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Research Article

Employment Challenges and Career Expectations of Pathology Laboratory Technicians

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Abstract

This study aims to evaluate the career expectations, post-graduation job-seeking anxieties, and perceptions regarding the professional significance of their diplomas among pathology laboratory technician students. The research was conducted between May and July 2025 with 326 students enrolled in the Pathology Laboratory Techniques programs at the Vocational School of Health Services of foundation universities in Istanbul. Data were collected through questionnaires using the convenience sampling method and analyzed with SPSS 24.0 software. It was determined that students experience significant levels of uncertainty and anxiety regarding their employment prospects. It was found that participants particularly desire a secure working environment in public hospitals; however, they carry concerns about their future due to insufficient appointment quotas and limited employment opportunities in the private sector. The study findings reveal the necessity of expanding employment areas for pathology technicians, increasing appointment quotas, and implementing regulations in health policies that will strengthen job security.

Keywords: Pathology laboratory technician, employment anxiety, career expectations, health education, career planning.

1. Introduction

Unemployment ranks among the foremost social problems of today [1]. This problem has led to job-seeking anxieties among university students even before graduation [2]. Several factors have intensified these concerns among students in pathology laboratory techniques programs, including the increasing number of universities offering the program, rising enrollment quotas, insufficient private sector pathology laboratories, and limited public sector appointments. Without appropriate interventions, the job-seeking anxieties of pathology laboratory techniques students will escalate rapidly, accompanied by heightened levels of hopelessness and pessimism.The organizational structure of pathology laboratories necessitates the effective utilization of medical and technical knowledge. Advancing techniques, organizational changes, and physical as well as theoretical arrangements highlight both the importance of these laboratories and the need for qualified personnel in their operations. In this context, the insufficient number of pathologists, pathology technicians, and secretaries relative to the volume of specimens examined in pathology laboratories clearly demonstrates the necessity for increased pathology

technician employment.Pathology technicians are professionals responsible for all technical procedures following the arrival of specimens sent to the laboratory. Consequently, the quality of their education plays a determinative role in their employability and selection during the hiring process. Key requirements in this field include enhancing educational quality, reviewing and updating curricula, conducting necessary assessments in public hospitals to identify staffing gaps, and developing appropriate employment planning for pathology technician graduates.On the other hand, the challenges faced by pathology technicians warrant attention. Students' career expectations are significantly influenced by various factors, including their academic performance during training, the quality of their educational environment, their knowledge and experience, as well as their individual lifestyles, worldviews, and values [3]. Within this framework, measuring students' job-seeking anxieties and career expectations is essential for sound sector-oriented planning.While similar studies measuring students' job-seeking anxieties and career expectations have been reported in programs such as Social Services [4] and Tourism and Hospitality Management [5], no study has been identified in the existing literature for the Pathology Laboratory Techniques program. The present study aims to address this gap in the literature. Furthermore, it is anticipated that this research will generate scientific knowledge that can inform policies and planning efforts aimed at expanding employment opportunities for Pathology Laboratory Techniques graduates, increasing the number of public sector appointments, and enhancing the employment of trained workforce in this field.The present study aims to measure the job-seeking anxieties and career expectations of Pathology Laboratory Techniques program students regarding the employment process they may encounter after graduation, as well as to emphasize the significance of their diploma on their professional standing.

