

PEDAGOGICAL SCIENCES

Syrovaya A.O.

Kharkiv national medical university, head of the department of medical and bioorganic chemistry, doctor of medical science, proffesor

Peretyaga L.E.

Kharkiv National Pedagogical University named after G.S. Skovoroda, PhD, assistant professor

Makarov V.O.

Kharkiv National Medical University, PhD, assistant professor of department of medical and bioorganic chemistry

Andreeva V.O.

Kharkiv National Medical University, PhD, assistant professor of department of medical and bioorganic chemistry

Tishakova T.S.

Kharkiv National Medical University, PhD, senior teacher of department of medical and bioorganic chemistry

PECULARITIES OF VOCAL LOAD OF CHEMISTRY TEACHERS IN MEDICAL UNIVERSITY

ABSTRACT

Teachers' professional activity in all fields is connected with high vocal load that has an adverse effect on their vocal apparatus. Additionally, specific factors associated with teacher's specialization affect too. Analysis of factors of professional activity of chemistry teachers in medical university has been done in this article. It was found that majority of teachers have insufficient level of knowledge about voice, can't use it correctly and effectively that results in occurrence of medical and psychological problems of different degree. Authors suggest that one of the effective ways of complex problem solving is a formation of teachers' vocal culture. This helps not only to learn how to reduce negative impact of professional activity factors on their vocal apparatus but promotes taking of skills to keep vocal apparatus in healthy and good working state.

Concept «vocal culture» consists of two multi-faceted concepts «voice» and «culture» every of which has several representations. Such as this concept is a new authors reveal structure of vocal culture and describe main ways of realization of this process which can pass spontaneously, by partially organized and specially organized way. The best result can be reached by the formation of vocal culture with special organized way during teachers' professional training. Problem of vocal culture formation for active teachers can be solved with the help of qualification upgrading courses and holding of travelling seminar-workshops at working places.

Keywords: *teachers, voice, functional voice disorders, vocal culture, professional training, prospective teachers.*

Introduction

Despite of active use of different teaching aids in teaching and learning process, voice for teacher (all specialties) has always been and remains main tool of professional activity. In public documents including laws of Ukraine "On education", "About general secondary education", "On higher education", state program «Teacher», National principles of development of education in Ukraine in XX century, National strategy of development of education in Ukraine to 2021 year there is a question about high requirements to the level of teacher's professional training, improvement of which is a purpose and means of social-economic and spiritual human progress. In other words, considering the problem of qualitative professional training of prospective teacher, important vocal aspect of his/her professional activity can not be ignored.

On the basis of psychologists' data efficiency of communication process on 55% depends on visual presentations connected with appearance, expression of mimic, gestures and on 38% is provided by voice quality, its intonation, crispness and emphasize, and only 7% is defined by words meaning.

That's why according to the classification of Union of European Phoniatricians profession of teacher belongs to the profession with high requirements of voice quality. Observations of teacher's professional activity and questionnaire results suggest that namely voice sets back teacher most frequently.

According to the data of doctors-phoniatriests teachers' voice problems appear 32 times greater than for common man. And although teachers are 4% of all working population, they gain the lead among all representatives of professions with heavy vocal load, composing 20% of all phoniatriest patients.

Many scientists, among which Z. Anikeeva, O. Lavrova, O. Orlova, L. Rudin etc. [1, 5, 6, 8, 9, 10], note that among all representatives of professions with heavy vocal load teachers are group of greatest vulnerability.

Vocal apparatus disorders reduce working efficiency practically for all healthy people and for representatives of professions with heavy vocal load, they create a hazard for occupational disability resulting in long-term disability and sometimes in invalidism leaving society without qualified specialists.

Voice is a «living» tool which reacts on changes in physical and psychological state of person sensitively, namely this tool suffers from influence of negative professional factors. Within this framework there is a need for a detailed study of the influence of factors of teachers' professional activity on the state of their vocal apparatus.

