

# Perception of Medical Microbiology by 4001 Medical Student of Lagos State University College of Medicine, Ikeja, Lagos, Nigeria

Oluwadamilare Afolabi Obe<sup>1</sup>

<sup>1</sup>Medical Microbiology and Parasitology Department, Lagos State University College of Medicine, Lagos, Nigeria

Wasiu Bamidele Mutiu<sup>2</sup>

<sup>2</sup>Medical Microbiology and Parasitology Department, Lagos State University College of Medicine, Lagos, Nigeria

## Abstract:-

### ➤ *Background*

Medical microbiology is a specialty in medicine that studied microorganisms that are capable of infecting and causing diseases in humans. It is also concerned with the prevention, diagnosis and treatment of the infections of man. It cannot be emphasized enough that a solid understanding of microbiology is the foundation for a good clinical practice. It is therefore important to understanding the students' perception towards this subject.

### ➤ *Aim*

This study was aimed at understanding the students' perception regarding microbiology as a subject and about the effectiveness of the various teaching-learning methods currently used by lecturers in the department.

### ➤ *Materials & Methods*

This study was carried out on 110 4<sup>th</sup> year medical students' of 2019/2020 academic session who are about to write the 2<sup>nd</sup> MBBS examination. A 4-point Likert-type scale structured questionnaire with questions pertaining to students' perception of medical microbiology were administered and responses were analyzed.

### ➤ *Results*

Majority of the students (85.5%) believed that microbiology is an integral part of medicine. About 88% of them agreed that a sound knowledge of microbiology is useful for their clinical practice. 37.3% of the student believed that lecturers made the lectures interesting while 46% believed the practical sessions were not helpful. A little above half (53.6%) agreed that participation was encouraged during classes while 72.7% had opportunity to ask questions and 60.0% believed their questions were answered satisfactorily. 70% of the student believed that the revision classes were helpful. Notable among the changes suggested by the students is the need to improve on the teaching style by lecturers (70%).

### ➤ *Conclusion*

Our study showed that most students had a positive attitude towards microbiology as a subject and believed it is pivotal to clinical medicine. However, a need to improve on the teaching style by lecturers were emphasized from the responses.

## I. INTRODUCTION

Medical microbiology is a specialty in medicine that study microorganisms (parasites, fungi, bacteria, viruses, and prions) capable of infecting and causing diseases in humans. Also it is concerned with the prevention, diagnosis and treatment of the infections of man.<sup>1,2</sup>

The undergraduate medical student studied medical microbiology in the 4<sup>th</sup> year with other courses in pathology (hematology, histopathology and clinical pathology)<sup>3,4</sup> All these four courses are aimed at helping the student appreciate the relevance of the subject to their training and subsequent practice as physicians.<sup>5,6</sup>

Medical Microbiology is taught to student so that they can understand how microorganism cause infections in different body sites. This will impacts on rationale sample choice and test interpretations.<sup>1,2</sup> It also helps the student understand how preanalytical variables determine the quality and yield of microbiologic testing, the use and limitations of different diagnostic tools and how knowledge of antimicrobial action and antimicrobial resistance is applied in patient care.<sup>7,8</sup> A sound knowledge of the subject matter will make the student to be a sound physician.

No study has been done about the perception of medical students in Lagos State College of Medicine toward medical microbiology. Investigating the perception of medical students about this subject will help lectures to access the level of impact on the students and identify possible gaps.<sup>9,10</sup> We thus carried out this survey to investigate the perception of 400 level medical students on the value of medical microbiology to their training as physicians.

## II. MATERIALS AND METHODS

### ➤ *Study Area*

The study was carried out in the Medical Microbiology and Parasitology department of Lagos State University College of Medicine (LASUCOM), Ikeja, Lagos, Nigeria.

### ➤ *Study Population*

This was made up of all medical undergraduates undergoing 4<sup>th</sup> year medical training during the 2019/2020 academic session.

### ➤ *Study Design*

This was a descriptive cross-sectional study.

