Student Perspectives on Ophthalmology Training in The Slovak Medical Education System: A Pilot Study

Haaris Shiwani[1], Muhammad Shaheer Aziz[2], Danyal Memon[3], Mohammed Yagoub Elfaki[4], Usama Zulfiqar[5], Abdul Aziz[6]

Corresponding author: Dr Haaris Shiwani shiwanih@tcd.ie

Institution: 1. Royal Lancaster Infirmary, Lancaster, 2. Jessenius Faculty of Medicine, Martin, 3. Royal Victoria Hospital, Belfast, 4. University College Dublin, 5. Vasile Goldiș Western University of Arad, 6. Torbay Hospital, Torquay

Categories: Students/Trainees, Teaching and Learning, Clinical Skills, Undergraduate/Graduate

Received: 17/01/2020
Published: 10/03/2020

Abstract

Introduction: Conditions of the eye and vision seen in ophthalmology constitute some of the largest disease burdens in the world. Evidence from other parts of the world indicate that exposure to ophthalmology in medical school can be lacking. We aimed to conduct a pilot study assessing students’ exposure to, and confidence in treating, common ophthalmic conditions. We hoped to see how this compares to a global cohort and whether there are indications that the nature of ophthalmology teaching in Slovakia necessitates change. This will further inform the need to expand the study nationally to more accurately distinguish areas of improvement.

Methods: A single-centre cross-sectional survey was conducted at Univerzita Pavla Jozefa Šafárika v Košiciach, Slovakia. A 24-item questionnaire was distributed to final year medical students via a web-based platform and was available to complete for a period of 1 week.

Results: A total of 25 responses were collected from approximately 100 students (25% response rate). 7/25 (28%) respondents declared an interest in ophthalmology as a future career option, with males predominating [8% of females vs. 50% of males, OR = 0.09, CI = 0.009-0.0943, P=0.045]. 40% of individuals, however, reported a lack of adequate exposure to make an informed decision. Average hours of clinical placement and classroom teaching equated to 1.5 ± 0.6 weeks (mean ± SD) and 18 ± 13 hours, respectively. 13/25 (52%) students reported adequate teaching in direct ophthalmoscopy and slit lamp examination. 15/25 (60%) of respondents reported inadequate clinical exposure. 7/25 (28%) of participants reported having witnessed cataract surgery, whereas 14 (56%) reported having not seen any ophthalmic surgery. 9/25 (36%), 15/25 (60%), 7/25 (28%), 7/25 (28%) and 13/25 (52%) of students felt competent in managing cataract, conjunctivitis, glaucoma, diabetic eye disease and dry eye, respectively.

Conclusions: From this pilot study we have identified that there is a relative lack of confidence in managing common eye conditions among this select cohort of students and this may stem from a lack of clinical exposure or
classroom teaching hours. This warrants further evaluation with a larger, national cohort.

**Keywords:** Ophthalmology; Training; Slovakia; Education; Students

**Introduction**

Conditions of the eye and vision seen in ophthalmology constitute some of the largest disease burdens in the world (Ono, Hiratsuka and Murakami, 2010). The World Health Organisation estimates that over 2.2 billion people globally have vision impairment or blindness (World Health Organization, 2019). Ageing and the growth of global populations signifies that greater individuals will be at risk of developing such conditions in the future. The need for a substantial specialist workforce is thus obvious.

Medical school curricula have seen a decline in the emphasis on ophthalmology training with the levels of exposure decreasing (Ah-Chan et al., 2001; Sherwin and Colville, 2008; Baylis, Murray and Dayan, 2011). This consequently limits the number of students who develop an interest in pursuing ophthalmology as a career. Not only does this affect the numbers of students entering the field, but it deprives students of the chance to recognise and manage common ophthalmic complaints that can be encountered in numerous specialities beyond that of just ophthalmology.