Object of research are chemistry teachers in Kharkov National Medical University.

Goal of research is of factors of professional activity of chemistry teachers in medical university for looking for effective ways for minimization of their effect on state of teachers' vocal apparatus.

Goals of research:

- to study problem state of prevalence of vocal disorders among the teachers and analyze influence of factors of chemistry teachers' professional activity on the state of their vocal apparatus;
- to propose effective ways for prophylaxis of vocal disorders during the work of teachers' vocal apparatus.

General methodology

The following methods of investigations are used in this study:

- analysis of national and foreign scientific literature;
- observations;
- questionnaire;
- measuring of teacher's lung power by audio-noise meter.

Literature review

Data of doctors- phoniatriests state that level of voice disorders among the teachers is 65% (O. Orlova). Lately there is an alarming worldwide increasing trend of a number of voice disorders among the teachers from 30 - 40% (30 – 60-thy years of XX century) to 55 – 60% over the last years of XX century. (O. Orlova). According to the most recent investigations 86 % of general academic school teachers have functional voice disorders (E. Romanenko). Significant part of scientists are interested in studying of voice disorders (A. Zuev, O. Kaglaev, G. Laymetene, A. Makuha, L. Trinos, S. Chernobelskyi, Heidelberg, Q. Heulliet-Martin, Sabol, Seinder, Wendier). World community is upset by negative trend of continuous growth of a number of voice disorders among the teachers and that's why alertness to voice problems are the main goals of the World Voice Day, which is celebrated yearly on April 16th. Aim of this celebration is to draw people attention to their voice and beef up knowledge about the maintenance tools of vocal apparatus in healthy and working state.

People, who have incorrect voice-leading resulting in overexertion of vocal apparatus, are susceptible to different voice disturbances (G. Bekbulatov, O. Lavrova, L. Dmitriev, Z. Anikeeva, N. Olenchik, I. Milaylovska etc.) State, that generally voice disturbances appear in working age (25–55 years) (O. Lavrova) and result in long-term disability and sometimes to invalidism (L. Goncharchuk, V. Pankova). Such health problems make teachers to change profession intentionally that in its turn keeps out of qualified specialists. Increasing of pension age in Ukraine makes teachers look after state of vocal apparatus keeping it in healthy and working state. New entrants into the teaching profession are the most liable to occurrence of voice disorders. According to the data published by O. Orlova 55% of young teachers have voice disorders of different degree during first year of work, but during further three year of work this value is 72%. This brings us to the conclusion that most of graduates of higher pedagogical educational institutions are not trained properly to vocal loads because they can't use voice correctly and effectively.

Because of wide occurrence of voice disorders among the teachers academic community must search into the causes of incidence rate of diseases associated with professional activity. Let's take a closer look at these problems.

Pedagogical profession is a very responsible and associated with high emotional tension. Teacher must always take into account audience's sentiment to maintain them in working state of «tonus». To do this teacher must not only maintain personal emotional tension but to cause it from others.

It is known that teachers' professional activity is connected with high emotional tension, that does not pass without traces for vocal apparatus. Teachers' inability to confront stress has a negative impact on a state of immune system, inhibiting it and making teachers vulnerable to action of microorganisms.

Research results give evidence that majority of teachers can not resist the stress. So, for example 87.2% of teachers have sleep disturbances, about 70% suffer from headache and 40% of teachers have persistent and occasional increasing of arterial tension. Signs of psychoemotional tension occur both among the teachers of exact sciences (83%) and teachers of humane sciences (80%). Observations show that only 17% of teachers make exercises focused on prophylaxis of neuropsychic defatigation, only 41% of teachers know procedures of autogenic training and less than 12% of them use it regularly [2].

On the basis of this teachers must learn all working practices for autogenic training for elimination of psychophysical loading to support whole organism and vocal apparatus in health and working state.

