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ASSESSMENT OF AWARENESS OF CAREERS IN PHARMACY PROFESSION AMONG SECONDARY SCHOOL CAREER ADVISORS IN KADUNA STATE, NIGERIA

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ABSTRACT

Background: Career advisors are traditionally required to guide students in choosing the right subject combinations, to do this the career advisors must have an accurate information about various professions.

Aim: This study aimed to assess the awareness of careers in pharmacy among secondary school career advisors in Kaduna State, Nigeria and also to compare their awareness scores.

Methodology: A cross sectional survey was conducted (from February 2019 to July 2019) among 83 conveniently sampled secondary school career advisors from Zaria and Giwa educational zones of Kaduna state, Nigeria. The awareness of careers in pharmacy profession was assed using a self-completed questionnaire. The data were analysed using SPSS version 22 and presented as descriptive and inferential statistics where appropriated.

Results: The response rate of 97.5% was obtained. Majority of the career advisors had fair knowledge of careers in pharmacy 68.8% (55), 77.5% (62) were aware of the institutions where pharmacists are trained, 65% (52) were aware of minimum duration of study for B. pharm degree 65% (52). Majority of the career advisors 95% (76) were not aware of the minimum duration for doctor of pharmacy degree. There was no significant statistical relationship between the demographic variables of the career advisors and their level of awareness about pharmacy profession ($p>.05$).

Conclusion: The secondary school career advisors had fair level of awareness of careers in pharmacy profession and this awareness had no significant statistical relationship to the demographic characteristics of the career advisors

Keywords: Secondary school, Pharmacy, Career advisors, B. Pharm

1.0 INTRODUCTION

The aspiration of an individual to study pharmacy starts from the right subject combination in secondary school and an individual's interest for a particular course. Career advisors are traditionally required to guide students in choosing the right subject combinations that suit the requirements of such students to pursue their prospective course at higher or next level of education. Factors such as teachers, family, friends,

self-employment in healthcare-related jobs and excellent career opportunities were described as important factors that influence students' choice of preferred course. (1–4) Students in Nigeria are expected to undergo six years of primary education followed by six years in secondary school (three years in junior and another three in senior secondary school), and finally, tertiary education that varies from 2-6 years depending on the institution and course of study. At senior

secondary schools, students are then required to focus on a combination of subjects that will lead to a career in any of the sciences, humanities or social sciences disciplines in tertiary institutions.

Career pathways in pharmacy practice have evolved beyond the core pharmacy practice settings (5) to the newer emerging areas such as journalism, public health, veterinary, consultancy, information and communication technology (6). Worldwide, pharmacy education is evolving and has undergone transformational changes in Nigeria, as the training of pharmacists has been reviewed to cover both the core pharmacy practice settings and the newer emerging areas, with a gradual transition from the five-year Bachelor of Pharmacy to the new six-year Doctor of Pharmacy degree program as it is available in many developed countries (7).

Analysis of global pharmacy workforce has indicated global shortages of pharmacists (8), Nigeria has a relatively low pharmacist population ratio (9), with uneven distribution of registered pharmacists in urban and commercial centres (10). The shortage of qualified pharmacists in rural areas has led to proliferation unprofessional practices (11), and wrong perceptions and inaccurate information about the pharmacy profession among secondary school students (12,13) have contributed to a lack of interest in pursuing careers in pharmacy. Career advisors play a critical role in guiding secondary school students to make informed career choices (14), but limited knowledge about the evolving roles of pharmacists in different practice settings may hinder their ability to provide accurate information. There is very limited information about the awareness of careers in pharmacy among secondary school career advisors in Nigeria.

Assessment of the awareness of careers in the pharmacy profession among secondary school career advisors in Kaduna State will, in addition to filling the literature gap, also help in designing educational interventions that will improve their awareness of up-to-date information in the pharmacy discipline. This study aimed to assess the awareness of careers in pharmacy among secondary school career advisors in Kaduna State, Nigeria and also to compare their awareness scores.

2.0 METHODS

2.1 Study Setting/Population

The research was carried out in Kaduna State, Nigeria. The regulation of secondary school education in the state is directly under the Ministry of Education. There are twelve zonal offices responsible for the direct supervision of all private and public secondary schools across the 23 local governments of the state. At the time the study was carried out, there were 305 senior secondary schools in the two zones (259 private and 46 public schools). The study population were secondary schools' career advisors from Zaria and Giwa educational zones of Kaduna state, Nigeria

2.2 Study Design

A cross sectional study design was used to collect data from the eligible participants between the months of February 2019 and July 2019.

