

Analysis of direct ophthalmoscopy teaching in Medical graduation courses of Mato Grosso State

Análise do ensino da oftalmoscopia direta nos cursos de graduação em Medicina do Estado de Mato Grosso

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ABSTRACT

Objective: direct ophthalmoscopy teaching is receiving less attention during graduation, which results in doctors without confidence to perform the exam. Therefore, the self-perception of students from medical schools of Mato Grosso about the direct ophthalmoscopy and the main factors responsible for the insecurity on performing it was analyzed. **Methods:** a literature review was done using the databases Pubmed, Scielo and Biblioteca Virtual em Saúde, then a questionnaire was applied, through the snowball method and after favorable assent of the Ethics Committee, to medical students from Mato Grosso who were regularly enrolled in the fifth or sixth year of the course. Statistical analysis was performed on the SPSS 20 software, considering a confidence interval of 95%. **Results:** it was verified that the proportion of students that have had classes about direct ophthalmoscopy was superior in public schools ($p < 0,001$); that the majority of students does not believe that their schools provide adequate conditions for learning the exam ($p = 0,001$); that 10,5% considerate themselves knowledgeable about theory and practice regarding direct ophthalmoscopy ($p = 0,004$); that few training during graduation is the main factor that hinders learning the exam; and that this results in underconfidence at performing it. **Conclusion:** direct ophthalmoscopy is not receiving the deserved importance during medical graduation in the state of Mato Grosso. With these results, measures can be taken to improve the teaching-learning process of the technique, which can bring benefit to the population.

Keywords: Teaching; Learning; Ophthalmoscopy; Diagnostic techniques, ophthalmological; Students, Medical

RESUMO

Objetivo: o ensino da oftalmoscopia direta vem recebendo menos atenção na graduação, o que resulta em médicos sem confiança para realizá-la. Diante disso, foi analisada a autopercepção dos acadêmicos dos cursos de medicina de Mato Grosso sobre a oftalmoscopia direta e os principais fatores responsáveis pela insegurança em executá-la. **Métodos:** foi realizada a revisão bibliográfica nas bases Pubmed, Scielo e Biblioteca Virtual em Saúde, sendo construído um questionário aplicado, pelo método bola de neve e após parecer favorável do Comitê de Ética, a acadêmicos de medicina do Mato Grosso que estavam cursando regularmente o quinto ou sexto ano do curso. A análise estatística foi realizada no software SPSS 20, considerando intervalo de confiança de 95%. **Resultados:** verificou-se que a proporção de acadêmicos que tiveram aulas sobre a oftalmoscopia direta foi superior em universidades públicas ($p < 0,001$); que a maioria dos alunos não acredita que suas escolas forneçam as condições adequadas para o aprendizado do exame ($p = 0,001$); que 10,5% se consideram conhecedores da teoria e prática da oftalmoscopia direta ($p = 0,004$); que a falta de treinamento durante a graduação é o principal fator que dificulta o aprendizado do exame; e que isso resulta em falta de confiança em realizar o mesmo. **Conclusão:** a oftalmoscopia direta não tem recebido a devida importância durante a graduação em medicina no estado de Mato Grosso. Com tais resultados, pode-se tomar medidas que melhorem o ensino-aprendizado da técnica, o que posteriormente trará benefício para a população.

Descritores: Ensino; Aprendizagem; Oftalmoscopia; Técnicas de diagnóstico oftalmológico; Estudantes de Medicina

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INTRODUCTION

Direct ophthalmoscopy (DO) is an important technique of medical propaedeutics⁽¹⁾ whereby the eye fundus is observed through the pupillary opening. The examination is carried out using a device called an ophthalmoscope, which allows illumination of the eye fundus and its evaluation by the examiner. With this technique it is possible to evaluate the red reflex, retina, optic disc and retinal vessels.⁽²⁾