Furthermore teacher' professional activity is connected with high level of vocal loading depending on the usable time of vocal apparatus. According to the data of chronometry teachers use their vocal apparatus from 50% to 80% of working period [1, 8].

Heavy and constant vocal loading has a negative impact on the state of teacher's vocal apparatus, that's why occurrence of phonopathy results in rising of percent of persons with vocal fatigue [5]. Because of working peculiarities in postsecondary institution teachers should give three-four lectures or practical classes per day, total duration of which is about six clock hours. Situation is complicated by that teachers should speak not only for a long time within standard business hours but over the years of professional activity. This makes teacher to acquire knowledge and skills for maintaining vocal apparatus at healthy and able to work state.

Increased vocal loading also connected with high sound (strength) intensity of the voice. Observations show that teachers in medical university during lectures must work with a large number of students in amphitheatre and it needs usage of loudspeaker equipment (microphones). To provide sufficient level of flexibility and qualitative information perceiving teachers have to speak at the high level of voice production (more than 80 dB), while intensity of healthy voice is within the limits of 65 to 74 dB [1].

Observations show that teachers face the need of unintentional increase of voice under the emotions and enhance the audibility of their voice. This phenomenon was named «Lombard effect» (by the name of scientist who first described this effect). Often teachers raise voice automatically and don't take no notice of effects of voice overload, that is a core of vocal apparatus damage. In other words, the more intensive teacher's voice production, the higher level of negative influence on vocal apparatus. [4]. Despite of there are small quantity of students (15-18 persons) in the room during practical or laboratory classes that decreases teacher's vocal load, usage of chemicals during the carrying out chemical experiments can affect adversely principally on the

state of teacher's vocal apparatus because he/she accompany experiments with explanations.

Vocal load imbalance undermines on teachers' vocal apparatus during academic year (fig. 1).

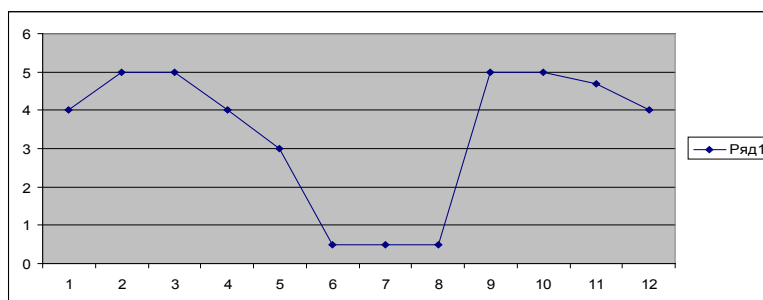


Fig. 1. Level of teacher's vocal load during academic year

Analysis of figure 1 allows us to note periods of rise and fall of vocal load. First period of maximal vocal load coincides with the beginning of academic year and I semester, that is accounted for period from September till November, but other maximal load coincides with the beginning of II semester (from November till March). The slight decrease in vocal load is observed in December, April and May, when the checks of learned material are carried out. The lowest level of vocal load is recorded from June till August (during teachers' summer recess). Martin directed attention to an interesting fact (2003): he found that during the first semester teachers feel certain problems in the work of vocal apparatus. It was found that during second semester problem worsen because of accumulation of the

problems in the work of vocal apparatus. In addition, high level of teachers' vocal load from October till November coincides with the growth of aerosol transmissible catarrhal diseases.

This period coincides with the beginning of the heating season in the premises, which leads to the over-drying of Schneiderian membrane and, as a consequence it results in loss of protective function followed by rising in problems in the work of teachers' vocal apparatus.

It is necessary to remember that teaching staff of educational institution mainly composes of women.

According to the data obtained by O. Orlova [5] voice disorder has been observed for women 8 times greater than for men (fig. 2).

