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Ophthalmological knowledge of Family Health Network physicians working as first care providers in Brazil

Igor Leonardo Carmona Chaves[1]*, Carlos Roberto Padovani[2], Denise de Cássia Moreira Zornoff[3], Ana Silvia Sartori Barraviera Seabra Ferreira[3], Edson Nacib Jorge[1], Silvana Artioli Schellini[1]

SUMMARY

OBJECTIVE: First care providers working in the Brazilian Unified Health System are often physicians from the Family Health Program. Their knowledge on ophthalmology could indicate whether there is a need for training to decrease ophthalmological demands to secondary or tertiary health levels.

METHODS: A cross-sectional observational study based on an electronic questionnaire was conducted to evaluate the ophthalmological knowledge of Family Health Program physicians working at the VI Regional Health Department, Sao Paulo, Brazil. All Family Health Program physicians from this regional health department were invited, and the study included those who responded to the full questionnaire (115 physicians). The data were evaluated using descriptive analysis.

RESULTS: There was no difference in the ophthalmological knowledge between sexes or in relation to undergraduate schools. Only 20% of the interviewees were specialized in Family and Community Medicine, which did not influence the number of correct answers. Only 22 (19.1%) physicians reported having enough knowledge about the main eye disorders, and 82 (71.3%) physicians considered themselves capable of treating ophthalmological emergencies. However, acute glaucoma was recognized by only 51 (44.3%) physicians, and eye perforations could only be handled by 65 (56.5%) of them. In addition, only 47 (40.9%) participants correctly answered that congenital cataracts should be operated right after diagnosis.

CONCLUSIONS: Family Health Program physicians working as first care providers in the Health System in Brazil presented poor ophthalmological knowledge. Providing training on ophthalmology may improve the ophthalmological care at the primary level within SUS and reduce the case demands at other healthcare levels.

KEYWORDS: Ophthalmology. Health personnel. Regional health strategies. Unified health system. Family health strategy.

INTRODUCTION

The Family Health Program (FHP) strategy is considered as the main strand of Primary Health Care (PHC). Effective PHC actions depend on training physicians to perform well in primary care[1-3].

In contrast, ophthalmological care within the Brazilian Unified Health System (SUS) needs improvement, since it is a specialty that often requires the use of expensive equipment[4,5].

Family Health Physicians (FHPh) with basic knowledge to recognize ophthalmological conditions can diagnose and

[1]Faculdade de Medicina de Botucatu – Botucatu (SP), Brazil.
[2]Universidade Estadual Paulista "Júlio de Mesquita Filho", Instituto de Biociências – Botucatu (SP), Brazil.
[3]Universidade Estadual Paulista "Júlio de Mesquita Filho", Núcleo de Educação a Distância e Tecnologia de Informação em Saúde – Botucatu (SP), Brazil.
*Corresponding author: igorleonardocarmona@hotmail.com
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treat low-complexity cases, as well as correctly refer patients to specialized services[6-8].

The objective of this study was to evaluate the ophthalmological knowledge of FHPh to build tools that can be used in training.

METHODS

This study considered the ethical principles that guide researches involving human subjects and was approved by the Research Ethics Committee of School of Medicine (FM), UNESP, Sao Paulo, Brazil. All participants signed an informed consent form, and the anonymity of the participants was guaranteed by data masking.

This was a cross-sectional, observational study, based on an electronic questionnaire administered to FHP physicians working at RHD-VI, Sao Paulo, Brazil. The questionnaire was developed by the authors through the Moodle Platform and included personal and medical training data and questions to evaluate the general and emergency ophthalmological knowledge. Sex, age, time of training, type of undergraduate institution, country where they studied, and whether the professional was specialized in Family and Community Medicine (FCM) or not were considered as independent variables[9].

INCLUSION CRITERIA

All physicians who worked in the RHD-VI FHP were invited to participate[10].

EXCLUSION CRITERIA

Physicians acting in other RHD, not working in FHP, and those who did not respond to the questionnaire fully were excluded from the study.

STATISTICAL ANALYSIS

Descriptive statistics was used to analyze the responses. Sex and the undergraduate institution variables were associated using the Goodman's test, which involves contrasts between and within multinomial populations[11,12]. The following expression was used for the percentage of correct answers, p(%)=n/30×100%, where "n" represents the number of correct answers. The Student's *t*-test was used to compare sex, undergraduate institution, and FCM specialization. The Pearson's linear correlation assessed the association of this percentage with time since graduation and patient age[13] (p=5%).

RESULTS

In the study period, the RHD-VI had a total of 214 FHPh, and 115 questionnaires were considered for the survey. Of the participants, 81 (70.4%) were male. The participants presented a mean age of 33.1±7.8 years and a median age of 30.5 years (Table 1).

