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Anonymous survey results of ophthalmology residents of Russian medical universities on the status of their visual analyzer

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ABSTRACT

BACKGROUND: A widespread visual impairment among medical students is known, but there are no data on the ophthalmic status of clinical residents.

AIM: To carry out an assessment of the visual analyzer status in Russian medical universities graduates who begin the clinical residency according to the specialty 31.08.59 Ophthalmology.

MATERIALS AND METHODS: An anonymous residents' online survey was conducted in 15 universities from 14 cities using an original interactive questionnaire. Responses were received from 249 respondents (mostly females: n = 188, 75.5%; mean age 24.80 ± 0.06 years). To compare, we used previously published data on a survey of senior students from 5 Russian medical universities, including 549 respondents (425 females, 77.4%; mean age 22.4 ± 0.06 years).

RESULTS: In comparison to students, residents were significantly more likely to rate their vision as excellent (20.8% and 28.9%, respectively, p = 0.01), to report emmetropia (16.2% versus 26.9%, p < 0.001), to deny continuing vision deterioration (33.0% and 43.5%, p < 0.005), to rate higher the importance of good vision (9.25 ± 0.06 and 9.73 ± 0.05 conditional points, respectively, p < 0.01). Students significantly more often did not know the meaning of the "clinical refraction" term (2.6% and 0.4%, respectively, p = 0.04), more often reported vision problems interfering with their studies (26.2% and 15.7%, p = 0.01), and reported ongoing vision deterioration (57.9% versus 45.0%, p < 0.001). Otherwise, survey results were comparable.

CONCLUSIONS: Visual impairments are widespread among clinical residents-ophthalmologists of Russian medical universities, 58.2% of the responders had ametropia (including 56.1% of myopia), 28.5% had astigmatism, 3.6% had other ocular conditions. The majority of survey participants (59.8%) used or felt a need in optical correction, 19.7% rated their vision as "poor" or "very poor", about a half (45.0%) believed their vision to worsen during recent years, and about as much (46.6%) reported that they experience limitations in everyday life related to decreased vision. Insufficient awareness of a part of the responders about their vision, and in some responders, a lack in basic ophthalmological knowledge were revealed.

Keywords: visual functions; ophthalmology; clinical resident; student; Russian Medical University; self-assessment; anonymous survey; myopia.

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Результаты анонимного опроса клинических ординаторов медицинских вузов России о состоянии их зрительного анализатора

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АННОТАЦИЯ

Актуальность. Известно о широкой распространённости зрительных нарушений среди студентов медицинских вузов, но отсутствуют данные о состоянии органа зрения клинических ординаторов.

Цель — провести ориентировочную оценку состояния зрительного анализатора выпускников медицинских вузов России, начинающих очное обучение в клинической ординатуре по специальности 31.08.59 Офтальмология.

Материалы и методы. Проведено анонимное онлайн-анкетирование ординаторов в 15 университетах из 14 городов страны с помощью оригинального интерактивного опросника. Получены ответы 249 респондентов (женщин 75,5 %; средний возраст 24,8 года). Для сравнения использовали ранее опубликованные данные опроса студентов старших курсов 5 медицинских вузов России (549 респондентов, 77,4 % женщин, средний возраст 22,4 года).

Результаты. Клинические ординаторы существенно чаще, чем студенты, оценивали своё зрение как отличное (28,9 и 20,8 % соответственно, $p = 0,01$), сообщали, что являются эмметропами (26,9 % против 16,2 %, $p < 0,001$), выражали несогласие с утверждением о продолжающемся ухудшении зрения (43,5 и 33,0 %, $p < 0,005$), а также выше оценивали важность хорошего зрения (9,73 и 9,25 условного балла соответственно, $p < 0,01$). Студенты значительно чаще не знали значение термина «клиническая рефракция» (2,6 и 0,4 % соответственно, $p = 0,04$), сообщали, что проблемы со зрением мешают им в учёбе (26,2 и 15,7 %, $p = 0,01$), а также признавались в продолжающемся ухудшении зрения (57,9 % против 45,0 %, $p < 0,001$). В остальном результаты опросов были сопоставимы.

Выводы. Нарушения зрения широко распространены среди клинических ординаторов-офтальмологов медицинских вузов России: 58,2 % респондентов имели аметропию (в том числе 56,1 % — миопию), 28,5 % — астигматизм, 3,6 % — другие заболевания органа зрения. Большинство участников опроса (59,8 %) пользовались средствами оптической коррекции или нуждались в них, 19,7 % оценили своё зрение как «плохое» или «очень плохое», около половины (45,0 %) считали, что их зрение ухудшилось за последние годы, и почти столько же (46,6 %) сообщили, что испытывают связанные со сниженным зрением ограничения в повседневной жизни. Выявлены недостаточная осведомлённость части опрошенных о состоянии своего зрения, а также пробелы отдельных респондентов в базовых знаниях по офтальмологии.

Ключевые слова: зрительные функции; офтальмология; клинический ординатор; студент; медицинский вуз России; самооценка; анонимный опрос; миопия.