The workload devoted to the teaching of Ophthalmology during graduation has been increasingly reduced,⁽³⁾ a matter of concern when considering that various extraocular diseases affect the eyes. These diseases include rheumatological, cardiac, endocrine, hematological, renal, dermatological and neurological diseases. These and other entities manifest important signs and symptoms in the eyes that guide the diagnosis, and thus establish early treatment and ensure a better prognosis. Especially in neurology, DO allows direct visualization and evaluation of a part of the central nervous system and its blood vessels.⁽⁴⁾

For the general practitioner, the part of the most accessible basic ophthalmic propedeutics from a financial and diagnostic effectiveness point of view is DO. As it is considered a complex exam and its effective performance requires a lot of practice, it usually has little focus and makes many doctors and medical students feel insecure when carrying out the exam, leaving them dependent on an ophthalmologist or neurologist, which are not always available at the service location.⁽⁵⁾

Epidemiological data show an important prevalence of retinal alterations mainly due to diabetes mellitus (DM) and systemic arterial hypertension (SAH) called retinopathy.⁽⁶⁾ It is the role of the physician who works in primary health care to minimize the long-term complications of these diseases,⁽⁶⁾ and in the case of ocular complications the main measure to enable that is OD, as it allows direct visualization of the affected region.

Given the clinical importance of DO, there is a need to improve its teaching during medicine graduation,⁽³⁾ so that future doctors can more fully meet their patients' demands in a more complete way. Therefore, researchers seek to create methods and tools to facilitate the teaching of ophthalmoscopy for this audience, such as models of the human eye,⁽³⁾ mannequins,⁽⁷⁾ and online tutorial platforms.⁽⁸⁾ Also, others suggest the use of more modern and less complex techniques such as panoptic ophthalmoscopes⁽⁹⁾ and eye fundus photographs.⁽¹⁰⁾

Although these new methods and tools are relevant for DO learning, there are gaps in the literature on the main factors contributing to DO not being properly trained during graduation, and not being common practice in medical care in general. The present study aims to analyze the self-perception of undergraduate medical students in the state of Mato Grosso about direct ophthalmoscopy, investigating their contact with the technique during graduation, and analyze the main factors responsible for the unsefaty in carrying out the exam and interpreting their findings. From these factors, methodologies can be developed favoring a stronger presence of examination within the context of the general practice.

METHODS

Literature was reviewed using Pubmed, Scielo, and Virtual Health Library (VHL) databases. The keywords used for the search were: "direct ophthalmoscopy", "ophthalmoscope",

"learning" and "medical students". By reading the papers both in Portuguese and English, an overview on the teaching of DO in medical schools was drawn, and this information was used to create a questionnaire on the subject (Annex 1).

ANNEX 1

QUESTIONNAIRE USED IN THE SURVEY

QUESTIONS

- 1) What is your age?
 - 20 years or less
 - 21-25 years
 - 26-30 years
 - 31-35 years
 - 36-40 years
 - Over 40 years
- 2) What is your university?
 - Unemat
 - UFMT - Cuiabá
 - UFMT - Sinop
 - UFMT - Rondonópolis
 - UNIVAG
 - UNIC
- 3) Which semester of the Medicine course are you currently attending?
 - 9th semester
 - 10th semester
 - 11th semester
 - 12th semester
- 4) Is ophthalmology one of your medical residency options?
 - Yes
 - No
- 5) Do you have an ophthalmoscope?
 - Yes.
 - No, because I was never interested in buying one.
 - No, because I think the instrument is very expensive.
- 6) Regarding the ophthalmoscopes available in your university:
 - They are enough to meet the demand and ensure the students learning.
 - There are few of them, making proper training of students impossible.
 - There are no ophthalmoscopes available in the University for training.
- 7) Regarding the classes in your college addressing the subject of "direct ophthalmoscopy" during the first 4 years of the course, it can be said that:
 - There were theoretical and practical classes on the exam.
 - There were only theoretical classes on the subject, with no opportunities to practice.
 - There were only practices of the exam, but without a theoretical explanation about it.
 - There were no theoretical nor practical classes on the exam.
- 8) Do you believe your course provides the students an opportunity for proper learning of direct ophthalmoscopy?
 - Yes
 - No
- 9) Have you had any contact with direct ophthalmoscopy in activities other than those offered by the Medicine graduation course?
 - Yes, in Ophthalmology, Neurology and/or other Academic Leagues.

