

## LEVEL OF KNOWLEDGE, INTEREST, AND PERCEPTION OF CLINICAL ROTATION STUDENTS REGARDING FORENSIC MEDICINE AND MEDICOLEGAL SCIENCE

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### ABSTRACT

**Background:** Forensic medicine and medicolegal science (FMMS) as mandatory competences that clinical rotation students must possess. However, the number of forensic medicine and medicolegal specialists is still significantly less. Currently, there are 271 people recorded and spread across Indonesia, including two people in Aceh Province with three medical faculties to be managed. For this reason, it is necessary to think about how to increase the number of forensic medicine and medicolegal specialists in Aceh. This study describes the level of knowledge, interest, and perceptions of clinical rotation students regarding FMMS.

**Methods:** The type of study was observational analytic with a cross-sectional design. The instrument used was an online questionnaire with a Content Validity Ratio of 0.750. The samples of this study were clinical rotation students who had passed the forensic medicine and medicolegal sciences stages. The samples were collected using the purposive sampling method.

**Results:** A total of 102 respondents were involved in this study. The majority of respondents had good knowledge (97.1%). As many as 63.7% of respondents were interested in studying forensic medicine and medicolegal and 59.8% of respondents positively perceived these studies. Based on the Spearman's statistical test showed a significant correlation between the interest and perception under the Sig.(2-tailed) 0.002 (Sig.(2-tailed)  $\leq 0.05$ ).

**Conclusion:** Clinical rotation students of the Faculty of Medicine, Syiah Kuala University have good knowledge, high interest, and positive perceptions. This is a new opportunity and challenges for the development of FMMS in Indonesia.

**Keywords:** Forensic medicine, Medico-legal science, Knowledge, Interests, Perception

### ABSTRAK

**Latar belakang:** Ilmu kedokteran forensik dan medikolegal (IKFM) merupakan kompetensi wajib yang harus dimiliki oleh setiap mahasiswa rotasi klinik. Namun jumlah dokter spesialis forensik dan medicolegal masih sangat kurang, terdapat saat ini sebanyak 271 orang yang tersebar di seluruh Indonesia, termasuk dua orang di Provinsi Aceh dengan tiga fakultas kedokteran yang harus diampu. Untuk itu perlu dipikirkan cara menambah jumlah dokter forensik di Aceh. Salah satu cara yang ditempuh adalah dengan mengetahui gambaran pengetahuan, minat serta persepsi mahasiswa rotasi klinik. Penelitian ini bertujuan untuk

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mengetahui gambaran tingkat pengetahuan, minat, dan persepsi mahasiswa rotasi klinik terhadap IKFM.

**Metode:** Penelitian ini bersifat observasional analitik dengan disain cross sectional. Instrumen penelitian ini menggunakan kuesioner online yang telah diuji validitas oleh para ahli dengan Content Validity Ratio sebesar 0.750. Sampel penelitian ini adalah mahasiswa kepaniteran klinik yang telah melewati stase ilmu kedokteran forensik dan medicolegal yang dikumpulkan dengan menggunakan metode purposive sampling.

**Hasil:** Sebanyak 102 responden yang dilibatkan dalam penelitian ini. Mayoritas responden memiliki pengetahuan yang baik tentang ilmu kedokteran forensik dan medicolegal (97,1%). Sebanyak 63,7% responden berminat mendalami ilmu kedokteran forensik dan medikolegal dan 59,8% responden memiliki persepsi positif terhadap keilmuan tersebut. Berdasarkan hasil uji statistik Spearman menunjukkan adanya korelasi yang signifikan antara minat dan persepsi dengan nilai Sig.(2-tailed) 0.002 (Sig.(2-tailed)  $\leq 0.05$ ).

**Kesimpulan:** Mahasiswa kepaniteraan klinik Fakultas Kedokteran Universitas Syiah Kuala memiliki pengetahuan baik, minat tinggi, dan persepsi positif. Hal ini merupakan peluang dan tantangan baru untuk perkembangan keilmuan kedokteran forensik dan medicolegal di Indonesia.

**Kata kunci:** kedokteran forensik, medikolegal, pengetahuan, minat, persepsi

### PRACTICE POINTS

- Forensic medicine and medicolegal science are needed in medical education so that their existence must be preserved.
- Good knowledge can foster interest and good perceptions so that it becomes an opportunity as well as a challenge for the development of forensic medicine and medicolegal science in Indonesia in the future.

### INTRODUCTION

Forensic medicine and medicolegal science (FMMS) applies the principles and practice of medical science to assist the administration of justice.<sup>1</sup> Forensic medicine is a branch of medical science that uses medical science and technology to benefit law enforcement and justice. Meanwhile, medicolegal is a branch of medical science that studies the legal aspects of medical action to help health services. Cases handled by forensic medicine are legal cases from outside health services such as murder, assault, and rape. Investigators handle these cases and ask doctors for help to make clear a criminal case. Meanwhile, cases handled by medicolegal services are events, problems, medical or non-medical cases that could potentially become legal problems in the form of criminal or civil cases.<sup>2,3</sup>