Как цитировать

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BACKGROUND

Various ocular disorders (in the first instance, refractive errors) are frequently encountered in the population, including young people. There are multiple data on the wide prevalence of visual analyzer's conditions among students of medical universities, including Russian ones [1–7], and this is the reason why the study of the ophthalmic status of graduating high school students who decided to cast in their lot with ophthalmology presents some features of interest.

In national and world literature, publications are encountered, which consider various aspects of teaching (evaluation of acquired knowledge and skills, interests and preferences, satisfaction by teaching programs, etc.) in residents, including ophthalmologists, through the means of questionnaires [8–18]. At the same time, we did not find any publications dedicated to the investigation of the status of refraction and visual functions of this category of health care professionals.

Aim of the study — to carry out a rough estimate of the visual analyzer's status of Russian high schools' graduates, starting their in-person resident training in specialty 31.08.59 Ophthalmology.

MATERIALS AND METHODS

In September 2023, we carried out an anonymous questionnaire survey of the first year in-person learning residents, specialty 31.08.59 Ophthalmology. Using an original interactive questionnaire survey composed using a form builder Google Forms, which includes 15 questions (11 out of them were mandatory to be completed), graduate students of five medical universities were interrogated previously: Federal State Budgetary Educational Institution of Higher Education "Tyumen State Medical University" of the Ministry of Health of the Russian Federation (TyumSMU, 5th year of the clinical medicine institute, n = 256), Federal State Budgetary Educational Institution of Higher Education "Ural State Medical University" of the Ministry of Health of the Russian Federation (USMU, 5th year of the general medicine and preventive care faculty, n = 96); Federal State Budgetary Educational Institution of Higher Education "Perm State Medical University named after Academician E.A. Wagner" of the Ministry of Health of the Russian Federation (PSMU, 5th year of the general medicine faculty, n = 78), Federal State Budgetary Educational Institution of Higher Education "Bashkir State Medical University" of the Ministry of Health of the Russian Federation (BSMU, 4th year of the general medicine and preventive care faculty, n = 63), and Federal State Budgetary Educational Institution of Higher Education "Academician I.P. Pavlov First St. Petersburg State Medical University" of the Ministry of Health of the Russian Federation (FSBEI, 4th year of the general medicine and preventive care faculty; n = 56); 549 respondents in total (425 out of them were women, 77.4%; mean age 22.4 ± 0.06 years) [7].

In the present study, residents of 15 universities out of 14 cities of the country took part (Table 1): 249 people in total (188 women, 61 men; mean age 24.8 ± 0.06 years). Overwhelming majority of respondents (221 people, 88.8%) answered the survey questions on or before September 10, 2023, that is, during the first days of resident training, this allows to evaluate the level of their awareness as basic one. The link to the online survey was obtained by residents from professors of chairs, a preliminary instruction on the rules of the questionnaire completion (in particular, a clarification on the task and on the necessity to provide credible responses), and the limitation of arrangements for setup was not performed in order to avoid putting pressure on respondents. In the preface of the questionnaire form, it was indicated: "We kindly ask you to take part in the anonymous survey carried out by the teaching staff of some Russian universities and being of a scientific research character... To the survey participants, anonymity, opportunity to turn down the participation in the survey, as well as absence of risks are guaranteed". Persons having confirmed being residents starting their ophthalmology training and having agreed to participate in the anonymous survey gained access to the survey questions. The informed consent including personal data of the respondents was not filled in, because the ethic norms applied to research and sociological studies were respected (including the respondents' rights). The present investigation was carried out according to the Ethics Code of the International Sociological Association, as well as to the requirements of the Declaration of Helsinki of the World Medical Association "Ethical principles for medical research involving human participants".

Formulations of questions and variants of answers are presented in Table 2. Only the developers of the questionnaire were allowed to introduce modifications into the questions. A maximal level of anonymity was set, not demanding from the respondent to enter into the account and not allowing the organizers to have access to the data of survey participants.

249 answers from 272 first year residents who started their training in the universities participating in the study (91,5%) were obtained. Among respondents, the age of which (mean ± standard error of the mean) was 24.80 ± 0.06 years, women prevailed (188 people, 75.5%).

Statistical analysis was carried out using the Statistica program v. 13.3. According to the results of Shapiro–Wilk criterion use, the hypothesis on normal-theory for variables "age" and "quality of vision estimation" was rejected, that is why to compare parameters of two independent samples, non-parametric Mann–Whitney U test

Table 1. Respondents' characteristics (*n* = 249)
Таблица 1. Характеристика респондентов (*n* = 249)

