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Factors Influencing Students Choice for Medical Laboratory Science as a Profession: A Case of Students at Usmanu Danfodiyo University (Udu), Sokoto, North-Western Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author KKI designed the topic and provided fund. Authors AG and AU did the data collectors, compiled and analysed the data using SPSS version 22. Authors KM, OMM and MS were interpreters and concerned with logistics of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To examine factors influencing students' choice for medical laboratory sciences as a Profession**:** A case at Usmanu Danfodiyo University, Sokoto, North-Western Nigeria.
Study Design: This was a cross-sectional qualitative study designed to examine factors influencing students' choice for medical laboratory sciences as a Profession.

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Place and Duration of Study: Faculty of Medical Laboratory Science, Usmanu Danfodiyo University, Sokoto, North-Western Nigeria, between January and April, 2016.
Methods: A structured self-administered questionnaire was designed and distributed for this study. Informed consent was obtained from the students before handing them a 12-item questionnaire for self-administration. Five Hundred and Six (506) questionnaires were distributed to the students (from 100 level (first year of study in the university) to 500 level (fifth and final year of study in Medical Laboratory sciences Profession)), but only Four Hundred and Eighty-Three (483) were returned completed (response rate was 95.45%).
Results: Of the 483 students who participated in this study; 331(68.5%) were male and 152(31.5%) were female. Out of the 483, 192 (39.8%) considered patients benefits, 106 (21.9%) self-employment, 72 (14.9%) opportunity for advancement, 41 (8.5%) more job opportunity, 38 (7.9%) working conditions while 34 (7.0%) for Job satisfaction, as factors influencing students' choice for medical laboratory sciences as a profession.
Conclusion: The findings of this study indicate that patients' benefits, self employment and availability of advancement opportunities are the most influential factors affecting career choices among students, while Job satisfaction was ranked last in consideration. The majority of the respondents perceived laboratory work as rewarding and challenging.

Keywords: Factors; influencing; students'; medical laboratory science; Sokoto; Nigeria.

1. INTRODUCTION

Medical Laboratory Science, otherwise known as Biomedical Science in the United Kingdom or Clinical Laboratory Science in the United States of America and Canada, is the practice which involves the analysis of human and animal tissues, body fluids [1], and excretions. It also involves the production of human and animal vaccines and diagnostic reagents (Anti-Sera, Bovine Albumin, and Anti Human Globulin etc). It now includes the design and fabrication of equipment for the purpose of laboratory diagnosis. A vital component of Medical Laboratory Science Practice is Biomedical Research, which is a necessary tool for clinical diagnosis and treatment of patient [1].

The number of Medical Laboratory Scientists in Hospitals in the north-west geopolitical zone in Nigeria is far below the minimum requirement (at least 3 to 5, 20 to 30, 30 to 50 qualified scientists in primary, secondary and tertiary health care establishments respectively) as outlined by the Medical Laboratory Science Council of Nigeria [2]. The same sad situation obtains in almost all the public and private health care delivery centers in Sokoto, Niger, Kebbi, Zamfara and Katsina States in Nigeria [2]. This glaring imbalance necessitated the establishment of the School by the authorities of the Usmanu Danfodiyo University Sokoto in 2002/2003 academic session with a total of twenty (20) pioneer students enrolled for the programme. Precisely, the instrument given birth to the School was the 225th Senate meeting of Wednesday, 30th July, 2003. National University Commission (NUC) granted full accreditation in 2005 while the Medical Laboratory Science Council of Nigeria (MLSCN) granted its accreditation in 2006 [3].

Career choice is a complex decision for students since it determines the kind of profession that they intend to pursue in life. As students try to make career choice while in secondary school, they face problem of matching their career choices with their abilities and school performance [4]. Career choice has become a complex science with the advent of information technology, the emergence of post industrial revolution and job competition. It was a common practice in the old days to find feudalism converting it into a family affair where the son of a blacksmith was destined to become a blacksmith and a feudal was born a leader. Industrialization and post industrialization has made it possible for a common person to be richer as long as she or he has due skills and knowledge as reported by Walttles in 2009. According to Kerka [5], career choice is influenced by multiple factors including personality, interests, self concept, cultural identity, globalization, socialization, role model, social support and available resources such as information and financial. According to Hewitt [6], factors influencing career choice can either be intrinsic or extrinsic or both. Hewitt further states that most people are influenced by careers that their parents favour, others follow the careers that their educational choices have opened for them, some choose to follow their passion