2. Conceptual Framework

Unemployment is defined as the inability of individuals with employment qualifications in a specific field to secure employment due to factors arising in the job-seeking process. Beyond its economic implications, unemployment brings along social, personal, and global adversities. The anxiety of not finding employment leads individuals to fall into hopelessness, causing them to feel unhappy, worthless, and useless [6]. The primary factors contributing to unemployment anxiety include the inability to earn an income necessary for sustaining one's livelihood, loss of self-confidence and self-esteem, loss of reputation toward dependents, lack of social environment, and the inability to improve quality of life [7]. These factors exacerbate individuals' hopelessness and anxieties.The foundation of success in healthcare services lies in establishing health systems aligned with developments and needs, and training educated personnel to meet these demands. In this context, having educated personnel in healthcare services and conducting workforce planning according to appropriate standards are considered the most critical inputs.The World Health Organization (WHO) (1993) defines health workforce planning as "workforce development, human resource planning, production, and management for health" [8]. According to the WHO, health workforce needs encompass planning, education, management, employment, equitable remuneration, and the provision of workforce empowerment opportunities [9]. This multidimensional structure holds critical importance for the sustainability and effectiveness of health systems. The factors necessitating workforce planning in healthcare organizations can be listed as personnel costs, social and political changes, advances in medicine, the need to support healthcare workers in terms of quantity and quality, and the increase in the rate of knowledge production [10]. In this context, two fundamental objectives of personnel planning emerge: First, to achieve optimum performance by utilizing human resources in the most efficient and economical manner; second, to meet future workforce needs in terms of both quality and quantity [11]. In Turkey, health workforce planning is conducted within a multi-institutional structure under the leadership of the Ministry of Health. This structure is linked to organizations such as the State Planning Organization (SPO), the Council of Higher Education (CoHE), the Turkish Statistical Institute (TURKSTAT), the Ministry of Labor and Social Policies, the Social Security Institution (SSI), and the Ministry of Interior [12]. Additionally, joint consultations with academics, professional organizations, the Ministry of National Education, and the Ministry of Finance are also significant in human resource planning [1]. The issues outlined by the WHO, such as planning, education, employment, and equitable remuneration, are also applicable to pathology technicians and hold particular importance for this occupational group. The efforts of institutions involved in health workforce planning in Turkey directly affect both the numerical adequacy and professional development of pathology technicians. Improving the education,

employment, and working conditions of pathology technicians contributes to the provision of stronger services throughout the health system [13]. Cancer is the uncontrolled proliferation of normal cells through differentiation. In Turkey, the incidence of cancer is higher among men, though it is similarly elevated among women [14]. Poor nutritional conditions, environmental factors, and stress factors associated with living conditions contribute to the increase in cancer cases. It is anticipated that approximately 22 million people will be diagnosed with cancer annually by 2030 [15]. Cancer diagnoses involve the process of examining tissues under a microscope following a series of procedures performed in pathology laboratories. Consequently, the increase in cancer cases will escalate the need for pathology technicians and pathologists in diagnostic processes.The procedures performed in pathology laboratories encompass the process of converting all types of tissue, fluid, and smear specimens obtained from patients into slides through laboratory analyses, examining them under a microscope, and reporting the findings based on the examination results. The service process in pathology laboratories consists of three phases. In the pre-analytical phase, procedures include patient preparation, specimen collection, packaging, fixation, and transportation to the laboratory. The analytical phase involves laboratory acceptance of the specimen, registration and protocol number assignment, macroscopic procedures, tissue processing, embedding, sectioning with a microtome, staining, and report writing under microscopy. The post-analytical phase encompasses the delivery of the report to the clinician and treatment planning for the patient. Pathology reports prepared in this phase not only establish the patient's diagnosis but also play a critical role in planning the treatment the patient will receivePersonnel employed in pathology laboratories assume different responsibilities across service phases. Individuals who graduate from the "Pathology Laboratory Techniques" program within the Vocational School of Health Services at universities and receive the title of "Pathology Technician" carry out the technical procedures defined in the analytical phase. This encompasses all technical procedures performed from the moment specimen samples obtained from patients arrive at the laboratory until they are prepared for microscopic examination. Medical school graduates, on the other hand, obtain the title of "Pathologist" or "Pathology Specialist" through specialization training and are responsible for examining prepared slides under a microscope, making diagnoses, and reporting findings.In Turkey, there are 34 universities offering education as the "Pathology Laboratory Techniques Program", of which 15 are state universities and 19 are foundation universities [16]. The curriculum of the pathology laboratory techniques program encompasses theoretical courses such as anatomy, physiology, histology, fundamental concepts in pathology, general chemistry, histotechnology, equipment used in pathology and their maintenance, cytotechnology, molecular pathology, forensic pathology, and macroscopic dissection, as well as practical courses and professional internships [17].Graduates generally find employment opportunities primarily in pathology-cytology laboratories of public and private hospitals, as well as in the pathology laboratory of the Forensic Medicine Institute, histology-embryology laboratories, pathology laboratories of veterinary faculties, and companies supplying materials to pathology laboratories. Pathology laboratories are specialized healthcare units where technicians who can effectively utilize technical and medical knowledge while possessing practical skills are employed [18]. An examination of the workload in public hospitals reveals that a pathology technician performs an average of 6200 blocks, 11500 slides, and 1000 immunohistochemical examinations annually, with an average block ratio of 3.4 per biopsy [13]. These data concretely demonstrate the need for experienced and well-trained technicians in the sector.