University	Number of received answers	Number of 1st year residents	Sex (female/male)	Age (mean)
1. North-Western State Medical University named after I.I. Mechnikov, Saint Petersburg	39	39	27/12	24.87
2. Novosibirsk State Medical University, Novosibirsk	25	25	16/9	24.48
3. Omsk State Medical University, Omsk	22	22	18/4	24.45
4. Academician I.P. Pavlov First St. Petersburg State Medical University, Saint Petersburg	22	22	19/3	24.54
5. Bashkir State Medical University, Ufa	21	22	17/4	24.33
6. Voronezh State Medical University, Voronezh	19	20	16/3	23.68
7. Saratov State Medical University named after V.I. Razumovsky, Saratov	15	19	12/3	24.40
8. South-Ural State Medical University, Chelyabinsk	14	18	9/5	24.79
9. Ural State Medical University, Yekaterinburg	13	14	11/2	25.54
10. V.I. Vernadsky Crimean Federal University, Simferopol	12	13	10/2	24.08
11. Siberian State Medical University, Tomsk	12	15	6/6	27.75
12. Orenburg State Medical University, Orenburg	10	12	9/1	24.30
13. The Russian National Research Medical University named after N.I. Pirogov, Moscow	10	11	6/4	25.90
14. Tyumen State Medical University, Tyumen	8	12	7/1	26.50
15. Academician E.A. Vagner Perm State Medical University, Perm	7	8	5/2	24.86
Total	249	272	188/61	24.80

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Table 2. Comparison of the survey results of the residents (*n* = 249) and previously collected data from the senior medical students (*n* = 549) of 5 medical universities

Таблица 2. Результаты опроса клинических ординаторов (*n* = 249) в сравнении с ранее полученными данными опроса студентов старших курсов 5 медицинских вузов (*n* = 549)

Question, answer options		Cohort, time frame of the survey		
		residents, specialty 31.08.59 Ophthalmology, first year of studies, *n* = 249, September, 2023	students, 4th–5th year, 31.05.01 General Medicine (specialist's degree) after "ophthalmology" subject mastery, *n* = 549, February–June, 2023	*p*
1. How old are you (completed years, specify in Arabic numerals)?	Mean value ± standard error of the mean, years	24.80 ± 0.18	22.40 ± 0.06	<0.01
2. Please specify your sex	Female	188 (75.5%)	425 (77.4%)	0.56
	Male	61 (24.5%)	124 (22.6%)	0.56
3. What is your estimate of your vision?	Excellent	72 (28.9%)	114 (20.8%)	0.01
	Good	58 (23.3%)	120 (21.9%)	0.67
	Satisfactory	70 (28.1%)	162 (29.5%)	0.69
	Bad	46 (18.5%)	131 (23.9%)	0.09
	Very bad	3 (1.2%)	17 (3.1%)	0.11
4. Do you know your clinical refraction (if you were subject to a surgical or laser correction, specify the refractive error before it; in anisometropia (different refraction of the eyes), specify the refraction of the better seeing eye)?	Yes, I have emmetropia	67 (26.9%)	89 (16.2%)	<0.001
	Yes, I have hypermetropia	3 (1.2%)	18 (3.3%)	0.09
	Yes, I have low myopia	63 (25.3%)	138 (25.1%)	0.95
	Yes, I have moderate myopia	64 (25.7%)	141 (25.7%)	1.0
	Yes, I have high myopia	15 (6.0%)	29 (5.3%)	0.69
	Do not know	36 (14.5%)	120 (21.9%)	0.015
	I do not know, what is "clinical refraction"	1 (0.4%)	14 (2.6%)	0.04
5. Do you have astigmatism?	Yes	71 (28.5%)	140 (25.5%)	0.37
	No	158 (63.5%)	345 (62.8%)	0.85
	Do not know for sure	19 (7.6%)	60 (10.9%)	0.15
	I do not know, what is "astigmatism"	1 (0.4%)	4 (0.7%)	0.61
6. If you have decreased visual acuity, please specify on what distance the most (if visual acuity is not decreased, disregard this question):	Only distance vision	135 (*n* = 147) (91.8%* / 54.2%**)	332 (*n* = 377) (88.1%* / 60.5%**)	0.22
	Only near vision	4 (*n* = 147) (2.7%* / 1.6%**)	23 (*n* = 377) (6.1%* / 4.2%**)	0.11
	Both distance and near vision	8 (*n* = 147) (5.4%* / 3.2%**)	22 (*n* = 377) (5.8%* / 4.0%**)	0.86
7. Are you concerned about limitations related to other functions of the visual analyzer (excluding central vision)?	No	245 (98.4%)	531 (96.7%)	0.18
	Yes, disturbances of the peripheral vision	1 (0.4%)	7 (1.3%)	0.24
	Yes, disturbances of the color vision	1 (0.4%)	4 (0.7%)	0.61
	Yes, absence of the binocular vision	2 (0.8%)	7 (1.3%)	0.54
8. If you encounter problems with vision, in what do they impede you in the first instance (if there are no such problems, there is no need to answer this question)?	In learning	39 (*n* = 116) (33.6%* / 15.7%**)	144 (*n* = 305) (47.2%* / 26.2%**)	0.01
	In working	16 (*n* = 116) (13.8%* / 6.4%**)	26 (*n* = 305) (8.5%* / 4.7%**)	0.10
	In leisure activities/hobby	18 (*n* = 116) (15.5%* / 7.2%**)	53 (*n* = 305) (17.4%* / 9.7%**)	0.64
	In sports activities	13 (*n* = 116) (11.2%* / 5.2%**)	26 (*n* = 305) (8.5%* / 4.7%**)	0.39
	In driving	30 (*n* = 116) (25.9%* / 12.0%**)	56 (*n* = 305) (18.4%* / 10.2%**)	0.09