The investigators task is in line with article 133 of the Criminal Procedure Code, paragraph 1, in the case that an investigator for the sake of justice

handles victims whether they are injured, poisoned or died due to a criminal act, he or she has the authority to submit expert testimony to an expert in forensic medicine or a doctor or other expert.<sup>4</sup> Aceh Province in 2018 ranks the 12<sup>th</sup> highest total number of crime cases in Indonesia, based on reports from the Indonesian National Police, Regional of Aceh, with 22 murder cases, 1,475 physical abuse cases, and crimes against decency (sexual immorality and rape) 262 cases.<sup>5</sup> Increasing cases of lawlessness relating to human bodies and lives, so the assistance of forensic medicine and medicolegal scientists is needed who can assist related parties in disclosing cases in the justice system.<sup>6</sup>

Based on data from the Indonesian Association of Forensic Medicine and Medicolegal in 2020, the number of forensic medicine and medicolegal specialists in Indonesia is 271, spread across 34 provinces and 514 districts or cities.<sup>7</sup> Aceh Province itself only has two forensic medicine and

medicolegal specialists. Aceh has three colleges that open medical education study programs, namely Syiah Kuala University, Abulyatama University, and Malikussaleh University.<sup>8</sup> In line with the Indonesian Doctors Competency Standards (IDCS) in 2012, FMMS is taught to undergraduate medical students.<sup>9</sup> So the level of need for forensic medicine and medicolegal specialists is very high because the number of lecturers and the number of medical faculties are not equal.

Candidates for forensic medicine and medicolegal specialists are also scarce. Specialist education centres are limited to 7 universities such as the University of Indonesia, Sumatera Utara University, Padjadjaran University, Gadjah Mada University, Diponegoro University, Airlangga University and Hasanuddin University. The Higher Education Data Base of the Ministry of Research, Technology and Higher Education reports that the Specialist Doctor Education Programme of Forensic Medicine and Medicolegal (SDEP-FMMS) of the University of Indonesia, only has 12 students during the odd semester in 2019. It is different from other study programs, such as the SDEP of Internal Medicine, which was also established in the same year with 202 odd semester students in 2019. Likewise, SDEP-FMMS of Gadjah Mada University, established in 1980, only had 2 students in even semester 2018.<sup>10</sup> Recapitulation of applicants' interest and capacity for admission to SDEP-FMMS of Diponegoro University reported that the number of applicants for the SDEP-FMMS was only 6 people from a capacity of 8 people. While the number of registrants for other specialties, such as the SDEP in Internal Medicine, total 70 people of a capacity of 10.<sup>11</sup>

A study conducted on 90 medical college students in Uttar Pradesh India, showed that most students (77.85%) did not want to choose forensic medicine as a career. Most of the students argued that they did not want to deal with the court. The majority of male students answered that it was related to death. In contrast, most female students said they were more interested in other specialties and did not want to be associated with the corpse.<sup>12</sup> Research conducted on 117 co-assistants in the Sumatra region showed

an interest in FMMS at 4.27%. The few interested in studying FMMS get the most answers: they are less attractive in terms of income or finances (27.32%) and because it is difficult to open a medical practice (20.51%).<sup>13</sup>

FMMS are relatively rarely chosen professions. Many medical students found them dire, outside the clinical setting, with long and unpredictable working hours and insufficient appreciation of jobs especially financial compared to other specialties. The study was conducted on 135 students at the Faculty of Medicine Toulouse, France showed that 60.5% of students did not have sufficient knowledge of forensics medicine and medicolegal. As many as 96% of students felt that they were not ready to examine a corpse, and 92.4% of students thought that they were not prepared to examine victims of criminal cases.<sup>14</sup> The results of another study conducted on 143 medical students at Damman University, Saudi Arabia stated that students had inadequate knowledge, poor attitudes, and limited awareness of the importance of forensic medicine courses among medical students. As many as 91.6% of students still know that forensic medicine only deals with people who have died. Only 23.1% of these students believed that forensic medicine courses would help in their future careers.<sup>15</sup> Another study conducted on 100 medical students in third year at Rai Medical College Sargodha Pakistan, as many as 36% of students agreed and 9% of students strongly agreed that they feel anxious when observing an autopsy. Students have the perception that autopsy is a skill that is less friendly to corpses.<sup>16</sup>

The importance of knowledge about FMMS, and the lack of interest in medical students and various negative perceptions of FMMS encourages researchers to conduct research related to the level of knowledge, interest, and perception of FMMS. This research also will be helpful as a preliminary survey for the opening plan of the SDEP-FMMS at the Faculty of Medicine, Syiah Kuala University, Banda Aceh. Researchers took respondents, the final stage of clinical rotation students because they had passed the exposure of all specialties and made decisions for their careers.

**METHODS**

**Instruments**

The instrument used is an online questionnaire (Google form) that was made by the researcher tested for validity with a Content Validity Ratio/CVR by experts. The CVR validity test was conducted from 29 June to 6 July 2020. The assessment of each question item involved 8 panellists consisting of 4 FMMS experts and 4 non FMMS experts such as pathology anatomy, biomedical science, tropical medicine and public health. The average result of the CVR value was 0.750. From this CVR value, it can be stated that the instrument content validity is at a high level.