The duration of the undergraduate course was noted to be 5 years for 64 (55.7%) participants, 58 (50.4%) participants were noted to have studied in a public institution, and 111 (96.5%) participants studied in Brazil. Only 23 (20%) participants were confirmed to have had FCM residence or specialization. The percentage of correct answers to our questionnaire was not related to sex, public or private medical undergraduate course, or having an FCM residence or specialization (Table 1). It was also not associated with training duration, age, or time since graduation. Physicians who graduated in public or private institutions reported having received only notions of ophthalmology in their undergraduate course.

About 58 (50.4%) interviewees reported having treated patients with eye complaints sometimes. Knowledge on the

Table 1. Descriptive measurements of variables by categories and in general.

		Minimum value	Median	Maximum value	Mean	Standard deviation	p-value*
Age (years)		25.0	31.0	62.0	33.1	7.8	–
Years since graduation		0	4.0	36.0	7.0	7.6	–
Correct answers (%)		23.3	66.7	86.7	65.9	13.8	–
Correct answers (%)	Women	30.0	66.7	86.7	63.5	13.4	0.232
	Men	23.3	70.0	86.7	66.9	14.0	
Correct answers (%)	Public	23.3	70.0	86.7	66.9	15.2	0.444
	Private	30.0	66.7	86.7	64.9	12.4	
Correct answers (%)	No FCM specialization	23.3	63.3	83.3	59.9	16.5	0.018
	FCM specialization	30.0	70.0	86.7	67.4	12.8	

*Student's *t*-test for independent samples.
FCM: Family and Community Medicine.

main eye conditions was reported as "reasonable" by 22 (19.1%) physicians, and only 44 (38.3%) physicians considered themselves capable of evaluating visual acuity using tables.

As for general ophthalmology, physicians who did not have an FCM specialization had a significantly higher rate of correct answers than those who had it (p <0.05). However, there was no statistical difference regarding ophthalmological urgencies knowledge (p>0.05) in the percentage of correct answers (Table 2).

As for the ability to identify ophthalmological emergencies, 82 (71.3%) physicians believed they were qualified. Only 18 (15.7%) physicians were able to report the most prevalent cause of irreversible blindness in the world. Most of them (96 physicians, 83.5%) knew that age-related cataract was the leading cause of cataract in the world, and 83 (72.2%) physicians marked the correct response about a clinical case of age-related cataract.

Only 47 (40.9%) physicians can manage correctly a case of congenital cataracts. Most of them (84 physicians, 73%) recognized that the detection and treatment of strabismus in children under seven years of age is important to prevent amblyopia. Seventy-five (65.2%) participants knew that visual deprivation in childhood can lead to amblyopia, and most of them (94 participants, 81.7%) knew the importance of detecting strabismus early in childhood. Refractive errors, such as presbyopia (78 participants, 67.8%) and myopia (95 participants, 82.6%), can also be recognized by most of them.

Most physicians (93, 80.9%) already observed the effects of properly treating diabetic retinopathy and are aware of the time to refer diabetic patients for ophthalmological evaluation (82, 71.3%). However, only 34 (29.6%) physicians correctly answered about the main cause of sudden vision loss in diabetic patients.

Regarding the importance of fundus examination in hypertensive patients, 63 (54.8%) physicians responded correctly, and most of them (94, 81.7%) recognized the most frequent cause of bilateral exophthalmia. The relationship between decompensated diabetes and myopic shift was known by 71 (61.7%) interviewees.

Most of the participants (100, 87%) are able to correctly perform the initial management of trauma in cases of alkali-induced eye burns. However, only 51 (44.3%) participants can recognize the clinical signs of acute glaucoma, 65 (56.5%) participants knew the initial behavior in ocular perforations, and 55 (47.8%) participants knew how to recognize the signs of blunt eye trauma.

Most of the participants can diagnose conjunctivitis (99, 86.1%), recognize the most common type of conjunctivitis (88, 76.5%), and know how to treat acute conjunctivitis (104, 90.4%). In addition, most of the participants (96/83.5%) can differentiate between bacterial and viral conjunctivitis. Most of the participants (99, 86.1%) correctly managed the cases of initial allergic conjunctivitis.

However, signs and symptoms of anterior uveitis and the differential diagnoses of conjunctivitis were only recognized by 28 interviewees (24.3%). Conditions such as retinal detachment (93, 80.9%) and orbital cellulitis (94, 81.7%) were recognized by the majority. In contrast, only 52 physicians (45.2%)

Table 2. Descriptive measurements of the percentage of correct answers by group of physicians with or without specialization in Family and Community Medicine.