- Yes, in extracurricular internships that made it possible to train the technique.
 - Yes, during individual training due to my own interest.
 - No.
- 10) Considering Medicine in general and not just Ophthalmology, do you consider direct ophthalmoscopy an important exam?
- Yes
 - No
- 11) By self-assessing your knowledge of direct ophthalmoscopy, you think that:
- You master the technique of the exam and can detect the main clinical signs that can be evidenced by it.
 - You master the technique of the exam, but do not know how to detect the main clinical signs that can be evidenced by it.
 - You do not master the technique of the exam but know the main clinical signs that can be evidenced by it.
 - You do not master the technique of the exam nor know the main clinical signs that can be evidenced by it.
- 12) Among the factors listed below, which do you think impose the greatest difficulty in teaching and learning direct ophthalmoscopy during graduation? Check up to 3 options.
- Few opportunities for training during graduation.
 - Few ophthalmoscopes available in the University.
 - The ophthalmoscope is very expensive.
 - Lack of questions on the subject in college tests.
 - Preceptor feedback limitation.
- 13) Among the factors listed below, which do you think impose the greatest difficulty in carrying out direct ophthalmoscopy during the medical practice? Check up to 3 options.
- The exam is difficult to perform.
 - The exam takes a long time.
 - The exam is not important.
 - Lack of confidence in carrying out the exam.
 - Lack of knowledge about eye fundus alterations.
- 14) Would you be interested in attending a theoretical-practical training course in direct ophthalmoscopy?
- Yes
 - No

The questionnaire was created and applied through the Google Forms platform between April 2, 2018 and August 4, 2018, and all questions were originally created by the author of the present paper, taking into account the main problems related to teaching and the application of DO according to the literature used, according to variables related to age, university, course period, having or not an ophthalmoscope, availability of ophthalmoscopes at the university, having taken classes involving DO during graduation, dedication to the study of ophthalmology during graduation, participation in activities beyond graduation that involved DO practice, considering DO an important exam, mastering the technique of the exam, knowing how to recognize the major alterations in the eye fundus, main factors that hinder the teaching, learning and practice of DO, being interested in participating in a theoretical-practical DO training course.

The target population comprised Medicine students from the six public and private universities in Mato Grosso State who were regularly attending the fifth or sixth year of the course during the period of application of the questionnaire. The universities were identified as Public A, B, C and D, and private A and B. In order to use the instrument, the snowball method was used: the

author contacted the representatives of the classes involved in the research, who distributed a link for the Google Forms to the other students. There was no direct involvement of universities at any point in the research.

Data collection began only after the opinion of the Research Ethics Committee (CEP), under Opinion Number 2,575,630.

By accessing link, participants initially were presented to the project title and a brief description of it, followed by the Informed Consent (IC). It was only after reading and declaring acceptance of the IC that the questionnaire was available. After answering the questions, all answers were automatically sent to the researcher to be inserted into the project database and subsequent statistical analysis.

After data collection was completed, a database was built on the software SPSS 20 for statistical analysis. Initially, an exploratory study was carried out, and subsequently the chi-square test was used to analyze proportions considering a confidence interval of 95% (CI: 95%).

RESULTS

A total of 105 participants who were included in the target population answered the questionnaire. Regarding age groups, 65 (61.9%) were aged between 21 and 25 years; 27 (25.7%) between 26 and 30 years; 9 (8.6%) between 31 and 35 years; and 4 (3.8%) between 36 and 40 years. No candidate was under 20 years nor over 40 years old.

