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Satisfaction index of professionals with methodological scientific training in an academic institution in Cuba.

Índice de satisfacción de profesionales con la formación científica metodológica en una institución académica de Cuba.

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Abstract: Background: as part of the strategy that the Manuel Fajardo School of Medicine has drawn up for the training of new doctors in science, a comprehensive academic scientific training diploma was designed. One of the courses taught was Updating on Scientific Research Methodology. Objective: To evaluate the level of satisfaction of the professionals who are part of the doctoral strategy of the Manuel Fajardo Faculty of Medical Sciences in relation to the course taught. Methods: A cross-sectional descriptive observational study was carried out, in which a questionnaire was applied to 40 students who participated in the refresher course on topics of scientific research methodology. The Iadov technique was applied to evaluate the overall Satisfaction Index. Results: 40% of the students were in the age range of 36-50 years, the female sex predominated (62.5%), the majority were doctors (72.5%) and with more than 25 years of experience. (40%). 40% do not have a teaching category, 65% do not have a scientific category. 50% have a master's degree academic category . 90% of the students were very satisfied with the course, obtaining a Global Satisfaction Index of 0.912. Conclusions: There is a high satisfaction of the students with the academic training in scientific research methodology, which reflects the learning and professional improvement needs for the subject, very useful to achieve the scientific degree.

Keywords: Satisfaction, doctoral strategy, postgraduate education, teaching-learning process, didactics, scientific research methodology, Iadov Technique.

Resumen: Antecedentes: como parte de la estrategia que se ha trazado la Facultad de Medicina Manuel Fajardo para la formación de nuevos doctores en ciencias se diseñó un diplomado de formación científica académica integral. Uno de los cursos impartidos fue el de Actualización en temas de Metodología de la Investigación Científica. Objetivo: Evaluar el nivel de satisfacción de los profesionales que forman parte de la estrategia doctoral de la Facultad de Ciencias Médicas Manuel Fajardo en relación al curso impartido. Métodos: Se realizó un estudio observacional descriptivo transversal, en el que se aplicó un cuestionario a 40 cursantes que participaron en el curso de actualización en temas de metodología de la investigación científica. Se aplicó la técnica de Iadov para evaluar el Índice de Satisfacción global. Resultados: El 40% de los cursantes estuvieron en el rango de edad de 36-50 años, predominó el sexo femenino (62,5%), en su mayoría fueron médicos (72,5%) y con más de 25 años de experiencia (40%). El 40% no tienen categoría docente, el 65% no poseen categoría científica. El 50% presenta categoría académica de máster. El 90% de los cursantes quedaron muy satisfechos con el curso, obteniéndose un Índice de Satisfacción Global de 0,912. Conclusiones: Existe una alta satisfacción de los cursantes con la formación académica en metodología de la investigación científica, lo cual refleja las necesidades de aprendizaje y superación profesional por el tema, de gran utilidad para alcanzar el grado científico.

Palabras clave: Satisfacción, estrategia doctoral, educación de posgrado, Proceso enseñanza aprendizaje, didáctica, metodología de la investigación científica, Técnica Iadov.

1. Introduction

It constitutes a policy of the Ministry of Higher Education (MES) and the Ministry of Public Health (MINSAP) of Cuba, the doctoral training of health professionals, as a guarantee of raising the scientific level that contributes to a better quality in medical attention to the population. Resolution 140/2019 of the Regulation of postgraduate education of the Republic of Cuba establishes in its chapter IV the organizational forms of postgraduate education in: professional improvement, postgraduate academic training and doctorate. Article 31 defines the organizational forms of academic training: the master's degree, the postgraduate specialty and the doctorate (1-2).