3. Material and Methods

This study aims to measure the job-seeking anxieties and expectations regarding the pathology laboratory technician profession among pathology laboratory techniques program students concerning the employment process they may encounter after graduation, as well as to emphasize the significance of their diploma on their profession.The study population consists of first- and second-year students enrolled in the "Pathology Laboratory Techniques" program at foundation universities located within the provincial boundaries of Istanbul. The study sample was calculated using the formula provided below [19]:

N: 1000 student

Z: the 95% confidence level ±1.96

p: 0.5

e: 0.05

n= N: (1+N*e²)

n= 1000: (1+1000*(0.05²)

n= 286 student

The sample size for the study was calculated as 286. In the present study, 326 students enrolled in the "Pathology Laboratory Techniques" program at the Vocational School of Health Services of foundation universities located within the provincial boundaries of Istanbul were reached between May and July 2025. Data were collected using the convenience sampling method, which is one of the non-probability sampling methods. A questionnaire was used as the data collection method, and the survey forms were administered online via Google Forms.The prepared questionnaire consists of three sections: The first section includes questions related to demographic characteristics; the second section contains statements regarding professional attitudes and employment [4]; and the third section includes statements aimed at measuring participants' career expectations [20]. Within the framework of the determined variables, a 5-point Likert Scale was used in the questionnaire form, and participants' levels of agreement with the statements were scaled using the options "strongly agree", "agree", "neither agree nor disagree", "disagree", and "strongly disagree". As part of the pilot study, responses were obtained from 10 selected participants, and it was determined that the questions were comprehensible and that there were no errors or ambiguities. The necessary ethical approval for the research was obtained from the Ethics Committee Commission with the decision numbered 61351342/020-1008 dated March 28, 2025. The collected data were checked and analyzed using SPSS 24.0 software.

Research Questions:

- To what extent is the employment problem in the pathology laboratory technician profession perceived as important by students?
- What is the level of job-seeking anxiety among students in the pathology laboratory technician profession?
- What impact does studying in the pathology laboratory techniques program have on career expectations?

Hypotheses:

H1: There is a significant difference between students' views on employment and gender.

H2: There is a significant difference between students' views on employment and their year of study.

H3: There is a significant difference between students' views on employment and their internship status.

H4: There is a significant difference between students' attitudes toward the pathology profession and gender.

H5: There is a significant difference between students' attitudes toward the pathology profession and their year of study.

H6: There is a significant difference between students' attitudes toward the pathology profession and their internship status.

H7: There is a significant difference between students' career expectations and gender.

H8: There is a significant difference between students' career expectations and their year of study.

H9: There is a significant difference between students' career expectations and their internship status.

H10: There is a significant relationship between students' views on employment and their career expectations.

H11: There is a significant relationship between students' attitudes toward the pathology department and their career expectations.

H12: There is a significant relationship between students' views on employment and their attitudes toward the pathology department.

Scale Reliability Analysis Results:
Cronbach's Alpha reliability coefficients were calculated to evaluate the internal consistency of the scales used in the study, and the results are presented in Table 1. Cronbach's Alpha is a statistical measure that reveals the extent to which a scale or its subdimensions consistently evaluate the construct being measured. A coefficient of 0.70 or above is generally considered an acceptable level of reliability [21]. In this context, Cronbach's Alpha values were examined for all subdimensions and the overall scale included in the study. Following the analysis, the statement "I regret studying in the pathology laboratory techniques program" yielded a low Cronbach's Alpha value (.577). After performing the necessary transformation for the relevant item, the reliability coefficients were recalculated, and a significant increase in the coefficient values (.783) was observed following the transformation.

