Surg* 2019;25:60-3.
- Moges T, Deribew M, Mariam DH. Knowledge, attitude, and practice of residents in medical research and barriers: A cross-sectional survey at Tikur Anbessa Specialized Hospital. *Ethiop J Health Dev* 2017;31:259-65.
- Azhar GS, Azhar AZ, Azhar AS. Overwork among residents in India: A medical resident's perspective. *J Fam Med Prim Care* 2012;1:141-3.
- Khan H, Khan S, Iqbal A. Knowledge, attitudes and practices around health research: The perspective of physicians-in-training in Pakistan. *BMC Med Educ* 2009;9:46.
- Chellaiyan VG, Manoharan A, Jasmine M, Liaquathali F. Medical research: Perception and barriers to its practice among medical school students of Chennai. *J Educ Health Promot* 2019;8:134.
- Soubhanneyaz AA, Salem KA, Al-Dubai SA. Perceptions, barriers, and practice of medical research of family medicine residents in Medina, Saudi Arabia. *Med Educ* 2019;26:227-31.