

## Awareness and Attitude of Medical Laboratory Science Students Towards Specializing in Histopathology

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**Abstract:** The objective of the research is to assess the awareness and attitude of Medical Laboratory Science (MLS) students towards histopathological speciality. The present study was based on data from two hundred and seventy two (272) Medical Laboratory Science students. Questionnaires were distributed to all the Students from year one to year five. Out of 350 Questionnaires, only 272 completed and returned there questionnaires. These students were from different backgrounds with age ranging from 15-35. The questions were designed to obtain “Yes”, “No” and “Unknown” answers. Inform consent was granted by the individual subjects. Thirty one (31) representing 11.4% of the total students choose to study Histopathology/Cytology, 83(30.6%) choose to study Haematology/Blood Transfusion Science, 67(24.7%) choose to study Medical Microbiology, 1(0.36%) choose to study Immunology and none (0%) choose Parasitology discipline. Total of 28(10.3%) students out of the total number that participated liked Histopathology as a discipline in MLS, 233(86.0%) dislike Histopathology and 10(3.7%) where indifferent. Histopathology is an interesting speciality in MLS, but the decline of students and lectures calls for attention and if no measure is taking, one wonders what the future holds for this speciality.

**Key words:** Histopathology Specialty • MLS • Tissue Processing • Histology

### INTRODUCTION

The rudimentary examinations of human body fluids has been date back to the time of the ancient Greek physician Hippocrates around 300 BC [1, 2], but the first clinical Laboratory was opened in 1896 at Johns Hopkins Hospital [3]. At that time, the diagnostic and therapeutic value of Laboratory testing was not yet appreciated and many physicians viewed clinical Laboratories simply as an expensive luxury that consumed both valuable space and time [4].

There are only few students and teachers of histopathology that understand the history of this medical specialization. The specialty of histopathology technique could be traced to the works of Johannes Muller in 1838. This followed the construction of the first compound microscope in 1591. The development of the simple microscope was credited to Anton van

Leeuwenhoek who started the development of simple microscopes with single lenses, this occurred in 1673. Microtome for sectioning animal tissues was first constructed in 1848. In mid 1800s, paraffin wax for infiltration and embedding was introduced. Formalin, widely used for fixation today was first used in 1893. In 1945, automated tissue processors replaced hand processing while cryostats were first manufactured in 1951. During the last 50 years, enzyme histochemistry, electron microscopy and polarizing microscopy have all become diagnostic tools in histopathology. In the 1980's, the widespread use of immunohistochemistry revolutionized cancer diagnosis and it is still evolving [5].

Histopathology it is a branch of pathology which deals with the study of disease in a tissue section. The tissue undergoes a series of steps before it reaches the examiners desk to be thoroughly examined microscopically to arrive at a particular diagnosis.

To achieve this it is important that the tissue must be prepared in such a manner that it is sufficiently thick or thin to be examined microscopically and all the structures in a tissue may be differentiated [6-8]. Histopathologists are well versed with histopathology for infectious diseases. Microbiologists often lack knowledge regarding the direct microscopic visualization of infectious agents in tissue biopsies [9]. When considered with relevant clinical information, the histological features seen in tissue biopsies may provide sufficient information to correctly identify a particular type of organism [10- 12].

The utility of histopathology in the diagnosis of infectious disease has been well established. Microscopic identification of a pathogen by its morphological features on staining continues to be the mainstay of diagnostic histopathology but recent developments in immunohistochemistry and molecular diagnostics will definitely be more rapid and also specific. The successful characterization of the infectious disease pathology requires the proper characterization of the inflammatory response, knowledge of associated pathogens, use of special histochemical stains and, in some instances, use of highly specific molecular technologies [9]. Hence the aim of this research is to assess the awareness and attitude of Medical Laboratory Science (MLS) students towards histopathology speciality.