### ➤ *Sample Size and Sampling Method*

The total population of 4<sup>th</sup> year medical students during the 2019/2020 academic sessions.

### ➤ *Data Collection*

A structured questionnaire which was a modification of the questionnaire designed by West et al. was used to know the student's perception about learning in microbiology. The demographic and personal characteristics including age, sex was noted. The questionnaire containing 17 questions was distributed amongst 110 4<sup>th</sup> year MBBS students of 2019/2020 academic session during one of the final revision classes before the final examination. The students were asked not to disclose their identities in order to make them express their ideas freely. In the questionnaire students were asked to denote their degree of agreement with the individual statements using a 4-point Likert type scale. The students were asked to tick the option they considered was the best.

### ➤ *Data Analysis*

Data collected from the questionnaire were analyzed using Statistical Package for Social Sciences (SPSS) Version 20.0

## III. RESULT

### ➤ *Age and Gender Distribution of Study Participants*

Out of the 116 students in the class, 110 (94.8%) took part in this study. Age distribution ranges between 18 and 35. There were 60(54.5%) male and 50(45.5%) female. Most of the study participant are within age group 21 – 25. The age and gender distribution are shown in table 1

### ➤ *Participant Responses to Statement in the Questionnaire*

85.5% of the students agreed that microbiology is an integral part of medicine. 82.6% of the respondents agreed that microbiology aids the understanding of clinical medicine. 98% of respondent acknowledged the relevance of microbiology in clinical practice while 88% agreed that the knowledge of microbiology has improved their understanding about disease condition. The students enjoyed bacteriology (71%) and virology (47%) more whereas, immunology and mycology, at 27% and 30% were least enjoyed by the students. These findings are clearly illustrated in table 2.

## IV. DISCUSSION

This study evaluates the perception of Medical Microbiology among 400 level medical students of Lagos State University College of Medicine, Ikeja. 85.5% of the student agreed that microbiology is an integral part of medicine. This finding is in agreement with a multicenter study to assess the usefulness of pathology for clinical student, where 82.6% of the respondent agreed that microbiology aids the understanding of clinical medicine.<sup>11</sup>

98% of respondent acknowledged the relevance of microbiology in clinical practice while 88% agreed that the knowledge of microbiology has improved their understanding about disease condition. The findings from this study is in tandem with study conducted among international students in an Ukrainian medical school where 85.6% of student agrees that microbiology is relevant in clinical practice and helps to understand disease condition more.<sup>12</sup> A comprehensive survey of preclinical microbiology curricula among US medical schools is also in agreement with our findings.<sup>13</sup> The reason for this may be due to the fact that physician taught microbiology in medical school and also because it is been taught within the teaching hospital where students can easily relate some of the things been taught with what they see in the hospital during clinical rotation.

Almost half of the respondents hold the opinion that the lecturers did not make the lectures interesting. This is in sharp contrast from study from Ukraine where 73.1% of the student believed that the lectures made the teaching of microbiology up to date, easy to follow and interesting.<sup>12</sup> The findings from the study is close to a similar study conducted in South eastern part of Nigeria where 34% of respondent believed the lecturer did not make the teaching of microbiology interesting. The reason for this may be the teaching style of the lecturers that is largely traditional classroom based directing style that promotes learning through listening and following directions. With this style, the teacher tells the students what to do, how to do it, and when it needs to be done. The teacher imparts information to the students via lectures, assigned readings, audio/visual presentations and demonstrations. Students gain information primarily by listening, taking notes and practicing what they are told to do.

More than two third of the respondent believed the teaching style should be improved on. The teaching style now is largely the traditional classroom-based teaching. It will be of great advantage if modern style of teaching can be adopted, like case based learning, problem based learning and team based learning, There was a shift in the student's perception towards the subject of microbiology, from being perceived earlier as theoretical and non-clinical to being perceived as interesting, appealing, easy to understand and clinically relevant in centers where the modern style of teaching microbiology to medical students has been adopted.<sup>8, 14-16</sup>

Our findings showed that about two third of the respondents (59%) were satisfied with interaction at the lectures, while less than half (37%) believed that complex issues were simplified during the lectures. This give the lecturer opportunity to evaluate his/her work and consider how to increase this percentage, involving more students in interactive activities during the lectures and also been able to simplify complex issues.