Data about visiting rate of phoniatic cabinets

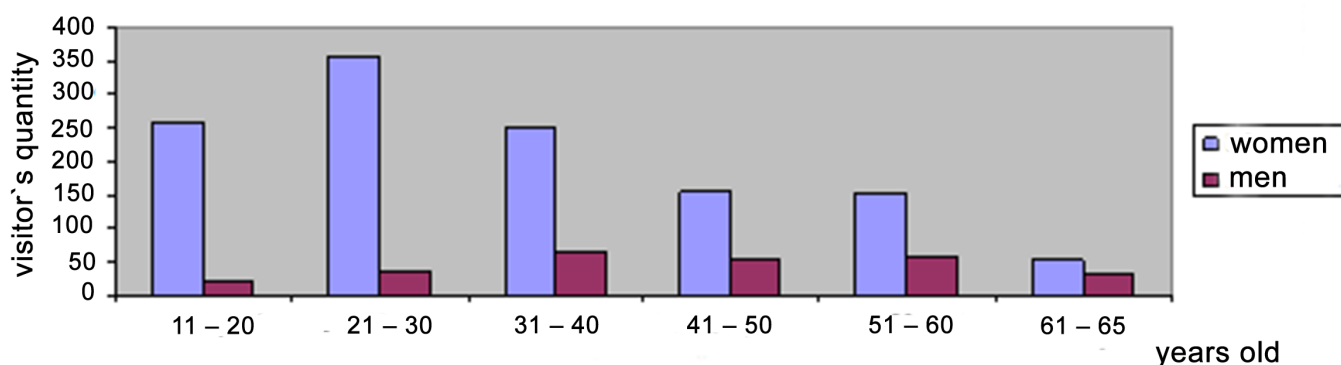


Fig. 2. Visiting rate of phoniatic cabinets (men/women)

High frequency of voice disorders among the women is explained by the structural peculiarities of vocal folds [1, 5, 6]. Men and women have different vocal fold sizes. The female vocal folds are shorter and thinner, they are between 14 mm long and 2 mm width. While the male vocal folds are longer and wider, they are between 19 mm and 22 mm long, and their width is in the range from 3,4 to 4,5 mm. Another reason of very common diseases are work features (rate of oscillation for female vocal folds is 160-340 oscillations per second, while for men this value is 85-200 oscillations per second) [11]. Hormone fluctuations taking place in female organism influence the state of vocal apparatus too. Besides, women are more emotional than men and that's why their vocal apparatus is vulnerable relation to rising of voice disorders. However, state of teachers' vocal apparatus is affected by additional specific factors, for example, chemical substances that are associated with chemistry teachers' professional activity.

For today, among the scientists (L. Rudin, Z. Anikeeva etc.)

there is a view that vocal load is a harmful occupational factor [6], creating conditions for incidence of various voice disorders. But we think that not so much vocal load as its unpreparedness becomes a reason of incidence of disorders. We are of the same view as R. West, who in 1957 noted: «it is not important what is a vocal load if vocal apparatus is prepared and used correctly» [10, p. 76].

So level of vocal load should always meet the capabilities of individual's vocal apparatus. Although everyone has their own individual «resilience», limits of it can be strengthened (depending on the physical and emotional status, age, level of training, etc.). But natural vocal features are inadequate for qualitative and safe usage of voice qualities in professional activity. With that in mind, improvement of voice qualities must precede active using of vocal apparatus in professional activity.

It has been established that teachers have insufficient level of knowledge about their voice, can not use it correctly and effectively that result in progression of medical problems at the

work of vocal apparatus, presenting to a variable degree from subjective sensation: rapid fatigability of voice, vocal range limitation, dryness of the throat, throat irritation, to total loss of voice and also to psychological problems associated with absence of mutual understanding between teacher and student audience.

