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Factors affecting medical students' satisfaction with study specialization: A structural equation modelling study at the university of Benghazi

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Abstract

This study used structural equation modelling (SEM) with 280 pre-medical students to analyses the relationship affecting student satisfaction with their specialisation. Explanatory variables included satisfaction with the curriculum. related to specialized fields of study, Future professional ambitions, and psychological satisfaction The results revealed a statistically significant direct effect of psychological satisfaction on each other; furthermore, there was a notable relationship between satisfaction and academic expertise. Satisfaction with the course and future ambitions.

Keywords: Structural equation modelling; Student satisfaction; Medical preparation; Psychological satisfaction; Academic specialisation

1. Introduction

From the most important stage of students from general education to university education, from the changes that occur to a student, including the stage of student entry to university education for medical sciences, and that specialization is medicine, pharmacy, medical technical sciences and public health, in terms of courses and curricula in English, as well as attendance of lectures and the number of hours of study, which puts us in the study of the psychological situation and the professional future of students (1), which believes that we must admit that the changes that have occurred in educational institutions in the past cannot be avoided, however, changing concepts has become one of the basic issues for graduating a person as he lives in the twenty-first century with the mentality of the twenty-first century (2).

To know the factors that affect the student's desire in the specialities of medical colleges and to identify the variables that affect in terms of the specialisation that the student thinks is appropriate for him and to facilitate the development of the educational process, so that we can identify the factors that help the student to complete a study in medical colleges correctly, "The presence of different levels of satisfaction with the special education specialisation in the study sample ranged from high, medium, to low in some paragraphs of the satisfaction scale (3).

1.1. The Study's Problem

The problem of study is in the acceptance of the student to attend lectures at the university, and the number of lecture hours, and this prompted the researcher to study some of the variables that affect the student's desire in medical disciplines, in terms of coursework, psychological comfort and professional future ambition, and therefore we show what variables help the student by modelling structural equations to form a model to know the impact of the satisfaction of students preparing in medical colleges in his specialization on the explanatory variables, as there is a crisis in the teaching of curricula by relying on traditional curricula in education without relying on modern curricula (simulation), as shown by (4), that the prevailing method of educational curricula has failed to solve many problems of science

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teaching, and science teachers agree that the best way to improve and develop science education can only be done through the use of the scientific method based on scientific research and clinical experiments, and the use of simulation to solve some practical problems, and this is not done in traditional science education. The development of education calls for reconsidering the way students think in a correct scientific way, and this is confirmed by (5) that we reconsider the way students think, which means what students learn, but what means is that students learn how to think. " The emancipation of the professor from traditional methods should also be studied, as illustrated by some models of modern trends, "where it is seen (6), that the professor does not find the use of any activity that may benefit at this educational stage on any book, lectures, or laboratories through direct friction factors The environment of society, its problems and needs, and since the importance of the university professor in teaching the specialization, as he plays an effective role in guiding and correct scientific practice, which clarifies the role of professors in the educational institutional environment.

1.2. Hypotheses of the Study

- What is the impact of the satisfaction of the academic specialisation on the variables of satisfaction with the courses, psychological satisfaction, and ambition of the future professional?
- Is there a relationship between the satisfaction of the specialisation and the variables, satisfaction with the courses, psychological satisfaction, and ambition for the future of the profession?
- Are there statistically significant differences in the academic specialisation attributable to the gender variable?

Objectives of the Study

- To assess students' satisfaction in the Benghazi University Medical College and their educational expertise.
- To understand the relationship between specialised satisfaction and related variables.
- To examine the difference in satisfaction levels between male and female students regarding academic expertise.

1.3. Importance of the Study

The University of Benghazi has been interested in granting institutional accreditation to the Faculty of Human Medicine at the University of Benghazi under Resolution No. 139 issued on June 5, 2023, thus becoming the first Faculty of Medicine at the university to obtain this accreditation. Therefore, the student's satisfaction with the academic specialisation was studied in the first year of learning in medical colleges, so the student can contribute to enhancing the university's position in the institutional programs and development that the university has recently witnessed, which attracts more students and researchers interested in medical specialisation education.

1.4. Limitations of the Research Study

- Human limitations relate to the first year of medical preparation.
- The spatial extent is defined as Benghazi University, which is a medical college.
- Deadline for the 2023-2024 academic year.

1.5. Population and Sample of the Study

The study population consisted of students entering their first year of medical college. A random sample of 280 students was selected, of which 119 were randomly selected from one group and 161 were randomly selected from the participation list and examination records. It uses a random number table to ensure that all participants have an equal chance (7).