Table 2 (continued) / Окончание таблицы 2

Question, answer options		Cohort, time frame of the survey		
		residents, specialty 31.08.59 Ophthalmology, first year of studies, *n* = 249, September, 2023	students, 4th–5th year, 31.05.01 General Medicine (specialist's degree) after "ophthalmology" subject mastery, *n* = 549, February–June, 2023	*p*
9. Do you use any optical vision correction?	No, because I do not feel any need for it	100 (40.2%)	211 (38.4%)	0.63
	No, but I am just going to start using it shortly	12 (4.8%)	26 (4.7%)	0.95
	Yes, I wear spectacles	71 (28.5%)	175 (31.9%)	0.34
	Yes, I use contact lenses	45 (18.1%)	108 (19.7%)	0.60
	I was subject to vision correction surgery	21 (8.4%)	29 (5.3%)	0.09
10. How long ago did you check your visual acuity for the last time?	During the last year	187 (75.1%)	421 (76.7%)	0.62
	Some years ago	41 (16.5%)	80 (14.6%)	0.49
	Prior to the admission to the University	11 (4.4%)	31 (5.6%)	0.48
	Do not remember	8 (3.2%)	14 (2.6%)	0.63
	Never	2 (0.8%)	3 (0.5%)	0.61
11. How long ago did you visit the ophthalmologist for the last time?	During the last year	170 (68.3%)	354 (64.5%)	0.29
	Some years ago	51 (20.5%)	112 (20.4%)	0.97
	Prior to the admission to the University	14 (5.6%)	52 (9.5%)	0.06
	Do not remember	12 (4.8%)	22 (4.0%)	0.60
	Never	2 (0.8%)	9 (1.6%)	0.36
12. If you have eye diseases (excluding refractive errors), specify them (otherwise, disregard this question):	Yes (diseases enumerated by responders are reported in the text)	9 (3.6%)	27 (4.9%)	0.41
13. Do you feel that during last several years, your vision worsened?	Yes	112 (45.0%)	318 (57.9%)	<0.001
	No	108 (43.5%)	181 (33.0%)	<0.005
	Cannot say	29 (11.6%)	50 (9.1%)	0.27
14. If you feel that during last time your vision worsened, to what this is related in the first instance (if your vision did not worsen, disregard this question)?	Excessive visual workload	113 (*n* = 132) (85.6%* / 45.4%**)	314 (*n* = 362) (86.7%* / 57.2%**)	0.75
	Incorrect arrangement of the workplace	4 (*n* = 132) (3.0%* / 1.6%**)	16 (*n* = 362) (4.4%* / 2.9%**)	0.48
	Athletic overexertion	4 (*n* = 132) (3.0%* / 1.6%**)	8 (*n* = 362) (2.2%* / 1.5%**)	0.61
	Emotional stress	10 (*n* = 132) (7.6%* / 4.0%**)	18 (*n* = 362) (5.0%* / 3.3%**)	0.27
	Bad ecology	0 (*n* = 132) –	0 (*n* = 362) –	1.0
	Insufficient nutrition	0 (*n* = 132) –	0 (*n* = 362) –	1.0
	Concomitant systemic disease	1 (*n* = 132) (0.8%* / 0.4%**)	6 (*n* = 362) (1.7%* / 1.1%**)	0.46
15. Please rate on a conventional scale from 1 point to 10 points (where 1 is a minimal score, and 10 — maximal score), how important for you is a good vision:	Mean value ± standard error of the mean, points	9.73 ± 0.05	9.25 ± 0.06	<0.01

* % from the number of participants, who answered this (optional) question; ** % from the total number of survey participants.
* % от числа участников, ответивших на данный (необязательный) вопрос; ** % от общего числа участников опроса.

was used. In other cases, to compare in two non-related samples qualitative characters, expressed in per cents (comparison of relative frequencies in two groups), the criterion of significance of two proportions' difference was used [19]. Statistical hypotheses were tested at 0.05 significance level.

RESULTS

Among answers to question No. 3 of the questionnaire on the subjective evaluation of own vision (Table 2), most often answers "excellent" (72 answers; 28.9%) and "satisfactory" (70; 28.1%) were encountered, more rarely respondents choose variants "good" (58; 23.3%), "bad" (46; 18.5%), and "very bad" (3; 1.2%). 212 (85.1%) of interrogated indicated their clinical refraction (question No. 4): 67 people (26.9%) stated having emmetropia, 3 (1.2%) people — hypermetropia, 142 (57.0%) — myopia (including low myopia — 63, moderate myopia — 64, high myopia — 15). At that, 36 respondents (14.5%) answered that they did not know their clinical refraction, and one more (0.4%) notified that he did not understand the meaning of this term. Answering the question No. 5, 71 resident (28.5%) confirmed the presence of astigmatism, 158 (63.5%) people notified its absence, 19 (7.6%) people choose the variant "do not know for sure", and one more (0.4%) notified that he did not know what it was.

