

Evaluation of Ophthalmology knowledge in Medical Graduation

Avaliação do conhecimento em Oftalmologia na Graduação Médica

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ABSTRACT

Objective: to evaluate the level of ophthalmological knowledge of medical students about fundus findings and changes in diabetic retinopathy, as well as the interest of these students in greater learning on the subject. **Materials and Methods:** The sample consisted of medical students from the Centro Universitário Christus (Unichristus), in the city of Fortaleza - Ceará - Brazil, during the months of November 2018 and December 2018. They answered a questionnaire composed of 20 multiple-choice questions, with four items each, containing only one correct item, with subjects related to fundus findings and changes in diabetic retinopathy. The fifth semester (s5) was chosen, for having recently completed the ophthalmology module, and the seventh semester (s7), to assess content retention one year after the end of the course. The questionnaire also addressed the students' interest in obtaining greater learning on the subject. **Results:** the questionnaire was applied to 120 students (62 students from s5 and 58 students from s7). There was a greater number of correct answers in s5, with an average of 57.2% of correct answers, compared to s7, whose average of correct answers was 49.9%. **Conclusion:** Given an average of hits below the desirable, and the interest of most students to obtain greater learning, it is clear the demand for a greater insertion of the discipline of ophthalmology in medical graduation, through educational institutions, giving due importance to the theme, offering its students support for learning concrete and continuous.

Keywords: Education, Medical; Ophthalmology; Diabetic Retinopathy; Ophthalmoscopy.

RESUMO

Objetivo: avaliar o nível de conhecimento oftalmológico dos estudantes de medicina sobre achados do fundo de olho e alterações da retinopatia diabética, assim como o interesse destes alunos por um maior aprendizado sobre o assunto. **Materiais e Métodos:** A amostra foi constituída por alunos do curso de medicina do Centro Universitário Christus (Unichristus), na cidade de Fortaleza – Ceará – Brasil, durante os meses de novembro e dezembro de 2018. Eles responderam a um questionário composto por 20 questões de múltipla escolha, com quatro itens cada, contendo apenas um único item correto, com assuntos relacionados à fundoscopia e à retinopatia diabética. Foram escolhidos o quinto semestre (s5), por ter finalizado recentemente o módulo de oftalmologia, e o sétimo semestre (s7), para avaliação da retenção de conteúdo após um ano do término da disciplina. O questionário também abordou o interesse dos alunos em obter maior aprendizado sobre o assunto. **Resultados:** o questionário foi aplicado em 120 alunos (62 alunos do s5 e 58 alunos do s7). Houve um maior número de acertos no s5, com média de 57,2% de acertos, em relação ao s7, cuja média de acertos foi de 49,9%. **Conclusão:** Diante de uma média de acertos abaixo do desejável, e do interesse da maioria dos alunos em obter maior aprendizado, fica clara a demanda por uma maior inserção da disciplina de oftalmologia na graduação médica, por meio das instituições de ensino, dando a devida relevância ao tema, oferecendo aos seus alunos suporte para um aprendizado concreto e contínuo.

Palavras-chave: Educação Médica; Oftalmologia; Retinopatia Diabética; Oftalmoscopia.

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INTRODUCTION

Worldwide, we have observed, for some decades, a reduction or even elimination of the ophthalmology content of the medical curriculum. ¹ Several medical schools in Canada, USA and UK do not require this discipline as compulsory, or do not have a standardized curriculum as recommended by the International Council of Ophthalmology. ^{2,3}

As a result, there is a lack of basic ophthalmological knowledge among medical students and a low level of confidence and ability of primary care physicians in addressing common and routine eye diseases, affecting basic eye health care. ⁴ Furthermore, many systemic diseases are accompanied by eye manifestations in various medical areas and need proper care or referral. ⁵

The teaching of ophthalmology, in medical graduation, favors the understanding of the visual system, and its interaction with other systems, and emphasizes the importance of ocular signs and symptoms related to various systemic changes, such as hypertension, diabetes mellitus, collagenous, intracranial hypertension and others, which can be detected by the simple evaluation of the fundus of the eye. In addition, studies show that ophthalmologic complaints are frequent reasons for visits to the general practitioner's clinic (5 to 19%). Fundoscopy is, therefore, an essential clinical tool that allows the detection of diseases that threaten the vision, or even life, and should be part of the general practitioner's clinical arsenal. ^{4,6,7}

Therefore, it is crucial that doctors who are at the forefront of medical care have the ability, safety, and effectiveness to properly diagnose, treat, or refer eye diseases. ^{6,8} Thus, the objective of this study was to evaluate the level of ophthalmological knowledge of medical students on basic findings of the fundus of the eye and alterations of diabetic retinopathy, as well as the interest of these students for further learning on the subject.