Practical classes account for a substantial part of the microbiology course. Our results prove that, close to half of the respondent (46%) do not see the usefulness of the practical sessions. This was similar to initial report from a pre interventional study in Indian where 45.4% claimed the practical session did not add any value to their knowledge of microbiology, however, post intervention, almost all the respondent 99% agreed that practical sessions in microbiology enhances the understanding of subject.<sup>9</sup> The reason for this poor outcome in our study may be due to the fact that non doctors handles the practical session and may not be able to connect the practical session with clinical scenario that will help the student to relate the lectures, clinical cases and practical's together. The other reason may be because the students had less than expected practical session due to the Covid 19 pandemic.

Findings from this study showed that the student enjoyed bacteriology (71%) and Virology (47%) more whereas, immunology and mycology, at 27% and 30% were least enjoyed by the students. This findings is similar to result from a study on student perception on learning and teaching of medical microbiology among Indian medical students.<sup>9</sup> The reasons for this may be due to the fact that, most clinical conditions seen in the hospital were of bacterial and viral origin, therefore the student tends to relate more with them. Another reason could be that the facility to make the diagnosis of mycotic infection in our environment is grossly inadequate, thereby making the topic less interesting to the students.

## V. CONCLUSION

This study established that students recognized the importance of medical microbiology in clinical medicine and that its understanding enhances the ability to be a good physician. However, there is a gap in the teaching methods employed by the lecturers, therefore there is a need for lecturers to present the subject to student in a way that students are adequately motivated.

- Competing Interest
- No Competing Interest.

## AUTHORS CONTRIBUTION

- **Author 1**(Oluwadamilare Afolabi Obe): Conceptualization, design, data collection, data analysis, funding, literature review, and writing.
- **Author 2** (Wasiu Bamidele Mutiu): Conceptualization, design, data analysis, funding, critical review.

## TABLES AND FIGURES

- Table 1. Age and gender distribution of study participants
- Table 2. Participant responses to statement in the questionnaire

## REFERENCES

- [1]. Kumar S. Textbook of microbiology: JP Medical Ltd; 2012.
- [2]. Greenwood D, Slack RC, Barer MR, Irving WL. Medical Microbiology E-Book: A Guide to Microbial Infections: Pathogenesis, Immunity, Laboratory Diagnosis and Control. With student consult Online Access: Elsevier Health Sciences; 2012.
- [3]. Marshall R, Cartwright N, Mattick K. Teaching and learning pathology: a critical review of the English literature. *Medical education*. 2004;38(3):302-13.
- [4]. Herrmann FE, Lenski M, Steffen J, Kailuweit M, Nikolaus M, Koteeswaran R, et al. A survey study on student preferences regarding pathology teaching in Germany: a call for curricular modernization. *BMC medical education*. 2015;15(1):1-7.
- [5]. Jalili M, Mirzazadeh A, Azarpira A. A survey of medical students' perceptions of the quality of their medical education upon graduation. *Annals Academy of Medicine Singapore*. 2008;37(12):1012.
- [6]. Oshikoya K, Bello J, Ayorinde E. Medical Students\ View On The Methods Of Teaching Pharmacology At The Lagos State University College of Medicine, Nigeria. *Nigerian Quarterly Journal of Hospital Medicine*. 2007;17(3):101-7.
- [7]. Dyar OJ, Nathwani D, Monnet DL, Gyssens IC, Stålsby Lundborg C, Pulcini C. Do medical students feel prepared to prescribe antibiotics responsibly? Results from a cross-sectional survey in 29 European countries. *Journal of Antimicrobial Chemotherapy*. 2018;73(8):2236-42.
- [8]. Lall M, Datta K. A pilot study on case-based learning (CBL) in medical microbiology; students perspective. *medical journal armed forces india*. 2021;77:S215-S9.
- [9]. Chavan S, Menon S, Ronghe A, Chowdhary A. Learning and teaching in Microbiology: Students' perception. *Virology*. 2016;28:17-2.
- [10]. Yang Y, GUAN Y-Z. A new model in the teaching of medical microbiology in clinical medicine. *Basic & Clinical Medicine*. 2017;37(11):1649.
- [11]. Okoye HC, Meka IA, Ugwu AO, Yahaya IA, Otokunefor O, Ojo OO, et al. Perception of problem based learning versus conventional teaching methods by clinical medical students in Nigeria. *The Pan African Medical Journal*. 2019;33.
- [12]. Melnyk V, Mikhnenko G. International Students' Perception of Teaching Microbiology, Virology and Immunology at Medical Universities in Ukraine. *Advanced Education*. 2020;15:56-65.
- [13]. Melber DJ, Teherani A, Schwartz BS. A comprehensive survey of preclinical microbiology curricula among US medical schools. *Clinical Infectious Diseases*. 2016;63(2):164-8.