regardless of how much or little it will make them while others choose the careers that give high income. In a study done by Natalie, 2006, young adults through interaction with the context of family, school and community learn about and explore careers which ultimately lead to their career choice. Parental support and encouragement are important factors that have been found to influence career choice. Children may choose what their parents desire simply to please them [7]. Generally, the choice of a career is influenced by parents, friends, and counselors however variations occur from one population to the other. Most of the students lack adequate information regarding various careers hence the choices they make are embedded in their perception of the ideal job and the subjects they study in secondary school. The only support students get within the school is from career masters or counselors as they are mostly refereed to and the teachers who are expected to support students in their career choice. When these students graduate from university, some of them join occupations that are totally different from what they trained for [4]. Career choices are also likely to be influenced by other various factors like perceived academic and career opportunities, societal/ family expectations, effects of role models among supervisors, faculty and resident, work-related hazards, opportunities to perform procedures and urgent interventions, prospects of working in an urban setting, difficulty level of training, number of practice work hour per week, opportunities to work independently in the specialty, type of problems and patients encountered and likely patients outcomes [8]. The main objective of Medical Laboratory Sciences program is to train competent clinical laboratory personnel to meet present and future needs of the health care services. In order to meet these demands and challenges, institutions offering medical laboratory sciences must do their best to structure curricula and design medical laboratory sciences training programs to be sufficiently enough to meet the health needs of hospitals and clinical services in the country [9].

2. MATERIALS AND METHODS

2.1 Study Area

This study was carried out in the Faculty of Medical Laboratory Science, Usmanu Danfodiyo University, Sokoto, North-Western of Nigeria. Sokoto state is located in the extreme North- West of Nigeria, near to the confluence of the Sokoto River and the Rima River [10]. The major indigenous tribes in the state are the Hausa and Fulani and other groups such as Gobirawa, Zabarmawa, Kabawa, Adarawa, Arawa, Nupes, Yorubas, Ibos and others [11]. Majority of the Hausas' are farmers while Fulanis are nomadic and are engaged in animal rearing [12]. Based on 2006 population census, Sokoto state had a population of 3,696,999, with an average estimate of 4,806,098 in 2015 based on the population annual growth rate of 3% [13].

2.2 Study Population

The study population included 483 students comprising male and female, randomly selected. The participants were recruited from the Faculty Medical Laboratory Sciences of Usmanu Danfodiyo University, Sokoto, North-Western Nigeria.

2.3 Study Design

This is a cross-sectional qualitative study designed to address factors influencing student's choice for Medical Laboratory Science as a profession in Usmanu Danfodiyo University, Sokoto, North Western Nigeria.

2.3.1 Sample size estimation

The sample was calculated using the following formula [14]:

$$n = Z^2pq/d^2$$

Where

- n = minimum required sample size in population >10,000
- Z = standard normal deviate set at 95% (1.96).
- p = proportion of success or prevalence
- q = proportion of failure (= 1- p)
- d = precision, tolerable margin of error, expected difference set at 5%.

Attrition rate of 10% was added.

57.7% participants chose working in hospital laboratory (i.e made their Career choices in Medical Laboratory Technology) in Saudi Arabia [15].

$n = Z^2pq/d^2$
z = 95% (1.96)
p = 57.7% (0.577)
q = 1-0.5 = 0.423
d = 5% (0.05)
$n = Z^2pq/d^2$
$n = (1.96)^2(0.577)\ (0.423) / (0.05)^2$
n = 375.049 = 375.1
Sample Size = 375.1
Attrition rate of 10% =37.5 =38+375 =413
Therefore, sample size = 413

2.4 Methodology

A structured Self-administered questionnaire was designed and distributed for this study. Informed consent was obtained from the respondents before handing to them; a 13-item questionnaire for self-administration. While five hundred and six questionnaires were distributed, only four hundred and eighty-three were returned with complete data (95.45% return rate); so sample reduction was due to missing data. Data was collected under the supervision of the primary author.

2.4.1 Inclusion criteria

Students admitted to the Faculty of Medical Laboratory Sciences of Usmanu Danfodiyo University, Sokoto, North-Western Nigeria and consented to participate in the study.