Further to this, ophthalmic problems form an important number of consultations in general practice (Sheldrick et al., 1992, 1993; Cherry, Woodwell and Rechtsteiner, 2007), and can often be treated in the community without the need to burden specialist services. This can only be achieved, however, with general practitioners who are confident and adept in dealing with common ophthalmic conditions and aware of when to refer. A strong foundation in clinical ophthalmology during medical school is the ideal cornerstone to providing this efficient balance between community and tertiary services.

A recent study conducted in Canada highlighted only 35.7% of Canadian medical schools providing mandatory ophthalmology clerkships (Gostimir, Sharma and Bhatti, 2018). Similarly, another Canadian study (Noble et al., 2009) found 64% of first-year residents stated having "too little" or "no exposure" to ophthalmology in medical school. Limited competency in certain areas of ophthalmic examinations were also identified, such as fundoscopy and slit-lamp examination.

The chronicity of many ocular diseases as well as the ocular manifestations of systemic conditions mean that it is imperative that all graduating doctors can confidently assess and manage common ophthalmic conditions. The ability to take a salient ophthalmology history, perform a thorough ocular examination and recognise emergencies are abilities all students should possess before graduation. Unfortunately, the evidence from other parts of the world suggest that this may not be the case. Studies investigating this in Europe, particularly in Slovakia, are limited. We aimed to conduct a pilot study to assess whether the medical education system in Slovakia may mirror the findings of studies performed elsewhere in the world, and whether a nationwide study is warranted.

**Methods**

Final year medical students at the English-based medical course of Univerzita Pavla Jozefa Šafárika v Košiciach (UPJS), Slovakia, were invited via an online platform to complete a 24-item, anonymous-response questionnaire. Students were asked to provide demographic details, as well as the nature of the teaching that they had received, their perspectives on it and their confidence in dealing with common ophthalmic conditions. A Likert scale was employed. Statistical analysis was performed using R 3.6.1 (R Foundation for Statistical Computing, Vienna, Austria).
Results/Analysis

From a cohort of approximately 100 final year students, 25 responded to the online survey (25%). Of these, 48% (12) were male, 48% (12) were female and 4% (1) declined to comment (Figure 1). The mean age was 26 ± 3 (mean ± standard deviation) years old (Figure 2).

Figure 1: Gender of respondents.

![Gender of respondents](image)

Figure 2: Age of respondents

![Age of respondents](image)

Ophthalmology training formed a compulsory component of the 5th year syllabus at UPJS. The students were taught using a combination of both clinical placement at the university hospital along with seminar-based classroom teaching. Clinical placement amounted to a mean of 1.5 ± 0.7 weeks of exposure (Figure 3), along with 18 ± 13 hours of classroom teaching on ophthalmology throughout the 6-year degree course (Figure 4). 48% (12) of
individuals rated the quality of classroom teaching as "good" or "very good", with 36% (9) reported the same for their clinical teaching placements.

**Figure 3:** Length of clinical placement.

7/25 (28%) respondents declared an interest in ophthalmology as a future career option, with males predominating [8% of females vs. 50% of males, OR = 0.09, CI = 0.009-0.0943, \(P=0.045\)]. 10 students (40%) cited a lack of adequate exposure to the field to make an informed decision.

As part of the survey, students were asked to report on their proficiency in and/or exposure to various ophthalmic
clinical skills exposure. The results are illustrated in Figure 5.

**Figure 5:** Proficiency and exposure to ophthalmic skills.

![Survey Results](https://example.com/survey_results.png)

Respondents were also asked to identify the factors which they found to be contributing factors to a satisfactory experience in their ophthalmology training. 36% (9) of students reported "Senior Doctor Led Teaching" as a factor, this being the most widely selected answer choice. An identical proportion gave no answer to this question. 56% (14) of students reported "Lack of Clinical Exposure" as a factor contributing to an unsatisfactory experience in their ophthalmology training, and this was the most commonly selected answer. 20% (5) of students did not select an answer to this question. Further details regarding factors influencing students' satisfaction at their training is illustrated in Figure 6 and Figure 7.