Table 1. *Reliability Analysis Results Related to Variables.*

Variables	**Number of Questions**	**Cronbach's Alpha**
Emp	4	.794
Patpre	7	.577
Patpost	7	.783
Exp	15	.903
Emp: Employment; Patpre: Pathology pre-transformation; Patpost: Pathology post-transformation; Exp: Expectation		

4. Results

Demographic and descriptive information related to the topic for respondents are presented in Table 2. Accordingly, it was determined that more than half of the participants were in the 20-22 age range. This finding indicates that students enrolled in vocational schools largely consist of young individuals who, after completing high school education, failed to secure placement in the first year and retook the entrance examination. In the present study, it was observed that 82.8% of the participants were female students. Regarding marital status, it was noted that 93.6% of the participants were single, which supports the notion that the sample group consists of young individuals. In the evaluation of career choice, it was determined that 88.7% of the participants made their decision of their own volition. When participants' internship status was examined, it was observed that 50.3% had completed an internship, indicating a balanced distribution of participants from both the beginning and graduation levels of the program. Indeed, in the pathology laboratory techniques program curriculum, internships such as summer internships and professional practice in the workplace are scheduled at the end of the first year or during the second year.

Tablo 2*. Descriptive Information of Respondents.*

Gender	**n**	**%**
Female	270	82.8
Male	56	17.2
Total	326	100.0
Age	**n**	**%**
17-19	95	29.1
20-22	166	50.9

23-25	38	11.7
26 and above	27	8.3
Total	326	100.0
Marital Status	**n**	**%**
Single	305	93.6
Married	19	5.8
Divorced	2	0.6
Total	326	100.0
Decision on Career Choice	**n**	**%**
Self/ Own decision	289	88.7
Family	23	7.1
Other	14	4.3
Total	326	100.0
Grade Level	**n**	**%**
1st Year	158	48.5
2nd Year	168	51.5
Total	326	100.0
Internship Status	**n**	**%**
Completed Internship	164	50.3
Not Completed Internship	162	49.7
Total	326	100.0

The levels of agreement of participants with statements regarding their views on employment and professional attitudes are shown in Table 3. According to Table 3, it is observed that 43.9% of respondents answered "neither agree nor disagree" to the statement "I believe I will be able to find a job after graduating from pathology laboratory techniques". It is observed that 35.9% responded "agree" to the statement "I believe that individuals who graduate from pathology laboratory techniques will not remain unemployed after improving themselves". 45.1% of participants stated that they like the pathology technician program. While 42.9% of participants indicated that they receive a good education in the pathology laboratory techniques program, it is observed that 35.3% responded "neither agree nor disagree" to the statement "pathology technician is a profession with a future".

Tablo 3. *Participants' Levels of Agreement with Statements on Employment Views and Professional Attitudes*.

Statements	**Total**	**Strongly agree**		**Agree**		**Neither agree nor disagree**		**Disagree**		**Strongly disagree**	
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
I believe I will be able to find a job after graduating from pathology laboratory techniques.	326	17	5.2	57	17.5	143	43.9	71	21.8	38	11.7
I believe I will be appointed through KPSS (Public Personnel Selection Examination in Türkiye) after graduating from pathology laboratory techniques.	326	22	6.7	67	20.6	136	41.7	60	18.4	41	12.6

I believe I will be able to find a job in the private sector after graduating from pathology laboratory techniques.	326	21	6.4	97	29.8	140	42.9	49	15.0	19	5.8
I believe that individuals who graduate from pathology laboratory techniques will not remain unemployed after improving themselves.	326	31	9.5	117	35.9	100	30.7	56	17.2	22	6.7
Considering job and career opportunities, I would recommend the pathology laboratory techniques program to people around me.	326	27	8.3	78	23.9	113	37.7	76	23.3	32	9.8
I like the pathology laboratory techniques program.	326	114	35.0	147	45.1	48	14.7	7	2.1	10	3.1
I regret studying in the pathology laboratory techniques program.	326	23	7.1	23	7.1	79	24.2	130	39.9	71	21.8
I believe I am receiving a very good education in the pathology laboratory techniques program.	326	82	25.2	140	42.9	69	21.2	27	8.3	8	2.5
Pathology laboratory technician is a profession with a future.	326	34	10.4	95	29.1	115	35.3	58	17.8	24	7.4
After graduating from pathology laboratory techniques, I plan to develop myself professionally and pursue training related to my field.	326	72	22.1	141	43.3	65	19.9	31	9.5	17	5.2
After graduating from the pathology laboratory techniques program, I want to complete a bachelor's degree.	326	72	22.1	84	25.8	94	28.8	59	18.1	17	5.2