2.3 Eligibility Criteria

All secondary school career advisors that consent to participate in the study. In addition, participation in the study was voluntary.

2.4 Sampling Technique and Participants Recruitment

The secondary schools included in the study were selected based on convenience from the two educational zones. One career advisor was selected from each of the selected secondary school based on their availability at the time of the visit to the school, where more than one career advisor was available in the school one was chosen at random.

2.5 Sample Size

The sample size for career advisors was determined using the formula put forward by (15). $n = N / [1 + N (e)^2]$

Where n is the sample size, N is the population size = 305 (Assuming each secondary school has one career advisor). $n = 75.3$ assuming 10% attrition the sample size was rounded up to 83 career advisors. Forty two career advisors were selected from the two educational zones, comprising 71 private schools and 13 public schools.

2.6 Study Instruments

Data for the study was collected using a modified questionnaire from previous similar studies (16,17). Additional questions were also included to suit the aim of the study. The draft questionnaire was then face validated by a panel of experts (three pharmacists and one professor from guidance and counselling) and tested on 10 career advisors, based on the responses some modifications were made to the questionnaire. The questionnaire was divided into three sections: Section A consisted of 10 questions covering demographic information about the school and the career advisor. Section B: consisted of three multiple choice questions, for which one mark was awarded for each correct

answer, and an open-ended question requesting the career advisers to state three places where pharmacists can work; for each place correctly stated, a mark was awarded. The maximum obtainable mark from this section was 6 marks. Section C consisted of twenty-two questions that addressed knowledge of careers in pharmacy and the roles of pharmacists in various practice areas. The career advisors were expected to respond by choosing one of three options: agree, unsure, or disagree. Out of the 22 questions, five were negative, while the remaining were positive. For the negative questions, the correct answer should've been disagreeing while for the positive answer agree was marked as the right, unsure was considered wrong in either case. One mark was allocated for any correct answer and zero for the wrongly picked answer. The maximum obtainable mark in this section was 22 marks. The final questionnaire was self-administered to the eligible participants at their various schools to obtain relevant data.

2.7 Data Analysis

Data extracted from questionnaires were coded and entered into SPSS version 20. The demographic information was presented as percentages.

The awareness of careers in pharmacy possessed by the career advisors was quantified in the form of knowledge scores, with a maximum obtainable score of 28 for the career advisors. The scores were arbitrarily categorized into three levels (Poor (<10), Fair (14-19) and Good (>20). The data was checked for normality and it was not normally distributed Mann Whitney U test was used to compare the awareness scores of the career advisors. The level of significance was set at $p < .05$.

2.8 Ethical Consideration

Written permission was obtained from the Kaduna state ministry of education and this was then taken to the two zonal offices relevant to the study, after which the selected schools were informed through a written letter from the zonal offices.

Verbal consent was also sought from all the participants because the study has little or no risk to them.

3.0 RESULTS

A total of 80 career advisors participated in this survey out of the 83 estimated sample size indicating a response rate of 96.4%. Most of the career advisors were males 52 (65%), from private schools 65 (81.3%), 74 (92.5%) located in Urban areas, 53 (66.3%) had training in guidance and counselling. Table 1. Concerning the sources of information about pharmacy, majority of the career advisors 54 (67.5%) had identified internet as the most common source of information about careers in pharmacy Table 2. Regarding the institution where pharmacists are trained, Majority of the career advisors 62 (77.5%) were able to correctly identify institution pharmacists are trained Table 3.

Sixty five percent of the career advisors were aware of the correct duration of study for Bachelor of Pharmacy (B. Pharm.) degree program but not aware of that of Doctor of Pharmacy (Pharm. D) 53 (66.3%). Table 4

Thirty six percent of the career advisors were able to identify three places where pharmacists could work, and 31 (38.8%) where able to list two places, while 20 (25%) were only able to correctly identify one.

Responses to 22 knowledge statements about pharmacy are shown on Tables 5a and b. The statements most often answered correctly by most of the career advisors were: 'Once registered, a pharmacist does not need to undertake any further training accounted for 66 (82.5%) of the responses, 'Pharmacists can be involved in the design and manufacture of medicines' yielded 72 (90%) responses, while 'Pharmacists are trained to work in the banking sector' gave a response of 73 (91.1%).

Most of the career advisors answered the following wrongly: 'Pharmacists and pharmacologists have the same job description' 68 (85%), 'Pharmacists can participate in hospital ward rounds' 64 (80%), 'Pharmacists can provide professional roles in oil and gas sector' 67 (83.3%), 'Pharmacists can work in retail and wholesale patent medicine shops (Chemist)' 76 (95%), 'Pharmacists can work as a professional in media sector' 66 (82.5%).