2. Material and Methods

2.1. Conceptual Framework

The concept of the teaching system courses is considered within the global educational system to evaluate the study programs in different colleges, as it organises the study based on the approved hours in teaching courses and not in the form of a quarterly or annual system, as the student through the study chooses the courses he wishes to study and determines the specialisation he wishes, and the ambition of the future professional for graduates depends on the extent of their vision for the future and the requirements of work in the public or private sector. As for the psychological satisfaction factor, the study questions refer to reducing the pressure of study to improve their level (8). psychological satisfaction is a state of compatibility or dynamic balance between the object and the environment (9). The concept of satisfaction with the specialisation indicates the expected satisfaction in the academic life of the individual through the

achievement of academic goals and aspirations, as (4) defined it as the satisfaction that the student derives as a result of enrolment in a particular specialisation and the status and appreciation of society for it and the degree of satisfaction of the courses for his need in the specialisation, the field training process, and the methods of evaluation.

2.2. Previous Studies

2.2.1. Stressors and coping strategies through the lens of early childhood/special education pre-service teachers by Paquette and Rieg (2016).

The study addressed the pressures faced by student teachers in the specialisation of special education and children's sports from the study sample of students of education, training, children's sports, and special education. The study showed that students of education and training face pressures in terms of overwork, communication, and classroom management. On the other hand, the study clarified the intensification of the role of the university coordinator in helping student teachers in terms of supporting them more and training them to develop effective communication with students with special needs in order to reassure them in practical training times (8).

2.2.2. Satisfaction of Academic Specialization among Students of the Department of Educational Sciences and Its Relation to Self-Esteem by Alsalkhi (2018).

The study aimed to find out the level of satisfaction with the specialization and its relationship to self-esteem among the students of the Department of Educational Sciences at the University of Petra. To achieve the goal of the study, a 30-paragraph measure of satisfaction with the specialization was built, and a 10-paragraph Rosenberg scale was used to measure self-esteem. The results of the study showed a high level of student satisfaction with their academic specialization, and statistically significant differences in satisfaction levels were observed due to the variable of the specialization and in favor of the specialization of child education. Similar differences were also shown due to the variable of the cumulative rate of the scale points and in favor of the excellent rate. However, the results of the study showed that there were no statistically significant differences in the level of satisfaction attributed to the variable of the academic level. Educational science students also have higher than average positive levels on the self-esteem scale, and the results showed a positive relationship between the level of satisfaction with the specialization and self-esteem (4).

2.2.3. What predicts doctors' satisfaction with their chosen medical specialty? A Finnish national study by Heikkilä et al. (2016).

The study In Finland, the number of medical specialists varies between specialties and regions, and post-graduation medical training is planned to be more organized, so it is important to clarify the factors that predict doctors' satisfaction with their chosen specialty, the random sample was on 50% of all Finnish doctors under the age of 70. The response rate was 50.5%. Working-age professionals were asked to assess their motivation when choosing a discipline. They were also asked if they would choose the same specialty again. The probability ratios were tested for not choosing the same specialization again, and the results of the study showed that work diversity is the most important motivation (74% of the respondents). 17% of GPs will not choose the same specialty again, compared to 2% of ophthalmologists and 4% of paediatricians. Diversity of work and prestigious field played a major role in the association with satisfaction while opportunity was associated with dissatisfaction with specialization (10).

2.2.4. Ambition at work and career satisfaction: The mediating role of taking charge behavior and the moderating role of pay by El Baroudi et al. (2017).

The results of the study showed that the behavior of taking charge mediates the positive relationship between employee ambition and employee job satisfaction. It also showed that pay moderates positively in this mediation, so that the relationship between employee ambition and the behavior of taking charge is stronger when aspiring employees receive a pay increase, which leads to an increase in their job satisfaction. Conversely, low pay is not moderated in the attitude of taking charge of aspiring employees and its impact on their job satisfaction.

What distinguishes the study is that the previous studies dealt with the measure of satisfaction with the academic specialization and institutional education in several fields and the impact of the approach followed in this study is the use of the structural equations model (SEM) to measure the apparent and latent direct impact of the knowledge of the satisfaction of the specialization and the impact on psychological satisfaction and professional future and study courses in the specialization (9).