2.4.2 Exclusion criteria

Students who were not admitted to the faculty of medical laboratory science and those in the faculty who did not consent to take part in the study.

2.5 Statistical Analysis

The data obtained were analyzed using Statistical Package for Social Science (SPSS) version 20. The results were expressed as the mean ± S.D simple percentage or proportion. Comparisons were made using X^2 test and $p< 0.05$ was considered statistically significant.

3. RESULTS AND DISCUSSION

Data was collected from Four hundred and Eighty-three students comprising 331(68.5%) male and 152(31.5%) female in the Faculty of Medical Laboratory Sciences of Usmanu Danfodiyo University, Sokoto, North-Western Nigeria.

Table 1. Gender distribution of the study population

Gender	Frequency	Percent (%)
Male	331	68.5
Female	152	31.5
Total	**483**	**100**

Table 2 shows the distribution of the study population based on classes (levels) with three hundred levels (300 level) having the highest number.

Table 2. Distribution of the study population based on the classes/levels (year of study in the university)

Levels (Classes)	Frequency	Percent (%)
100	83	17.2
200	108	22.4
300	162	33.5
400	70	14.5
500	60	12.4
Total	**483**	**100**

100 Level = first year of study in the university, 200 Level = Second year, 300 Level = 3rd, 400 Level = 4th year, while 500 Level = fifth and final year of study in the profession of medical laboratory science.

Table 3 revealed the factors considered by students in career choice and majority of the students considered patients benefits while choosing career in medical laboratory profession.

Table 3. Factors considered by students in career choice to medical laboratory science profession

Factors	Frequency	Percent (%)
More jobs opportunity	41	8.5
Job satisfaction	34	7.0
Self-employment	106	21.9
Considering patients benefits	192	39.8
Working condition	38	7.9
Opportunity for advancement	72	14.9
Total	**483**	**100**

Family members have the highest contributions in influencing students to the profession of medical laboratory science, as shown in Table 5. This might be attributed to the moral and

financial supports usually provided by the family members.

Table 4. Factors influencing students' choice to medical laboratory science as a profession

Factors	Frequency	Percent (%)
Teacher(s)	29	6.0
Friend(s)	50	10.3
Family member(s)	163	33.7
Health care professional	93	19.3
I have not been encouraged	148	30.7
Total	**483**	**100**

The levels of awareness (before admission) between the students in the classes were compared and the junior classes (100 and 300) were seen to be more enlightened about the profession of medical laboratory sciences as shown in Table 5.

Table 5. Comparison of the level of awareness among the medical laboratory science students based on the level or class/year of study

Class	Awareness		Total
	Yes	No	
100	59	14	73
200	90	18	108
300	131	31	162
400	58	25	83
500	42	15	57
Total	**380**	**103**	**483**

X^2 = 6.7, p=0.151

The main objective of Medical Laboratory Sciences program is to train competent clinical laboratory personnel to meet present and future needs of the health care services. The demand for allied health professionals; laboratory technologists, physiotherapists, and respiratory therapists is increasing globally. In order to meet these demands and challenges, institutions must do their best to structure curricula and design new training programs to meet the health needs of hospitals and clinical services in the country. It is useful to study the factors influencing students' considering career to the profession of Medical Laboratory Sciences programs and educational needs to help in the implementation of changes for the best possible improvements [16].

This study indicated that majority 192(39.8%) of the students considered patients benefits as an important factor influencing their choice for medical laboratory sciences as a profession and more than 34(7.0%) for job satisfaction. This present study agreed with the study done in Saudi Arabia [17,18], which indicated that majority of students surveyed considered patients benefits. The potential explanation for the students considering career to the profession of Medical Laboratory Science could be the mindset that this profession may be the alternative career that affects patient care, and this may contribute to the more proportion of qualified candidates seeking career in Medical Laboratory sciences. It stands to reason that students with a strong interest in being involved with patient care may consider a career in Medical Laboratory Science, if they were exposed to the technical skills required of this profession [19,20]. This study was inconsistent with the study done by Jennifer in 2014, which reported that many students in their survey regarded work-life balance as an important factor in career preference [21]. According to the results of this study, job satisfaction was not the most important factor when considering career to Medical Laboratory Science Profession. Students ranked Considering Patients Benefits as the most important factor when considering a career while self-employment was ranked the second most important factor. The majority of the respondents perceived laboratory work as rewarding and challenging. It has been reported that Medical Laboratory Technology or Science is a career with a high job satisfaction [22]. Offering Medical Laboratory Science courses with an occupational focus does not dilute the science but rather enhances the material through practical application [9].