The assessment of the career advisors knowledge of careers in pharmacy profession revealed that 19 (23.8%) had poor, 55 (68.8%) had fair and 6 (7.5%) had good knowledge of careers in pharmacy.

There was no statistically significant difference in awareness scores and the independent variables (Gender, School Type, school location and training in Guidance and counselling) Table 6.

Table 1: Demographic Information of Career Advisors

Variable	n (%)
Gender	
Female	28 (35)
Male	52 (65)
School Type	
Private	65 (81.3)
Public	15 (18.8)
School Location	
Urban	74 (92.5)
Rural	6 (7.5)
Training in guidance and counselling	
Yes	53(66.3)
No	27(33.8)

n; Number of students

Table 2: Sources of Information about Pharmacy

Sources	Frequency	Percentage
Media	7	8.8
Pharmacists	6	7.5
Career pamphlet	13	16.3
Internet	54	67.5

Table 3: Career Advisors' Awareness of Institutions where Pharmacists are trained

Institution	Frequency	Percentage
Federal college of education	1	1.3
University	62	77.5
College of health science	3	3.8
University and college of health science	14	17.5

Table 4: Minimum duration pharmacists spent in the university through JAMB

Duration	B. Pharm. n (%)	Pharm. D n (%)
Years	2 (2.5)	3 (3.8)
5 years	52 (65)	12 (15)
6 Years	21 (26.3)	4 (5)
7 years	2 (2.5)	8 (10)
I Don't know	3 (3.8)	53 (66.3)

n; number of career advisors

Table 5a: Career advisors' responses to various knowledge questions

Statements	Responses n (%) Correct	Wrong
Pharmacists are trained to prepare, mix and dispense medicines ^a	58 (72.5)	22 (27.5)
Pharmacists can provide information on the use of herbal medicines and health products ^a	60 (75.0)	20 (25)
Once registered, a pharmacist does not need to undertake any further training ^b	66 (82.5)	14 (17.5)
Pharmacists are involved in the sale of medical and surgical aids and other health products ^a	44 (55)	36 (45)
Pharmacists often assist patients in managing long-term health conditions ^a	43 (53.8)	37 (46.2)
Pharmacists spend most of their time in the dispensary counting tablets ^b	43 (53.8)	37 (46.2)
Pharmacists and pharmacologists have the same job description ^b	12 (15)	68 (85)
Pharmacists can participate in hospital ward rounds ^a	16 (20)	64 (80)
Pharmacists can be involved in conducting clinical trials ^a	23 (28.8)	57 (71.3)
Pharmacists can be involved in the design and manufacture of medicines ^a	72 (90)	8 (10)

^a Positive statements

^b Negative statements

Table 5b: Career Advisors' Responses to various Knowledge Questions

Statements	Responses n (%) Correct	Wrong
Pharmacists can provide services such as blood pressure measurement and glucose testing ^a	18 (22.5)	62 (77.5)
Pharmacists are involved in the design and implementation of policies and procedures for medicines use throughout hospitals ^a	49 (61.3)	31 (38.8)
Pharmacists can work in veterinary hospitals ^a	26 (32.5)	54 (67.5)
Pharmacists can provide information to individual ward areas on budgets and expenditure on drugs ^a	45 (56.3)	35 (43.7)
Pharmacists can work as a professional in the military and para-military forces ^a	61 (76.3)	19 (23.8)
Pharmacists are trained to work in the banking sector ^b	73 (91.1)	7 (8.8)
Pharmacists can work as a professional in academia ^a	48 (60)	32 (40)
Pharmacists can provide professional roles in oil and gas sector ^a	13 (16.3)	67 (83.3)
Pharmacists can work in retail and wholesale patent medicine shops (Chemist) ^b	4 (5)	76 (95)
Pharmacists can work in Aviation Industry as a professional ^a	27 (33.8)	53 (66.3)
Pharmacists can work as a professional in media sector ^a	14 (17.5)	66 (82.5)
Pharmacists can work in NGOs like WHO ^a	59 (73.8)	21 (26.2)

NGOs; Non-governmental Organisations, WHO; World Health Organisation, ^aPositive statements, ^bNegative statements

Table 6: Relationship between awareness scores of career advisors and the independent variables

Variable	n	Median	U-statistic	z-score	p-value*
Gender					
Male	52	15.00			
Female	28	14.00	569.00	-1.622	0.105
School Type					
Private	65	15.00			
Public	15	8.00	382.00	-1.315	0.188
School Location					
Urban	74	15.00			
Rural	6	14.50	216.50	-0.102	0.919
Training in G and C**					
Yes	53	15.00			
No	27	14.00	710.00	-0.057	0.955

*Mann-Whitney Test, n; Number of students, G and C; guidance and counselling

DISCUSSION

The study was aimed at assess the awareness of pharmacy profession as a career among secondary school career advisors in Kaduna State, Nigeria.