From the visual analyzer's functions, the most vulnerable is the central vision: 147 interrogated residents (59.0%) notified of having visual acuity decrease (question No. 6). In most of them (135; 91.8%), only distance vision suffered, 8 (5.4%) и 4 (2.7%) people choose answer variants "both distance and near vision" and "only near vision", respectively. Limitations related to other visual functions (question No. 7) were reported by 4 respondents (1.6%): 2 (0.8%) informed about the absence of binocular vision, one person (0.4%) notified about having disturbances of the color vision, one more (0.4%) — about having disturbances of the peripheral vision. In answer to question No. 8 ("If you encounter problems with vision, in what do they impede you in the first instance?"), following answers were received (n = 116, 46.6% of participants): "in learning" — 39 (33.6% from among those who answered), "in driving" — 30 (25.9%), "in leisure activities/hobby" — 18 (15.5%), "in working" — 16 (13.8%), "in sports activities" — 13 (11.2%).

Less than a half of respondents (100 people; 40.2%) notified that they did not use any optical correction and did not feel the need in it (question No. 9). 12 more residents (4.8%) informed that they plan to begin using it shortly. The answers of the remaining respondents allocated as follows: "I wear spectacles" — 71 (28.5% of the total number of the survey participants), "I use contact lenses" — 45 (18.1%), "I was subject to vision correction surgery" — 21 (8.4%).

The majority of interrogated residents have had a visual acuity test (187; 75.1%) and/or visited an ophthalmologist (170; 68.3%) during last twelve months (questions No. 10, 11). At the same time, 14 (5.6%) survey participants visited an ophthalmologist and 11 (4.4%) people had a visual acuity test before their admission to the university only, and 2 (0.8%) respondents informed about never visiting an ophthalmologist, 2 (0.8%) more — about never having a visual acuity test.

The question about concomitant eye conditions (excluding refractive errors) was answered in the affirmative by 9 (3.6%) residents. Among answers, dry eye syndrome (4 mentions) ranked, as well as macular dystrophy, posterior vitreous detachment, meibomian gland dysfunction, peripheral vitreochorioretinal dystrophy, habitually-excessive accommodation strain, and proptosis (one respondent mentioned two diseases).

The question No. 13 ("Do you feel that during last several years, your vision worsened?") was answered in the affirmative by 112 people (45.0%), in the negative — by 108 residents (43.4%), and 29 respondents (11.6%) found it difficult to give a straight answer. Among causes of visual acuity decrease, presented as answer variants to the question No. 14, which was answered by 132 (53.0%) of survey participants, most frequently excessive visual workload, which was named by 113 people (85.6% out of 132 answers; 45.4% from the total number of study participants). 10 residents (7.6% of those who answered the question) believe that their vision worsened due to emotional strain, 4 (3.0%) — due to an incorrect arrangement of the workplace, 4 (3.0%) — due to an athletic overexertion, 1 (0.8%) — due to the progression of a concomitant systemic disease; variants "bad ecology" and "insufficient nutrition" were not mentioned among answers. Note should be made that the question about visual acuity decrease was answered in the affirmative by 112 respondents, and the connection of the visual acuity decrease with any factor was notified by 132 people.

We also elucidated the subjective estimation of good vision's order of importance for respondents using a conventional scale from 1 point to 10 points (where 1 is a minimal score, and 10 — maximal score). The mean value of the index was 9.73 ± 0.05 points (5–7 points — 7 answers; 8 points — 13; 9 points — 14; 10 points — 215).

In total, our results are in line with those of a recent survey of graduate students of Russian medical universities [7]. At that, the comparison of the results of these two studies allowed to elucidate some discrepancies, which found evidences at 0.05 significance level (Table 2). Apart from an obvious difference in age, residents significantly more often rated their vision as excellent (28.9 and 20.8% respectively, p = 0.01), notified an emmetropic refraction (26.9% versus 16.2%, p < 0.001), expressed their disagreement with the statement about a decline in vision over the last years (43.5 и 33.0%, p < 0.005),

and also rated higher the importance of good vision for them (9.73 ± 0.05 и 9.25 ± 0.06 points respectively, $p < 0.01$). Besides, it was established that students significantly more often did not know the meaning of the term "clinical refraction" (2.6 and 0.4% respectively, $p = 0.04$), reported that problems with vision hinder them in learning (26.2 and 15.7%, $p = 0.01$), and also recognized an ongoing decline of vision (57.9% versus 45.0%, $p < 0.001$).

DISCUSSION

The carried-out survey allowed us to know the view of residents from various universities on fairly broad spectrum of questions dealing with visual impairment. Among the merits of the study, it should be noted that we succeeded to receive information from a large number of respondents from various cities during a short period of time, and its anonymous character allows to hope that the majority of statements were faithful and open. As possible shortages, a potential influence of subjective factors should be noted (for example, unwillingness to give true answers, haste and carelessness of answers).