[14]. Chamberlain NR, Stuart MK, Singh VK, Sargentini NJ. Utilization of case presentations in medical microbiology to enhance relevance of basic science for medical students. *Medical education online*. 2012;17(1):15943.

[15]. Beylefeld AA, Struwig MC. A gaming approach to learning medical microbiology: students' experiences of flow. *Medical teacher*. 2007;29(9-10):933-40.

[16]. Masiello I, Ramberg R, Lonka K. Attitudes to the application of a Web-based learning system in a microbiology course. *Computers & Education*. 2005;45(2):171-85.

Table 1 Age and Gender Distribution of Study Participants

Age groups (in years)	Gender		Total Nos (%)
	Male	Female	
15 - 20	8	10	18 (16.4)
21 - 25	42	35	77 (70.0)
26 - 30	7	5	12 (10.9)
30 - 35	3	0	3 (2.7)
Total	60 (54.5%)	50 (45.5%)	110 (100)

Table 2 Participant Responses to Statement in the Questionnaire

QUESTIONS	YES (%)	NO (%)	NOT LIKELY (%)	NO COMMENT (%)
Microbiology is an integral part of medicine	94 (85.5)	4(3.6)	11(10.0)	1(0.9)
There is relevance of Microbiology in clinical practice	96(87.3)	5(4.5)	9(8.2)	0 (0)
My application of disease condition improved as a result of Microbiology lecture	88(80.0)	6(5.5)	12(10.9)	4(3.6)
I am motivated to study Microbiology	30(37.3)	27(24.5)	41(39.1)	12(10.9)
The lecturers made Microbiology interesting	41(37.3)	18(16.4)	43(35.1)	8(7.3)
Were complex issues simplified during classes	37(33.6)	18(16.4)	48(43.6)	7(6.4)
Was participation encouraged during classes	59(53.6)	15(13.6)	30(27.3)	6 (5.5)
Do you have opportunity to ask question	80(72.7)	6(5.5)	18 (16.5)	6 (5.5)
Were your questions answered satisfactory	66(60.0)	8(7.3)	25(22.7)	11(10.1)
Do you think we should improve on teaching style	91(82.7)	3(2.7)	12(10.9)	4(3.6)
Were the practical classes satisfactory	27(24.5)	46(41.8)	34(30.9)	3(2.7)
Were the tutorial revision classes helpful	77(70)	10(9.1)	15(13.6)	8(7.3)
Which lecture session do you enjoy (Bacteriology)	71(64.5)	12(10.9)	14(12.7)	13(11.8)
Virology	47(42.7)	23(20.9)	18(16.4)	22(20)
Mycology	30(27.3)	29(26.4)	27(24.5)	24(21.8)
Parasitology	46(41.8)	18(16.4)	30(27.3)	16(14.5)
Immunology	27(24.5)	24(21.8)	34(30.9)	25(22.7)