**Design and research subjects**

The research type is an observational analytic with a cross-sectional design. This study involved 102 students who met the inclusion criteria. Respondents who participated in this study were medical students from academic year 2011-2015 who entered the clinical rotation at forensic medicine in 2015-2020. The study aims to get information about the level of knowledge, interests and perceptions of clinical rotation students at the Faculty of Medicine, University of Syiah Kuala, forensic medicine and medicolegal science. The respondents of this study were students of the Faculty of Medicine at Syiah Kuala University who had passed the clinical rotation in the forensic medicine and medicolegal department.

**Population and samples**

The population in this study were all clinical rotation students of the Syiah Kuala University Medical Faculty in the 2019/2020 academic year total of 378 people. The sample in this study were clinical rotation students of the Faculty of Medicine, Syiah Kuala University who met the requirements based on the inclusion criteria. The minimum sample size used in the study can be calculated using the Slovin formula, which is obtained at least 79 respondents.

**Research procedure**

The data collection technique in this study uses primary data using an online questionnaire

(Google form) which researchers have prepared to respondents, which are distributed via social media by enumerators to help gather students in filling out the questionnaire. The time for data collection began on 19 August to 19 September 2020. All respondents filled out the questionnaire independently consisting of student knowledge (19 questions), interests (6 statements), and perceptions related to FMMS (33 questions).

Knowledge is everything that clinical rotation students know about FMMS. The measurement of knowledge uses the Guttman scale which consists of correct and wrong answer choices. Each correct answer is given a value of 1 and each wrong answer is given a value of 0.<sup>17</sup> Criteria for assessing the respondent's knowledge:<sup>18</sup> (1) Good knowledge: 76-100%, (2) Good enough knowledge: 56-76%, and (3) Poor knowledge: < 56%.

Interest is a feeling of preference or interest in the FMMS without any coercion felt by the clinical rotation student. The measurement of interest uses a Likert scale which consists of 5 answer choices, namely strongly agree, agree, neutral, disagree and strongly disagree. To answer positive questions, strongly agree is given a value of 5, agree is given a value of 4, doubt is given a value of 3, disagrees with a value of 2, and strongly disagrees is given a value of 1. As for answers to negative questions, it is returned with positive questions. respondents' interest:<sup>18</sup> (1) High interest: 76-100%, (2) Medium interest: 56-76%, and (3) Low interest: <56%.

Perception is the response or assessment of clinical rotation students on FMMS. Perception measurement uses a Likert scale which consists of 5 answer choices, namely strongly agree, agree, neutral, disagree and strongly disagree. To answer positive questions, strongly agree is given a value of 5, agree is given a value of 4, doubt is given a value of 3, disagrees with a value of 2, and strongly disagrees is given a value of 1. As for answers to negative questions, it is returned with positive questions.<sup>19</sup> Respondents' perceptions:<sup>20</sup> Positive perceptions if the total score obtained by the respondent from the questionnaire > mean. Negative perception if the total score obtained by the respondent from the questionnaire is ≤ mean.

## Data analysis

This study uses univariate and bivariate data analysis to describe each variable. Descriptive statistics are used to explain the characteristics of respondents, the knowledge, interests and perceptions of students regarding the FMMS. To investigate the correlation between knowledge, interests, and perceptions was determined by the Spearman's test at 90% confidence intervals, it was taken significant when found Sig. (2-tailed) value <0.05. Data were processed and analysed by using SPSS version 22.

## Ethical clearance

The Health research ethics committee at the Medical Faculty of Syiah Kuala University / Zainoel Abidin Regional Public Hospital approved this study No. 144/ EA/FK-RSUDZA/2020. The researcher explained the purpose and benefit of the research, also how to fill out the questionnaire before data collection. Respondents participated in the study voluntarily. All respondents agreed to participate in the study by signing the consent sheet in Google form before answering the questionnaire.

## RESULTS AND DISCUSSION

### Characteristics of subjects

This study was conducted in the Faculty of Medicine, Syiah Kuala University with a data collection time span of one month, namely 19 August 2020 to 19 September 2020. Data were collected using primary data, namely online questionnaires (google form). The characteristics of the respondents in this study were grouped by gender, age, and year in the medical profession education, which shows that the largest number of respondents based on gender were female with 67 students (65.7%), while male amounted to 35 students (34.3%). Based on the age, many respondents were 24 years old, namely 39 students (38.2%). Based on the year of class in attending the clinical rotation, many respondents came from the 2014 class, namely 59 students (57.8%).

Measurement of knowledge, interest and perceptions regarding FMMS in clinical rotation students of the Faculty of Medicine, Syiah Kuala University was assessed using a questionnaire that had been compiled by researchers and validated by experts. In table 1, it is found that the majority of respondents

**Table 1. Sociodemographic characteristics of the subject (n=102)**

Characteristics	Variables	Frequency	Percentage (%)
Sex	Male	35	34,3%
	Female	67	65,7%
Age (Years)	21	4	3,9%
	22	12	11,8%
	23	36	35,3%
	24	39	38,2%
	25	6	5,9%
	26	4	3,9%
	27	1	1%
Registered as medical student	Student class of 2011	2	2%
	Student class of 2012	0	0%
	Student class of 2013	4	3,9%
	Student class of 2014	59	57,8%
	Student class of 2015	37	36,3%
Knowledge	Poor	0	0%
	Moderate	3	2,9%
	Good	99	97,1%
Interest	Low	7	6,9%
	Moderate	30	29,4%
	High	65	63,7%
Perception	Negative	41	40,2%
	Positive	61	59,8%

have good knowledge of forensic and medicolegal medicine, namely 99 people (97.1%). Meanwhile, the respondents' interest is high (63.7%), and the respondents' perceptions are more positive (59.8%).