Majority of the career advisors had identified internet to be the most common source of career information this may be due its ease of accessibility, availability and prompt response when compared to other sources of information but it is also associated with other challenges such as reliability and the quality of the information obtained from it (18).

The institution where pharmacists are trained and the time it takes to study the bachelor of pharmacy degree appeared to be common knowledge among majority of the career advisors, this was contrary to what was reported among secondary school students from the same educational zones in Kaduna State Nigeria (12). This could depicts little or lack interaction between students and career advisors in the study settings.

Majority of the career advisors are not aware of the minimum duration required before award of doctor of pharmacy degree. This is because Pharm. D. programs are still very new in Nigerian universities (7).

Majority of the career advisors were able to correctly identify the three areas where the pharmacist can practice; this contrary to what was reported among secondary school students from the same educational zones in Kaduna State (12).

Majority of the career advisors displayed low level of awareness of the clinical pharmacist's services (blood pressure measurement, blood glucose monitoring etc) available in the community pharmacies (19), this could be due to low community pharmacists-to-patent medicine vendors ratio and the patent medicine shops are somehow barely regulated (20), and they are involved in a lot of unethical practices (21). This could have contributed to the low awareness of various career pathways among secondary school students in the same geographical setting (12).

The career advisors had displayed low level of awareness as regards to contemporary pharmacy practice settings may be due to relatively low number of pharmacists practicing in such settings (10), this could translate in to low level of interest in the contemporary pharmacy practice settings among their students.

The awareness of the respondents regarding the pharmacy profession was assessed to be fair. Considering the important roles of secondary school career advisors, this is not enough because the students may require any bit of accurate information from them in order to make an informed career decision that is devoid of regrets in the future.

The demographic characteristics of the career advisors were found to have no statistically significant relationship with their knowledge of careers in pharmacy. This is not surprising because the majority of the career advisors have similar sources of information about careers in pharmacy. There is a need for regular interaction between pharmacists in various settings and secondary school career advisors, especially career advisors from schools located in rural areas, since students from rural areas were shown to be less knowledgeable about careers in pharmacy (12).

The study employed convenience sampling and also focused on only two educational zones; these will limit the generalization of the findings of the study. We therefore recommend a larger study that will cover a larger population of career advisors. The study has also not assessed the perception of career advisors about careers in the pharmacy profession, which could influence how they seek out pharmacy-related career information and the kind of information they share with their students.

CONCLUSION

The secondary school career advisors have fair level of awareness of careers in pharmacy profession and this awareness is has no relationship to the demographic characteristics of the career advisors

REFERENCES

1. James P, Nathanael M, Batema P, Jawo A, Brewah S, Tejan A, et al. Was Pharmacy Their Preferred Choice? Assessing Pharmacy Students' Motivation to Study Pharmacy, Attitudes and Future Career Intentions in Sierra Leone. *Heal Prof Educ* [Internet]. 2018;4(2):139–48. Available from: <http://dx.doi.org/10.1016/j.hpe.2017.06.001>
2. Bright JEH, Pryor RGL, Wilkenfeld S, Earl J. The role of social context and serendipitous events in career decision making. *Int J Educ Vocat Guid* [Internet]. 2005;5(1):19–36. Available from: <http://dx.doi.org/10.1007/s10775-005-2123-6>
3. Neilson GR, Jones MC. What predicts the selection of nursing as a career choice in 5th and 6th year school students? *Nurse Educ Today*. 2012 Jul 1;32(5):588–93.
4. Campbell-Heider N, Whistler MP. Connecting with guidance counselors to enhance recruitment into nursing of minority teens. *J Prof Nurs*. 2008;24(6):378–84.
5. Ahmed, Ibrahim Fathelrahman Mohamed IMI, Wertheimer AI. Pharmacy practice in Nigeria. In: Fathelrahman AI, Wertheimer AI, editors. *Pharmacy practice in Developing countries: Achievement and Challenges*. London: Elsevier B.V.; 2016. p. xxix–xxxix.
6. Ubaka CM, Ochie UM, Adibe MO. Student pharmacists' career choices: A survey of three Nigerian schools of pharmacy. *Pharm Pract (Granada)* [Internet]. 2013;11(3):149–55. Available from: <http://www.embase.com/search/results?subaction=viewrecord&from=export&id=L369868244%5Cnhttp://www.pharmacypractice.org/journal/index.php/pp/article/view/345/310%5Cnhttp://sfx>