Questions	Descriptive measurement	Specialization in Family and Community Medicine		p-value*
		Yes (n=23)	No (n=92)	
General ophthalmology	Mean	56.8	65.9	**<0.05**
	Standard deviation	20.3	15.6	
	Minimum value	6.7	13.3	
	Median	66.7	66.7	
	Maximum value	80	93.3	
Ophthalmological urgent care	Mean	63.7	69.1	**>0.05**
	Standard deviation	14.9	13.7	
	Minimum value	28.6	14.2	
	Median	71.4	71.4	
	Maximum value	85.8	92.9	

*Student's *t*-test for the percentage of correct answers in both study groups.

knew that rural workers can develop with traumatic corneal ulcer in the region.

DISCUSSION

This study evaluated the ophthalmological knowledge of physicians working in FHP at RHD-VI. There are only a few studies on the ophthalmological knowledge of PHC[14,15] professionals, which motivated this research. The results of the study found the need to complement the ophthalmological training of FHPh on several themes.

The physicians adhered to our study, with the research reaching almost all of them. Nevertheless, only fully completed questionnaires were considered in the study. The profile of FHPh working in the FHP in the analyzed region showed that most of them were men (81, 70.4%), which is related to the male predominant profile of the professionals working in FHP at RHD-VI (65.7% male professionals)[16].

The FHPh who participated in the research have a mean age of 33.1 years, and about half of them were trained for about 5 years, showing that the study included a large percentage of young professionals. This emphasized the presence of large number of recently graduated professionals working in PHC, who were there either to acquire more experience or due to a lack of other opportunities.

The number of private schools has increased much more than public schools in Brazil[17], which can be identified by the similar number of physicians coming from the public and private schools in the study. Only 20% of the interviewees were specialized in FCM, confirming the worrisome low demand for this specialization[18], although the consolidation of the FCM medical specialty is an essential condition to strengthen the current PHC guidelines. According to the interviewees, they frequently have ophthalmology cases; however, they evaluated their own knowledge of ophthalmology as poor.

The results showed no significant interference of sex, age, time since graduation, or graduated school in the percentage of correct answers, showing that, regardless of these variables, there is a need to better prepare these professionals in ophthalmological practice.

FCM specialization showed no significant effect on the percentage of correct answers. Although having an FCM specialization is seen as a positive point[1], the teaching of ophthalmology in such courses should be more emphasized.

Eye complaints are relatively frequent, but most physicians reported not being able to identify the main conditions that threaten vision. Questions on systemic diseases and general medicine had more correct answers since these subjects, such as general medical practice, are part of the syllabus, and the daily experience with patients increases the physicians' performance.

Questions about more common subjects in ophthalmology, such as conjunctivitis in general, cataract causes, retinal detachment findings, effects of prolonged steroid therapy, management of orbital cellulitis, concepts of amblyopia, and refractive errors, had a greater chance of correct answers since they were more related to general medicine. However, important causes of blindness and urgent eye conditions had less correct diagnoses and managements, such as congenital cataract, which is often underdiagnosed, affecting prognosis.

The lack of knowledge on ophthalmology affects health promotion and prevention, which is a concern for everyone working with basic health actions given the lack of training on eye conditions[19,20].

The results show that, in general, ophthalmological training is lacking, especially regarding visual disorders that cause irreversible vision consequences such as glaucoma, congenital cataracts, and strabismus, which can also cause uveitis and corneal ulcers. These are frequent disorders encountered in the FCM routine care that require early identification to avoid irreversible complications[21].

A large number of cases that could have been solved with basic care are referred to tertiary hospitals, which was anticipated in the introduction of this study. Undoubtedly, improving the basic care quality can reduce the number of ophthalmological demands resulting from low-complexity conditions in tertiary services[14].

One limiting factor of this research is the fact that it was a regional study, and thus broader studies covering other regions or states of the country are necessary to broaden the knowledge about this subject.

The positive points of this research included the fact that it was based on a questionnaire developed for this specific research, it evaluated a subject scarcely studied in the literature, and it showed that FHP physicians need further ophthalmological training. Based on the results, it was possible to elaborate didactic material directed at professional training to improve eye care at the PHC level and possibly decrease ophthalmological demands. This material can be found at: https://drive.google.com/file/d/1JGBpCvYz0siWUlYMgaNQ1KUeNbukUCXN/view.

CONCLUSIONS

The authors concluded that there is an important gap in the ophthalmological knowledge of FHPh, thus emphasizing the need for training to reduce the ophthalmological demand at other healthcare levels and to decrease the incidence of preventable blindness.

AUTHORS' CONTRIBUTIONS

ILCC, ENJ, SAS: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **DCMZ:** Software, Writing – original draft, Writing – review & editing. **CRP:** Formal Analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **ASSBSF:** Writing – original draft, Writing – review & editing.

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