### Description of subject knowledge

Questions 1-8 relate to the respondent's knowledge of the definition and scope of FMMS. FMMS are medical practice terms related to medical and legal sciences.<sup>6</sup> In other words, it can be interpreted as applying medical knowledge to solve findings and opinions in assisting legal proceedings.<sup>1,6</sup> The term forensics comes from the Latin "forensis" which means forum. A forum in a public place to resolve disputes over the cause of death and the level of injury and determine who caused the injury in ancient Roman times.<sup>6,21</sup> Medicolegal services are services provided by medical personnel in the application of medical science for the benefit of laws in force in a country and law in medical ethics.<sup>22</sup> The results of medical evidence that can be used in a court of law are called medicolegal evidence.<sup>23</sup> Comprehensive medicolegal management is needed to ensure that forensic medical examinations relate to living or dead victims, and contain ethical responsibilities and human interests for victims and victims' families.<sup>24</sup> Medicolegal has greater relevance to civil law and prosecutions, which affect patient care. In contrast, forensics deals with criminal law and damage to or by patients.<sup>25</sup> Detailed information about respondents' knowledge about FMMS can be seen in table 2.

In this study, the knowledge about FMMS is divided into three, namely knowledge about definition, role, and scope. In the following three aspects, it is found that the majority of respondents have good knowledge. This study found that the majority of respondents have good knowledge of forensic medicine and medicolegal. It was found that there were 99 people (97.1%) who had good knowledge (see Table.1). Knowledge within the scope of forensic toxicology, ethics, medicolegal, and products from forensic medicine is the component of knowledge most mastered by respondents. These results are in line with a study conducted by Taufan. The study with a cross-sectional design involving

76 medical students aimed to determine the level of knowledge of medical students in the clinical phase of malpractice and medicolegal forensics. This study found that the majority of research respondents had a good level of knowledge about malpractice and medicolegal forensics.<sup>26</sup>

Table 2, the three questions (Q9,13 and 16) were the questions most answered correctly by the respondents, namely by 101 people (99.01%). Meanwhile, knowledge about the scientific role of FMMS about crime scene investigation (CSI) (Q15) and state medicine (Q19) is the component of knowledge that is least mastered by respondents. This question was the question most frequently answered incorrectly by 18 people (17.64%) for CSI and 24 people (23.53%) for state medicine. CSI is an initial step in seeking clues, collecting and analyzing the crime scene. In various cases, such as murder, suspected murder, and others that are suspicious, investigators can ask for a doctor's presence at CSI before the victim's body is moved.<sup>27</sup> Article 120 of the Criminal Procedure Code paragraph (1) states that "In case the investigator deems necessary, he/she can ask the opinion of an expert or person with special expertise".<sup>4</sup>

In many cases, CSI is more important than the autopsy. Through a complete CSI will lead to a correct diagnosis of the cause and manner of death. By looking at the victim's body in its context in the environment, forensic medicine and medicolegal experts are better able to interpret certain findings before the autopsy is performed, such as the pattern of neck marks in hanging cases and advising investigators about the nature of death, determining homicide in some way, natural death, as well as due to certain diseases.<sup>28</sup> CSI contains elements between the victim, the perpetrator, and evidence in accordance with the theory of "triangle evidence".

The qualification of the forensic medical examiner cannot be separated from the prevailing laws and regulations. The Law of the Republic of Indonesia No.8 of 1981 concerning Criminal Procedure Law grants this authority to an expert in judicial medicine (read: a forensic doctor) or a doctor or other expert. The law firmly gives the forensic