Analysis of scientific literature permits to establish that today voice is a subject matter of many sciences: philosophy, sociology, culturology, psychology, linguistic, rhetoric, physics (acoustics), physiology, phoniatics, laliatry (phonopedia) etc. Every of science studies certain aspect of this difficult phenomena and has certain advances in that direction, but today single approach to the studying of voice was not formed. To have integrated knowledge about voice is very important for all representatives of professions with heavy vocal load. L. Rudin insists on the

necessity of multidisciplinary approach to the studying of man's voice.

Discussion

We consider that one of the attempt to approach a problem from the position of multidisciplinary cultural knowledge is a formation of voice culture. In spite of the fact that modern scientists (V. Bagrunov, S. Martin, L. Darnley etc.) use term voice culture they do not explain its content and structural components.

We review voice culture as personal, dynamic square formation with difficult horizontal and vertical structure [7].

Considering the fact that concept «voice culture» is a new and consists of two multiaspect concepts «voice» and «culture» every of which has several representation, authors regard it is necessary to examine its structure.

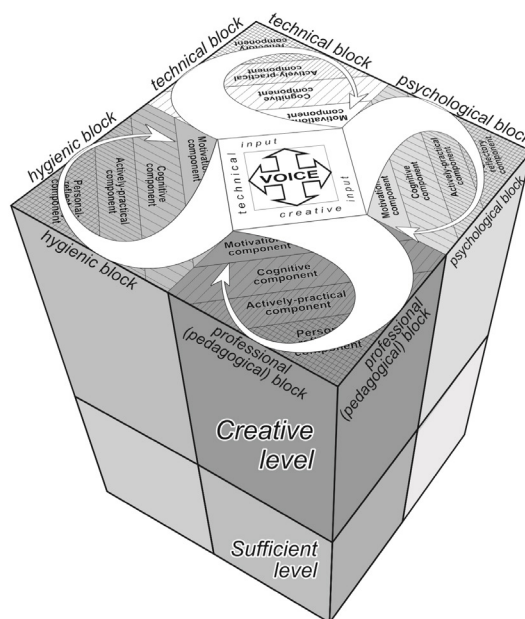


Fig. 3. Model of teacher's voice culture

Horizontal structure of voice culture consists of four inter-related blocks: professional (pedagogical) that provides relevant use of pedagogue's voice qualities depending on conditions and tasks of professional activity, technical forms "technical base" for active voice exploitation; provides preparation of vocal apparatus to increased vocal load: hygienic block maintains vocal apparatus in healthy and capable to work state and psychological block facilitates the achievement of mutual understanding with others by taking into account peculiarities of voice production.

Vertical structure of voice culture consists of four inter-related blocks: motivational-axiological (axiological stance on voice as to tool of professional activity, which is very delicate and can be easily damaged but difficult to restore), cognitive (integrative knowledge about voice that is heritage of different sciences about voice), actively-practical (ability to use voice quality correctly and effectively) and reflexive (ability to estimate and improve voice qualities).

Authors emphasize that between segregates of voice culture and blocks there are intercomponent and interblock connections that interinfluence leading to the development of every one. It is observed that voice culture is not passed genetically but must be formed for every representative of professions with heavy vocal load and first of all for teachers. Authors think that discussed process goes: spontaneously (instinctively at the process of professional activity), by partially organized and specially organized way. Authors believe that best result can be obtained

by special organized formation process of voice culture, which must be realized at the period of professional training of prospective teachers in pedagogical educational institution. This can assure sufficient level of voice culture formedness for correct, effective and safe using of vocal qualities in professional activity and orient prospective teachers on further work on self-improvement. However, for teachers-practicians this problem can be solved with the help of qualification upgrading courses and holding of travelling seminar-workshops at working places.