On the other hand, Decree Law No. 372/2019 of the National System of Scientific Degrees aims to train doctors from university graduates at the highest scientific level in each area of knowledge, in accordance with the present and future needs of the country. (1). The Manuel Fajardo Faculty of Medical Sciences develops a doctoral strategy that consists of a diploma called "Comprehensive scientific academic training to obtain a scientific degree" made up of nine courses aimed at 93 doctoral students and 21 young applicants who are studying various specialties from 16 institutions of the three levels of health care.

One of these courses is the "Update on Scientific Research Methodology" (hereinafter: MIC) which covers 180 hours of classes taught, six academic credits, blended and virtual through a Virtual Teaching Environment. and Learning (EVEA) with a profile of the graduate to elaborate the theoretical and methodological design of the research project with the new trends in the MIC. Audio-conferences, video-conferences, power point presentations, study guides, and a vast updated bibliographical source of each of the topics that were available in the EVEA of the course were developed. Within the non-contact activities, discussion forums and interactive chats were developed to clarify doubts. In addition to the formative evaluation, the development of a methodological praxis of the future doctoral thesis was delivered as a final exam, which consisted of the following elements: practical problem, scientific problem, object of study, field of action, hypothetical approach, general objective and specific, and definition of the chapters with their respective general objectives and operationalization of the variables.

Motivated to investigate the degree of perception of well-being of the students in relation to this course, the Iadov technique was used. This technique was created by Kuzmina (3) to study satisfaction with the profession in teaching careers and allows determining the level of individual and group satisfaction of a sample from a questionnaire made up of five questions (three closed and two open) where the Closed questions are interrelated through the so-called "Iadov Logical Table" and open questions serve as argumentation and coherence of the respondent on the subject evaluated and to contrast the answers of the closed ones (4). This technique is based on the following levels of satisfaction: clear satisfaction (maximum satisfaction), more satisfied than dissatisfied, not defined, more dissatisfied than satisfied, clear dissatisfaction (maximum dissatisfaction) and contradictory. If each of the previous levels is associated with a numerical scale that goes from +1, +0.5, 0, -0.5 and -1, the Group Satisfaction Index (ISG) can be obtained (5). In recent years, the Iadov technique has been used by several authors (6-12), demonstrating its effectiveness in various fundamentally pedagogical and academic investigations, aimed at evaluating the level of satisfaction of people with respect to methodological proposals, plans and programs. study, models, strategies, systems,

processes and procedures, among others, hence its wide and successful use in the field of Social and Humanistic Sciences. Therefore, the objective of this work was to evaluate the level of satisfaction of the professionals who are part of the doctoral strategy of the Manuel Fajardo Faculty of Medical Sciences in relation to the MIC Course.

2. Methods

Study type and sample

A cross-sectional descriptive observational study of the positivist paradigm that contributes to a basic research project was carried out. A total of 40 professionals were studied, made up of master students (n=18) from the genetic counseling master's degree of the National Center for Medical Genetics and doctoral students (n=22) from the faculty itself, from the polyclinics of primary health care. : Moncada and Plaza de la Revolución, from the secondary care level hospitals: Borrás-Marfán, Manuel Fajardo, Fructuoso Rodríguez, and from the Institutes of Oncology, Cardiology - Cardiovascular Surgery and Endocrinology. The informed consent of the research participants and those who attended 100% of the face-to-face and virtual activities was taken into account.

Variables and their operationalization

Thirteen variables related to three closed questions were characterized:

- Q1: To what extent are you satisfied with the results achieved in the training received? It was operationalized as an ordinal qualitative variable through a Likert scale in: Very satisfied; More satisfied than dissatisfied; Indifferent (neutral); More dissatisfied than satisfied and Dissatisfied.
- Q2: Do you consider that the knowledge and skills acquired meet your professional needs in your field of competence?
- Q3: Are you satisfied with the methodology applied to transmit and evaluate the knowledge and skills of the program?; both were operationalized as nominal qualitative variables with the following categories: Yes, No, and I don't know.

And the open questions were:

- Q4, What favorable aspects can you highlight about the training received?
- Q5: What unfavorable aspects limit the training received?