**Table 2. Number and percentage of answers for questions regarding knowledge**

Questions	Correct answer	Wrong answer
	n (%)	n (%)
Forensic medicine and medicolegal science is that studies the use of medical science and technology for the benefit of law enforcement and justice.	98 (96,07%)	4 (3,92%)
Forensic medicine and medicolegal science consists of 4 scientific fields, namely clinical forensics, forensic pathology, ethics and medicolegal, and forensic molecular.	98 (96,07%)	4 (3,92%)
The role of Forensic medicine and medicolegal science is to assist the judicial process, which includes the investigation stage until the court hearing.	97 (95,09%)	5 (4,90%)
Bioethics, health law, forensic toxicology, forensic odontology and forensic psychiatry included in the scope of Forensic medicine and medicolegal science.	98 (96,07%)	4 (3,92%)
Cases that include abuse, rape, violence against children and domestic violence are included in clinical forensics.	99 (97,05%)	3 (2,94%)
Determining the cause of death, mode of death and time of death is part of forensic pathology.	98 (96,07%)	4 (3,92%)
Medicolegal relating to aspects of medical services and practices regulated in law.	100 (98,03%)	2 (1,96%)
Examination of teeth, bite marks and components on the mouth and face for judicial purposes including in forensic odontology.	98 (96,07%)	4 (3,92%)
Forensic toxicology is concerned with the analysis of chemicals or drugs in medical legal investigations in cases of chemical deaths.	101 (99,01%)	1 (0,98%)
Serology and biomolecular forensics can help determine paternity (biological father) in inherited disputes.	99 (97,05%)	3 (2,94%)
Clinical forensics is in charge of handling cases of living victims.	96 (94,11%)	6 (5,88%)
Forensic pathologists are in charge of handling cases of dead victims.	96 (94,11%)	6 (5,88%)
Ethics and medicolegal in charge of handling cases of clinical ethical dilemmas, ethics and legal conflicts and medical disputes.	101 (99,01%)	1 (0,98%)
Forensic molecular and serology deals with cases of disputed paternity and DNA identification.	100 (98,03%)	2 (1,96%)
Examination at the scene of a crime is a field of forensic medicine and medicolegal.	84 (82,35%)	18 (17,64%)
One of the scientific products of forensic and medicolegal medicine is visum et repertum.	101 (99,01%)	1 (0,98%)
Providing expert information is the obligation of all doctors, including forensic medicine and medicolegal science experts.	98 (96,07%)	4 (3,92%)
Forensic medicine and medicolegal science are “the mother of forensic sciences”	97 (95,09%)	5 (4,90%)
Forensic medicine and medicolegal science is also called “state medicine”	78 (76,47%)	24 (23,53%)

doctor the “primary” authority, but also gives the “doctor” (general or any specialist) the opportunity to act as an examiner. This shows that doctors other than forensic doctors only obtain authority if certain requirements are met, such as “unavailability” of forensic doctors. At the same time, outside these circumstances the referral system commonly applied in the medical world or it means that the forensic doctor is authorized. Because of its interests for the state, forensic medicine is also called state medicine.<sup>29,30</sup>

**Description of subject interests**

Interest is a condition in which individuals are interested in something accompanied by curiosity to learn and prove further. The definition of interest is a feeling of liking and a tendency to something or an activity without orders from others. The basis of interest is a form of acceptance of bonds between individuals and things outside the individual. Interest is a psychological aspect of a person that can form feelings of liking and being attracted to a particular object and can change an individual's behavior. The sense of interest causes the individual

to have a happy feeling when involved in the thing he is interested in so that he will show more attention to the object.<sup>31</sup>

Interest indicators are divided into four parts, namely: (1) Feeling happy. A person who likes something, then he will continue to learn what he likes. A person will do what he likes voluntarily, without coercion. (2) Interesting. Interest is related to the constant urge that makes someone always feel attracted to do activities that they are interested in. (3) Attention. Someone's interest in something causes that person to continuously make observations on the object he is interested in, without realizing it. (4) Involvement. Individuals who have an interest in and enjoy a certain thing tend to take part and be involved in carrying out activities that they are interested in.<sup>32</sup>

The results of this study found that the majority of respondents have a high category of interest in FMMS. It was found that there were 65 people (63.7%) who had a high level category (see Table.1) . Statement 1 relates to indicators of attention, with 90 people stating “I think the forensic medicine and

**Table 3. Analysis of the distribution of respondents' answers regarding interests in forensic medicine and medicolegal sciences**

Statement	Strongly agree	Agree	Doubtful	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
I think the forensic medicine and medicolegal science are both interesting and exciting fields.	46 (45.09%)	44 (43.13%)	10 (9.8%)	1 (0.98%)	1 (0.98%)
I am interested in hearing or watching information or news in the media related to forensic medicine and medicolegal science.	49 (48.03%)	37 (36.27%)	0 (0%)	14 (13.72%)	2 (1.9%)
I enjoy studying forensic medicine because of the nature of the job.	43 (42.15%)	35 (34.13%)	18 (17.64%)	5 (4.9%)	1 (0.98%)
I am interested in studying forensic medicine for personal interests and personal reasons (e.g. family or friends).	36 (35.29%)	35 (34.13%)	18 (17.64%)	12 (11.76%)	1 (0.98%)
I am interested in continuing my career in the fields of forensic medicine and medicolegal science.	40 (39.21%)	23 (22.54%)	17 (16.66%)	14 (13.72%)	8 (7.84%)
I feel challenged when dealing with victims and perpetrators of crimes.	38 (37.25%)	37 (36.27%)	19 (18.62%)	8 (7.84%)	1 (0.98%)



medicolegal science are both interesting and exciting fields". Statement 2 deals with indicator 4, statement 3 deals with indicator 1, statement 4 deals with indicator 2, statements 5 and 6 deals with indicator 4.