### MATERIALS AND METHODS

**Study Area:** A cross-sectional survey was conducted in Madonna University Elele Campus. Elele is a town in Ikwerre Local Government Area of Rivers state. Elele is a sub-urban town located in the tropical rain forest of South South Nigeria. It has a population of 42213 (47.8% males, 52.2% females) and is cosmopolitan, being home to indigenes of Ikwerre speaking area of Rivers state.

**Population Study:** The present study was based on data from Two hundred and seventy two (272) Medical Laboratory Science Students. Questionnaires were distributed to all the students from year one to year five. Out of 350 Questionnaires, only 272 completed and returned there questionnaires. These students were from different backgrounds with age ranging from 15-35. The questions were designed to obtain “Yes”, “No” and “Unknown” answers. Inform consent was granted by the individual subjects

**Statistical Analysis:** Values were represented as percentages and as mean  $\pm$  SD. Data were analyzed using one-way analysis of variance (ANOVA) and group means were compared using the Tukey-Kramer Multiple Comparison Test using Graph Pad Instat® software. P values  $<$  0.05 were considered significant.

### RESULTS

The ages of the students ranged from 15-25 years were 270 (99.3%) and ages group 26-35 only 2 (0.7%). 4 (1.5%) of the students were married, while 268 (98.5%) were single at the time of this research. Almost all the students were Christians, 269 (98.8%), there were 2 (0.8%) Muslims, while traditional was 1 (0.4%). 248 (91.2%) of the students reside in an urban area and 24 (8.8%) in rural area (Table 1).

**Preferred Discipline in Medical Laboratory Science:** Thirty one (31) representing 11.4% of the total students choose to study Histopathology/Cytology, 83 (30.6%) choose to study Haematology/Blood Transfusion Science, 67 (24.7%) choose to study Medical Microbiology, 1(0.36%) choose to study Immunology and none (0%) choose Parasitology discipline. However, on class basis, 3 (13%) out of 23 students in first year, 5 (9.4%) out of 53 students in second year, 5(8.9%) out of 57 students in third year, 16 (18.6) out of 85 students in fourth year and 2 (3.7%) out of 54 students of fifth year choose histopathology. Statistically when histopathology was compared with other speciality using mean  $\pm$  SD of the percentages, there was significant difference between histopathology and haematology, unlike other specialities where there are no statistical difference (Table 2).

Table 1: Demographic characteristic of respondents.

Demographic characteristics	Category	f	%
Age group	15-25	270	99.3
	26-35	2	0.7
Marital status	Married	4	1.5
	Single	268	98.5
	Separated	0	0
	Divorced	0	0
Religion	Christianity	269	98.8
	Traditional	1	0.4
	Muslim	2	0.8
	Others	0	0
Sex	Female	200	73.5
	Male	72	26.5
Residence	Rural	24	8.8
	Urban	248	91.2

Table 2: Preferred discipline in medical laboratory science.

Year of Class	Histopathology	Chemical pathology	Haematology	Microbiology	Immunology	Parasitology	Total (%)
1.	3(13.0)	1(4.3)	16(69.5)	3(13.0)	0(0.0)	0(0.0)	23
2.	5(9.4)	20(37.7)	23 (43.3)	4(7.5)	1(1.8)	0(0.0)	53
3.	5(8.9)	18 (32.1)	21(41.0)	13 (23.2)	0(0.0)	0(0.0)	57
4.	16 (18.6)	25(29.0)	21(24.4)	23 (26.7)	0(0.0)	0(0.0)	85
5.	2(3.7)	19(35.8)	9 (16.9)	24 (45.2)	0(0.0)	0(0.0)	54
Mean ± SD (%)	10.720±5	27.780±13	39.020±20*	23.120 ±14	0.3600±0	0.000±0	272(100)

Each value represents the mean ± standard deviation (n = 5), values are statistically different from control at p< 0.05\*one-way analysis of variance (ANOVA) + Turkey -Kramer Multiple Comparisons Test.

Table 3: Histopathology discipline a problem in Nigeria?