2.3. Variables of the Study

The questions were formed through the questionnaire, and they represent the explanatory variables, which were paragraphs (1-5) that met with satisfaction with the study courses, paragraphs (6-11) to measure the ambition of the professional future, paragraphs (12-18) to measure and dimension psychological satisfaction, and finally the dependent variable represented in paragraphs (19-22) to measure the dimension satisfaction with the specialisation, which is measured on the five-point Likert world scale, where the questions were positively according to the following gradation (strongly disagree - disagree - neutral - agree - strongly agree).

2.4. Methodology for Using Structural Equation Modeling in Research

The purpose of using it is to know the appropriate statistical methods we use in the research field to test the model suitable for that study. The methodology of using the Structural Equation Model (SEM) is working on more than one test model in the study, which allows an estimate of the actual reality of the educational process, as it works to develop the analysis of the interrelationships between multiple variables in a model, including the simple and multiple linear regression models. It also uses the model of structural equations in the model (11) for estimation methods, the Maximum Likelihood Method (M.L.E.) and the Least Squares Method (L.S.). One of the most important techniques in the structural equations model (SEM) used in data analysis is the study of covariance analysis, confirmatory factor analysis, latent variable analysis, path analysis, multiple regression analysis, and linear structural analysis (12).

2.5. The Importance of using the Methodology of Structural Equations Modelling (SEM)

List deletion is the most common way to deal with missing data for many analyses. This means that complete data is required for all variables in the statistical analysis, i.e., cases with missing values in one or more variables have been excluded from the analysis. However, simulation studies convincingly show that when there are a lot of missing values, an omission in the form of a list will have biased parameters and standard errors (13). For using the methodology of structural equations (SEM), estimation that uses all cases in analyses is often incorporated by default. The model estimation type is an extension of the maximum probability of complete instances; this is called the Full Information Maximum Likelihood (FIML), as this method provides continuity in estimating unbiased parameters and standard errors that are more efficient, and also more efficient type I error rates than list-form deletions (13).

2.6. Assumptions of Use the Structural Equations Modelling

By default, the use of structural equation modelling needs the following assumptions:

- Multivariate normal distribution is the most important assumption for estimating the maximum probability in modelling structural equations.
- It is assumed that there are linear relationships between the latent variables and between the observed and latent variables.
- Extreme value negatively affects the relevance of the Existence Model.
- Three or more observable variables should be used to measure each latent variable.
- It is assumed that there is no relationship between independent variables.
- In some sources, a minimum sample size of 150 is recommended for structural equation models (14).
- It is assumed that there is no correlation between error terms in the structural equation modelling method.

2.7. Indexes of the Hypotheses

In terms of the analysis required for the hypotheses of the study when using structural equations, it is needed to match and accept the indicators, which are as follows:

- Absolute fit index (AFI) The degree of acceptance of the worker is determined as appropriate or inappropriate (3,15).
- The goodness of fit index (GFI) measures the suitability of a model's data quality. It calculated the minimum variance function necessary to achieve optimal suitability in maximum probability conditions (16,17).
- Adjusted goodness of fit index (AGFI) (5).
- The root mean square error of approximation (RMSEA) indicator is one of the indicators in the degree of acceptance and matching of the model to the data. In contrast, the appropriateness indicator is in the standard error of the error that evaluates the discrepancy between the matrix of variance and covariance seen and the implicit variance matrix in the model (6).

2.8. Pilot Study

After reviewing the theoretical framework, we conducted an exploratory study to examine and clarify the questionnaire questions. The purpose of this analysis was to assess satisfaction with the educational specialisation based on specific variables. The survey sample consisted of 30 participants.

- Perceived accuracy: This measures how well the dimensions of the study are represented in the wording of the question. Feedback from teachers' Experts in management, education, curriculum and scientific research Led to modification of the questionnaire for clarity and convenience. Information from experts in psychology indicates that the correction causes multiple paragraphs to be deleted.
- Internal consistency validity: This is determined by calculating the correlation coefficient between each question and the overall test score, as well as between individual questions and related domains. A high correlation coefficient indicates validity. We also analysed the relationship between the scores of each domain and the total questionnaire scores to examine construct validity.
- Reliability of a Scale: It refers to the consistency of a scale in producing the same results over repeated use. Consistency is important for data collection tools. We measured it using Cronbach's alpha coefficient and the split-half reliability method. These methods assess the consistency and stability of the results of the questionnaires administered multiple times under the same conditions.

3. Results and discussion

3.1. Normal Residual Distribution Test

Study the extent to which the test of normal distribution of data is achieved Kolmogorov-Smirnov test.