The levels of agreement of participants with statements regarding their career expectations are shown in Table 4. According to Table 4, it is observed that 46.6% of participants responded "agree" to the statements "I will work in a profession that people will be proud of me as a pathology technician" and "I will work in public hospitals as a pathology technician," 42.5% responded "agree" to the statement "pathology laboratory technician is a profession in which I will work with pleasure", and 33.4% responded "neither agree nor disagree" to the statement "I will not find the education I receive sufficient and will continue to higher education".

Tablo 4. *Participants' Levels of Agreement with Statements on Career Expectations.*

Statements	**Total**	**Strongly agree**		**Agree**		**Neither agree nor disagree**		**Disagree**		**Strongly disagree**	
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
I will work in a profession that people will be proud of me as a pathology technician.	326	39	21.2	152	46.6	75	23.0	17	5.2	13	4.0

I will work in a job where I can demonstrate my abilities as a pathology technician.	326	63	19.3	157	48.2	71	21.8	24	7.4	11	3.4
I will work in a respected job as a pathology technician.	326	72	22.1	170	52.1	55	16.9	22	6.7	7	2.1
I will work in public hospitals as a pathology technician.	326	48	14.7	152	46.6	96	29.4	18	5.5	12	3.7
I will work in a desk job as a pathology technician.	326	18	5.5	52	16.0	124	38.0	99	30.4	33	10.1
I will work in a job that does not bore me as a pathology technician.	326	46	14.1	150	46.0	90	27.6	27	8.3	13	4.0
I will work in a high-income job as a pathology technician.	326	56	17.2	104	31.9	123	37.7	23	7.1	20	6.1
I will work with intellectual people as a pathology technician.	326	46	14.1	101	31.0	131	40.2	29	8.9	19	5.8
I will work in a job with the possibility of advancement as a pathology technician.	326	57	17.5	117	35.9	99	30.4	37	11.3	16	4.9
I will enjoy the work I do.	326	91	27.9	155	47.5	57	17.5	15	4.6	8	2.5
The pathology technician profession will provide me with a luxurious life.	326	25	7.7	41	12.6	127	39.0	88	27.0	45	13.8
Pathology technician is a profession suitable for my gender.	326	87	26.7	170	52.1	55	16.9	10	3.1	4	1.2
Working as a pathology technician will not interfere with my personal life.	326	77	23.6	170	52.1	64	19.6	12	3.7	3	9
Pathology technician is a profession that will secure my future.	326	34	10.4	91	27.9	135	41.4	49	15.0	17	5.2
I will not find the education I receive as a pathology technician sufficient and will continue to higher education.	326	48	14.7	85	26.1	109	33.4	64	19.6	20	6.1

Independent samples t-tests were conducted to examine whether there were significant differences in the means of participants' views on employment (Empavg), professional attitudes (Pathavg), and career expectations (Expavg) according to gender, grade level, and internship status. The findings obtained are presented in Table 5. The analysis results indicate that there are no statistically significant differences in participants' job-seeking anxieties, perceptions toward the pathology profession, and career expectations according to gender, year of study, and internship status (p >0.05). This finding reveals that the theoretical and practical educational content provided within the pathology laboratory techniques program is delivered in a balanced manner to all student groups, thereby ensuring a homogeneous distribution of professional knowledge, attitudes, and skill levels. Furthermore, obtaining similar results across different demographic variables demonstrates that equality of opportunity is

provided in the program's educational process and that learning outcomes are supported with continuous consistency.