Student's awareness about a program plays an important role in the choice of their future careers [23], in this study, 380 (78.7%) of the students have ideas on the profession of Medical Laboratory while the remaining 103 (21.3%) have no ideas about the profession. Our study is in variance with the study done in Saudi Arabia [24], which revealed that many students were unaware of the profession of Medical Laboratory Sciences. This could also be linked to the facts that many students considered medicine and surgery as the ultimate or only career that affects patient care.

This study compared the level of awareness between the students based on their year of study, and the junior classes were seen to be more enlightened about the profession of Medical Laboratory Sciences than the upper classes, the difference however was not

significant (p>0.05). This seems to indicate that the level of awareness is increasing with time. Gender comparison between the student's interest in the choice of career to Medical Laboratory profession does not show any significant difference (p>0.05). This study agreed with the study done in Kenya, which reported that most students were not influenced by their gender when choosing their career [5].

This study also examined factors influencing students considering Medical Laboratory Sciences as a future carrier. Majority 163 (33.7%) of the students who participated in this study, were influenced by family member(s), while 148(30.75) had not been influenced by anybody. This study was consistent with the studied done by Kerka [6]; Hewitt [7] and Natalie [8] that students were influenced by the family members (parents), health care professional, friends, and teachers.

4. CONCLUSION

This study indicated that, majority of the students enrolling for training in medical laboratory sciences profession were influenced by family members and motivated by their desire to impact on the health of patients rather than other considerations. Educators on these programs should find other methods to expand students' awareness about medical laboratory science profession, the diversity of skills they will possess and the various opportunities available to them at the end of the program. These will better enable them explore their potential and accord them professional satisfaction. Academicians in Medical Laboratory Sciences and other professionals need to provide mentoring, support and guidance to science students in order to consider Medical Laboratory as careers. In addition, career counselors need to network with the professional Medical Laboratory Scientists and organizations to identify existing such as internship, incentives and scholarships available to students interested in pursuing careers in the medical laboratory science profession.

CONSENT

All authors declare that written informed consent was obtained from the patients (or other approved parties) for publication of this paper.

ETHICAL CONSIDERATION

All authors declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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RESEARCH QUESTIONNAIRE

Study Title: Factors influencing students' choice for medical laboratory science as a profession: A case at Usmanu Danfodiyo University (UDU), Sokoto, North-Western Nigeria.

I am Ibrahim K. Kwaifa, currently an Assistant Lecturer in the Department of Haematology, Faculty of Medical Laboratory Sciences, Usmanu Danfodiyo University, Sokoto. This is a survey study developed to some factors influencing students considering career to Medical Laboratory Science Profession in the Faculty of Medical Laboratory Sciences, Usmanu Danfodiyo University, Sokoto, Nigeria profession. You are kindly requested to complete this questionnaire. It is entirely voluntary, and in no way will it have any effect on your grade. This survey is anonymous so I am asking that you do not write your name or any other identifying marks anywhere on this questionnaire. If you should have any question, please feel free to ask.

1. Age .....
2. Sex: Male [ ] Female [ ]
3. Level/Class……..
4. What was your score? .....
5. Course applied for (e.g zoology) ……..
6. Initial Course given by the University ……..
7. Any change of course? Yes [ ] No [ ]
8. If yes, to question 6 above which course? ……
9. Awareness about Medical Laboratory Science before admission: Yes [ ] No [ ]
10. Is it your choice to study Medical Laboratory Science (MLS): Yes [ ] No [ ]
11. If yes in no (10) above, who influenced your choice?

    A. Teacher(s)
    B. Friend(s)
    C. Family member(s)
    D. Health care professional(s)
    E. I have not been influenced by anybody

12. Considering Career in Medical Laboratory Science Profession is because of:

    A. More jobs Opportunity.
    B. Job satisfaction.
    C. Self-employment.
    D. Working conditions
    E. Considering patient Benefits
    F. Opportunity for advancement.

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