

## Specialization Preferences of Medical Faculty Students, Consideration of Choosing Medical Pharmacology and Related Factors; An Example of Term 3

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**Cite this article as:** Ozkula S, Dogan E. Specialization Preferences of Medical Faculty Students, Consideration of Choosing Medical Pharmacology and Related Factors; An Example of Term 3. Med J SDU 2025; doi: 10.17343/sdutfd.1460668

### Abstract

#### Objective

This study aims to determine the specialty preferences of third-year medical students and their considerations regarding choosing Medical Pharmacology as a specialty, as well as to evaluate the related factors.

#### Material and Method

The universe of this cross-sectional analytical study consisted of 3rd-year students of Suleyman Demirel University Faculty of Medicine. Data were collected by using a questionnaire prepared by the researchers. Analyses were conducted by using SPSS 22.0 software.

#### Results

The data of 143 participants were used in this study, and 85.3% of the participants indicated that they chose the medical faculty by their own will. 97.9% of the research group stated that they planned to specialize after graduation. The specialty that the participants

considered most for the Medical Specialization Exam was internal medicine with 57.3%.14.7% of the group expressing a desire to specialize in medical pharmacology. The most preferred factor affecting the choice of medical pharmacology was the absence of night shifts at 49.7%.

#### Conclusion

In our study, it was determined that the majority of medical students planned to specialize, and many of them stated that they preferred areas of specialization within medicine. The primary rationale for preferring medical pharmacology is the absence of seizures, whereas the main reason for its disfavor is the perceived lack of professional satisfaction. Determining the factors affecting the specialty preferences of medical school students and addressing relevant issues is important for increasing the effectiveness of health service delivery. Therefore, comprehensive studies are needed on this subject.

**Keywords:** Medical specialization, medical education, medical pharmacology

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**Received:** 15.04.2024 • **Accepted:** 30.12.2024

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## Introduction

One of the most important factors in evaluating healthcare service quality is the humane abilities, skills, and knowledge of physicians. Being happy with professional satisfaction, which is influenced by many factors, improves the service provided as it makes one feel that they are being rewarded both spiritually and materially for their work and that they are applying their skills in their job. Graduates of medical schools face a significant crossroads where they must make serious decisions. This crossroad involves choosing medical specialties in which they can receive medical specialization training that will impact their success and happiness. One of the determining factors in this choice is the experiences gained by physicians during their medical education. Working in an area where people feel comfortable and their abilities, personality, and mental characteristics are compatible provides more efficiency (1-5).

Physicians earn the title of "medical doctor" after six years of education in medical faculties. When they graduate from medical school, they can practice as a general practitioner and enter the specialties of surgery, internal medicine, and basic medical sciences with the Medical Specialization Exam (6-7). Medical Specialty Examination, covering Basic Medical and Clinical Medical Sciences, has been conducted annually in our country since 1987. Candidates taking the Medical Specialty Examination are placed in their preferred specialty departments according to their scores. Many factors play a role in candidates' preferences for specialty departments (4). With a good understanding and definition of these factors, candidates can be placed in specialization departments where they can practice medicine more efficiently in their fields.

According to the Health Statistics Yearbook, in 2022, the number of general practitioners was 53.697, the number of assistant physicians was 45.391, the number of specialist physicians was 95.600 and the total number of physicians was 194.688. According to the same source, there were 228 physicians per one hundred thousand people (8). The number of physicians taking the Medical Specialty Examination has been increasing with the increase in medical school quotas, and approximately one out of every ten physicians receives specialty training (7).

Pharmacology, the science of drugs, examines the interaction between drugs and the biological system and encompasses various types of research such as in vivo studies with voluntary human subjects/ experimental animals. It also investigates drug

interactions with functional protein molecules by using in vitro studies including cells, tissues, bioactive molecules, or more and silico methods. (9-10). The branches of pharmacology are quite diverse and are developing and deepening. Pharmacokinetics, pharmacodynamics, and toxicology are just a few of the many branches of pharmacology (10). Pharmacology, which describes the development of treatments from natural sources, is a scientific discipline that opens new horizons in the field of science. (11).

