

# Attitude and Perception of Medical Students Towards Histology Subject at Wollo University, Ethiopia

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**Introduction:** Students' perceptions and feedback have a significant impact on academic progress.

**Objective:** To assess the attitude and perception of medical students towards histology subject at Wollo University, Northern Ethiopia.

**Methods:** An institution-based cross-sectional study design was carried out in Wollo University from January, 2021 to February, 2021. A pre-tested and structured self-administered questionnaire was used for data collection. All opinions were rated using a positive-point Likert scale, which ranges from "strongly disagree" to "strongly agree." The data were entered and analyzed using SPSS version 20.

**Results:** A total of 184 students participated in this study, with a 100% response rate. Of the respondents, 84.24% of them were very much interested in histology subject. However, only 31 (16.85%) thought of histology as a career choice. The two major reason for not joining histology was less chance of promotion (65, 35.33%) and financial growth (41, 22.28%) followed by difficulty of the subject (23, 12.5%). Most of the respondents (155, 84.24%) agreed or strongly agreed that histology knowledge will help them a lot in their future clinical practice. Regarding different methods of teaching histology, our study reveals that there were 82.61% of participants who agreed with the proposed integration of histology and pathology. Moreover, system approach in teaching pathology with other disciplines was preferred by 70.1% and was comparable to several studies.

**Conclusion:** Overall, the study findings indicate that medical students have a favorable attitude toward histology courses. But, they are unable to join the field due to the lower chance of promotion and financial growth. The curricular integration of histology and pathology in the first year needs to be continued, and much effort is needed to increase students' affinity for microscopic anatomy. This evidence serves as an additional motive for the development of histology courses focusing on practical application of knowledge in a clinically oriented setting.

**Keywords:** Attitude, Perception, Medical Students, Wollo University

## Introduction

Histology is the science of microscopic structures of human tissues and organs.<sup>1</sup> Since it is a pre-clinical medical subject, it is important for understanding the complexity of cell and tissue organization and function.<sup>2,3</sup> Understanding the normal morphology and function of organs is important not only in the early years of medical school, but also serves as a foundation for pathology.<sup>4</sup> Understanding disease mechanisms in terms of altered human body structure necessitate a thorough understanding of histology.<sup>5</sup> Anatomy is a highly tough subject for the vast majority of students, and it is regarded as the most extensive subject of the first year of medical school.<sup>6</sup> Gross anatomy education receives the majority of the overall number of hours allotted to anatomy instruction. Students are slower to recognize the importance of histology because gross anatomy is overemphasized, and their attitudes against histology form early in the course.<sup>7</sup>

Teaching histology as an image-intensive science is one of the most difficult tasks encountered by medical educators. Both "traditional" and "nontraditional" methods have been used<sup>8</sup> and modalities such as peer teaching,<sup>9</sup> audiovisual tools,<sup>10</sup> and

technological and traditional drawing approaches have been extensively studied and tested.<sup>11,12</sup> Furthermore, virtual microscopy has proven to be advantageous in a variety of ways.<sup>13</sup> Understanding histology is essential for every medical student when doing pathology at medical school.<sup>14,15</sup>

In many Ethiopian medical schools, innovative curriculums have been implemented, all of which have in one way or another achieved system-based curricula or curricula based on problem-based learning. In our medical school, the students taught the course histology during their first and second years of study. At our university, a systemic approach to teaching histology was used, with 40–45 students in a single class and an adequate instructor lecturing in person. Both a laboratory-based and a theoretical method of teaching histology were applied.<sup>16</sup>

According to a study conducted in Pakistan on the clinical importance of histology, students do not recognize the importance of histology in clinical practice.<sup>17</sup> Another study conducted by Pushpa et al, on the perception and attitudes of first-year medical students in India found that the majority of the students' attitudes towards histology improved over the course of a year, from ambiguity to clarity, neglect to interest, and lastly, increased self-confidence.<sup>18</sup> Furthermore, medical students have a favorable attitude toward histology, according to a survey done in Serbia on the relevance and attitudes toward histology courses.<sup>19</sup>

Many researches has been done to show how important gross anatomy is in clinical practice.<sup>20–23</sup> However; there have been few studies on the importance of histology in medical school. There have been no studies in Ethiopia to analyze medical students' perceptions of the clinical importance of histology to date. Histology teachers will be able to design methods for excellence in academic and clinical competency based on an assessment of medical students' attitudes toward histology. The purpose of this study is to determine how medical students feel about the clinical importance of histology. In order to construct effective learning strategies for teaching microscopic anatomy, it will be necessary to first identify student attitudes.

