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Health Education for the Professional Performance of the Graduate in Optometry and Optics

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Abstract

Introduction: *For health professionals, professional improvement is necessary because they respond to the ever-increasing social demands of health problems - illness.*

Objective: *To assess the current state of professional improvement of graduates in Optometry and Optics in the management of glaucoma.*

Materials and Methods: *A descriptive observational, intervention and evaluation study were carried out on 50 graduates in Optometry and Optics regarding glaucoma care in the period from 2020 to 2024, at the Ramón Pando Ferrer Cuban Institute of Ophthalmology, where Being a graduate in Optometry and Optics participating in the medical services of the institution was taken into consideration for the selection of the sample.*

Results: *Significant results of the Observation Guide show insufficient integration into institutional programs for participation in research projects related to glaucoma.*

Conclusion: *The results obtained with the application of the instruments, the inventory of problems and potentialities was prepared.*

Keywords: Diagnosis, Profesional Improvement, Professional Performance, Performance Improvement.

Introduction

Glaucoma is a chronic and progressive optic neuropathy, of multifactorial origin; in which intraocular pressure is its main risk factor. It is characterized by a typical damage pattern of the optic nerve and bilateral asymmetric loss of the visual field [1]. Today in Cuba this disease is treated from the perspective of comprehensive care in which the performance of the optometry and optics technologist is essential.

In Cuba, the first cause of irreversible blindness occurs, which occurs silently on many occasions, according to the national survey of blindness and visual disability in older adults, which was carried out in the country [2-4].

It has been identified that the optometry and optics technologist must be able to carry out, in their work setting, professional actions aimed at contributing to the prevention, identification, diagnosis and treatment of visual function alterations; to the execution of optometric examinations, study of the psychophysics of vision; design, manufacturing, adaptation of optical compensators and the development of visual training programs [5,6].

The graduate in Optometry and Optics must undergo permanent professional improvement to reach the required level of skills and for this purpose, diagnostic evaluations are required to determine the level achieved. Any diagnostic alternative capable of assessing improvement for professional performance becomes an important instrument for opinions of this nature [7].

A summary of the skills that the professional improvement of the Graduate in Optometry and Optics contributes is shown in the box in illustration [1].

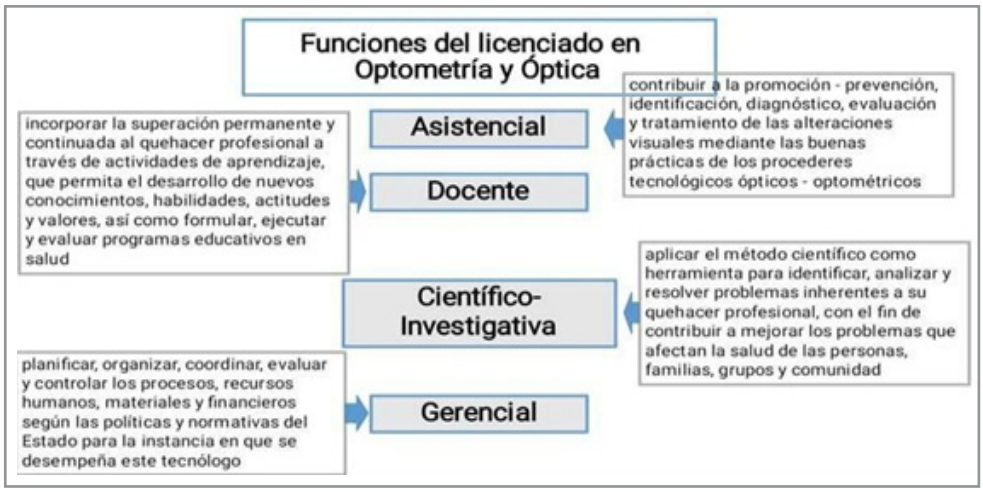

Figure 1: Competencies of the Graduate in Optometry and Optics. (Source: Thematic plan of the Graduate in Optometry and Optics).

The performance of the Graduate in Optics and Optometry is assumed as a qualitative variable under study and is about his status in the sample studied, and in the period of time studied, which is the subject of this report. As a good transformative dialectic, a proposed Improvement Strategy is associated with the diagnostic state obtained with the purpose of achieving appropriate levels of competencies in the Optometry and Optics Technologist [8].