As opposed to the survey of students carried before [7], which was of selected character due to low respondent activity, in the present survey, more than 80% of the total sample (91.5%) took part, and this allows to consider it as indiscriminate one. And the fact that the obtained results turned out to be to a great extent corresponding to the survey data of graduate students, outlines their authenticity. It is possible to acknowledge that both graduate students and residents of ophthalmic chairs of Russian medical universities highly appreciate the importance of high visual acuity. At the same time, more than a half of respondents have visual impairments (main of them being myopia) and use optical correction means. In both studies, insufficient awareness of a part of respondents on the state of their vision and gaps in ophthalmological knowledge (among residents, their proportion was somewhat lower in comparison with that among students).

We were able to establish that ophthalmology residents more rarely than students encounter problems with vision. That is why it is not likely that the state of own health is a key factor in the choice of future specialty for most of them.

CONCLUSIONS

For the first time ever, a survey is performed dedicated to the self-rating of the state of visual functions and refraction in residents starting their studies in the specialty 31.08.59 Ophthalmology in Russian medical universities. From 249 respondents, 58.2% notified of having ametropia (56.1% of them — myopia), 28.5% — astigmatism, 3.6% — other ophthalmic diseases. About a half (46,6%) of respondents encountered limitations in everyday life related to decreased vision. Most of the survey participants (59.8%) used means of optical correction or were in need of them, 19.7% estimated their vision as "bad" or "very bad", and about a half (45.0%) thought that their vision decreased during last years. Respondents ranked high the significance of good vision (9.73 points out of 10) and were inclined to take care on the state of their health (75.1% checked their vision and 68.3% visited the ophthalmologist during the last year). Unveiled were the insufficient awareness of the part of the respondents on the state of their vision (14.5% did not know their clinical refraction, 7.6% — about having astigmatism), as well as gaps of some residents in basic ophthalmological knowledge.

ADDITIONAL INFO

Authors' contribution. All authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study. Personal contribution of each author: E.V. Bobykin — concept and design of the study, collection and processing of material, writing the text; S.R. Avkhadeeva, V.B. Antonyan, A.E. Aprelev, S.Yu. Astakhov, N.Yu. Beldovskaya, T.V. Gavrilova, E.A. Drozdova, A.Sh. Zagidullina, N.G. Zumbulidze, T.G. Kamenskikh, M.A. Kovalevskaya, S.A. Korotkikh, O.I. Lebedev, Ya.A. Martusevich, I.B. Medvedev, P.A. Nechiporenko, D.F. Pokrovsky, M.N. Ponomareva, L.I. Solovyeva, A.V. Surov, E.V. Tur, L.A. Filina, A.Zh. Fursova, S.V. Chistyakova — concept and design of the study, collection and processing of material, editing; V.Ya. Krokhalev — statistical processing of material; S.B. Ismailova, P.N. Pozdnyakova — collection and processing of material.

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Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией. Вклад каждого автора: Е.В. Бобыкин — концепция и дизайн исследования, сбор и обработка материала, написание текста; С.Р. Авхадеева, В.Б. Антонян, А.Е. Апрелев, С.Ю. Астахов, Н.Ю. Белдовская, Т.В. Гаврилова, Е.А. Дроздова, А.Ш. Загидуллина, Н.Г. Зумбулидзе, Т.Г. Каменских, М.А. Ковалевская, С.А. Коротких, О.И. Лебедев, Я.А. Мартусевич, И.Б. Медведев, П.А. Нечипоренко, Д.Ф. Покровский, М.Н. Пономарева, Л.И. Соловьева, А.В. Суров, Е.В. Тур, Л.А. Филина, А.Ж. Фурсова, С.В. Чистякова — концепция и дизайн исследования, сбор

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REFERENCES

1. Alqudah AA, Bauer AJ, Aleshawi A. Refractive errors among medical students in Jordan: prevalence, types and possible risk factors. *Future Sci OA.* 2023;9(2):FSO839. doi: 10.2144/fsoa-2022-0075

2. Khalili AF, Razzaghi S, Motlagh BF, et al. Prevalence of refractive errors and its associated risk factors among medical students of Jazan University, Saudi Arabia: A cross-sectional study. *Middle East Afr J Ophthalmol.* 2021;27(4):210–217. doi: 10.4103/meajo.MEAJO_240_20

3. Aprelev AE, Setko NP, Korshunova RV. Frequency of myopia and functional indicators of visual organ in students of a medical institution. *Practical Medicine.* 2017;2(9):21–24. EDN: ZNLTHJ

4. Tikhomirova IYu, Zagidullina ASh, Valieva LS, Rakhmatullina RR. Analysis of risk factors accompanying myopia of various degrees in first-year students of Bashkir State Medical University. *Bulletin of Bashkir State medical University.* 2020;(S2):111–115. EDN: OCKOBM

5. Tretiakova YuD, Bobykin EV, Korotkikh SA. Results of an anonymous survey of the fifth-year students of the medical and prophylactic faculty of the Ural State Medical University on self-assessment of eye condition and visual functions. In: Proceeding of the VIII International science and practice conferences of young scientists and students: *"Topical issues of modern medical science and public health care"*; 19–20 Apr 2023; Yekaterinburg. Yekaterinburg: USMU; 2023. P. 2285–2290. (In Russ.)