In addition, biological and academic variables were obtained: age, sex, years of experience, profession, academic and/or scientific degree, teaching category, scientific category and main motivation of the training.

Ethical aspects

The principle of autonomy was respected, by selecting only the students who offered informed consent. The importance of the investigation was explained as well as the confidentiality of the information was respected.

Techniques and procedures for obtaining information

The survey was applied as a technique for collecting information through a self-administered questionnaire with three closed and two open questions validated by a Committee of experts and the Iadov (4) methodology was applied to study the level of satisfaction in relation to the academic and scientific training of master and doctoral students of the University of Medical Sciences of Havana. The questionnaire was designed through the Google Forms application or "Google Forms", free online software that allows the creation of these documents and their massive application through cell phones or mobile phones. It was distributed from the cell phone through the WhatsApp platform to the universe of students. Once the students answered the questionnaire, they sent it

through their mobile phones and it was then exported to SPSS, version 27 for statistical processing.

Information processing techniques and procedures

Descriptive statistics were used for qualitative variables (absolute and relative frequencies), which allowed the preparation of frequency distribution tables for each of the analytical variables. A Pearson's Chi square test was applied with the objective of relating the variables of sex and length of service. For statistical decision making, the level of statistical significance α=0.05 was defined. The Global Satisfaction Index (ISG) was calculated taking into account the scale in table 1 and the following formula was applied from the information generated from the previous table (4):

$$ISG = \frac{A(+1) + B(0.5) + C(0) + D(-0.5) + E(-0.5)}{N}$$

Table 1 . Scoring for the Likert scale.

	Scale	**Meaning**
A	+ 1	Maximum satisfaction
B	+0.5	More satisfied than dissatisfied
C	0	Undefined and contradictory
D	-0.5	More dissatisfied than satisfied
E	- 1	Maximum dissatisfaction

Figure 1 shows the correct interpretation of the ISG. The widest interval [-0.49; +0.49] indicates the zone of contradiction or lack of definition, so that the values that fall within it do not allow conjectures about the level of satisfaction or dissatisfaction of those surveyed; the interval [-1;-0.5] indicates the zone of dissatisfaction, which will be higher the closer the values are to -1; the interval [+0.5;+1] corresponds to the area of satisfaction that will grow the closer the values are to +1.

Figure 1. Interpretation of the Global Satisfaction Index.

Frequency distribution tables were made, applying Iadov's Logical Table (4) where the first three questions were interrelated as shown in figure 2. Finally, the open questions were coded from the analysis of textual data; This analysis is a technique that describes, synthesizes and analyzes qualitative information contained in the responses to these questions. They were ordered according to frequency.

Scope and limitations

The questionnaire validated and applied in the present investigation can be generalized to other postgraduate academic formations with the objective of knowing the ISG with the Iadov technique, so it is applicable to similar investigations.

Figure 2. Iadov Logical Table Model

	Question Y								
	Yes			**I don't know**			**No**		
Question X									
	Question Z								
I am very satisfied	**Yes**	**Don't know**	**No**	**Yes**	**Don't know**	**No**	**Yes**	**Don't know**	**No**
More satisfied than dissatisfied									
It does not matter to me									
I'm not satisfied									
I don't know what to say									

Source: Own elaboration of the authors

3. Results

Table 2 shows the biological characteristics in terms of age and sex as well as academic characteristics such as profession, years of experience, teaching and scientific category of the 40 students. 72.5% are doctors, 40% have more than 25 years of experience, however, 40% and 65% do not hold any teaching and scientific category respectively. 50% of the sample is not a master's degree, and 39 of the 40 are not PhDs in science.