This study aimed to determine the medical specialty preferences of third-year medical students, which can be considered as the beginning of their professional careers, the place of medical pharmacology in their preferences, and the factors affecting these preferences.

## Material and Method

### Type of Study, Population, and Sampling Selection

The study conducted in February 2024 is cross-sectional. The universe of the study consisted of third-year students (n=263) at Suleyman Demirel University Faculty of Medicine during the 2023-2024 academic year. No sampling was performed; the aim was to reach the entire universe. However, only 143 students could be reached due to reasons such as not participating or being on leave (53.35%).

### Data Collection and Evaluation

A survey prepared by the researchers, including sociodemographic questions, specialty preferences, and factors affecting the selection or non-selection of Medical Pharmacology courses, was administered to the participants who agreed to participate in the study. The questionnaire was distributed to students via a form created by the researchers on the Internet, and data were collected accordingly. The data collection form used in the study consisted of a total of 17 questions. The variables in the study included gender, age, family type, living arrangements, parents' educational status, perception of income status, presence of healthcare professionals in the family, voluntary selection of the medical faculty, reasons for choosing the medical faculty, post-graduation specialization plans, preferred specialty in specialization, consideration of selecting medical pharmacology in specialization, and factors affecting the selection or non-selection of medical pharmacology.

### Statistical Analysis

The data was evaluated using the SPSS 22.0 (Statistical Package for Social Sciences) application. Normality tests were used to determine whether

the data followed a normal distribution. Descriptive statistics were presented as numbers and percentages. The chi-square test was used to investigate two categorical variables. Categorical variables were re-categorized as family type; nuclear family and other (extended family or broken family); living with family, with friends (at home or in a dormitory), and alone (at home or in a dormitory); mother and father education level; secondary school and below (middle school or primary school), high school and above (high school or university); income status perception; income less than expenses, income equal to or more than expenses; presence of Specialty plans include Medical Specialty

Examination and overseas (or other). To identify the factors influencing the choice of Medical Pharmacology as a specialty, variables found to be significant in univariate studies were added to the model, and logistic regression analysis was done. The Hosmer-Lemeshow test was employed to assess model fit. All tests were approved with a statistical significance criterion of  $p < 0.05$ .

## Results

Data from 143 participants were utilized in this study. The mean age of the research group was  $21.37 \pm 1.23$

**Table 1** Distribution of the research group according to sociodemographic characteristics

Variables	n (%)
<b>Gender</b>	
Male	64 (44,8)
Female	79 (55,2)
<b>Family Type</b>	
Nuclear family	130 (90,9)
Extended family	11 (7,7)
Dispersed family	2 (1,4)
<b>Who do you live with?</b>	
With family	35 (24,5)
With friends at home	15 (10,5)
With friends at dormitory	24 (16,8)
Alone at home	63 (44,1)
Alone at dormitory	6 (4,2)
<b>Mother's education level</b>	
Elementary school graduate	33 (23,1)
Middle school graduate	14 (9,8)
High school graduate	35 (24,5)
University graduate	61 (42,7)
<b>Father's education level</b>	
Elementary school graduate	16 (11,2)
Middle school graduate	6 (4,2)
High school graduate	25 (17,5)
University graduate	96 (67,1)
<b>Perceived income status</b>	
Income exceeds expenses	50 (35,0)
Income equals expenses	73 (51,0)
Income falls short of expenses	20 (14,0)

years (ranging from 20 to 29). 55.2% of the participants are women and 90.9% belong to a nuclear family structure. Regarding living arrangements, 44.1% of the research group lived at home alone while 24.5% lived with their families. It was observed that the majority of the parents had a university education, and 42.7% of the mothers and 67.1% of the fathers were university

graduates. Among the participants, 69.2% did not have any healthcare professionals in their families, 18.9% had non-physician healthcare professionals, and 11.9% had physicians in their families.