Based on the answers to the questionnaire, it is known that the components that increase respondents' interest the most are information or news in the media related to forensic medicine and medicolegal. Other components such as the nature of the job, job challenges, and personal reasons are also components that increase respondents' interest. However, there were 8 respondents (7.84%) who were not very interested and 14 (13.72%) respondents who were not interested in continuing their education in the fields of forensic medicine and medicolegal. This research is in line with research conducted by Madadin at the University of Damman, Saudi Arabia. The study with a cross sectional design involving 143 medical students showed 115 students (80.4%) considered forensics an area where they wanted to specialize and only 6 students (4.2%) did not consider forensics as a specialization in the future and 22 students (15.4%) answered that they did not know.<sup>15</sup>

The unique thing about this research is the number of respondents who are interested in continuing their careers in this field are 61.75% (39.21% strongly agree, and 22.54% agree) with statements "I am interested in continuing my career in the fields of forensic medicine and medicolegal science

(statement 5)". This result is relatively different from a study conducted by Alawad *et al*, at the Faculty of Medicine, University of Medical Science and Technology, Khartoum, Sudan. This research involving 604 medical students with a cross sectional design aims to determine the specialization preferences chosen by medical students. The study found that very few medical students chose forensics medicine as one of their chosen specialities. Only 5 (1.1%) medical students were interested in becoming forensic and medicolegal specialists.<sup>33</sup>

A person's interest can be influenced by several factors, including internal, social, and emotional factors. Although the respondent's interest in FMMS is high, this interest can change over time with many factors that can affect respondents when they become general practitioners later.<sup>31</sup>

### Description of subject perception

This study found that the majority of respondents had a positive category of perception regarding FMMS. It found that 61 people (59.8%) had positive perceptions. Respondents of this study perceived that FMMS is indispensable in various legal practices, clinical practices, and higher education. Respondents also perceived that it is necessary to add education and training programs on FMMS in higher education. In addition, respondents also considered that forensic and medicolegal specialists

**Table 4. Analysis of the distribution of respondents' answers regarding perception about forensic medicine and medicolegal sciences**

Statements	Strongly agree	Agree	Doubtful	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
Forensic medicine and medicolegal is indispensable in medical and legal practice.	84 (82,35%)	18 (17,65%)	0 (0%)	0 (0%)	0 (0%)
Forensic medicine and medicolegal contribute to upholding justice and human rights.	76 (74,51%)	22 (21,57%)	3 (2,94%)	1 (0,98%)	0 (0%)
Clinical forensic examination is beneficial for the victim / patient.	76 (74,51%)	24 (23,53%)	2 (1,96%)	0 (0%)	0 (0%)
Clinical forensic examination should be carried out in all clinical cases that have the potential to become legal issues.	67 (65,69%)	31 (30,39%)	4 (3,92%)	0 (0%)	0 (0%)

Statements	Strongly agree	Agree	Doubtful	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
It is necessary to establish a standard operating procedure in the hospital regarding the urgency of clinical forensic examination.	64 (62,75%)	36 (35,29%)	2 (1,96%)	0 (0%)	0 (0%)
It is necessary to carry out clinical forensic supervision by carrying out a follow-up examination of the visum et repertum.	62 (60,78%)	37 (36,27%)	3 (2,94%)	0 (0%)	0 (0%)
A follow-up visum et repertum is beneficial for the victim/patient.	71 (69,61%)	29 (28,43%)	2 (1,96%)	0 (0%)	0 (0%)
Forensic pathology examination is beneficial for the victim/patient.	68 (66,67%)	28 (27,45%)	4 (3,92%)	1 (0,98%)	1 (0,98%)
Forensic pathology is useful in cases of clinical death.	69 (67,65%)	27 (26,47%)	5 (4,9%)	0 (0%)	1 (0,98%)
An autopsy is necessary for the investigation of deaths in clinical cases if the external examination is still in doubt.	67 (65,69%)	27 (26,47%)	8 (7,84%)	0 (0%)	0 (0%)
Forensic pathology examination is useful in cases of death due to crime.	70 (68,63%)	25 (25,51%)	6 (5,88%)	1 (0,98%)	0 (0%)
Forensic pathology examination is useful in cases of accidental death.	49 (48,04%)	32 (31,37%)	18 (17,65%)	3 (2,94%)	0 (0%)
An autopsy is necessary for the investigation of death in a victim of a criminal case if the external examination is still in doubt.	71 (69,61%)	29 (28,43%)	2 (1,96%)	0 (0%)	0 (0%)
An autopsy is necessary for the investigation of deaths in accident victims if the external examination is still in doubt.	50 (49,02%)	42 (41,18%)	8 (7,84%)	2 (1,96%)	0 (0%)
Ethical and medicolegal assessments benefit the patient.	68 (66,67%)	30 (29,41%)	3 (2,94%)	1 (0,98%)	0 (0%)
There needs to be a standard operating procedure in the hospital regarding the urgency of ethical and medicolegal assessments.	71 (69,61%)	27 (26,49%)	4 (3,92%)	0 (0%)	0 (0%)
Ethical and medicolegal studies are useful in cases of ethical dilemmas in medical practice	70 (68,63%)	32 (31,37%)	0 (0%)	0 (0%)	0 (0%)
Ethical and medicolegal studies are useful in cases of ethics and medicolegal conflicts	68 (66,67%)	31 (30,39%)	3 (2,94%)	0 (0%)	0 (0%)
Ethical and medicolegal studies are useful in cases of medical disputes.	62 (60,78%)	38 (37,25%)	2 (1,96%)	0 (0%)	0 (0%)
With the high number of criminal cases in Indonesia, the role of forensic medicine and medicolegal science is needed in society.	74 (72,55%)	27 (26,47%)	0 (0%)	1 (0,98%)	0 (0%)
With the high number of ethical dilemmas and medical disputes in Indonesia, the role of forensic medicine and medicolegal science is very much needed in society.	72 (70,59%)	29 (28,43%)	1 (0,98%)	0 (0%)	0 (0%)