Table 2. Characterization of the students according to biological and academic variables

Variables	**Frequency**	**Percentage (%)**
Age		
Up to 35 years	9	22.5
36-50	16	40.0
+50 years	15	37.5
Sex		
Female	25	62.5
Male	15	37.5
Profession		
Medicine	29	72.5
Nursing	7	17.5
Others	4	10.0
Years of experience		
Up to 15 years	14	35.0
16 to 25	10	25.0
+25 years	16	40.0
Teaching category		
Does not have	16	40.0
Instructor	5	12.5
Assistant	10	25.0
Auxiliary	7	17.5
Full	2	5.0
Scientific category		
Does not have	26	65.0
Candidate	10	25.0
Aggregate	2	5.0
Assistant	1	2.5
Full	1	2.5

One of the aspects that was investigated was related to the motivation to attend the training, and 100% was due to the interest in professional improvement. A statistically significant relationship was obtained between the time in health service and the sex of the sample surveyed ($r^2 = 6{,}926$; $p=0.031 < \alpha = 0.05$). Men have less service experience (up to 15 years) than women. 90% of the students were very satisfied with the course (Table 3). And 97.5% considered that the knowledge and skills acquired meet the professional needs in their field of competence and are satisfied with the methodology applied to transmit and evaluate the knowledge and skills of the program.

Table 3. Satisfaction with the training received.

levels	Frequency	Percentage
Very satisfied	36	90.0
More satisfied than dissatisfied	3	7.5
Indifference or Neutral	0	0.0
More dissatisfied than satisfied	0	0.0
Dissatisfied	1	2.5
Total	**40**	**100.0**

Iadov's logical framework is shown in Table 4. The student who overall felt more satisfied than dissatisfied considered that the knowledge and skills meet their needs but was not satisfied with the methodology used. The trainee who felt dissatisfied did not agree with the methodology either. The rest (n=36) felt very satisfied with the two elements that were investigated in questions 2 and 3. Finally, the Group Satisfaction Index was 0.912, which indicates a high level of satisfaction.

Table 4. Logical Table of Iadov

Q1: Are you satisfied with the results achieved in scientific and technological activity in your field of competence?	Q2: Do you consider that the knowledge and skills acquired meet your professional needs in your field of competence?								
	Yeah			I don't know			No		
	Q3: Are you satisfied with the methodology applied to transmit and evaluate the knowledge and skills of the program?								
	Yes	Don't know	No	Yes	Don't know	No	Yes	Don't know	No
Very satisfied	36	0	0	0	0	0	0	0	0
More satisfied than dissatisfied	2	0	1	0	0	0	0	0	0
I am indifferent (neutral)	0	0	0	0	0	0	0	0	0
more dissatisfied than satisfied	0	0	0	0	0	0	0	0	0
Dissatisfied	0	1	0	0	0	0	0	0	0
Summary	38	1	1	0	0	0	0	0	0

The favorable elements of the training received defined by the students who stood out the most in order of frequency were:

- Preparation and pedagogical mastery of the teacher
- theme update
- Depth and practical utility of the content
- Interactive chat and the virtual environment
- Using technology to self-manage learning
- Bibliography and complementary videos

The unfavorable elements that limited the training according to the students in order of frequency were:

- internet connectivity

- Hours and daily frequency
- Limited course time to receive so much information, especially in front of the computer
- Assistance activities, by the student, that cause unwanted absences

4. Discussion

The training of doctors in sciences in Cuba is a priority and an urgent need and requires modifications in some of its conceptions (13). In this sense, the University of Medical Sciences of Havana has experienced a qualitative leap after the COVID-19 pandemic with respect to the development of doctoral and master's programs. Currently, there are three doctoral programs: medical sciences, public health, and basic medical sciences. Master's programs are developed with a research profile aimed at assistance, teaching, administration and research itself. Its purpose is that the research carried out as a master's thesis has continuity towards a doctoral training. The Manuel Fajardo Faculty of Medical Sciences has a strategy that guarantees the increasingly solid training of master students, doctoral students and applicants with the purpose of achieving maturity in scientific knowledge so that they reach an increasingly solid doctoral training at an early age. . Satisfaction is the fulfillment of expectations, states of favorable opinion according to a given activity, which corroborates compliance with the requirements of the proposed activity (14). Research related to the level of satisfaction guarantees having feedback and improving it. The MIC course is a felt need for learning of master and doctoral students reflected in the different interviews offered as part of the advisory functions of the scientific degree and master's degrees as well as the direction of science and technological innovation that the authors of this article assume. The ISG was high and this result corresponds to dissimilar investigations from different areas of knowledge (15-19) that use the Iadov technique to measure this statistician.