## Materials and Methods

### Study Design, Area, and Period

An institution-based cross-sectional study design was carried out from January 2021 – February 2021 at the College of Medicine and Health Sciences, Wollo University which is a public university in Northern Ethiopia.

### Data Collection Tool and Procedure

For data collection, a pre-tested and structured self-administered questionnaire was used. The questionnaire was adapted from previous research on the subject.<sup>17–19,24–26</sup> A pre-test was conducted on 5% of the sample size to assess the substance and clarity of the questionnaire. During the 2021 academic calendar, all PC-II (Pre-clinical II or second-year medical students), C-I (Clinical year I or third-year medical students), C-II (Clinical year II or fourth-year medical students), and interns undergraduate medical students at Wollo University's College of Medicine and Health Sciences were participated in this study. A total of 184 questionnaires were given to the students after receiving their consent for participation in this study. The survey comprised of the questions on socio-demographic characteristics, students' attitudes towards histology subjects, interest and career choices of the students, different methods of teaching histology, and their perceptions regarding the integration of histology and pathology in integrated courses. All opinions were rated using a positive point Likert scale, which ranges from “strongly disagree” to “strongly agree.” After completion of data collection, the data has been checked for errors and completeness to assure the quality of the data.

### Data Entry and Analyses

For this study, Epi-info version 7.1 was used to clean, code, and enter the data, which was then exported to SPSS version 20 for analysis. All levels of opinion were evaluated. Descriptive statistics and Pearson's chi-square test were used.

## Results

### Socio-Demographic Characteristics

A total of 184 students participated in this study, with a 100% response rate. More than one-third of the respondents (128, 69.57%) were within the age group of 23–27. The majority of the respondents (151, 82.07%) were males. More than half

of the participants (102, 55.98%) came from rural areas of the country. Nearly half of the respondents (88, 47.82%) were of Orthodox religion (57, 30.98%). Almost one-third of the participants (58, 31.52%) were from the Amhara ethnic group, followed by the Oromo (53, 28.8%). Among the respondents involved in this study, 49 (26.63%), 46 (25%), 48 (26.1%), and 41 (22.27%) were PC-II, C-I, C-II, and intern students, respectively (Table 1).

## Attitude Towards the Course Histology

One hundred sixty-two (88.02%) of the respondents perceived that histology is important in medicine. More than three-fourths of them agreed that learning histology (155, 84.24%) and histology lab sessions (144, 78.26%) was interesting. Out of the 184 respondents, 121 (65.76%) of them found practical histology was more difficult than theory. Of the participants, only 76 (41.3%) of the respondents reported that their grades in practical histology exams were higher than theoretical exams. When compared to other disciplines, only 68 (36.96%) of the participants felt histology was easier than other basic medical science subjects. More than one-third of the respondents (72, 39.13%) perceived that practical histology needs more lab sessions and more effort was put forth by the instructor than what the student took. Most of the respondents (155, 84.24%) agreed or strongly agreed that histology knowledge will help them a lot in their future clinical practice. Regarding the

**Table 1** Socio-Demographic Characteristics of the Respondents

Socio-Demographic Characteristics		Frequency	Percentage
Age	18–22	42	22.82
	23–27	128	69.57
	28–32	14	7.61
Gender	Female	33	17.93
	Male	151	82.07
Residence	Rural	103	55.98
	Urban	81	44.02
Religion	Muslim	57	30.98
	Orthodox	88	47.82
	Protestant	32	17.4
	Others	7	3.8
Ethnicity	Oromo	53	28.8
	Amhara	58	31.52
	SNNP	33	17.93
	Tigre	19	10.34
	Afar	6	3.26
	Others	15	8.15
Study years	PC-II student	49	26.63
	C-I student	46	25
	C-II student	48	26.1
	Intern	41	22.27

**Abbreviations:** SNNP, South Nation and Nationality People; PC-II, preclinical year II; C-I, clinical year I; C-II, clinical year II.