In the system approach that is assumed, the existence of essential characteristics is recognized and it is established to identify them as variables, which to be studied are operationalized and thus gives rise to the creation of indicators associated with each of these dimensions with the purpose of measure its degree of relevance [9,10].

As part of the information search and processing process, survey, interview and scientific observation instruments were designed and applied, techniques to collect and analyze a set of data from the samples taken, according to substrates, in the population under study.

Material and Method

A descriptive observational, intervention and evaluation study was carried out on 50 graduates in Optometry and Optics regarding comprehensive glaucoma care in the period from 2020 to 2023, at the Ramón Pando Ferrer Cuban Institute of Ophthalmology, Governing Center for Scientific Research. , where being a Graduate in Optometry and Optics participating in the institution's medical services was taken into consideration for the selection of the sample.

Measurements were made and the variable of interest was manipulated; the change in it after the intervention was assessed, from which proposals for improvement emerged for the tertiary care level institution, where the research was carried out.

As sources of information to carry out the diagnosis of the current situation, in addition to the closed survey in which they are asked to issue criteria of very low, low, medium, high or very high by indicator, an interview with ten managers who practice positions of department heads, administrators and director of the center where the graduates in Optometry and Optics who make up the research population work. Finally, a Guide is applied to evaluate performance in the workplace. Table 1 summarizes the designed instruments.

Table 1: Information collection instruments (Source: Own elaboration).

Instrument	For	Objective
Inquiry	Graduates: Optometry Optics	Evaluate professional performance.
Interview	Managers	Assess the current state, in carrying out the procedures to be carried out with specific advanced biomedical techniques and the implementation of health education actions through information and communications technologies.

Observation guide	Graduates: Optometry Optics	Assess in practice the current state of professional performance of graduates in Optometry and Optics, in carrying out the procedures to be carried out with specific advanced diagnostic means for the management of glaucoma and the implementation of health education actions through information and communications technologies.

In the characterization of the performance studied, four dimensions and 13 indicators were identified that summarize the meaning and scope of the variable, and which are summarized in Table 2 below. This structure allowed the declared instruments to be applied to obtain evaluative criteria about the performance indicators being studied. For the final analysis of the results achieved by the application of the described instruments, a group of scenarios is indicated, with the purpose of defining the condition presented by the indicator and the dimension at the time of the investigation, in this way it is possible to measure them through triangulation more precisely. (Table 3).

Table 2: Parameterization of the variable Object of study according to dimensions and indicators

Dimensions	Indicators
Teaching and improvement	• Degree of participation in improvement courses. • Level of integration of general knowledge of glaucoma.
Scientific - investigative	• Degree of participation in scientific events. • Degree of participation in research projects related to glaucoma. • Degree of completion of tutorials and advice related to glaucoma. • Degree of published research related to glaucoma.
Professional - technical	• Level of knowledge of the national visual impairment program. • Level of knowledge about glaucoma and the risk and predisposing factors that generate an aggravated progression of this entity. • Degree of detection and implementation of actions to promote and prevent glaucoma through the use of information and communications technologies.
Ethical - Humanist	• Degree of understanding of the biopsychosocial impact of the visual disability generated by glaucoma. • Degree of sensitivity in the technologist-patient relationship. • Level of compliance with the ethical principles required by the profession. • Level in the detection and implementation of collaboration, cooperation and integration actions in order to generate more effective promotion and prevention actions to prevent the progression of glaucoma.

Table 3: Scenarios for methodological triangulation

Scenery	Condition
Potential	Positive results between 80% and 100%
Increase	Positive results between 50% and 79%
Difficulty	Positive results between 330% and 49%
Severity	Positive results less than 30%

In systemic articulation to the diagnostic instruments designed and applied to the subjects, an Improvement Strategy is conceived to pay attention to the insufficiencies detected in the professional performance of the Graduate in Optometry and Optics. The Strategy is assumed as a systemic model, structured in stages with planned actions based on a diagnosis, which facilitate the improvement of professional performance, with a humanistic and ethical sense [11-13].

Results

The results produced by the instruments are described with the purpose of finding consensus on the scenario in which the dimensions and indicators of the studied variable are found. The triangulation by indicators in the survey is shown in the following table 4.

Table 4: Results in percentages of the surveys.