MATERIALS AND METHODS

The research followed the principles outlined in the Declaration of Helsinki, previously submitted to the Plataforma Brasil and approved by the Ethics in Research Committee with the number CAAE: 76733417.0.0000.5049. The sample consisted of students from the medical course of the Centro Universitário Christus (Unichristus), in the city of Fortaleza - Ceará - Brazil.

The study was carried out in November 2018 with the students in the fifth semester (s5), and in December 2018 with the students in the seventh semester (s7) of Unichristus medicine. The students were invited to answer a questionnaire, prepared by Unichristus medical professor, composed of 20 multiple choice questions, with four items each, containing only one correct item, which elaborated subjects on fundoscopy and diabetic retinopathy (Table 1). This questionnaire also approached the interest of the students in obtaining more learning about the subject.

The data collection was carried out in class, and 20 minutes were available to answer the questionnaire. After this stage, the students performed an evaluation on the questionnaire applied. The Informed Consent Term (TCLE) was made available before the data collection.

The data were tabulated in Microsoft Excel and exported to the Statistical Package for the Social Sciences (SPSS) software version 20.0 for Windows, in which the absolute and percentage frequencies of each item were expressed, compared between semesters, adopting a 95% confidence, through Fisher's exact tests or Pearson's chi-square. The mean and standard deviation of the percentage of hits for each group that were compared by the Mann-Whitney test (non-parametric data) were calculated. Values of $p < 0.05$ were considered statistically significant.

Table 1. Questions and their respective subjects

TOPICS	QUESTION	
Normal fundoscopic findings	1 2 3 4 5 6	
Microaneurysm as early find of diabetic retinopathy	10	
Macular edema as the most frequent cause of low vision in diabetes	16	
Neovascularization as a differentiating sign of Proliferative and Non Proliferative Diabetic Retinopathy	17	
Pathological signs identified in fundoscopy, such as:	increased optical disc excavation	7
	Microaneurysm	8
	intra-retinal hemorrhages	9
	venous beading	11 12
	cotton wool spots	13
	candle flame-shaped hemorrhage	14
	hard exudates	15
	Retinal detachment	18
	neovascularization	19
pre-retinal hemorrhages	20	

RESULTS

The sample was composed of 120 students (62 from the s5 and 58 from the s7). The average percentage of correct answers for s5 students (57.25 ± 11.86) was significantly higher than for s7 students (49.90 ± 12.60) ($p=0.021$, Mann-Whitney test). The total number of correct items in s5 students ($n=710$, 57.4%) was also significantly higher than s7 students ($n=489$, 51.7%) with a hit rate 1.26 (95%CI = 1.06 - 1.49) times higher ($p=0.008$) (Figure 1)

The following questions were highlighted: question 1, in which only three students (4.8%) from s5 got it right and none from s7 got it right; question 11 also got a low rate of hits, with 9.7% from s5 and 4% from s7. In questions 14 and 19, there was a higher number of hits

from s7 in relation to s5. In question 14, 76,9% of hits on the s7, compared with 53,2% on the s5 and, in question 19, 52,6% on the s7 against 38,7% on the s5. In question 20, there was the same amount of absolute hits for both semesters, totalizing eight hits per semester, however, the s7 presented greater proportional hit, quantified in 13,8% against 12,9% on s5. In the other questions, the s5 remained ahead in absolute numbers of hits compared to s7 (Table 2).

Table 3 shows the average, absolute and proportional amount of hits by both semesters.

Regarding students' interest in having a greater knowledge about ophthalmology, 88.7% of s5 students and 86.2% of s7 students agreed or strongly agreed that they would like to learn more about the subject.

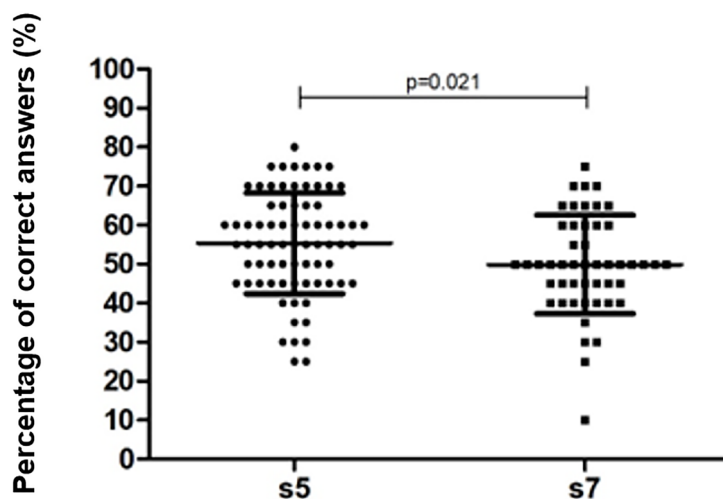


Figure 1. The average percentage of hits for students in the fifth and seventh semesters ($p=0.021$, Mann-Whitney test)

