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Voice Culture of Chemistry Teacher

Key words: *teacher, voice quality, voice culture, vocal folds, voice strain, voice disorders, upper respiratory tract.*

Annotation: *Teachers are professionals with high requirements to the voice quality and the necessity to maintain the highest level of a voice culture. Voice disorders associated with high voice strain of teachers, wrong voice-technique, the effect of adverse external factors including chemicals and diseases of the upper respiratory tract. Proper and effective use of the vocal apparatus in the teacher's professional work possible only when they are acquiring the voice culture.*

Despite the extensive usage of the various technical means in teaching, the teacher's voice continues to be the main tool of his professional activity. According to chronometric studies, teachers actively use their vocal apparatus more than 60% of their working time. Teachers are professions with high demands on the voice quality in accordance with international classification (UEP). This is determined by the fact that 55% of information students receive through visual perception (expressive poses, facial expressions, gestures), 38% are provided by voice quality (modulating, pausing, crispness and accent) and only 7% are determined by the content (Mehrabian) (4).

However, the observations show that teachers rarely think about the potentials of their vocal apparatus, its condition, badly informed about the professionals who deal with voice problems, to whom and under what circumstances it is necessary to contact in case of problems with the voice. The fact that teachers often use their vocal apparatus in an unhealthy

state gives concern about negative consequences for it. All this factors indicate a low level of voice culture among teachers.

It should be noted that, traditionally, singers, actors, and later speakers were exclusively engaged in the preparation for development and improvement of voice. At the same time nobody purposefully focused on development of teachers' voice. This situation led to a high prevalence of voice disorders among teachers. In accordance with the data obtained from phoniatriests an alarming trend of increasing incidence of vocal apparatus appears among teachers from 30-40% in the 30 years of the twentieth century to 55-60% in the past decade (2). Teachers have 32 times greater voice problems than representatives of other professions. Representatives of voice professions during the peak of productive years (from 25 to 55) most often have voice disorders. (O.Orlova). Society has shortage in qualified professionals caused by voice disorders that lead to a long-term loss of working ability up to disablement.

This tendency could be explained by presence of stressful situations in modern life, increasing weekly voice strain. Persons that do not have skills in voice technique are most susceptible to voice disorders. Incorrect voicing technique and, as a consequence, overwork of vocal apparatus are common reasons for the emergence disorders that may result in occupational disability.

Let's consider the professional activity of chemistry teacher. The result of conducted analysis shows that voice strain of chemistry teacher during the school year is distributed unevenly. Peak of voice strain occurs at the beginning of the school year (September - October) in the first semester and in February - in the second semester, which is associated with a lecturing. Particularly negative voice strain has an impact on the vocal mechanism after a long period of summer vacations, when there was no need to speak for long period of time, loudly and daily. It should be noted that the lecturing in large auditoriums is connected with the necessity of loud speaking than usual, in order to ensure sufficient hearing. For example, the volume of the voice in ordinary conversation does not exceed 40 dB, and in large lecture halls lecturer's voice must be more than 55 dB. The use of voice in a forced manner, gives rise to various kinds of problems in the vocal apparatus.

It should be noted that teacher's work is closely linked to the constant attention towards the audience. It is necessary to hold the audience's attention via certain tone. This helps not only to maintain an emotional stress, but also cause response from students, forcing them to catch every word. Anxiety causes a considerable muscle tension and cover entire body, including respiratory and vocal apparatus speech defects as dull muffled voice, sudden hoarseness, shortness of breath and so on result from muscle stiffness. Capability to avoid muscle stiffness gives freedom and flexibility to the voice.

Observations show that very often teachers in class write on a blackboard. Inhalation of chalk dust causes the appearance of sore throat and discomfort during the explanation of the material. Therefore, it is safer to use a marker to work on the board, otherwise to monitor that sponges were always wet.

Beyond that, the professional activities of chemical teachers associated with the active use of various chemicals during the laboratory works.

Pathological changes in upper respiratory passages and mucous membrane of voice apparatus can be observed during influence of certain concentration of volatile toxic chemical compounds having irritant effect. Hydrochloric, sulfuric and nitric acids are used during

laboratory practical classes on medical and bioorganic chemistry. Chlorine, ammonia, sulphur gas, nitrogen oxides and other volatile aggressive substances are formed as products of chemical experiments. Vapor of these substances affects and causes severe hyperemia of mucous membrane in upper respiratory passages and even leads to formation of necrotic processes that negatively influence on phonation function of throat because its chondral skeleton is damaged. Spasm of the glottis, sore throat and cough occur after reflex impact caused by irritation of the mucous membranes interoceptor (1). In this regard, chemical experiments accompanied by the formation of volatile chemicals should be conducted in a fume hood. In order to minimize the risk of such substances experiments were carried out using the micro method.

According to British scientists' research, the teacher voice effect student' achievement. For this reason, teachers should speak dynamically, because monotonous speech quickly tires vocal folds, and it is difficult for students to listen to mumble speech.

We believe that it is essential for teachers to learn how to maintain healthy vocal apparatus because only healthy teacher is able to cope with the big voice strain. After all, educators more prone to colds, this is localized in the upper respiratory tract. This is due to the special sensitivity of their vocal apparatus for cooling, working conditions and mobility of nervous processes (5).

It is necessary to pay attention to unreasonable changes in voice, hoarseness and excessive fatigue. Teachers should correctly use their vocal apparatus and know that whisper and shout are equally harmful. During whispering vocal folds do not vibrate and the sound is formed by the noise. Prolonged use of whisper speech forms the wrong mechanism of phonation (3,4).

Considering everything said above, all teachers and especially chemistry teachers should acquire voice culture to ensure proper and efficient use of the vocal apparatus in professional work.

Voice culture is considered as a complex integrated unit, which is based on the latest achievements of various voice sciences (phoniatics, phonopedia, rhetoric, elocution et al.). This culture involves the formation of the solicitous attitude to the teacher's voice, necessary knowledge about the voice (structure and functioning of the vocal apparatus, types and causes of voice disorders that cause them, etc.), as well as skills necessary for the proper and effective usage of vocal apparatus (proper breathing, clear diction, the active use of resonator features the vocal apparatus) as well as continuous improvement of vocal apparatus in the course of professional activities.

We consider it necessary to introduce new subject "Voice culture" in the training process for future teachers and master classes for all university teachers which will improve the quality of students' knowledge, prevent teachers' voice disorders and extend professional longevity.

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