6. Plotnikov DYu, Agliullina ST, Ashryatova LSh, et al. Analysis of the prevalence of myopia in medical students. *Medicine.* 2023;11(1): 25–34. EDN: CFIVDI doi: 10.29234/2308-9113-2023-11-1-25-34

7. Avkhadeeva SR, Aliverdieva EV, Astakhov SYu, et al. On the self-assessment of ocular status and of visual functions by senior students at Russian medical universities (anonymous survey results). *Ophthalmology Reports.* 2023;16(4):23–34. EDN: IWFEOE doi: 10.17816/OV609533

8. Hasan SJ, Castanes MS, Coats DK. A survey of ophthalmology residents' attitudes toward pediatric ophthalmology. *J Pediatr Ophthalmol Strabismus.* 2009;46(1):25–29. doi: 10.3928/01913913-20090101-09

9. Thomas A.S., Redd T., Hwang T. Improving the transition to ophthalmology residency: a survey of first-year ophthalmology residents. *J Clin Acad Ophthalmol.* 2016;08(01):e10–e18. doi: 10.1055/s-0036-1581109

10. Musa KO, Aribaba OT, Rotimi-Samuel A, et al. Subspecialty preferences among ophthalmology resident doctors in Nigeria. *Nigerian Journal of Ophthalmology.* 2017;25(2):123–128. doi: 10.4103/njo.njo_25_17

11. Binenbaum G, Volpe NJ. Ophthalmology resident surgical competency: a national survey. *Ophthalmology.* 2006;113(7):1237–1244. doi: 10.1016/j.ophtha.2006.03.026

12. Abdelfattah NS, Radwan AE, Sadda SR. Perspective of ophthalmology residents in the United States about residency programs and competency in relation to the International Council of Ophthalmology guidelines. *J Curr Ophthalmol.* 2016;28(3):146–151. doi: 10.1016/j.joco.2016.06.001

13. Harkins K, Agraz D, Aggarwal K, et al. Survey of ophthalmology residents to assess techniques for diagnosing macular edema. *Invest Ophthalmol Vis Sci.* 2017;58(8):4628.

14. Robles-Holmes H, Kolli A, Cox V, et al. Perspectives of U.S. ophthalmology residents and medical students on ophthalmology exposure during medical school. *J Acad Ophthalmol (2017).* 2023;15(1): e119–e125. doi: 10.1055/s-0043-1769463

15. Tsai ASH, Yeo BSY, Anaya Alaminos R, et al. Survey of ophthalmology training experiences among young ophthalmologists in the Asia-pacific. *Asia Pac J Ophthalmol (Phila).* 2022;11(5):434–440. doi: 10.1097/APO.0000000000000556

16. Chemodanov IG, Shestakov EA, Kamelskikh DV, et al. Assessement of knowledge and skills of clinical ordinators in transfusiology. *Bulletin of Pirogov National Medical & Surgical Center.* 2018;13(1):124–126. EDN: YVXIYX

17. Deriushkin VG, Gatsura OA, Kochetkova IO, et al. Testing of residents as a tool for assessing quality of their training in the discipline of public health and health care. *Medical Education and Professional Development.* 2022;13(3):20–29. EDN: KCVKYE doi: 10.33029/2220-8453-2022-13-3-20-29

18. Ivanov DO, Aleksandrovich YuS, Kulbakh OS, et al. The quality of post-graduate training of residents. *Annals of the Russian Academy of Medical Sciences.* 2019;74(5):333–341. EDN: RREUVG doi: 10.15690/vramn1177

19. Trukhacheva NV. *Mathematical statistics in medico-biological research using Statistica package*. Moscow: GEOTAR-Media; 2013. 384 p. EDN: THVXOF (In Russ.)

СПИСОК ЛИТЕРАТУРЫ

1. Alqudah A.A., Bauer A.J., Aleshawi A. Refractive errors among medical students in Jordan: prevalence, types and possible risk factors // Future Sci OA. 2023. Vol. 9, N 2. P. FSO839. doi: 10.2144/fsoa-2022-0075

2. Khalili A.F., Razzaghi S., Motlagh B.F., et al. Prevalence of refractive errors and its associated risk factors among medical students of Jazan university, Saudi Arabia: A cross-sectional study // Middle East Afr J Ophthalmol. 2021. Vol. 27, N 4. P. 210–217. doi: 10.4103/meajo.MEAJO_240_20

3. Апрелев А.Е., Сетко Н.П., Коршунова Р.В. Частота миопии и функциональные показатели органа зрения у студентов медицинского вуза // Практическая медицина. 2017. Т. 2, № 9. С. 21–24. EDN: ZNLTHJ