Table 1 The Normality Distribution Test

Themes of the study	Z	P-value
Student Satisfaction with Specialization	0.096	0.200
Satisfaction of courses with the specialization	0.155	0.198
and future ambition	0.146	0.189
Psychological comfort	0.194	0.178
Topics	0.084	0.200

It is clear from Table 1 that all probability values range between (0.178-0.200) and are greater than the statistical significance level (0.05), and therefore we accept the null hypothesis that the data follow the normal distribution.

3.2. Validity of the Internal Consistency

Table 2 Pearson Correlation Coefficient Test Results (Satisfaction with Courses)

Satisfaction with Courses		
Paragraphs	**Correlation coefficient**	**P-value**
1	0.577**	0.00
2	0.696**|	0.00
3	0.623**	0.00
4	0.491**	0.00
5	0.495**	0.00

Table 3 Pearson Correlation Coefficient Test Results (Future Ambition)

Future Ambition		
Paragraphs	**Correlation coefficient**	**P-value**
1	0.597**	0.00
2	0.492**	0.00
3	0.586**	0.00
4	0.554**	0.00
5	0.450**	0.00
6	0.602**	0.00

Table 4 Pearson Correlation Coefficient Test Results (Psychological Comfort**)**

Psychological Comfort		
Paragraphs	**Correlation coefficient**	**P-value**
1	0.553**	0.00
2	0.454**	0.00
3	0.384**	0.00
4	0.669**	0.00
5	0.512**	0.00
6	0.580**	0.00
7	0.596**	0.00

Table 5 Pearson Correlation Coefficient Test Results (Satisfaction with the Specialization)

Satisfaction with the Specialization		
Paragraphs	**Correlation coefficient**	**P-value**
1	0.817**	0.00
2	0.729**	0.00
3	0.736**	0.00
4	0.717**	0.00

Through Tables 2-5, the correlation coefficient is calculated for each paragraph with the sum of the paragraphs that belong to the axis, that paragraphs “D” are statistical for the correlation between the paragraph and the sum of the degrees of the axis to which the paragraph belongs at the level of significance (0.05), and the values of Pearson correlation coefficient range between (0.491-0.696) in the axis of satisfaction with the decisions, and the values of Pearson correlation coefficient between(0.45-0.602) in the future ambitious axis, and the values of Pearson correlation coefficient range between (0.38-0.669) in the axis of psychological satisfaction, and the last values of the correlation coefficient between (0.717-0.817) in the axis of satisfaction with specialization, and the values of correlation coefficients are considered between average and strong.

3.3. Testing of Cronbach's alpha Coefficient

Table 6 Results of the reliability and validity test

Themes of the study	Number of paragraphs	Cronbach's alpha coefficient	Honesty
Student Satisfaction with Specialization	4	0.782	0.884
Satisfaction of courses with the specialization	5	0.798	0.893
and future ambition	6	0.860	0.927
Psychological comfort	7	0.899	0.948
Axes:	22	0.891	0.973

Table 6 shows that the Cronbach's alpha coefficient for all variables has reached (0.891), and the value of the stability resulting from the square root (0.973), where it shows that the value is high, where the dimensions of the study range between (0.782-0.899) and the value of the stability between (0.884-0.948) and is considered higher than (0.7).

Means, standard deviations and the relative importance of the study axes are given in Table 7.

Table 7 Results of the descriptive statistics of the study variables

Study Variables	Mean	Standard Deviation	Relative importance
Satisfaction with courses	3.56	0.569	71.2%
Future Ambition	3.57	0.508	71.4%
Psychological comfort	3.55	0.559	70.9%
Specialty Satisfaction	3.46	0.815	69.3%

From Table 7, where it was found that the highest axis of professional future ambition was (71.4), where the value of its relative importance came in the first order with an arithmetic mean of (3.57) with a standard deviation of (0.508), then the axis of satisfaction with the decisions, where the value of relative importance reached (71.2%) and was in the second order with an arithmetic mean of (3.56) and a standard deviation of (0.569), and came in the third order with the importance of relativity (70.9%) represented by the psychological satisfaction axis with an arithmetic mean of (3.55) and a standard deviation of (0.559), and the last in the fourth order was the satisfaction axis of specialization with the importance of relativity (69.3) and an arithmetic mean of (3.46) and a standard deviation of (0.815).