Statements	Strongly agree	Agree	Doubtful	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
Expert information during examination at the investigation level is very useful for the police's duties.	80 (78,43%)	21 (20,59%)	1 (0,98%)	0 (0%)	0 (0%)
Expert information during examination at court level is very useful for judicial and prosecutorial duties.	76 (74,51%)	26 (25,49%)	0 (0%)	0 (0%)	0 (0%)
The role and function of forensic medicine and medicolegal is needed by the state.	74 (72,55%)	28 (27,45%)	0 (0%)	0 (0%)	0 (0%)
The role and function of forensic medicine and medicolegal science is needed by higher education institutions.	72 (70,59%)	29 (28,43%)	1 (0,98%)	0 (0%)	0 (0%)
It is necessary to increase the number of forensic and medicolegal specialists in Indonesia.	78 (76,47%)	24 (23,53%)	0 (0%)	0 (0%)	0 (0%)
There is a need for additional training and practical exposure to forensic medicine and medicolegal in undergraduate medical education.	73 (71,57%)	25 (24,51%)	4 (3,92%)	0 (0%)	0 (0%)
There is a need for additional training and practical exposure to forensic medicine and medicolegal in medical professional education.	73 (71,57%)	26 (25,49%)	3 (2,94%)	0 (0%)	0 (0%)
Forensic medicine and medicolegal are professions with good prospects in the future.	60 (58,82%)	34 (33,33%)	8 (7,84%)	0 (0%)	0 (0%)
Forensic and medicolegal medicine science must be conducted on the principle of being independent and impartial (not taking sides).	79 (77,45%)	22 (21,57%)	1 (0,98%)	0 (0%)	0 (0%)
Specialization education forensic medicine and medicolegal is equivalent to other specialties.	86 (84,31%)	16 (15,69%)	0 (0%)	0 (0%)	0 (0%)
The career opportunities for forensic medicine and medicolegal specialists are very large because they can work in higher education institutions, police agencies, police hospitals, and teaching and non-educational hospitals.	72 (70,59%)	28 (27,45%)	2 (1,96%)	0 (0%)	0 (0%)
Research opportunities and scientific developments in forensic medicine and medicolegal are very broad and promising.	66 (64,71%)	30 (29,41%)	6 (5,88%)	0 (0%)	0 (0%)

have good career prospects and are on par with other specialties. All respondents believed that autopsy was a vital examination to be carried out in various criminal cases and accidents. Detailed information about perceptions can be seen in table 4.

Respondents who agreed that FMMS were indispensable in medical and legal practice were 84 respondents (82.35%) strongly agreed, and 18

respondents (17.65%) agreed. An assessment of the urgency of FMMS is critical given the increasing number of criminal cases in Indonesia and cases of reporting of suspected medical negligence, which require an expert who can to understand medical and legal sciences to assist investigators in disclosing a case so that it does not cause harm to other parties.<sup>6,29,30</sup>

Research on medical students' perceptions of FMMS has been researched several times before, especially regarding perceptions of autopsy, one of which is a study conducted by Jadeep at BJ Medical College, India. With a cross-sectional design involving 200 medical students, the study aims to determine the attitudes and perceptions of medical students regarding demonstrations of various medicolegal actions, including autopsy, as part of forensic science training. This study found that the majority of respondents thought that the autopsy was one of the actions needed in the medicolegal process and the majority of respondents also felt uncomfortable when they first went through the autopsy training process.<sup>34</sup>

The result which is also in line with this study is a study conducted by Ravi at the All India Institute of Medical Sciences, India. The study with a cross-sectional design involving 166 medical students aimed to determine medical students' attitudes towards autopsy. This study found that most respondents agreed with the existence of an autopsy and felt that autopsy was an essential step in the medicolegal process.<sup>35</sup> Similar results were also shown by a study conducted by Chawla at the Government Medical College of Southern Haryana, India. With a cross-sectional design involving 249 medical students, this study aimed to determine the knowledge and perceptions of medical students towards autopsy. This study found that most respondents had a good level of expertise and positive perceptions about the autopsy procedure.<sup>36</sup>

Factors affecting perception: 1) Experience or knowledge. The factors are most important in interpreting an object, namely the experience or knowledge possessed by each individual. 2) Expectations. Everyone has different expectations so that it will impact the perceptions that each person has. 3) Needs. A person's needs will affect the person's perception of something. 4) Motivation. Motivation in a person affects his perception. 5) Emotions. The stimulus that appears in an individual who feels scared or sad will be different if he is brave or happy. 6) Culture. Individuals who have different backgrounds will interpret things in different ways.<sup>37</sup>

This study aims to get information about perceptions of clinical rotation students regarding FMMS and

as a preliminary survey for the opening plan of the SDEP-FMMS at the Faculty of Medicine, Syiah Kuala University. The most important thing is to look at the three factors that influence perceptions, namely expectations, needs and motivation. Statements 26, 27, 28 deals with expectations, statements 20, 21, 24, 25 deals with needs, and statements 29, 31, 32, 33 deals with motivation. The number of respondents who have expectations for the scientific development of FMMS were 96.7%, meanwhile 98.8% of respondents also need this programme, and 95.8% of respondents are motivated.