85.3% of the participants stated that they chose to study medical school willingly. 28.0% of the participants

Table 2

Distribution of the research group according to the presence of healthcare workers in the family, willingly choosing medical school, and preferred specialty characteristics

Variables	n (%)
<b>Presence of healthcare worker in the family</b>	
Yes, physician	17 (11,9)
Yes, non-physician	27 (18,9)
No	99 (69,2)
<b>Did you choose medical school intentionally?</b>	
Yes	122 (85,3)
No	21 (14,7)
<b>What is your purpose in choosing medical school?</b>	
Perceived as an ideal profession	25 (17,5)
Desire to help people	33 (23,1)
Prestige	14 (9,8)
Belief that the salary will be high	13 (9,1)
Family's desire	7 (4,9)
Thought of professional satisfaction	40 (28,0)
High score in university entrance exam	11 (7,7)
<b>Are you planning to specialize?</b>	
Yes	140 (97,9)
No	3 (2,1)
<b>What is your specialization plan?</b>	
National Medical Specialty Examination	109 (76,2)
Specialization abroad	33 (23,1)
Other	1 (0,7)
<b>Which group does the specialty you consider for specialization belong to?</b>	
Internal medical sciences specialties	82 (57,3)
Surgical medical sciences specialties	49 (34,3)
Basic medical sciences specialties	12 (8,4)
<b>Are you considering selecting Medical Pharmacology as a specialty?</b>	
Yes	21 (14,7)
No	122 (85,3)

Table 3

Distribution of the research group based on the criteria influencing whether or not Medical Pharmacology was chosen as a specialization

	n (%) <sup>*</sup>
Pharmacology is a branch I enjoy and it aligns with my interests	41 (28,7)
Academic career plans	18 (12,6)
Absence of on-call duty in the department	71 (49,7)
Working on a shift basis	40 (28,0)
Absence of malpractice risk	65 (45,5)
Absence of physical or verbal violence risk	69 (48,3)
Patients not being in critical condition and not requiring urgent intervention	58 (40,6)
Lower professional satisfaction	96 (67,1)
Concerns about salary	38 (26,6)
Unclear boundaries in professional definition in specialization	62 (43,4)

\*Multiple options could be selected

stated that the most common reason for choosing a medical school was the expectation of professional satisfaction, followed by the desire to help people with 23.1%. Seeing medicine as an ideal profession (17.5%) and the desire for respect (9.8%) were other significant reasons cited.

The research group comprised 97.9% of participants who stated that they intended to specialize after graduation. Among them, specialization through the Medical Specialty Examination was the most preferred option with 76.2%, followed by pursuing specialization abroad with 23.2%.

Among the participants, 57.3% expressed their consideration of choosing a branch within the field of internal medical sciences specialties for specialization through the Medical Specialty Examination. Although it was found that females tended to prefer internal medicine specialties more frequently compared to males, however, this difference was not statistically significant ( $p=0.09$ ). Moreover, 14.7% of the group expressed their interest in specializing in medical pharmacology. The inclination to choose medical pharmacology as a specialty was slightly higher among females compared to males, but again, this difference was not statistically significant ( $p=0.25$ ). Descriptive characteristics of the participants are presented in Table 1 and Table 2.

The most preferred factor affecting participants' consideration of choosing medical pharmacology as a

specialty was the absence of night shifts with 49.7%. The absence of the risk of physical and verbal violence was the second most common factor with 48.3%, followed by the absence of the risk of malpractice, which is the most common factor, with 45.5%. The distribution of factors affecting the selection of medical pharmacology by the group is presented in Table 3. The most preferred factor affecting the group's decision not to choose medical pharmacology was the lack of professional satisfaction with 67.1%. This was followed by those who stated that the boundaries of the professional definition in specialization were not clear with 43.4%. The distribution of factors influencing the group's decision not to choose medical pharmacology is presented in Table 3.