**Figure 6:** Factors affecting satisfactory teaching experiences.
Figure 7: Factors affecting unsatisfactory teaching experiences.

![Diagram showing factors affecting unsatisfactory teaching experiences.]

- Lack of Senior Doctor Led Teaching
- Limited Hours of Teaching
- Lack of Clinical Exposure
- Limited Resources
- Poor English language skills
- No response

If you have found the Ophthalmology teaching to be unsatisfactory, which of the following have contributed to this?

Figure 8 shows the percentages of different ophthalmic surgical procedures observed by students during their clinical attachment. 56% (14) students reported having not seen any ophthalmic surgery.

**Figure 8: Observations of surgical procedures**

| Procedure                | No. of Students |
|--------------------------|-----------------|
| Cataract Surgery         | 7 (28%)         |
| Glaucoma Surgery         | 3 (12%)         |
| Laser Surgery            | 4 (16%)         |
| Oculoplastic Surgery     | 1 (4%)          |
| Corneal Surgery          | 3 (12%)         |
| Strabismus Surgery       | 1 (4%)          |
| Vitreo-Retinal Surgery   | 2 (8%)          |
| None                     | 14 (56%)        |

25 responses

Figure 9 shows students' self-reported competency in recognising the signs and symptoms of common ophthalmological conditions such as conjunctivitis, cataract and glaucoma. Figure 10 shows the corresponding competency in managing these conditions.

**Figure 9: Self-reported competencies in recognising common ophthalmic conditions**
Figure 10: Self-reported competencies in managing common ophthalmic conditions

Finally, 84% (21) students were not aware of any ophthalmology interest groups at the university and 72% (18) of students reported not having had an opportunity to be involved in ophthalmology research in their time as a medical student (Figures 11 and 12 respectively).

Figure 11: Awareness of ophthalmology interest groups.
Discussion

This pilot study represents a small cohort of the overall medical student population of Slovakia from a single university programme. The results that have been highlighted, however, are substantial. The general exposure of students to ophthalmology seems to be poor overall and deficiencies in basic skills have been highlighted.

Students have indicated that there is very limited exposure to surgery, with 72% of students having not witnessed cataract surgery, the definitive solution to one of the leading causes of blindness in the world today (Bourne et al., 2013). Exposure to other forms of sub-specialist surgery is even less as evidenced in Figure 8.

A large minority (40%) of students indicated that they did not receive adequate exposure to ophthalmology to make an informed decision about choosing ophthalmology as a speciality for their future careers. The overall clinical placement time was rather uniform with the mean being 1.8 weeks, which compares rather favourably to other
courses internationally (Noble et al., 2009). The reporting of classroom hours of ophthalmology teaching as shown in Figure 4, however, showed quite a large variation in the responses (mean= 17.92, standard deviation= 12.65, range= 2-50) and we believe this may be explained by some of the limitations of this study that are discussed below. When compared to other similar studies, it has been shown that a placement of a satisfactory length was related to a high level of proficiency in the subject matter (Davari et al., 2017). Perhaps one method that could be explored to improve students’ self-reported levels of competency in ophthalmic skills is increasing the placement duration.

Although ophthalmology training forms a mandatory part of this course, a significant proportion of students expressed certain factors influencing their experiences. Although there seems to be an adequate proportion of senior led clinical teaching which the students found helpful, poor resources, lack of teaching hours, in addition to lack of clinical exposure were mentioned as causes for finding the ophthalmology training experience to be unsatisfactory (Figure 7). An exploration of how students would prefer to be taught in their ophthalmology rotation may yield higher satisfaction levels and increased competency among students (Triepels et al., 2018). Deeper to this, a survey to explore students’ attitudes regarding the inclusion of an ophthalmology rotation as part of a mandatory aspect to their course may enlighten course directors as to how best approach teaching the subject and emphasising its importance in clinical practice (Foo et al., 2018).