Tablo 5. *Independent Samples t-Test Results.*

					t test		
Variable	**Group**	**N**	**X**	**ss**	**t**	**sd**	**p**
Empavg	Female	270	3.013	.824	-.097	326	.332
	Male	56	3.12	.733	-1.049	326	.297
	1st Year	158	3.11	.740	1.740	326	.083
	2nd Year	168	2.95	.864	1.748	326	.081
	Comp. Internship	164	3.001	.864	- .722	326	.471
	Not Comp. Internship	162	3.066	.751	-.723	326	.470
Pathavg	Female	270	3.53	.715	-.361	326	.718
	Male	56	3.56	.637	-.390	326	.697
	1st Year	158	3.54	.685	.172	326	.863
	2nd Year	168	3.53	.719	.172	326	.863
	Comp. Internship	164	3.60	.680	1.792	326	.074
	Not Comp. Internship	162	3.46	.718	1.791	326	.074
Expavg	Female	270	3.507	.633	-.570	326	.569
	Male	56	3.560	.667	-.551	326	.583
	1st Year	158	3.546	.573	.823	326	.411
	2nd Year	168	3.488	.719	.828	326	.408
	Comp. Internship	164	3.544	.670	0.806	326	.421
	Not Comp. Internship	162	3.487	.606	0.806	326	.421

Empavg: Mean of views on employment**,** Pathavg: Mean of professional attitudes**,** Expavg: Mean of career expectations.

5. Discussion

Pathology laboratories hold a significant place within healthcare services. An error that may occur in a pathology laboratory not only prevents the patient from receiving a diagnosis but can also create situations that hinder the timely initiation of treatment processes in diagnosed patients. Therefore, it is crucial that personnel working in pathology laboratories possess strong empathy skills, can effectively use hand-eye coordination, are capable of solution-oriented thinking, and can efficiently manage laboratory processes. The aim of this study is to reveal the employment challenges and career expectations of pathology laboratory techniques program graduates.When the demographic characteristics of the students participating in the study were examined, it was determined that 82.8% were female, 93.6% were single, and more than half were in the 20-22 age range. The concentration of participants in the 20-22 age range may stem from associate degree students taking a gap year before university enrollment and beginning higher education in the second year. Similarly, a study conducted by Tuncer and Tanaş [2]. among vocational school associate degree students reported that 83.3% of participants were in the 18-22 age range. Regarding reasons for program preference, 88.7% of participants stated that they chose the pathology laboratory techniques program of their own accord. This finding is significant in demonstrating that students made conscious choices.In the present study, it was found that 50.3% of participants had completed an internship. This finding reveals that participants demonstrate a balanced distribution between first- and second-year students. The primary reason for this is that courses such as summer internships and professional practice in the pathology laboratory techniques program are typically included in the second-year curriculum.When students' post-graduation employment expectations are evaluated, a notable state of indecision and uncertainty emerges. 43.9% of participants indicated uncertainty regarding job-finding expectations, 41.7% regarding appointment through KPSS, and 42.9% regarding employment in the private sector. These data reveal that pathology laboratory techniques students lack a clear projection regarding the post-graduation employment process. However, 35.9% of participants expressed their belief that graduates who develop themselves will not remain unemployed. This