LEVELS OF ASSESSMENTS QUESTIONS					
S.no	VERY LOW	LOW	MEDIUM HIGH		VERY HIGH
1	10	40	20	13,30	16,70
2	10	40	33,30	10	6,70
3	0	40	30	13,30	16,70

4	20	56,7	0	10	6,70
5	56,70	20	16,70	0	6,70
6	46,70	26,70	19,7	0	6,70
7	20	20	43,30	10	6,70
8	26,7	23,7	26,70	16,7	6,70
9	20	36,70	16,7	20	6,70
10	3,3	36,70	33,30	16,70	10
11	0	6,70	16,70	30	46,70
12	0	6,60	16,60	36,60	40
13	6,60	6,60	46,70	20	20

A graphical display of the results from the table above is on a Likert chart.

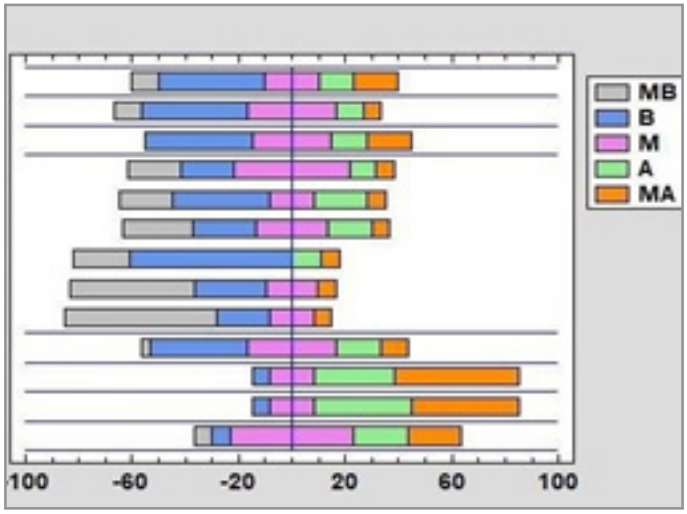

Figure 2: Likert graph for percentage values of the scale in the 13 indicators (Source: Prepared with Statgraphics).

The illustration reads: MB: Very low; B: Bass; M: Medium; A: High; MA: Very high

In evaluating the internal consistency of the survey, Cronbach's alpha coefficient was calculated, resulting in the calculations were made from the formulation:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_1^{50} V_i}{V_t}\right)$$

V_i V_t

For K=13, where: Variance of each case and: Total variance.

The result obtained ensures good internal consistency of the instrument.

For the interview, a summary criterion of the qualitative assessment of the managers was compiled and is reflected in the following table 5.

Table 5: Percentage results of satisfaction of managers in the performance of the Graduate in Optometry and Optics.

INDICATORS DEFINED	IN APPROPRIATE	NBIT APPROPRIATE	APPROPRIATE	VERY APPROPRIATE
1	10	40	30	30
2	30	40	30	0
3	10	50	10	15
4	20	70	10	0
5	60	20	20	0
6	50	30	20	0
7	30	40	30	0
8	30	40	30	0

9	20	50	20	10
10	10	40	40	10
11	0	10	20	70
12	0	0	20	80
13	10	10	60	20

In The Applied Observation Guide, the following evaluation criteria and results were determined based on Rodríguez [12].

- Always observed: 81 - 100%
- It is observed: 61 – 80%
- Sometimes observed: 41 – 60%
- Little is observed: 21 – 40%
- Not observed: 1 – 20%

Category is Always Observed

- Knowledge of the risk and predisposing factors of the aggravated progression of glaucoma.
- Actions to promote and prevent visual impairment.
- Understands the biopsychosocial impact of the visual disability caused by glaucoma.
- Demonstrates its sensitivity in the technologist-patient relationship.
- Shows a spirit of cooperation, collaboration and integration.

Category is Observed

- Integrates general knowledge into the promotion and prevention of visual impairment.
- Category is Little Observed.
- Has knowledge of health promotion and prevention actions through the use of information and communications technologies for comprehensive glaucoma care.
- Detects and carries out actions to promote and prevent glaucoma through the use of information and communications technologies.

The indicators associated with the scientific-research dimension are little observed.

Category is Not Observed

- Participate in improvement courses

The category that is observed sometimes does not have the established percentage, since all the values are significant for the other categories.