Among the participants, 66 (62.8%) were from public universities, and 39 (37.2%) from private universities. Of the total, 44 (41.9%) belonged to public university A; 23 (21.9%) to private B; 16 (15.2%) to private A; 13 (12.4%) to public B; 7 (6.7%) to public D; and 2 (1.9%) to public C. Considering the semester of medical school being attended when they answered questionnaire, 38 (36.2%) were in the 9th semester; 28 (26.7%) in the 10th semester; 28 (26.7%) in the 11th semester; and 11 (10.5%) in the 12th semester.

When asked about ophthalmology as a Medical Residency option, 94 (89.5%) of participants answered "no", and 11 (10.5%) answered "yes" (Table 1).

Among the university students interviewed, it was observed that more than 90% did not have their own ophthalmoscope. Regarding the availability of ophthalmoscopes in universities, the ratio of equipment in public universities was lower compared to that in private universities. However, there was no statistical significance ($p = 0.117$).

The ratio of students from public universities who had both theoretical and practical classes was 53.0%, statistically significant when compared to private universities, whose proportion was 12.8% ($p < 0.001$). In private schools, it was observed that 66.7% of students had only theoretical or practical classes, and 20.5% had none. In public universities, 34.8% had only one class modality, and 12.1% had none.

Considering the type of university, the ratio of private school students who participated in extracurricular activities involving DO was higher among the Academic Leagues (12.8%). In public schools, the largest ratio of activities was in internships and individual training, both with 13.6% but without statistical significance ($p = 0.050$).

When the students were asked about believing that their respective universities guarantee the right conditions for learning DO, it was observed that the ratio of students who answered "yes"

was 5.1% among private universities, and 34.8% among private universities, statistically significant ($p = 0.001$).

When asked about having sufficient theoretical and/or practical knowledge regarding DO, it was found that the ratio of

Table 1
Percentage distribution of medical school residents according to variables related to the target population

Variables	n	%
Age		
21-25 years	65	61.9
26-30 years	27	25.7
31-35 years	9	8.6
36-40 years	4	3.8
> 40 years	0	0.0
Total	105	
University		
Public A	44	41.9
Public B	13	12.4
Public C	2	1.9
Public D	7	6.7
Private A	16	15.2
Private B	23	21.9
Total	105	
Period		
9th semester	38	36.2
10th semester	28	26.7
11th semester	28	26.7
12th semester	11	10.5
Total	105	
Residency in Ophthalmology		
Yes	11	10.5
No	94	89.5
Total	105	

students who reported knowing theory and practice was 9.1% in public universities, and 12.8% in private universities, statistically significant ($p = 0.004$). Considering the knowledge of only one between theoretical and practical modalities, the highest ratio of students for such approach was 80.3% and 51.3% respectively for students from public and private schools (Table 2).

The study found that the ratio of students with their own ophthalmoscope was 27.3% among those with theoretical and practical knowledge about DO, statistically significant when compared to students with theoretical or practical knowledge (1.4%) or no modality of knowledge (9.5%), with $p = 0.002$.

The ratio of students who claim their universities have ophthalmoscopes available for training was over 50% among groups with theoretical and practical knowledge, theoretical or practical, or no knowledge at all. This ratio was higher among those with theoretical and practical knowledge, with 81.8%, but without statistical significance ($p = 0.182$).

Considering the students who had theoretical and practical classes on DO until the fourth year of Medicine school and those who did not have any of these classes, it was observed that 100% of those who had both modalities have theoretical and practical knowledge on the exam according to their own perception, which was statistically significant ($p = 0.001$). Among the group

with theoretical or practical knowledge 77.5% said they had theoretical and practical classes, and considering those who consider having no knowledge on DO, 22.2% had theoretical and practical classes. For this ratio analysis, 49 individuals who had only theoretical or practical classes were excluded.

The ratio of students who participated in extracurricular activities addressing DO was less than 50% in the groups with theoretical and practical knowledge, theoretical or practical knowledge, and with no knowledge, without statistical significance ($p = 0.287$). When considering whether the student believes that the university ensures proper learning of DO, 45.5% of those with theoretical and practical knowledge said "yes", which was also stated by 27.7% of those with theoretical or practical knowledge, and by 0.0% of those without any kind of knowledge, but without statistical significance ($p = 0.007$) (Table 3).