3.4. Study Hypotheses

3.4.1. Study the correlation between the dependent variable and the explanatory variables

Studying the correlation coefficient between the variables to know the significance of the test and also to know the direction and strength of the linear relationship between the study variables

Table 8 Results of linear correlation between variables

Study variables	Statistical Methods	Satisfaction with courses	Future Ambition	Psychological comfort
Specialty Satisfaction	Correlation Coefficient	0.461**	0.437**	0.847**
	P-value	0.000	0.000	0.000
	Quantity	280	280	280

Through Table 8, it shows that all correlations between the dependent variable of the satisfaction of specialization and the explanatory variables are significant, where the probability values reached (0.00), which is less than the level of

statistical significance (0.05). As for the direction and strength of the relationship between the variables, it is clear that a strong and direct relationship between the satisfaction of specialization and psychological satisfaction, where the value of the linear correlation reached Pearson's coefficient (0.847), and the average and direct relationship between the satisfaction of specialization and the satisfaction of the courses, where the value of the linear correlation coefficient reached Pearson's coefficient (0.461), and the last study of the relationship between the satisfaction of specialization and professional future ambition, where the linear correlation coefficient was (0.437), where the relationship between them was medium and direct, which helps us in testing hypotheses Research.

3.4.2. Studying statistical differences in the satisfaction of the specialization attributes the gender variable

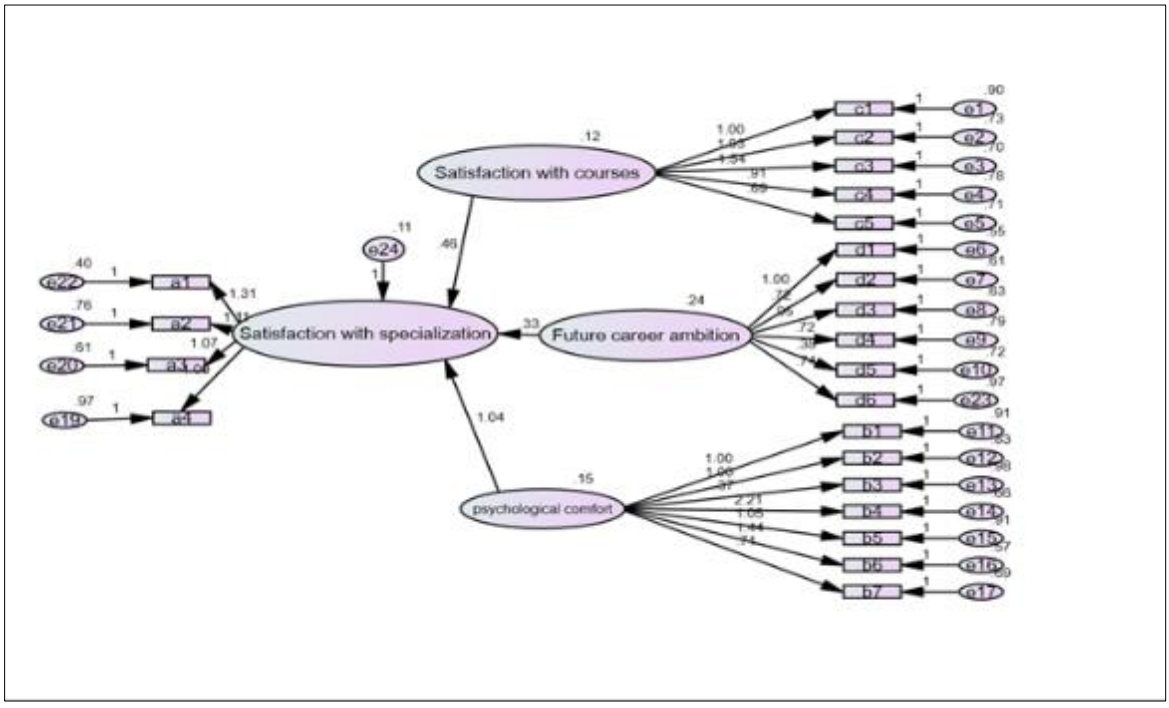
Table 9 Test results for a difference between two independent samples

Gender	Quantity	Mean	Standard Deviation	T- test	Degree of freedom	P-value
Female	161	3.62	0.5017	1.753	278	0.081
Male	119	3.51	0.5113			

Through Table 9, it shows the statistical difference between male and female students, where the value of the test (T=1.753) with a degree of freedom (278) and the corresponding probabilistic value (0.081), which is greater than the level of statistical significance (0.05), and therefore there are no statistically significant differences in satisfaction with the academic specialization.