Problems Detected

Insufficient integration into institutional programs for participation in research projects related to glaucoma and insufficient knowledge of actions carried out by the institution in favor of health promotion and prevention through the use of information and communications technologies for care comprehensive glaucoma.

Scenario Selection Based on Methodological Triangulation

In the first dimension, the Growth scenario is evident for the degree of participation in improvement courses and the level at which they integrate general knowledge of visual disability.

In the second dimension, the following scenarios are evident:

- Growth in the degree of participation in scientific events.
- Stagnation in the degree of participation in research projects; the degree of completion of tutoring and consulting; and the extent of published research related to glaucoma.

In the third referring dimension, the following scenarios were evident:

- Growth in the level of knowledge of the national visual impairment program; the level of knowledge about the risk and predisposing factors that generate aggravated progression of glaucoma; and the degree of understanding of the biopsychosocial impact of the visual disability generated by glaucoma.
- Difficulty in understanding glaucoma and the risk and predisposing factors that generate an aggravated progression of this entity; the degree of detection and implementation of health promotion and prevention actions through information and communications technologies in comprehensive glaucoma care.

In the fourth dimension, the Potential scenario for the degree of sensitivity in the technologist-patient relationship is evident; the level of compliance with the ethical principles required by the profession.

Discussion

In the research, diagnosis is assumed as a process of intervention and evaluation. The intervention carried out with the three instruments, applied according to the operationalization of the variable under study and integrated according to triangulation resources, allowed such an evaluation to be carried out [14].

Triangulation is based on the theoretical assumption from the point of view of the procedure, which is defined as those steps that are carried out in obtaining the data and how these will be processed and analyzed, the form will also be different when using a quantitative and a qualitative approach. It allows the information received from different sources, techniques and instruments to be grouped, to identify coincidences and discrepancies in the phenomenon being studied [10,14]."

As a synthesis of the evaluation, they allow us to obtain as unified criteria that there is evidence of insufficient integration of Graduates in Optometry and Optics into institutional systems to participate in educational-research development alternatives related to glaucoma, as well as a low level of performance of follow-up actions of the disease in the sense of promoting procedures to prevent glaucoma and its progression.

It is also conclusive the existence of Potentials in the Graduate in Optometry and Optics that show from the culture about

the Visual Disability Program to having a high sensitivity in the technologist-patient relationship, as well as one in accordance with ethical principles and actions of collaboration, cooperation and integration.

The integration of the interpretations of the tabulations in integration with the results of the Guide showed that the dimensions with the best results were teaching and self-improvement and ethical-humanistic, in contrast as dimensions with low results the scientific investigative and the technical-professional were identified.

Patients and the disease, in their comprehensive care, need a Graduate in Optometry and Optics, but they need institutional academic offers that ensure their performance in order to efficiently carry out their functions.

The modeling process enables the foundation and structuring of the Improvement Strategy for graduates in Optometry and Optics in comprehensive glaucoma care; whose implementation allows overcoming the limitations found in their actions during the diagnosis, by producing changes in their level of preparation and reducing the contradictions between the ideal state and the current one, in which the improvement of professional performance is evaluable [14,15].

The Improvement Strategy was put to the evaluation of specialists at the "Ramón Pando Ferrer" Cuban Institute of Ophthalmology, who evaluated it taking into account the essential elements, in terms of its design, structure, stages and actions, purpose, characteristics, directed contribution to the generation of actions to promote and prevent glaucoma, issuing their considerations.

In addition, their considerations about improvement were taken into account from the perspective of improving the professional performance of technologists in Optometry and Optics, which made it possible to assess on a theoretical level and the activities proposed for their implementation in practice [15].

The Conceived Improvement Strategy, raised from corresponding theoretical references, is structured in an introductory Conference, essentially motivating, a Course to develop theoretical aspects and two Trainings. The first to create a solid interface with the practice of professional performance and the second for the development of skills in professional performance. Its specification is the following:

Specialized Conference: Chronic Diseases
General objective. Analyze the influence on the progression of glaucoma from the characterization of chronic conditions, to promote the ability to carry out promotion and prevention actions in relation to the disease.
Summary
1. Diabetes mellitus
2. High blood pressure
3. Glaucoma

Teaching strategy. Aimed at raising awareness in carrying out actions to promote and prevent the progression of glaucoma associated with chronic diseases that lead to visual impairment. Conceived as the beginning of the process of improvement in professional performance

Course: Glaucoma Associated with Chronic Diseases

General objective. Update knowledge of glaucoma associated with chronic diseases that cause visual impairment.