In the systematic review carried out, the Iadov Technique is used in all areas, predominantly in Pedagogy, with two fundamental purposes: to validate documentary measurement instruments and to evaluate perception or satisfaction with intervention strategies, study plans, analytical programs, among others. others. The investigations that evaluate the ISG in scientific improvement courses regarding the MIC were almost null. The closest one was carried out at the University of Informatics Sciences of Cuba (UCI) in which Pérez Pino, MT et al (13) obtained an ISG of 0.93, similar to that of the present investigation and related to the realization of workshops for the preparation of PhD topics. Jiménez Quintana et al (5) obtained an ISG of 0.95, related to the validation of an instrument to measure quality of life related to the oral component of health in edentulous patients. Hernández-Pérez et al (14) carried out an evaluation of the nursing professional with a care intervention as a way to manage knowledge. The ISG was 0.90, which is in the very satisfied range. Hernández Ruiz et al (15) prepared an informed consent document for patients admitted to secondary health care services, whose ISG was 0.86, a finding that denoted acceptance by the specialists surveyed of the document. Pérez Rumbaut GI et al (16) carried out a study of student and teacher satisfaction on an integration workshop in Human Morphophysiology III and the ISG ranged from 0.60 (referring to activities for content consolidation) to 0.81 with the quality of the guide, usefulness of the tasks and organization of the workshop. In the research carried out by Valdés Naranjo et al. (17) they discussed that their surveyed students feel a high level of satisfaction with the improved Chemistry program, expressed in ISGs of 0.84, 0.81 and 0.90 for satisfaction with receive the Chemistry study program, for using the learning objectives that are declared therein as a guide for the study and for its link with Medicine, respectively. Other investigations were related to Hernández-Pérez et al (18) who obtained an IGS of 0.90 with the intervention of nursing care.

One of the strategies that was taken into account in the course for professionals who could not attend the face-to-face modality, especially residents in full academic training, was the creation of an EVEA through the dynamic learning environment modularly oriented to objects, acronym in English, *MOODLE* , which constitutes an educational content management system that enables the organization of courses from the creation and combination of educational resources managed within the same platform. This modality guaranteed reflective, autonomous learning, learning to learn, continuous training, learning communities and collaborative learning (19).

Asencios Trujillo, et al (19) found that the Iadov index decreased as the respondent's age increased. Luz Vargas et al (20) also applied a questionnaire to students regarding Information and Communication Technologies (ICTs) in the teaching and learning process where the ISG varied according to the major (Mathematics= 0.783; Statistics= 0.83 Computer Science= 0.817 and Physics= 0.78). These evidences show that there is a wide application of the Iadov Technique in research related to the teaching-learning process, however, it is suggested for future research to evaluate the ISG according to different elements that characterize the applied training strategy, as well as the ISG. for master students and the ISG for doctoral students with the purpose of assessing whether there are differences.

5. Conclusions

- There is high satisfaction of the students with the academic training received on scientific research methodology.
- Assessing consistently and objectively the levels of individual and group satisfaction resulting from academic training constitutes an essential interactive and dynamic process .
- When a virtual learning environment is applied for the self-management of knowledge, the process guarantees "learning to learn", "learning to unlearn" and "learning to relearn", making the master or doctoral student an active entity in the management of knowledge. their own knowledge, becoming a pleasant academic experience.

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