ub.rug.nl:9003/sfx_local?sid=EMBASE&issn=18863655&id=doi:&atitle=Student+pharmac

7. Ogaji JI, Ojabo CE. Pharmacy education in Nigeria: The journey so far. *Arch Pharma Pr*. 2014;5(2):47–60.

8. Bates I, John C, Seegobin P, Bruno A. An analysis of the global pharmacy workforce capacity trends from 2006 to 2012. *Hum Resour Health*. 2018;16(1).

9. FIP. FIP pharmacy education in sub-Saharan Africa The FIP-UNESCO UNITWIN Programme: A decade of education partnership across Africa [Internet]. 2020 [cited 2020 Oct 21]. Available from: www.fip.org

10. Ekpenyong A, Udoh A, Kpokiri E, Bates I. An analysis of pharmacy workforce capacity in Nigeria. *J Pharm Policy Pract*. 2018;11(1).

11. Awaisu A, Mohammed S, Yakubu R. Pharmacy Practice in Nigeria. In: *Pharmacy Practice in Developing Countries: Achievements and Challenges*. Elsevier Inc.; 2016. p. 343–70.

12. Musa A, Magaji MG, Bello RM. Assessment of awareness of pharmacy profession as a career among secondary school students in Kaduna state, Nigeria. *Pharm Educ* [Internet]. 2021 Dec 2 [cited 2023 Apr 30];21(1):803–9. Available from: <https://pharmacyeducation.fip.org/pharmacyeducation/article/view/1502>

13. Palumbo MV, Rambur B, McIntosh B, Naud S. Perceptions of an Ideal Career versus Perceptions of Six Health Careers [Internet]. *Journal of Allied Health*. 2008 [cited 2020 Oct 21]. Available from: <https://www.ingentaconnect.com/content/asahp/jah/2008/00000037/00000001/art00003>

14. Yaqoob U, Samad M. Career counselling and its knowledge among high school students in Pakistan. *Artic Int J Community Med Public Heal* [Internet]. 2017 [cited 2023 Apr 30]; Available from: <http://dx.doi.org/10.18203/2394-6040.ijcmph20172817>

15. Yamane T. Statistics, an Introductory Analysis. *J Am Stat Assoc* [Internet]. 1967 Jun

[cited 2020 Sep 17];60(310):678. Available from:

<https://www.jstor.org/stable/2282703?origin=crossref>

16. Langridge SM, Stensland SL, Warholak TL, Mattingly L. Impact of the Career Explorers program on high school students' perceptions of the pharmacy profession. *Am J Pharm Educ*. 2008;72(3):68.

17. Aspden T, Cooper R, Liu Y, Marowa M, Rubio C, Waterhouse EJ, et al. What secondary school career advisors in New Zealand know about pharmacy and how that knowledge affects student career choices. *Am J Pharm Educ*. 2015;79(1):1–8.

18. Zainudin ZN, Hassan SA, Abu Talib M, Ahmad A, Yusop YM, Asri AS. Technology-Assisted Career Counselling: Application, Advantages and Challenges as Career Counselling Services and Resources. *Int J Acad Res Bus Soc Sci*. 2020;10(11).

19. Ali M, Schifano F, Robinson P, Phillips G, Doherty L, Melnick P, et al. Impact of community pharmacy diabetes monitoring and education programme on diabetes management: a randomized controlled study. *Diabet Med* [Internet]. 2012 Sep 1 [cited 2023 May 1];29(9):e326–33. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1464-5491.2012.03725.x>

20. Oyeyemi AS, Ogunnowo BE, Odukoya OO. Patent Medicine Vendors in Rural Areas of Lagos Nigeria: Compliance with Regulatory Guidelines and Implications for Malaria Control. *Trop J Pharm Res* [Internet]. 2014 Feb 13 [cited 2023 Oct 12];13(1):163–9. Available from: <https://www.ajol.info/index.php/tjpr/article/view/101075>

21. Awosan KJ, Ibitoye PK, Abubakar AK. Knowledge, risk perception and practices related to antibiotic resistance among patent medicine vendors in Sokoto metropolis, Nigeria. *Niger J Clin Pract* [Internet]. 2019 Feb 1 [cited 2023 May 1];21(11):1476–83. Available from: <https://www.ajol.info/index.php/njcp/article/view/182861>