Table 4 and Table 5 show the distribution of factors influencing the decision to specialize in medical pharmacology. Those with a health worker in their family, those considering pursuing an internal branch as a specialty, and those who stated that medical pharmacology is a branch they enjoy were significantly more likely to choose medical pharmacology as a specialty ( $p=0.022$ ;  $p=0.037$ ;  $p=0.001$ , respectively). Those who believe professional satisfaction in medical pharmacology is low were considerably less likely to choose medical pharmacology as a specialty ( $p=0.003$ ). Gender, family type, living with, mother's education level, father's education level, perception of income status, willingly choosing a medical school, specialization planning, specialty plan, academic career plan, medical pharmacology as a non-shift

Table 4

Distribution of the research group according to the variables affecting the decision to choose medical pharmacology as a specialty

Variable	Considering Choosing Medical Pharmacology			
	Yes		No	
	Number	%	Number	%
<b>Gender</b>				
Male	7	10,9	57	89,1
Female	14	17,7	65	82,3
p= 0,184				
<b>Family Type</b>				
Nuclear family	18	13,8	112	86,2
Other	3	23,1	10	76,9
p=0,293				
<b>Who do you live with?</b>				
With family	3	8,6	32	91,4
With friends	5	12,8	34	87,2
Alone	13	18,8	56	81,2
p= 0,349				
<b>Mother's education level</b>				
Middle School and Below	7	14,9	40	85,1
High School and Above	14	14,6	82	85,4
p= 0,572				
<b>Father's education level</b>				
Middle School and Below	3	13,6	19	86,4
High School and Above	18	14,9	103	85,1
p= 0,590				
<b>Perceived income status</b>				
Income falls short of expenses	5	25,0	15	75,0
Income equals expenses or exceeds	16	13,0	107	87,0
p=0,144				
<b>Presence of healthcare worker in the family</b>				
Yes	11	25,0	33	75,0
No	10	10,1	89	89,9
p= 0,022				
<b>Did you choose medical school intentionally?</b>				
Yes	18	14,8	104	85,2
No	3	14,3	18	85,7
p= 0,629				
<b>Are you planning to specialize?</b>				
Yes	21	15,0	119	85,0
No	0	0,0	3	100,0
p= 0,619				
<b>What is your specialization plan?</b>				
Medical Specialty Examination	16	14,7	93	85,3
Specialization abroad	5	14,7	29	85,3
p= 0, 595				
<b>Which group does the specialty you consider for specialization belong to?</b>				
Internal	14	17,1	68	82,9
Surgical	3	6,1	46	93,9
Basic	4	33,3	8	66,7
p= 0,037				

**Table 5**

The research group is successful in deciding on the field of treatment, distribution of pharmacology, according to expert viewpoints and advancements

<b>Considering Choosing Medical Pharmacology</b>				
<b>Variable</b>	<b>Yes</b>		<b>No</b>	
	<b>Number</b>	<b>%</b>	<b>Number</b>	<b>%</b>
<b>Pharmacology is a branch I enjoy and it aligns with my interests</b>				
Yes	13	31,7	28	68,3
No	8	7,8	94	92,2
<b>p=0,001</b>				
<b>Academic career plans</b>				
Yes	2	11,1	16	88,9
No	19	15,2	106	84,8
<b>p=0,486</b>				
<b>Absence of on-call duty in the department</b>				
Yes	11	15,5	60	84,5
No	10	13,9	62	86,1
<b>p=0,486</b>				
<b>Working on a shift basis</b>				
Yes	7	17,5	33	82,5
No	14	13,6	89	86,4
<b>p=0,362</b>				
<b>Absence of malpractice risk</b>				
Yes	12	18,5	53	81,5
No	9	11,5	69	88,5
<b>p=0,177</b>				
<b>Absence of physical or verbal violence risk</b>				
Yes	9	13,0	60	87,0
No	12	16,2	62	83,8
<b>p=0,383</b>				
<b>Patients not being in critical condition and not requiring urgent intervention</b>				
Yes	12	20,7	46	79,3
No	9	10,6	76	89,4
<b>p=0,077</b>				
<b>Lower professional satisfaction</b>				
Yes	8	8,3	88	91,7
No	13	27,7	34	72,3
<b>p=0,003</b>				
<b>Concerns about salary</b>				
Yes	6	15,8	32	84,2
No	15	14,3	90	85,7
<b>p=0,505</b>				
<b>Unclear boundaries in professional definition in specialization</b>				
Yes	11	17,7	51	82,3
No	10	12,3	71	87,7
<b>p=0,252</b>				