Our study seems to suggest that with regard to clinical skills and knowledge of common ophthalmic conditions, students have numerous self-reported deficiencies in obtaining adequate exposure and teaching of basic ophthalmic skills, such as fundoscopy, visual acuity testing, visual field testing, pupillary testing etc. Whilst the majority of students felt confident in recognising and managing conditions such as conjunctivitis and dry eye (92% and 60% for conjunctivitis, and 64% and 52% for dry eye, respectively), a significant amount fell short when asked the same about diabetic eye disease or age-related macular degeneration. Only 28% of students felt able to recognise diabetic eye disease, and only 28% again felt that they could appropriately manage it. For age-related macular degeneration the picture is even more worrisome- only 20% and 16% felt confident in recognising and managing it, respectively. An alarming 28% of students reported not feeling competent to manage any of the listed common ocular conditions. Our study shows here a significant lack of self-reported competency which needs to be targeted in the focussed areas highlighted by our survey responses, in order to graduate cohorts of new doctors who are able to manage ophthalmic presenting complaints confidently and appropriately.

Our study presents numerous limitations. Given the self-reported nature of surveys, a level of recall bias is to be expected. This may be further evidenced by the widely varied values that have been reported regarding hours of classroom teaching. A poor response rate may be evidence of a level of response bias. As expected with pilot studies, our sample size was small and from a single centre, and this work will need to be performed on a larger scale in order to bring it forward further. A form of question-order bias may be expected within our survey. An extent of language bias may also have had a role to play as this survey was available only in English. Although this survey was available to the international, English-based course, the primary language of Slovakia is not English and the levels of proficiency of the students may vary.

Conclusion

In conclusion, the evidence generated from this pilot study indicates that the Slovakian medical education system may have deficiencies in the ophthalmology training that it provides. A nationwide study is now warranted to better establish whether these results are reproduced on a national level as this may signal the need for widespread change.
Take Home Messages

1. Training in ophthalmology can often be overlooked in medical curricula
2. The need for ensuring graduates are competent in basic ophthalmic skills is essential
3. Further study is needed to fully ascertain the standards of ophthalmology teaching in the Slovak Medical education system

Notes On Contributors

Dr Haaris Shiwani - Junior doctor in Department of Medicine, Royal Lancaster Infirmary with an interest in ophthalmology and medical education.

Dr Muhammad Shaheer Aziz - Junior doctor undertaking sabbatical and graduate of Jessenius Faculty of Medicine, Slovakia with an interest in medical education.

Dr Danyal Memon - Junior doctor in Department of Medicine, Royal Victoria Hospital with an interest in ophthalmology and medical education.

Mr Mohammed Yagoub Elfaki - Medical student at University College Dubln committed to improving standards of medical education.

Mr Usama Zulfiqar - Medical student at Vasile Goldiș Western University of Arad committed to improving standards of medical education.

Dr Abdul Aziz - Medical Consultant in Department of Respiratory Medicine at Torbay Hospital.

Acknowledgements

Please note that all figures have been generated via Google Forms - Copyright belongs to Dr Haaris Shiwani.

Bibliography/References

Ah-Chan, J. J., Sanderson, G., Vote, B. J. T. and Molteno, A. C. B. (2001) ‘Undergraduate ophthalmology education survey of New Zealand ophthalmologists, general practitioners and optometrists’, Clinical and Experimental Ophthalmology. Wiley, 29(6), pp. 416–425, https://doi.org/10.1046/j.1442-9071.2001.d01-26.x.

Baylis, O., Murray, P. I. and Dayan, M. (2011) ‘Undergraduate ophthalmology education - A survey of UK medical schools’, Medical Teacher, 33(6), pp. 468–471, https://doi.org/10.3109/0142159X.2010.540594.

Bourne, R. R. A., Stevens, G. A., White, R. A., Smith, J. L., et al. (2013) ‘Causes of vision loss worldwide, 1990–2010: a systematic analysis’, The Lancet Global Health. Elsevier BV, 1(6), pp. e339–e349, https://doi.org/10.1016/s2214-109x(13)70113-x.