Year of Class	Yes	No	None	Total (%)
1	2(8.6)	7(30.4)	14 (60.8)	23
2	8 (15.0)	31(58.4)	14(26.4)	53
3	5(8.7)	25(44.6)	27(48.2)	57
4	20(23.2)	57(67.4)	8(9.3)	85
5	17(32.0)	31(56.6)	6(11.3)	54
Mean ± SD (%)	17.198±10	51.480±14*	31.200±22	272 (100)

Values are statistically different at p< 0.05\* one-way analysis of variance (ANOVA) + Tukey -Kramer Multiple Comparisons Test.

Table 4: Students who liked histopathology/cytology discipline in MLS

Category	f	%
Those who liked histopathology/cytology discipline	28	10.3
Those who disliked histopathology/cytology discipline	234	86
Indifferent	10	3.7

Table 5: Responds for awareness of histopathology.

Questions	Yes	No	Unknown
Have you heard of histopathology as a discipline in MLS?	245(90%)	17(6.3%)	10(3.7%)
Have you been to histopathology laboratory before?	165(60.6%)	88(32.4%)	19(7.0%)
Have you ever had a close contact with anyone who is a histo-scientist?	130(47.7%)	125(46%)	17(6.3%)
Do you think histopathology is a stressful discipline in MLS?	77(28.3%)	140(51.5%)	55(20.2%)
Do you think histopathology is Inter-related to other fields of discipline in MLS?	206(75.7%)	34(12.5%)	32(11.8%)

**Histopathology Discipline a Problem in Nigeria:**

A total number of 2 (8.6%) out of 23 student in first year, 8 (15%) out of 53 students in second year, 5 (8.7%) out of 57 students in third year, 20 (23%) out of 85 students in fourth year and 17 (32%) out of 54 students in fifth year said yes that histopathology is a problem. Statistically when those that said “yes” were statistically lower than those that said “no” when compared using mean ± SD of the percentages (Table 3). Total of 28 (10.3%) students out of the total number that participated liked Histopathology as a discipline in MLS, 233 (86.0%) dislike Histopathology and 10 (3.7%) where indifferent (Table 4).

**Responds for Awareness of Histopathology:**

In Table 5, a total of 245 (90%) student said “yes” that they have heard of histopathology, 17 (6.3%) of student said “No” while 10 (3.7%) had no idea. 165 (60.6%) said “yes” they have been to histopathology laboratory before, while 88 (32.4%) have never been to a histopathology laboratory, 19 (7%) knew nothing about it. 130 (47.7%) have had contact with a histo-scientist, 125 (46%) have not had any contact with any histo-scientist, while 17 (6.3%) had no idea. 77 (28.3%) said histopathology is a stressful discipline, while 140 (51.5%) said it is not, 55 (20.2%) of the respondents had no idea. 206 (75.7%) said “yes” that histopathology is inter-related to other fields in MLS, while 34 (12.5%) said “no” and 32 (11.8%) had no idea.

## DISCUSSION

In choosing a discipline in MLS only 31 (11.4%) out of the total 272 students choose histopathology, which is an indication of low interest in the speciality. On class basis there were still low interest in making histopathology a choice of specialization as only 3 (13%) out of 23 students in first year, 5 (9.4%) out of 53 students in second year, 5 (8.9%) out of 57 students in third year, 16 (18.6) out of 85 students in fourth year and 2 (3.7%) out of 54 students of fifth year choose histopathology (Table 2). This low interest is apparently connected to the excruciating effect of formaldehyde (exposure due to inhalation of the fumes of formaldehyde caused shortness of breath, mild irritation of the upper respiratory tract [13]. Statistically when histopathology was compared with other speciality using mean  $\pm$  SD of the percentages, there was significant difference between histopathology and haematology, unlike other specialities where there are no statistical difference (Table 2).