Table 6

Regression analysis results of variables found to be linked in univariate analyses while choosing medicinal pharmacology

Considering Choosing Medical Pharmacology			
Variable	[B]	%95 Confidence Interval	p
Presence of healthcare worker in the family (No=0, Yes=1)	0,98	0,934-7,686	0,067
Considering Choosing an Internal Branch in Specialization (No=0, Yes=1)	0,55	0,572-5,252	0,331
Pharmacology is a branch I enjoy and it aligns with my interests (No=0, Yes=1)	1,91	2,295-20,016	<b>0,001</b>
Lower professional satisfaction (Yes=0, No=1)	1,55	1,603-14,014	<b>0,005</b>

-2 Log Likelihood: 92,728; Cox&Snell R<sup>2</sup>: 0,170; Nagelkerke R<sup>2</sup>: 0,300

department; Working in shifts, no risk of malpractice, no risk of physical or verbal violence, patients being treated not being in an emergency and not requiring emergency intervention, salary concerns, and lack of clear professional boundaries in the specialty of medical pharmacology did not significantly influence choosing medical pharmacology as a specialty (respectively p= 0.184; p= 0.293; p= 0.349; p= 0.572; p= 0.590; p= 0.144; p= 0.629; p= 0.619; p= 0.595; p= 0.486; p= 0.486; p= 0.362; p= 0.177; p= 0.383; p= 0.077; p= 0.505; p= 0.252).

Having a health worker in the family increases the likelihood of selecting medical pharmacology as a specialty by 0.98 times, considering an internal branch by 0.55 times, liking medical pharmacology by 1.91 times, and finding professional satisfaction in medical pharmacology not low by 1.55 times (p=0.067; p=0.331; p=0.001 and p=0.005, respectively). The regression results are presented in Table 6.

### Discussion

In this study, research was conducted on third-year medical students who had not yet started clinical training on their specialty preferences and preferences for choosing a branch of pharmacology.

The most frequently cited reasons for choosing medical school were professional satisfaction, the desire to help people, and the perception of medicine as an ideal profession. This finding is consistent with the literature. In a study conducted in Poland, the reasons for choosing medical school were found to be as follows: the most common reason was an interest in medicine, followed by the desire to help people and

the prestige associated with being a physician (12). Similarly, studies conducted in Turkey also found that the respectability of being a doctor, the desire to help people, and career aspirations were the most common reasons for choosing medical school (13-15). Medicine, one of the oldest professions in history, is not only an admired profession that keeps ideals at the top but also one of the most prestigious professions of today. Physicians are professionals who, in addition to their knowledge and experience, undertake many missions such as understanding and empathizing with patients' thoughts and feelings (16-17) With the mission of protecting the health and welfare of societies, physicians continue to maintain this respected tradition from past to present.

In this study, the research group planned a high rate of specialization. In the literature, many studies conducted in Germany, France, and Turkey showed a high percentage of those who wished to specialize after graduating from medical school (13,18-24). This study also reveals that a very high percentage of third-year students do not intend to pursue a career as a general practitioner in the future. General practice in our country refers to doctors who have completed their medical education (22). Medical educators should analyze the fact that the majority of students do not prefer such an important healthcare service in their training. The relatively high desire to specialize in Turkey can be attributed to problems such as the low professional prestige of general practitioners, inadequate economic conditions, and limited specialization opportunities (22, 25-26).