**Table 2** Medical Student Attitudes Towards the Course Histology During Their Study Year

Variables	Strongly Disagree/ Disagree No (%)	Neutral No (%)	Strongly Agree/ Agree No (%)
Histology is important in medicine.	7 (3.8)	15 (8.15)	162 (88.05)
Histology was interesting to learn.	10 (5.43)	19 (10.33)	155 (84.24)
Histology lab sessions were interesting.	12 (6.52)	28 (15.22)	144 (78.26)
Practical histology was more difficult than theory.	60 (32.61)	3 (1.63)	121 (65.76)
Microscopic morphology of tissue was more difficult to identify than gross morphology.	0	9 (4.89)	175 (95.11)
Your marks in practical Histology exams were worse than theory.	76 (41.3)	23 (12.5)	85 (46.2)
Histology was more difficult other basic medical science subjects.	68 (36.96)	44 (23.91)	72 (39.13)
Practical histology needs more lab sessions and more effort by instructors than what you took.	54 (29.35)	58 (31.52)	72 (39.13)
Histology knowledge will help me a lot in my future clinical practice	14 (7.61)	15 (8.15)	155 (84.24)
In pathology introductory course, you remembered practical histology well and this helped you in practical pathology	17 (9.24)	33 (17.93)	134 (72.83)

knowledge retention of histology, 134 (72.83%) students responded that they remembered normal microscopic morphology well when they tried to identify microscopic disease morphology in the introductory pathology course (Table 2).

## Interest and Career Choice of Histology

Of the respondents, one hundred fifty-five (84.24%) of them were very much interested in histology subjects. However, only 31 (16.85%) of the respondents thought of histology as a career choice. In addition, only 33 (17.93%) of the respondents will guide their juniors to join histology as a career. The two major reasons for not joining histology were less chance of promotion (65, 35.33%) and financial growth (41, 22.28%) followed by the difficulty of the subject (23, 12.5%). More than three-fourths of the respondents (145, 78.8%) agreed that the histology teachers encourage the students to join the field. Out of 184 study participants, more than half (121, 65.76%) of them perceived that an integrated curriculum increased their interest in the histology course (Table 3).

## Perception Toward Teaching Methodology of Histology

One hundred and fifty-two (82.61%) of the respondents preferred the integration of histology and pathology lectures and lab sessions into integrated courses starting from the first year instead of teaching each discipline alone. Besides, adding case discussion (PBL) combining histology and pathology was preferred by the majority of the respondents (125, 67.93%). The majority of the respondents (110, 59.78%) agreed that the microscope is more effective than showing images in teaching histology and that preparing tissue slides was the preferred teaching methodology, as indicated by the majority of the respondents (165, 89.67%). But, nearly half (85, 46.2%) of them agreed that it is more effective to draw microscopic images during teaching histology. In addition, most of the study participants (129, 70.1%) responded that the systemic approach is more effective in teaching histology than teaching each discipline alone. About half (83, 45.12%) of the study participants agreed or strongly agreed that examining a normal and abnormal example of the same tissue at the same time is better than observing alone. However, 76 (41.3%) of them perceived that histology lab material in the first year was not restricted to what needed to be compared with common pathologic conditions (Table 4).

**Table 3** Career Choice and Interest of Medical Students Towards Histology Subject

Variables	Rate	Frequency	Percentage
How much you are interested in histology subject?	Very much	155	84.24
	Minimal	19	10.33
	Null	10	5.43
Do you have a plan to join it as a future career?	Of course	31	16.85
	Maybe	29	15.76
	Never	124	67.39
Will you guide your junior to join the histology as a career?	Of course	33	17.93
	Maybe	45	24.46
	Never	106	57.61
What are the reasons for not joining the histology field?	Less chance of promotion	65	35.33
	Less financial growth	41	22.28
	Difficulty of the subject	23	12.5
	Absence of role model	12	6.52
	Lack of future specialization	16	8.7
	High work load	17	9.24
	Effect on the eye	10	5.43
Does histology teachers encourage the students to join this field	Yes	145	78.8
	No	39	21.2
Will integrated curriculum increase the interest of medical students to the histology course?	Yes	121	65.76
	No	40	21.74
	I do not know	23	12.5

## Discussion

A variety of strategies were tried to improve students' comprehension and knowledge retention. Students at our institution complete general histology courses by the end of the second semester of their second year. The course's major goal is to educate students on how to recognize and understand the structures of cells, tissues, and organs using light microscopy in connection to their function. This is a prerequisite for the succeeding years of education, when students will be exposed to abnormal organ structure and function. In addition, their capacity to integrate the knowledge gained in basic and clinical medical courses will be predicated on their ability to diagnose and treat diverse diseases properly and critically in their future medical practice.<sup>27</sup>