finding reflects the perception that professional development, internship performance, the transformation of theoretical knowledge into practice, and foreign language proficiency will enhance employability. When perceptions regarding the future of the profession are examined, it is observed that 35.3% of participants remained uncertain about the future of pathology technician profession. This uncertainty can be associated with structural issues such as the numerical inadequacy of pathology laboratories in the private sector, the absence of pathology departments in every private hospital, and insufficient public sector appointments. In terms of perception of educational quality, although 42.9% of participants stated that they were satisfied with the education they received, it is noteworthy that this rate remains below 50%. This situation indicates a need for curriculum revision and an increase in the weight of practical courses in the pathology laboratory techniques programs at foundation universities in Istanbul that constitute our sample group.When students' perceptions regarding their career expectations are evaluated, 46.6% of participants stated that they agreed with the statement "I will work in a profession that people will be proud of me", and 39.9% expressed that they did not regret studying in the program. These findings reveal that a significant portion of students perceive the pathology technician profession as valuable and meaningful. A study conducted by Kenwright [22]. with laboratory workers also demonstrated that factors such as collaboration with other healthcare professions, the meaningfulness of work, taking responsibility, and feeling competent in daily tasks increase professional satisfaction, which is consistent with the results of the present study. Additionally, 42.9% of participants stated that they received a good education in the program. However, a considerable portion of students experience indecision and uncertainty on various issues. 37.7% of participants remained uncertain about recommending the pathology laboratory techniques program to people around them, 35.3% experienced uncertainty regarding the statement "pathology laboratory technician is a profession with a future", and 33.4% could not reach a clear decision about whether they found the education they received sufficient and whether to continue to higher education. A study conducted by Gür and Güdücü [23]. among medical laboratory students showed a lower program satisfaction rate (18.3%), and it was determined that female students were significantly more satisfied with the program compared to male students. A study conducted by Al-Enezi et al. [24]. with medical laboratory graduates also revealed differences between their expectations regarding work environment, career, and advancement opportunities and their post-graduation experiences. The aforementioned study indicated that pre-graduation career expectations did not align with post-graduation reality and that this mismatch caused dissatisfaction, which may explain the indecision observed in the present study.46.6% of participants stated that they believed they could be appointed to public hospitals, and it was observed that students wished to practice their profession with an associate degree if they could find employment. When evaluated overall, it was determined that participants feel emotional attachment to the program but experience significant indecision and uncertainty regarding the future of the profession and job opportunities. This situation demonstrates that students love the profession but carry concerns about employment conditions. Similarly, a study conducted by Çelen et al. [25] at Gülhane Training and Research Hospital determined that the job satisfaction level of technicians was moderate (mean 3.16), and this finding indicates that the professional expectations of health technicians are not fully met. In the present study, it is also observed that students exhibit a similar profile of uncertainty and moderate satisfaction.The results of the present study indicate that there are no statistically significant differences in participants' job-seeking anxieties, perceptions toward the pathology profession, and career expectations according to gender, year of study, and internship status. This finding suggests that the career expectations of pathology laboratory techniques students at the associate degree level are at similar levels regardless of demographic characteristics. Various results have been obtained at different educational levels in the literature. In a study conducted by Dikmen [26]. among undergraduate students, it was determined that students' future expectations did not differ significantly according to gender and age level but differed significantly according to grade level. In a study conducted by Demirel and Arslan [27] among graduate students, it was found that master's students had high mean scores only for social future expectations, while doctoral students showed statistically significant differences only in the educational future subdimension. These comparisons reveal that students at the associate degree level have a more homogeneous career expectation profile, whereas at undergraduate and graduate levels, future expectations show differentiation as educational level increases. A study conducted by Artan et al. [28]. among social work graduates also demonstrated that expectations regarding the future of employment were low, which supports that employment uncertainty is a common concern in different fields such as healthcare and social services.

5. Conclusions

Based on the research findings, various recommendations have been developed to strengthen pathology laboratory techniques education and employment. First, students should be enabled to graduate well-equipped by increasing their internship and practical training opportunities. Second, appointment quotas through KPSS for pathology laboratory technician graduates should be increased, and candidates with "Pathology Laboratory Techniques" diplomas should be prioritized in appointments. Third, a balance should be established between the private sector and public hospitals in terms of both job security and wage policy. Fourth, in-service training programs should be organized, and continuous education programs should be planned for the professional development of working technicians. Fifth, the Association of Pathology Laboratory Technicians needs to assume a more active role in protecting technicians' rights and providing solutions to problems in the sector. Finally, a national monitoring and data platform should be established to track the employment challenges of pathology technicians and provide data for policy development.The present study is quantitative research that revealed participants' attitudes toward the profession through numerical data. In future research, qualitative research methods including in-depth interviews or focus group studies can be used to understand in detail the reasons underlying students' indecisive attitudes toward the profession. Additionally, comparative studies conducted with pathology technicians who have completed their education and are actively working in the field will be beneficial in evaluating the alignment between educational curriculum and professional life. Such studies can contribute to both the development of educational policies and the establishment of career expectations on a more realistic foundation.

Author Statements:

- **Ethical approval:** The conducted research is not related to either human or animal use.
- **Conflict of interest:** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper
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