### **Histopathology Discipline a Problem in Nigeria:**

The general response of the students on if histopathology discipline is a Problem in Nigeria. The result shows only few students saying "yes" 2 (8.6%) out of 23 student in first year, 8 (15%) out of 53 students in second year, 5 (8.7%) out of 57 students in third year, 20 (23%) out of 85 students in fourth year and 17 (32%) out of 54 students in fifth year said yes that histopathology is a problem. Statistically when those that said "yes" were statistically lower than those that said "no" when compared using mean  $\pm$  SD of the percentages (Table 3). In this section it is obvious the histopathology if not a problem in Nigeria but 233 (86%) out of 272 students dislikes histopathology as against 23 (10.3%) that likes it (Table 4)

### **Response for Awareness of Histopathology:**

Although quite a good number of the students, 245 (90%) have heard of histopathology, it was surprising to know that 17 (6.3%) of the student have never heard of the word histopathology and 10(3.7) had no idea as well (Table 5). This could also be as a result of the fact that 88 (32.4%) of them have not been to a histopathology laboratory and only 130 (47.7%) have had contact with a histo-scientist. 165 (60.6%) said "yes" they have been to histopathology Laboratory before, 19 (7%) knew nothing about it. 130 (47.7%) have had contact with a histo-scientist, 125 (46%) have not had

any contact with any histo-scientist, while 17 (6.3%) had no idea. 77 (28.3%) said histopathology is a stressful discipline, while 140(51.5%) said it is not, 55(20.2%) of the respondents had no idea. 206 (75.7%) said "yes" that histopathology is inter-related to other fields in MLS, while 34 (12.5%) said "no" and 32 (11.8%) had no idea. The students demonstrated good awareness of histopathology but choosing it as a specialization has been a problem.

## CONCLUSIONS

Histopathology is an interesting speciality in MLS, but the decline of students and lectures calls for attention and if no measure is taking, one wonders what the future holds for this speciality. Therefore, it is recommended that the misconception and phobia of autopsy and handling of the diseased and there parts should be totally dealt with. The study of histopathology should be simplified and made more interesting. Only qualified lecturers specializing in histopathology should be allowed to teach histopathology.

## REFERENCES

1. Schloman, B.F., 1997. Mapping the literature of allied health: project overview. *Bull. Med. Libr. Assoc.*, 85(3): 271-277.
2. Berger, D.A., 1999. Brief history of medical diagnosis and the birth of the clinical laboratory. part 1: ancient times through the 19th century. *Med. Lab. Obs.*, 31(7): 28-30.
3. Lindberg, D.S., M.S. Britt and F.W. Fisher, 1984. Williams' introduction to the profession of medical technology. 4th ed. Philadelphia, PA: Lea & Febiger.
4. Kotlarz, V.R., 1998. Tracing our roots: origins of clinical laboratory science. *Clin. Lab. Sci.*, 11(1): 5-7.
5. Titford, M., 2006. A Short History of Histopathology Technique: *The J. Histotechnol.*, 29(2): 99-110.
6. Bancroft, J.D. and A. Stevens, 1990. Theory and practice of histological techniques Ed. 3, Churchill livingstone Inc. Edinburgh. London, Melbourne and New York.
7. Lillie, R.D., 1965. Histopathologic technique and practice histochemistry. Ed. 3, New York, McGraw Hill Book Co.
8. Manual of histologic and special staining techniques ed. 2, New York, 1960, The Blakiston Division McGraw Hill Book Co.

9. Gupta, E., P. Bhalla, N. Khurana and T. Singh, 2009. Histopathology for the diagnosis of infectious diseases. *Indian J. Med. Microbiol.*, 27: 100-6.
10. Woods, G.L. and D.H. Walker, 1996. Detection of infection or infectious agents by the use of cytologic and histologic stains. *Clin. Microbiol. Rev.*, 9: 382-404.
11. Powers, C.N., 1998. Diagnosis of infectious diseases: A cytopathologist's perspective. *Clin. Microbiol. Rev.*, 11: 341-65.
12. Procop, G.W. and M. Wilson, 2001. Infectious disease pathology. *Clin. Infect. Dis.*, 32: 1589-601.
13. Onyije, F.M. and O.G. Avwioro, 2012. Excruciating effects of formaldehyde exposure to students in gross anatomy dissection laboratory. *The Intern. J. Occup. & Environ. Med.*, 3: 92-95.