In our study, a large number of students found histology is important in medicine and were interested to learn. Besides, the majority of students thought that practical histology was more difficult than theory and gross morphology. This was higher than the number reported in a recent study from Serbia (79.2%).<sup>19</sup> This discrepancy may be due to variations in the teaching methodology of histology instructors in two countries. In our study, the majority of students agreed that histology knowledge would be very useful to them in their future clinical practices, and they remembered practical histology well during the pathology introductory course, which helped them in practical pathology. This finding

**Table 4** Participants' Perceptions of Different Methods for Improving Histology Teaching

Improving Methods	Strongly Disagree/ Disagree No (%)	Neutral No (%)	Strongly Agree/ Agree No (%)
Courses integrating histology and pathology in the first and second years are better than teaching each discipline alone.	15 (8.15)	17 (9.24)	152 (82.61)
It is better to add case discussions (PBL) combining histology and pathology.	28 (15.22)	31 (16.85)	125 (67.93)
Microscope is more effective than images in teaching microscopic morphology.	35 (19.02)	39 (21.2)	110 (59.78)
It is more effective to draw microscopic images during teaching histology.	85 (46.2)	24 (13.04)	75 (40.76)
It is better to prepare tissue slide during teaching histology	0	19 (10.33)	165 (89.67)
It is better to see normal and abnormal examples of the same tissue type at the same time.	79 (42.93)	22 (11.95)	83 (45.12)
In teaching histology, systemic approach is more effective than each discipline alone.	55 (29.9)	0	129 (70.1)
It is better for histology lab material in the first year to be restricted to what need to be compared with common pathologic conditions.	76 (41.3)	40 (21.74)	68 (36.96)

is in agreement with the study conducted in Serbia.<sup>19</sup> However; these findings contradict a study conducted in central Jordan, which found that only 31.3% of respondents remembered practical histology well during the pathology introductory course.<sup>23</sup> This difference may be due to variation in the organization of histology labs and integrated curricular differences between the two countries.

In the present study, 84.24% of medical students were interested in histology subjects. But, only 16.85% of them wish to join the field as a future career. Besides, the main reasons for not joining the basic medical science field were that there was less chance of promotion and less financial growth in these fields. This finding is in line with the study conducted in Ethiopia, China, Malaysia, and South Asia, which found that there is a limited opportunity in basic medical science, restricted to teaching, research, and diagnostic laboratories.<sup>28,29</sup> In our study, nearly one-third of the medical students acknowledge the significance of the integration of histology with clinical discipline, which helps in a better understanding of respective subjects. However, 34.24% of those polled said the integrated curriculum had not increased their interest in basic medical sciences. This finding is in agreement with Teshome et al reports.<sup>28</sup> Regarding different methods of teaching histology, our study reveals that there were 82.61% of participants who agreed or strongly agreed with the proposed integration of histology and pathology. Furthermore, a system approach to teaching pathology in conjunction with other disciplines was preferred by 70.1%, which was consistent with previous researches.<sup>24,30,31</sup>

An integrated curriculum in teaching laboratory medicine has been shown to be effective in medical students' satisfaction and better understanding.<sup>32,33</sup> The need to start the integration of histology and pathology in the first year is well highlighted by the ratio of students who were unsatisfied with practical histology in the first year (39.13%) and the significant proportion of students who were uncomfortable with co-presenting normal and abnormal examples at the same time in the second year pathology introduction (45.12%). Correlating normal histology of organs with the morphology of disease is a major learning outcome that boosts students' knowledge and understanding.<sup>34</sup> In addition, combining this integration with new teaching and learning methods such as virtual microscopy needs to be tested.<sup>35</sup> However, our results showed that microscopy is still the preferred tool for 59.74% of students.

## Conclusion

This cross-sectional study examined the attitudes and perceptions of medical students towards histology subjects at Wollo University, Ethiopia. Overall, the study findings indicate that medical students have a favorable attitude toward histology courses. But, they are unable to join the field due to the lower chance of promotion and financial growth. The curricular



integration of histology and pathology in the first year needs to be continued, and much effort is needed to increase students' affinity for microscopic anatomy. This evidence could be used as an additional motive for the development of histology courses, with special emphasis on the practical application of knowledge in a clinically-oriented setting.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Ethics Approval and Consent to Participate

Ethical clearance was obtained from Wollo University, College of Medicine and Health Sciences. All study participants were informed about the purpose and confidentiality issues related to the study. Participation was voluntary and written informed consent was obtained from each participant. Finally, the data were collected and confidentiality of client information was maintained. Lastly, the author confirmed that this study was conducted in accordance with the declaration of Helsinki.

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## Disclosure

The author declares that he has no conflict of interest in this work.

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