Considering the factors listed affecting negatively the learning of DO, 76.2% of the students interviewed considered the lack of undergraduate training (Table 4).

Among the five factors listed affecting negatively the performance of the exam during academic activities, 73.1% of respondents stated that lack of confidence is one of these factors, whereas the lack of importance of the exam was considered by 0.0% (Table 5).

DISCUSSION

The study found that contact with DO during Medicine graduation is insufficient for students to complete college with the knowledge and confidence required for the exam, and that this is mainly due to the limited opportunities for training in the classes during the course. The variables analyzed took into consideration subjective aspects involving students' self-perception regarding contact with DO and the skills developed on the examination during the first four years of medical school.

During the research it was evident that a good part of the students did not have theoretical nor practical classes during the first four years of graduation, especially in private schools. Only 23.8% of those involved in the research believe that they have had DO learning guaranteed by the university, and only 10.5% consider having knowledgeable on the exam in both theoretical and practical modalities.

It was possible to evaluate the impact that classes have on students, with statistical significance, by comparing students who had theoretical and practical classes on DO with those who had no classes. By randomly choosing one of these students who considered to have theoretical and practical knowledge on DO, it is certain that they took theoretical and practical classes. When selecting a student who considered not having any knowledge, the greater chance is that they did not have theoretical nor practical classes.

In fact, in listing the factors affecting negatively the learning of DO, poor training of the technique during graduation was the main aspect observed according to the self-perception of the target population. The high price of ophthalmoscopes was the factor least considered by respondents. Among the factors interfering negatively with the practice of the exam in the students' hospital activities, lack of confidence was predominant. The strong and important relation between training of a semiological technique and the consequent confidence to perform it is evident - and one is not possible without the other.

The study presented an original proposal based on the observation that there is almost no DO during medicine graduation, and that most students show little ability with DO. The main limitation found was the difficulty in collecting questionnaire

Table 2
Percentage distribution of Medicine internship students from public and private universities according to the variables related to direct ophthalmoscopy teaching

Variables	Tipo de Universidade						X ²	p-Value
	Public		Private		Total			
	n	%	n	%	n	%		
Own ophthalmoscope								
Yes	4	6.1	2	5.1	6	5.7	0.04	0.842
No	62	93.9	37	94.9	99	94.3		
Ophthalmoscopes in the university								
Yes	41	62.1	30	76.9	71	67.6	2.45	0.117
No	25	37.9	9	23.1	34	32.4		
DO classes until fourth year								
Theoretical and practical	35	53.0	5	12.8	40	38.1	16.86	0.000
Theoretical or practical	23	34.8	26	66.7	49	46.7		
No classes	8	12.1	8	20.5	16	15.2		
Extracurricular activities								
Academic leagues	7	10.6	5	12.8	12	11.5	7.82	0.050
Internships	9	13.6	1	2.6	10	9.5		
Individual training	9	13.6	1	2.6	10	9.5		
No	41	62.1	32	82.1	73	69.5		
Guaranteed learning*								
Yes	23	34.8	2	5.1	25	23.8	11.94	0.001
No	43	65.2	37	94.9	80	76.2		
DO knowledge								
Theory and practice	6	9.1	5	12.8	11	10.5	11.14	0.004
Theory or practice	53	80.3	20	51.3	73	69.5		
Neither theory nor practice	7	10.6	14	35.9	21	20.0		

Note: *Believe the university ensures proper learning of direct ophthalmoscopy.