Cherry, D. K., Woodwell, D. A. and Rechtsteiner, E. A. (2007) ‘National Ambulatory Medical Care Survey: 2005
summary’, *Advance data*, (387), pp. 1–39.

Davari, P., Millsop, J. W., Johnson, M. A. N., Takahashi, S. R., *et al.* (2017) ‘Dermatology medical education: A multicenter survey study of the undergraduate perspective of the dermatology clinical clerkship’, *Dermatology Online Journal*. Dermatology Online Journal, 23(12).

Foo, M., Maingard, J., Phan, K., Lim, R., *et al.* (2018) ‘Australian students’ perspective on interventional radiology education: A prospective cross-institutional study’, *Journal of Medical Imaging and Radiation Oncology*. Wiley, 62(6), pp. 758–763, [https://doi.org/10.1111/1754-9485.12764](https://doi.org/10.1111/1754-9485.12764).

Gostimir, M., Sharma, R. A. and Bhatti, A. (2018) ‘Status of Canadian undergraduate medical education in ophthalmology’, *Canadian Journal of Ophthalmology*, 53(5), pp. 474–479, [https://doi.org/10.1016/j.jcjo.2017.11.015](https://doi.org/10.1016/j.jcjo.2017.11.015).

Noble, J., Somal, K., Gill, H. S. and Lam, W.-C. (2009) ‘An analysis of undergraduate ophthalmology training in Canada’, *Canadian Journal of Ophthalmology*. Elsevier BV, 44(5), pp. 513–518, [https://doi.org/10.3129/i09-127](https://doi.org/10.3129/i09-127).

Ono, K., Hiratsuka, Y. and Murakami, A. (2010) ‘Global inequality in eye health: Country-level analysis from the global burden of disease study’, *American Journal of Public Health*, 100(9), pp. 1784–1788, [https://doi.org/10.2105/AJPH.2009.187930](https://doi.org/10.2105/AJPH.2009.187930).

Sheldrick, J. H., Vernon, S. A., Wilson, A. and Read, S. J. (1992) ‘Demand incidence and episode rates of ophthalmic disease in a defined urban population’, *BMJ (Clinical research ed.)*, 305(6859), pp. 933–936, [https://doi.org/10.1136/bmj.305.6859.933](https://doi.org/10.1136/bmj.305.6859.933).

Sheldrick, J. H., Wilson, A. D., Vernon, S. A. and Sheldrick, C. M. (1993) ‘Management of ophthalmic disease in general practice’, *British Journal of General Practice*, 43(376), pp. 459–462.

Sherwin, J. C. and Colville, D. (2008) ‘Ophthalmology education for Australian medical students’, *Clinical & Experimental Ophthalmology*. Wiley, 36(5), pp. 491–492, [https://doi.org/10.1111/j.1442-9071.2008.01796.x](https://doi.org/10.1111/j.1442-9071.2008.01796.x).

Triepels, C. P. R., Koppes, D. M., Van Kuijk, S. M. J., Popeijus, H. E., *et al.* (2018) ‘Medical students’ perspective on training in anatomy’, *Annals of Anatomy - Anatomischer Anzeiger*. Elsevier BV, 217, pp. 60–65, [https://doi.org/10.1016/j.aanat.2018.01.006](https://doi.org/10.1016/j.aanat.2018.01.006).

World Health Organization (2019) *Blindness and vision impairment*. Available at: [https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment](https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment) (Accessed: 21 November 2019).

**Appendices**

None.

**Declarations**

*The author has declared that there are no conflicts of interest.*
Ethics Statement

The study was conducted in accordance with the 2013 Declaration of Helsinki. Access was not available to a formal ethics review committee.

External Funding

This article has not had any External Funding

MedEdPublish: rapid, post-publication, peer-reviewed articles on healthcare professions’ education. For more information please visit www.mededpublish.org or contact mededpublish@dundee.ac.uk.