A total of 78 respondents (76.47%) strongly agreed, and 24 respondents (23.53%) agreed regarding the statement that there is a need for additional forensic and medicolegal specialists in Indonesia. This assessment is critical due to the lack of FMMS specialists in small cities in Indonesia.<sup>9</sup> Some provinces do not have FMMS specialists such as North Kalimantan, Gorontalo, West Sulawesi, North Maluku, and West Papua.<sup>38</sup>

The role of FMMS is needed in the process of medical education by higher education institutions. Respondents also perceive that it is necessary to add education and training programs on FMMS in higher education. This is in line with the research conducted by Fouche, *et al.*<sup>39</sup> that there is a need for additional exposure to integrate the theory and practice of forensic medicine at the undergraduate level. The exposure increases the medical graduates' knowledge, given many cases involved will be faced when they become a doctor later.<sup>39</sup> In addition, respondents also considered that forensic medicine and medicolegal specialists have good career prospects and are on par with other specialities.

A total of 60 respondents (58.82%) strongly agree, and 34 respondents (33.33%) agree with the statement. FMMS specialists themselves can work in teaching hospitals, regional hospitals and police hospitals. The demand for FMMS in the police department is also increasing. At present, the availability of FMMS specialists in every city is needed to facilitate and speed up the investigation process, thereby reducing the various losses that can arise due to the referral process to regional hospitals with forensic experts which can be time consuming and costly.<sup>9</sup>

## Statistical analysis

Table 5 describes the correlation between knowledge and interest, knowledge with perception, and interest with perception. The Spearman's statistical test showed a positive correlation between knowledge and perception but with a deficient level of correlation. A positive correlation between knowledge and perception can be understood because one of the factors that influence perception is knowledge. In this study, the correlation is very low because other factors predominantly influence perception. Perception can also be inadequate and subjective because various situations and variables affect it. The results of this study at least provide an overview of students' perceptions if they are related to the forensic and medicolegal professions that they will do as careers.<sup>40</sup>

content validity has been tested by experts who assess the relevance of the contents of the questionnaire. This study also measures the level of knowledge, interest and perception in detail with valid questions. Another advantage is that respondents are given a time limit in filling out the questionnaire to ensure the answers given are as objective as possible. So much information was generated from this research that it can be re-explored into several studies, both quantitative and qualitative approach.

A limitation of this study is that the data collection was limited to respondents from the Faculty of Medicine at the Syiah Kuala University at the time of the study, so the study results may not reflect all respondents who had undergone clinical rotation in previous years. It may also be irrelevant to the knowledge, interests and perceptions of students

**Table 5. The correlation between knowledge, interest, and perception**

		Knowledge	Interests	Perceptions	
Spearman's rho	Knowledge	Correlation coefficient	1.000	-0.019	0.094
		Sig.(2 tailed)	0.000	0.852	0.347
		N	102	102	102
	Interests	Correlation coefficient	-0.019	1.000	0.304
		Sig.(2 tailed)	0.852	0.000	0.002
		N	102	102	102
	Perceptions	Correlation coefficient	0.094	0.304	1.000
		Sig.(2 tailed)	0.347	0.002	0.000
		N	102	102	102

This study found that the Spearman's statistical test showed a positive correlation between interest with perception, but with a low level of correlation. If the significance of the correlation is assessed, there is a significant correlation between interest and perception with a Sig.(2-tailed) 0.002 (Sig.(2-tailed)  $\leq 0.05$ ). Respondents have positive perceptions about FMMS because they are influenced by expectations, needs, motivation and emotion. This correlation shows that the higher the interest in a career will be increasing to positive the perception about the career, so it can also be interpreted that the more positive the perception of a profession will increase interest in studying or pursuing that career.

The advantage of this research is that it uses a questionnaire that the researcher made and the

from other institutions. Another limitation is that the research results obtained only describe knowledge, interests and perceptions quantitatively, have not measured the quality of respondents' answers, and further research is needed, which is more focused on career choice interests for final stage clinical rotation students. However, in general, this research is very useful for the development of FMMS in Indonesia in the future.

## CONCLUSION

The level of knowledge of the clinical rotation students of the Faculty of Medicine, Syiah Kuala University towards FMMS is very high, while the level of interest and perception is moderate. This

is an important asset for the Faculty of Medicine, University of Syiah Kuala in its plan to develop this science in the future given the lack of teaching staff in the forensic medicine and medicolegal sciences.

**RECOMMENDATION**

Given the importance of adding medical specialists in forensic medicine and medicolegal in Indonesia both for educational activities and medical services, it takes innovation from all medical institutions, especially the Faculty of Medicine, University of Syiah Kuala to continuously socialize in order to continue to foster student interest and motivation. Further research is needed on how much interest and motivation doctors have in choosing a career as a forensic medicine and medicolegal specialist.

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**COMPETING INTEREST**

The authors declare that there are no competing interests related to the study.

**AUTHORS' CONTRIBUTION**

*Taufik Suryadi* – data analysis, and publication manuscript.

*Vera Dewi Mulya* – developing research proposal

*Fathin Hidayah* – developing research proposal and collecting data.

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