Table 3
Percentage distribution of the factors contributing to the theoretical and/or practical knowledge of Medicine internship students at universities in the State of Mato Grosso

Variables	Self-perception of knowledge about DO								X ²	p-Value
	Theoretical and practical		Theoretical or practical		None		Total			
	n	%	n	%	n	%	n	%		
Own ophthalmoscope										
Yes	3	27.3	1	1.4	2	9.5	6	5.7	12.61	0.002
No	8	72.7	72	98.6	19	90.5	99	94.3		
Ophthalmoscopes in the university										
Yes	9	81.8	51	69.9	11	52.4	71	67.6	3.41	0.182
No	2	18.2	22	30.1	10	47.6	34	32.4		
DO classes until the fourth year*										
Theoretical and practical	7	100.0	31	77.5	2	22.2	40	71.4	14.20	0.001
None	0	0.0	9	22.5	7	77.8	16	28.6		
Atividades extracurriculares										
Yes	5	45.5	23	31.5	4	19.0	32	30.5	2.50	0.287
No	6	54.5	50	68.5	17	81.0	73	69.5		
Guaranteed learning										
Yes	5	45.5	20	27.4	0	0.0	25	23.8	9.92	0.007
No	6	54.5	53	72.6	21	100.0	80	76.2		

Note: *49 individuals who had only theoretical or practical classes were not considered.

Table 4
Factors affecting negatively the learning of direct ophthalmoscopy in residents of Medicine schools in the State of Mato Grosso

Variables	n	%
Little training during graduation		
Yes	80	76.2
No	25	23.8
Lack of ophthalmoscopes in the university		
Yes	60	57.1
No	45	42.9
Preceptor feedback limitation		
Yes	43	41.0
No	62	59.0
Lack of approach to the theme in the evaluations		
Yes	41	39.0
No	64	61.0
High price of ophthalmoscopes		
Yes	34	32.4
No	71	67.6

Table 5
Factors affecting negatively the practice of direct ophthalmoscopy during hospital activities of residents of Medicine schools in the State of Mato Grosso

Variáveis	n	%
Lack of trust		
Yes	76	73.1
No	28	26.9
Difficulty in interpreting findings		
Yes	68	64.8
No	37	35.2
Difficulty in examining		
Yes	37	35.2
No	68	64.8
Time required to exam		
Yes	10	9.5
No	95	90.5
Lack of importance on the exam		
Yes	0	0.0
No	105	100.0

responses using the snowball method: there were several requests from the target audience students, but it took a long time to get an adequate number of participants. Perhaps this is especially due to the lack of interest in collaborating with the study and/or the large number of tasks to which medicine students are subject at this stage of the course - residency - having to deal with internships in health institutions, lectures, tests, and personal life.

Os estudos de Mackay et al.⁽⁵⁾ e Schulz et al.⁽¹¹⁾ evidenciaram que o oftalmoscópio é um equipamento pouco utilizado durante a graduação médica. O mesmo se aplica aos cursos de medicina no Estado de Mato Grosso, considerando o número de estudantes que não fizeram pelo menos uma aula de ensino de oftalmoscopia, e também que mais de 75% afirmaram que suas escolas não garantem o aprendizado adequado da técnica. Além disso, é notável que a falta de oportunidades de treinamento durante a graduação foi o fator mais votado pelos respondentes entre aqueles que negativamente interferem no aprendizado da técnica.

A pergunta sobre o conhecimento da técnica em particular foi feita com o objetivo de avaliar como os estudantes se sentiram ao lidar com a técnica. Foi relevante que aproximadamente um em dez estudantes consideraram capazes de realizar a técnica, o que requer conhecimento prático, e interpretar os achados, o que requer conhecimento teórico. Essas descobertas são consistentes com os estudos de Martins et al.⁽³⁾ e Yusuf et al.⁽¹²⁾; esses autores observaram que a nova geração de médicos tem um número crescente de pessoas que não possuem a confiança e a competência para lidar com problemas básicos de oftalmologia.

Schulz et al.⁽¹¹⁾ demonstraram que os principais fatores que contribuem para a proficiência dos estudantes médicos em realizar a técnica são mais oportunidades de realizar o exame com instrução formal durante os semestres de graduação e até mesmo após a conclusão do curso; exposição a mais casos com alterações retinianas para refinar a distinção entre normal e alterado; receber mais avaliações e feedback sobre a própria habilidade de examinar. Os resultados desses autores são consistentes com o presente estudo, considerando que a falta de práticas durante o curso de graduação foi encontrada com um amplo impacto na familiaridade dos estudantes com a técnica.