4. Тихомирова И.Ю., Загидуллина А.Ш., Валиева Л.С., Рахматуллина Р.Р. Анализ факторов риска, сопровождающих миопию различных степеней у студентов первого курса Башкирского государственного медицинского университета // Вестник Башкир-

ского государственного медицинского университета. 2020. № S2. С. 111–115. EDN: OCKOBM

5. Третьякова Ю.Д., Бобыкин Е.В., Коротких С.А. Результаты анонимного опроса студентов пятого курса лечебно-профилактического факультета Уральского государственного медицинского университета о самооценке состояния глаз и зрительных функций. В кн.: Материалы VIII Международной научно-практической конференции молодых учёных и студентов: «Актуальные вопросы современной медицинской науки и здравоохранения»; Апрель 19–20, 2023; Екатеринбург. Екатеринбург: Издательство УГМУ, 2023. С. 2285–2290.

6. Плотников Д.Ю., Аглиуллина С.Т., Ашрятова Л.Ш., и др. Анализ распространённости миопии среди студентов медицинского вуза // Медицина. 2023. Т. 11, № 1. С. 25–34. EDN: CFIVDI doi: 10.29234/2308-9113-2023-11-1-25-34

7. Авхадеева С.Р., Аливердиева Э.В., Астахов С.Ю., и др. О самооценке состояния зрительного анализатора и функций органа зрения студентами старших курсов медицинских вузов России (результаты анонимного опроса) // Офтальмологические ведомости. 2023. Т. 16, № 4. С. 23–34. EDN: IWFEOE doi: 10.17816/OV609533

8. Hasan S.J., Castanes M.S., Coats D.K. A survey of ophthalmology residents' attitudes toward pediatric ophthalmology // J Pediatr Ophthalmol Strabismus. 2009. Vol. 46, N 1. P. 25–29. doi: 10.3928/01913913-20090101-09

9. Thomas A.S., Redd T., Hwang T. Improving the transition to ophthalmology residency: a survey of first-year ophthalmology residents // J Clin Acad Ophthalmol. 2016. Vol. 8, N 1. P. e10–e18. doi: 10.1055/s-0036-1581109

10. Musa K.O., Aribaba O.T., Rotimi-Samuel A., et al. Subspecialty preferences among ophthalmology resident doctors in Nigeria // Nigerian Journal of Ophthalmology. 2017. Vol. 25, N 2. P. 123–128. doi: 10.4103/njo.njo_25_17

11. Binenbaum G., Volpe N.J. Ophthalmology resident surgical competency: a national survey // Ophthalmology. 2006. Vol. 113, N 7. P. 1237–1244. doi: 10.1016/j.ophtha.2006.03.026

12. Abdelfattah N.S., Radwan A.E., Sadda S.R. Perspective of ophthalmology residents in the United States about residency programs and competency in relation to the International Council of Ophthalmology guidelines // J Curr Ophthalmol. 2016. Vol. 28, N 3. P. 146–151. doi: 10.1016/j.joco.2016.06.001

13. Harkins K., Agraz D., Aggarwal K., et al. Survey of ophthalmology residents to assess techniques for diagnosing macular edema // Invest Ophthalmol. Vis. Sci. 2017. Vol. 58, N 8. P. 4628.

14. Robles-Holmes H., Kolli A., Cox V., et al. Perspectives of U.S. ophthalmology residents and medical students on ophthalmology exposure during medical school // J Acad Ophthalmol (2017). 2023. Vol. 15, N 1. P. e119–e125. doi: 10.1055/s-0043-1769463

15. Tsai A.S.H., Yeo B.S.Y., Anaya Alaminos R., et al. Survey of ophthalmology training experiences among young ophthalmologists in the Asia-pacific // Asia Pac J Ophthalmol (Phila). 2022. Vol. 11, N 5. P. 434–440. doi:10.1097/APO.0000000000000556

16. Чемоданов И.Г., Шестаков Е.А., Камельских Д.В. и др. Оценка знаний и навыков клинических ординаторов по трансфузиологии // Вестник Национального медико-хирургического центра им. Н.И. Пирогова. 2018. Т. 13, № 1. С. 124–126. EDN: YVXIYX

17. Дерюшкин В.Г., Гацура О.А., Кочеткова И.О. и др. Тестирование ординаторов как инструмент оценки их подготовки по дисциплине «Общественное здоровье и здравоохранение» // Медицинское образование и профессиональное развитие. 2022. Т. 13, № 3. С. 20–29. EDN: KCVKYE doi: 10.33029/2220-8453-2022-13-3-20-29

18. Иванов Д.О., Александрович Ю.С., Кульбах О.С. и др. Качество последипломной подготовки ординаторов // Вестник РАМН. 2019. Т. 74, № 5. С. 333–341. EDN: RREUVG doi: 10.15690/vramn1177

19. Трухачёва Н.В. Математическая статистика в медико-биологических исследованиях с применением пакета Statistica. Москва: ГЭОТАР-Медиа, 2013. 384 с. EDN: THVXOF

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