3.4.3. Testing the impact between the dependent variable, the satisfaction of the specialization and the explanatory variables

Studying the impact between the dependent variable with the explanatory variables using the Amos program, V22 based on the path analysis test, which shows the relationship of the impact of specialization satisfaction on psychological satisfaction, satisfaction with courses and future professional ambition, as it shows the results of the Amos program in Fig. 1 and Table 10.



Chi-square = 741.087 - Degrees of freedom = 206 - Probability level = 0.000

Figure 1 The relationship of the impact of the dimensions of the study

Table 10 Impact Relationship with the Study Dimensions: Illustrative Variables in the Specialized Satisfaction Dimension

Dependent variable		Illustrative Variables	Estimate	S.E.	C.R.	P
Specialty Satisfaction	--->	Satisfaction with courses	0.456	0.171	2.668	0.008
Specialty Satisfaction	--->	Future Ambition	0.334	0.108	3.096	0.002
Specialty Satisfaction	--->	Psychological comfort	1.038	0.239	4.337	***

Table 10 shows the degree of the relationship of the dependent variable effect with the illustrative variables, and therefore the results were reached between the satisfaction with the courses and the satisfaction of the specialization, where it was clear that there was a direct, positive and statistically significant impact based on the probabilistic value (0.008) less than the level of statistical significance (0.05) and also the percentage of critical weight regression (C.R=2.668) greater than the tabular value (1.96), where the value of the impact was (0.456), and also the impact of future professional ambition and satisfaction of the specialization, where it was clear that there was a direct, positive and statistically significant impact based on the probabilistic value (0.002) less than The level of statistical significance (0.05) and also the critical ratio of the weight of regression (3.096), which is greater than the tabular value (1.96), where the value of the impact reached (0.334), and the measurement of the impact between psychological satisfaction and satisfaction with specialization, as it became clear that there is a direct, positive and statistically significant impact based on the probabilistic value (0.00), which is less than the level of statistical significance, and also the critical ratio of the weight of regression(4.337) is greater than the tabular value (1.96), where the degree of impact reached (1.038), which reinforces that the desire to continue studying is the most important psychological factors are psychological satisfaction, future ambition and dealing with students in terms of coursework.

Table 11 Results of Relevance Quality Indicators (Acceptance and Conformity Score)

Threshold value	Fit indices	Measure	N
0.90 and above	0.91	AGFI	1
0.90 and above	0.897	GFI ≥ 0.90	2
0.90 and above	0.941	AFI	3
Lee than 0.08	0.056	RMSEA	4

From Table 11, the quality indicators of the model matching required for the analysis of the data are shown, as its conformity with the threshold of values greater than 0.9 has been achieved in the indicators (AGFI =0.91, GFI = 0.899, AFI=0.941). Based on the above values, we are able to continue in statistical analyses, and the value (RMSEA=0.05) is less than (0.08) of the most important indicators that assess the extent of acceptance of the model from proximity to the real model or the integrated model of the study hypotheses, the less the value of the RMSEA increases the model used from proximity to the real or integrated model.

4. Conclusion

The findings of our study reached conclusions in the following points:

- The application used granted institutional accreditation to the Faculty of Human Medicine at the University of Benghazi, where it came to students to prepare medicine that psychological satisfaction on satisfaction with the specialisation has a positive impact.
- Achieving the relationship between satisfaction with the speciality effectively increases psychological satisfaction with the continuation of the student in medical colleges.
- As for the relationship between satisfaction with specialisation and future ambition, it is positive in the lowest average, and that is fewer job opportunities in the public or private sector.
- The relationship between satisfaction with the specialisation and the courses is positive on average, despite the knowledge of the previous courses, and also the inclusion of some paragraphs on the teaching methods facing students.

Recommendations

Recommendations or suggestions may be addressed in the following points:

- The introduction of other factors that help to satisfy the academic specialisation, including the administrative aspect and the economic aspect.
- Introducing the intermediary factor in the study, which is dealing with the professor and the employees.
- Requires effective application of study in theoretical and practical courses.
- Continuing and following up on the quality of education for medical colleges in the courses of study helps to keep the student based on satisfaction with the academic specialisation.
- To the Ministry of Labour and Rehabilitation through which students are qualified and enabled to enter the labour market in the required specialisation, which contributes to creating real job opportunities and enhancing their participation in the field of health, based on their desire to be satisfied with the specialisation and its relationship with other variables.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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