A avaliação do fundo de olho com a técnica dá ao médico uma ferramenta importante para ajudar a diagnosticar doenças como meningite, endocardite, retinite e violência infantil.⁽¹²⁾ É importante entender que a técnica é uma habilidade básica que deve fazer parte do arsenal de todos os recém-formados médicos. Não é algo relacionado apenas aos especialistas, no presente caso, os oftalmologistas.⁽¹²⁾

Em seu estudo, Yusuf et al.⁽¹²⁾ fez uma comparação pertinente entre a técnica e a auscultação cardíaca, duas técnicas que fazem parte do arsenal semiológico que deve ser incluído no treinamento do generalista. Ambas as técnicas requerem equipamentos caros (estetoscópio e oftalmoscópio), e são consideradas complexas pelos estudantes médicos. No entanto, as escolas médicas não as consideram ensináveis devido a tais justificativas. Além disso, as universidades certamente se opõem a quem considera a auscultação cardíaca uma avaliação relevante apenas para o cardiologista.⁽¹²⁾

Outra tendência é pensar que a técnica poderia ser substituída por técnicas modernas de exame do fundo de olho⁽¹³⁾ como o oftalmoscópio panorâmico⁽¹⁴⁾ e fotografias do fundo de olho, conhecidas como retinografia.⁽¹⁰⁾ No entanto, a técnica permanece o método mais convencional e acessível para o exame do fundo de olho.⁽¹³⁾ As vantagens do oftalmoscópio incluem portabilidade, permitindo que seja usado em locais onde não há equipamentos mais complexos,⁽⁵⁾ e o preço,⁽¹⁴⁾ que é menor do que o preço de outros equipamentos para o exame do fundo de olho.⁽⁵⁾

Um médico que não sabe como fazer e/ou interpretar a técnica é um médico com poucos recursos diagnósticos. Isso coloca em risco a saúde do paciente ao gerar atrasos ou diagnósticos incorretos, e é um fator que gera ansiedade e custos financeiros⁽¹²⁾ que poderiam ter sido evitados se a técnica fosse conhecida.

Os estudos nacionais atuais buscam avaliar diferentes técnicas para melhorar o aprendizado da técnica, como podemos ver nos estudos de Damasceno et al.,⁽¹⁾ Martins et al.⁽³⁾ e Androwiki,⁽⁷⁾ mas há falta de dados sobre por que os estudantes médicos não aprendem e praticam a técnica. Este estudo é novo em relação à proposta de investigar os fatores que estão mais relacionados à falta de prática para realizar a técnica, o que pode ser usado como suporte para a construção de novas abordagens didáticas para a academia.

CONCLUSION

The analysis of the data obtained with the questionnaire showed that the DO has not been very relevant in the Medicine graduation courses in the state of Mato Grosso. This was evident as most students do not start graduation with the necessary skills to perform the exam, nor to interpret it. Lack of opportunities to learn the technique during graduation results in professionals with poor knowledge in an exam that is part of the basic medical semiology, and which can save the patient's sight or even their life in various health sectors and different medical specialties.

The idea is that at some point the medical community will realize the importance of DO and stop seeing it as a special exam or an exam that could be easily replaced by retinography. When this becomes a reality, DO may start to be more important in graduations courses, with due acknowledgement as it is with the cardiac auscultation and other indispensable semiological techniques.

Given the direction of the major obstacles to DO teaching in the State of Mato Grosso, one can begin to think of how to give students and their professors some better guidance on the true importance of the exam for public health. From this acknowledgement, measures can be taken to improve the teaching and learning of the technique, which in the long term will turn into direct benefits for the population of Mato Grosso, as well as other regions that will receive future doctors.

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