Conclusions

Taking all of this into account, it can be come to conclusion that:

1. High incidence of voice disorders among the teachers is a consequence of inability to resist negative professional activity's outcomes.
2. Effective way of decreasing of voice disorders is a formation of teachers' voice culture which must be realized at the period of professional training of prospective teachers but for teachers-practicians this problem can be solved with the help of qualification upgrading courses and holding of travelling seminar-workshops at working places.
3. Voice culture acquisition permits teachers to learn how to use their vocal apparatus correctly and effectively during the professional activity and minimize exposure of professional activity with a view to maintain vocal apparatus at healthy and able to work state. This not only elongates teachers' vocal

longevity but enhances the quality of digestion of educational material by students.

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Шовковий В.М.

доктор педагогічних наук, професор, завідувач кафедри методики навчання іноземних мов та прикладної лінгвістики
Інституту філології Київського національного університету імені Тараса Шевченка;

Патієвич О.В.

кандидат педагогічних наук, асистент кафедри іноземних мов для природничих факультетів
Львівського національного університету імені Івана Франка

МЕТОДИЧНА СИСТЕМА НАВЧАННЯ НАУКОВОГО ПИСЕМНОГО АНГЛІЙСЬКОГО МОВЛЕННЯ СТУДЕНТІВ МАГІСТРАТУРИ ПРИРОДНИЧИХ СПЕЦІАЛЬНОСТЕЙ УКРАЇНИ

ACADEMIC WRITING IN ENGLISH: METHODS APPLIED TO TEACH STUDENTS WITHIN A MASTER'S PROGRAMME IN SCIENCES IN UKRAINE

Shovkovyi V.M., Sc.D., Professor, the Head of the Department of Foreign Language Teaching Methodology and Applied Linguistics, Philology Institute of Taras Shevchenko National University of Kyiv;

Patiyevych O.V., Ph.D., Department of Foreign Languages for Sciences of Ivan Franko National University of L'viv

АНОТАЦІЯ

У статті йдеться про сутність методичної системи навчання наукового писемного англійського мовлення студентів магістратури природничих спеціальностей та уточнюється зміст вищезазначеного поняття. Подані характеристика основних жанрів наукового стилю, а саме: наукової статті, анотації та наукових тез, а також аналіз їх структурних компонентів. Окреслюються лінгвостилістичні характеристики наукових текстів, основні компоненти і структура методичної системи навчання, детально розглядаються аспекти вмінь, підходів, принципів, методів, а також система вправ для навчання написання основних академічних текстів, що реалізується в чотири етапи, взаємодії між якими надається особливе значення у процесі продукування текстів академічного стилю. Особлива увага відводиться проектній методиці, яка сприяє формуванню у студентів необхідних алгоритмів дослідницької діяльності. Метод вправлення розглядається в як важливий фактор у реалізації навчання письма. Стаття має на меті зробити свій внесок в ефективне застосування цієї методики, а також її подальшого розвитку

ABSTRACT

The article focuses its attention towards the essence of methods applied to teach academic writing to students doing their Master's Degrees in Sciences. The notion "methods system" has been given a more accurate definition. It also outlines linguistic and stylistic characteristics of academic texts, gives a deeper insight into the basic components and the structure of methods, the aspects of skills, principles as well as the system of exercises presented by four stages which have been defined by highlighting the key areas of agreement between them. The efficiency of project-based learning as the main component in the process of successful implementation of the suggested teaching technology has been emphasized. Finally, the potential of task-based learning has been considered as an important factor for teaching writing realization. The article tends to contribute to both the effective adoption of this methods and its further development.

Ключові слова: методична система, науковий жанр, науковий текст, навчання англійської мови, метод проекту, метод вправлення, студенти природничих спеціальностей, критерії оцінювання.

Keywords: method, academic genre, academic text, the English language teaching, project-based learning, task-based learning, Science majors, evaluation criteria.

Розвиток фундаментальних досліджень у галузі природничих наук (зокрема фізики та астрономії) нині можуть забезпечити лише наукові колективи за тісної взаємодії

науковців різних науково-дослідних організацій країн світу. Однією з передумов такої взаємодії є володіння науковцями іноземними мовами, яке набуло особливої актуальності