When we look at the preferred branches of specialization in medicine, the most common ones are



internal medicine specialties, followed by surgical medical sciences specialties, and lastly, basic medical sciences specialties. There are studies parallel to the results of this study (15, 27-28). Factors such as the number of shifts, duration of residency, working hours, and stress induced by working conditions may affect students' choices (5,29). The fact that basic medicine and pharmacology specialties were less preferred in this study can be attributed to the fact that the research group was in the third year and had not yet transitioned to clinical medicine education.

In this study, the most important factors for choosing Medical Pharmacology as a specialty were the absence of on-call duties, lower risk of violence, and no risk of malpractice. Additionally, students who expressed that Medical Pharmacology is their preferred field had a statistically significant higher likelihood of choosing this specialty. The prominence of violence and malpractice risks in the top three concerns, particularly affecting third-year students who have three years until graduation, highlights the severity of the issue. Low professional satisfaction emerged as the most significant reason for not choosing Medical Pharmacology, with those reporting low satisfaction having a significantly higher inclination to avoid the field. Furthermore, a quarter of the students surveyed expressed concerns about salary. The fact that the country's intelligent and educated youth have salary concerns, especially after medical education and specialization in Medical Pharmacology, is a significant issue. No study has been found in the literature that directly focuses on pharmacology selection. However, when factors such as night duties, overtime hours, and the risk of violence in the medical profession are considered, even third-year students are influenced in their specialty choices. In a study, students ranked professional satisfaction as the primary reason for their specialty preferences (22). In another study, when students were questioned about their reasons for specialty preferences, the top three reasons were 'providing happiness', 'professional satisfaction', and 'quality of residency training' (7). In another study, when their opinions about the necessity of being an expert were questioned, the highest rate was found in professional satisfaction. In the same study, they also stated 'their own interests' among their reasons for choosing specialization. (13).

According to this study, there was no significant difference found between gender and specialty preferences. In many studies in the literature, no significant difference has been found between gender and specialty preference (6, 30-32). However, there are also studies with opposite findings. In studies

conducted by Tekin et al. in 2013, Açıkgöz B et al. in 2019, and Yılmaz N et al. in 2021, it was concluded that men tended to prefer surgical specialties more (22,29,33). Similarly, Khader et al.'s study in 2011 also reached the same conclusion (34). Finding different results regarding gender suggests that gender alone may not be a determining factor in choosing a medical specialty.

In conclusion, it has emerged that third-year medical students plan to specialize at a high rate but do not consider pursuing a career as general practitioners in the future. The lack of interest in such an important area of healthcare should be taken into account by educators. Additionally, factors such as on-call duties, risk of violence, malpractice risk, professional satisfaction, and salary concerns have influenced preferences for the Medical Pharmacology specialty. It is quite concerning that these worries exist among students who have not yet started clinical practice. Identifying and addressing the motivations, concerns, and attitudes of future doctors, along with implementing appropriate measures, will be crucial for effective and efficient healthcare.

#### **Conflict of Interest Statement**

There is no financial conflict of interest with any organization, institution, or person related to our article and there is no conflict of interest between the authors.

#### **Ethical Approval**

Before the study, ethical approval was obtained from the Ethics Committee of Suleyman Demirel Faculty of Medicine (Decision No: 15, dated 03.01.2024), and permission was received from the Dean's Office of Suleyman Demirel University Faculty of Medicine on January 12, 2024, for the conduct of the study. Participants were given necessary information about the purpose of the research and the scientific evaluation of the data. The study was conducted in accordance with the principles set forth in the Declaration of Helsinki.

#### **Consent to Participate and Publish**

Written informed consent to participate and publish was obtained from all individual participants included in the study.

#### **Funding**

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### **Availability of Data and Materials**

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

### Authors Contributions

SO: Conceptualization of the study; Formal analysis; Investigation; Methodology; Visualization; Writing original draft; Writing review & editing.

ED: Conceptualization of the study; Data curation; Formal analysis; Investigation; Methodology; Writing original draft.

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