Table 2. Number of hits for each question [N (%)], per semester of medicine

Question number	Hits s5	Hits s7
Question 1	3 (4,8%)	0 (0%)
Question 2	39 (63,9%)	27 (48,2%)
Question 3	50 (80,6%)	45 (78,9%)
Question 4	26 (42,6%)	18 (32,1%)
Question 5	32 (51,6%)	19 (33,9%)
Question 6	43 (69,4%)	31 (56,4%)
Question 7	48 (77,4%)	42 (72,4%)
Question 8	41 (66,1%)	31 (53,4%)
Question 9	46 (74,2%)	37 (63,8%)
Question 10	35 (57,4%)	19 (32,8%)
Question 11	6 (9,7%)	4 (7%)
Question 12	29 (46,8%)	25 (43,1%)
Question 13	54 (87,1%)	48 (82,8%)
Question 14	33 (53,2%)	40 (76,9%)
Question 15	47 (75,8%)	36 (62,1%)
Question 16	46 (74,2%)	44 (75,9%)
Question 17	56 (90,3%)	46 (83,6%)
Question 18	44 (71,0%)	36 (62,1%)
Question 19	24 (38,7%)	30 (52,6%)
Question 20	8 (12,9%)	8 (13,8%)

Table 3. Mean of hits per semester of medicine (data expressed as mean and standard deviation)

	s5	s7	p-value*
Number of hits	11,45 ± 2,37	9,98 ± 2,52	0,002
Percentage hits	57,26 ± 11,86	49,90 ± 12,60	0,002

*p < 0.05, Mann-Whitney test

DISCUSSION

The highest average of hits in s5 (57.2%), in relation to s7 (49.9%), was expected, due to the ophthalmology discipline being taught during the fifth semester at the Unichristus Medical School, and therefore, it was natural that the general results of s5 be higher than those of s7. However, the average number of hits of s7 was not so lower than that of s5, suggesting that there was a noticeable retention of knowledge about ophthalmology in the following semesters, or that the subjects were explored again in other clinical contexts. It is worth mentioning that the s5 were chosen, for having recently finished the ophthalmology module, and the s7, for content retention evaluation after one year of the course completion. In a study conducted in Brazil, at Universidade Federal do Piauí, on ophthalmological knowledge of the students who attended the course, there was an average of 72.22% of hits, a value higher than that found in the present study, but the retention of knowledge in subsequent semesters was not evaluated. Despite the good rate of success in this study, 99.1% of the students considered themselves unsafe in attending patients with ophthalmological diseases.⁹

When asked about their interest in having more knowledge about ophthalmology, the vast majority of students in the fifth and seventh semesters (88.7% and 86.2%, respectively) agreed that they would like more knowledge on the subject. Another study published in 2016 also showed the interest of students (74.1%) to obtain more information and have more exposure to the discipline of ophthalmology in medical undergraduate.⁶ Corroborating the results of this study, Howie and collaborators¹⁰ showed that 92% of recent university graduates in Australia considered knowledge in ophthalmology important for their medical practice, but did not consider the training received during graduation sufficient, and said they would like more learning opportunities.¹⁰

Among the limitations of this study, it is worth mentioning the fact that the evaluation was carried out in a single medical school, limiting its scope, but with a considerable number of participants (n=120). It became evident the unsatisfactory result and below the average required by the Unichristus medical school (which would be 70%), regarding knowledge in funduscopy and diabetic retinopathy, but maintaining a retention of this learning, after one year of discipline taught, perhaps giving a continued approach to the subject, even considered insufficient by students.

CONCLUSION

Faced with an average of hits below the desirable, it is clear the need of students for an expanded education in ophthalmology, and the demand for a greater insertion of the discipline in medical undergraduate through educational institutions.

By giving due relevance to the subject, support can be offered to students for a concrete and continuous learning, allowing the improvement in the rates of knowledge and retention of content. This measure may provide greater security, for students and general practitioners, in the recognition of ocular or systemic diseases, contributing to the preservation of vision and life of the patient.

The results of the present study substantiated our interest in developing a portable device for acquiring images of the fundus of the eye, with the aim of promoting the theoretical-practical learning of Ophthalmology students about funduscopy and diabetic retinopathy. In the future, we will have these data for new publication.

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AUTHORS' CONTRIBUTION:

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