Thematic plan
Topic 1: "Glaucoma, diabetes mellitus and arterial hypertension.
- **Objective:** Analyze the influence of chronic diseases on the mechanism of glaucoma in each patient.
- **Contents:** Introduction to glaucoma associated with chronic diseases. Factors that influence the examination, management and treatment of patients with glaucoma. Assistance resources.

Topic 2: "How the optometry and optics technologist can have a more active role in the Visual Disability Prevention Program."
- **Objective:** Characterize essential diagnostic tests in the early detection of glaucoma.
- **Contents:** Essential diagnostic exams: eye strain and pachymetry. Factors that influence the examination, management and treatment of patients with glaucoma. Assistance resources.

Topic 3: "Healthy lifestyles in ophthalmological diseases." Objective: Guide healthy lifestyles in the face of glaucoma associated with chronic diseases.
- **Contents:** Management of patients with glaucoma and healthy lifestyles. Assistance resources.
- **Training I:** Glaucoma Associated with Chronic Diseases for the Prevention of Visual Impairment

Thematic plan
Topic 1. "What we should know about glaucoma, diabetes mellitus and high blood pressure."

Thematic objectives
- Delve into Glaucoma and its classifications.
- Analyze the impact of chronic diseases on the progression of glaucoma.
- Require glaucoma diagnostic tests.

Contents: Procedures for glaucoma diagnostic tests.

Topic 2. "Healthy lifestyles in ophthalmological diseases."
Thematic Objectives
- Guide healthy lifestyles in the face of glaucoma associated with chronic diseases.
- Evaluate and guide resources that can reduce eye strain.
- Establish other elements that can increase intraocular tension and cause glaucoma progression.

Consider glaucoma in pregnant women.
Contents: Procedures for guiding healthy lifestyles.
Topic 3. "Role of the optometry and optics technologist in the Visual Disability Prevention Program."

Thematic Objectives
- Verify procedures for requesting diagnostic tests.

- Specify procedures of techniques used with diagnostic means
- Specify procedures for carrying out diagnostic tests.
- Specify procedures for placing the patient in the equipment.
- Specify exam reliability parameter procedures.
- Carry out reliability and quality examinations.

Contents: Technological procedures for diagnosis.
Training II: Technological Procedures for Comprehensive Glaucoma Care

General Objectives: To comprehensively apply the theoretical-practical knowledge of Glaucoma and refractive errors with a high professional level, which complements the training of graduates in Optometry and Optics, for the care of patients with Glaucoma, allowing the prevention of disability visually and contributes to the quality of life of the individual.

Contents
Knowledge System: Introduction to optics and optometry.

Medical record. Biomicroscopy. Eye strain, gonisoscopy, Pachymetry. Keratometry, Topography. Corneal tomography. Visual Field. Specular and confocal microscopy. Aberrometry for refractive surgery.

Skill System
1. Use and interpret the different diagnostic means for the evaluation of patients with refractive errors
2. Identify the specificities of the equipment available for each study technique: Keratometry, Topography, Corneal Tomography, specular and confocal microscopy.
3. Carry out the appropriate correction of defects by the trainee.

Conclusion

The growing scientific and technological development demands the need to have health services equipped with comprehensive, updated and updatable professionals, capable of providing solutions to health problems that arise in everyday life, efficiently and in line with the economic, political and social scenario of the current historical moment.

For this reason, the authors consider that the results obtained previously presented serve as fundamental elements for the projection of actions in the Strategy for improvement in comprehensive glaucoma care for the improvement of the professional performance of graduates in Optometry and Optics, aimed to provide solutions to the professional problems that were identified.

The parameterization of the process, with its variable, dimensions and indicators, conditioned the preparation of the instruments to characterize the initial state of the professional performance of the graduate in Optometry and Optics in the comprehensive care of glaucoma.

Through the analysis of the results obtained with the application of the instruments, the inventory of problems and potentialities was prepared, which demonstrate the need to develop the Overcoming Strategy for comprehensive glaucoma care.

Gratitude

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Conflict of Interest

There are no conflicts of interest between the authors

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