PROBLEMS AND FEATURES OF SITTING SITES IN THE MEDICINES OF MUSICS OF LIVING INSTRUMENTS

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Abstract

We can only assume how many types of seating specifics and positions exist, approximately as much as the number of different people. The chair as an object is available to all exists in various forms that are transformed depending on the material, it can be simple in its concept or with a different meaning, and this depends primarily on its purpose and which is the target group of users and the duration of use.

The base form consists of a horizontal surface at a standard distance from the floor intended to support the body while sitting, the vertical surface is set to support the back. Besides the basic elements, the chair consists of many more elements. The psychological connection with the user, which is stronger than with any other furniture, can be a symbol of status and belief. But when sitting, it enters a strict category of workplace, before the functional factors determine it. Factors of consideration are the specific seating positions in the synth orchestra and the problems that arise in a long-term sitting-room.

Musculoskeletal disorders related to musical performance are a problem for professional musicians. Given the numerous consequences that musicians have in using musical instruments, these consequences can be considered a threat to their professional activity.

Key words: chair, symphony orchestra, sitting position, ergonomics

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The furniture has the main function of the synthian orchestra, of special importance is the chair.

It has been established that man spends most of his life in a sitting position. This is largely due to the contemporary way of life of society and the ever-growing development of

new technologies. The ways of sitting that different types of chairs and appropriate application are of the utmost importance, which relate and directly reflect on the health of people.

An important factor in studying the modern development of work tables is familiarization with ergonomic factors and comfort in sitting.

The research on the profile and the functional dimensions of the seating furniture is the basis for a proper understanding of their shape, design and modern development.

The attempt to raise the quality of work in the working environment, where most of its time is spent, is the main driver introducing the development of this type of furniture. It should be emphasized that generally the design of desktops products is mainly associated with solving problems related to the search for comfort.

The chair as an object is available to everyone, exists in various forms. The base form consists of a horizontal surface at a standard distance from the floor intended to support the body while sitting, the vertical surface is set to support the back. Besides the basic elements, the chair consists of many more elements. The psychological connection with the user, which is stronger than with any other furniture, can be a symbol of status and belief.

The authors Fiell & Fiell write that the success of a chair is measured by how the designer made a synthesis of aesthetics and function while damping certain needs. Designer George Nelson argues that the shape of the chair consists of three factors: function, aesthetics and material.

In order to make an overview of this type of seating, one should first be divided into categories of specific job positions depending on the instrument and its intuition. They play a central role in man's everyday life and for this reason they appear as natural reflection, giving a clear idea of aesthetic taste, status in society and emotional behavior of users.

Ergonomics

Research and data from ecomonomy, designed as norms and standards, help optimize the use of humans and the use of a particular environment. When considering the anthropometric dimensions of the human body, the method of persantil (P) 5 and (P) 95 is applied. In economically developed countries there are specific surveys for working in a sitting position and with limited movement in the working position that enters the issues of ergodysyne. In his morphology and psychophysics, man is created in motion. Statistics show that up to retirement, a man sitting in a sitting position spends 80,000 hours in his sitting position. This causes damage to the spine, muscles, joints. Circulation of blood and lymphatic

fluid is impaired. From 70 to 80% of workers suffer from spinal diseases, and 30% of sick days are for the same reason. These data set high standards in seated ergonomic studies. All options that allow a diversified work flow, the transition to a sitting / standing position is preferred by the initial design stage. Another direction for improving the working position is made with furniture improvements, which provide the opportunity to increase comfort by selecting materials and changing positions on their surfaces.

It is clear that the most serious requirements regarding ergonomic norms are those that apply to the working environment. The latter is under strong pressure from innovative technologies and that new electronic devices work with increasingly rational dimensions and ease of use.

Sitting positions and its specifications among orchestra musicians

Due to the high physical and psychological demand for work, musicians have a high risk of developing a variety of health problems. This study aims to produce indications for musicians for the right music chair choice by analyzing the chair concepts. Based on the observed results it's another objective of this paper to reduce or to prevent the physical disorders through analysis of the sitting behavior and the upper body posture during the musicians' specific play position.

For continuous performance, the musicians need to acquire the right ergonomic movements and postures, the musician needs to apply minimum of physical effort to sustain the necessary body movement (Klein-Vogelbach, 2000).

A group of musicians that are in the focus of this paper are the string instrument musicians like the violinists and violists who often suffer from conditions in the body. The most critical points are the jaw, back, neck, shoulder and hands, which can be either nerve related or muscular disorders Remaining seated for a long time or the weight of the instrument is a result of inappropriate postures and stress on the body (Zaza, 1997). In order to conduct ergonomic analysis, the position between the musician and the instrument should be studied. Studies of the postural alignments are essential for gaining the right results for neck and hand positions (Foxman, 2006).

Musicians are seated during the entire performance period, looking for the best body position, seeking balance in order to obtain precision of movements in the instrumental execution.

Methods of research

For the purpose of this study and obtaining more information regarding the problems that string instrument musicians face we used articles, theses, different surveys in English and Spanish. Materials and bibliography in relevant books, magazines were also utilized. Studies that mentioned string instrumentalists, violinists and violists and professional musicians were included in the analysis. We created a short description of the chosen studies:

Study by	**Type of musicians**	**Methods used to analyze**	**Results**
Costa C (2003)	6 male violists, aged between 22 and 47 years.	There were semi-structured individual's interviews, an ergonomic work analysis and a printed questionnaire.	5 of the 6 subjects felt pain related to playing. Diagnoses: tendinitis, postural problem, psychosomatic problem and Repetitive Strain Injury (RSI). Treatment: physiotherapy (4 cases) and acupuncture (2 cases). The organization of the work allows them only a slight maneuvering margin to minimize the occurrence of pain.
Zaza C, Farewell V. (1997)	281 professional classical musicians and students from the Ontario Music University	Questionnaires and hypermobility measures were applied.	String musicians are 4x more likely to develop lesions related to playing music. Women were affected more.
Hagberg M, Thiringer G, Brandstrom L. (2005)	407 music students	A questionnaire was applied	Violinists have twice as much risk of developing pain in the neck, right shoulder and left forearm, when

			compared with pianists. Violists and violinists have a higher incidence of pain in the neck, shoulder, elbow and forearm than pianists.
Abreu-Ramos A, Micheo W (2007)	75 musicians from the Puerto Rico Symphony Orchestra	Questionnaire and neuromusculoskeletal evaluation	81.3% reported musculoskeletal disorders. Of these, 83.6% reported correlation with practicing. Lumbar pain was mentioned by 75.4%. Violinists and violists reported pain in the cervix and left shoulder.

Discussion

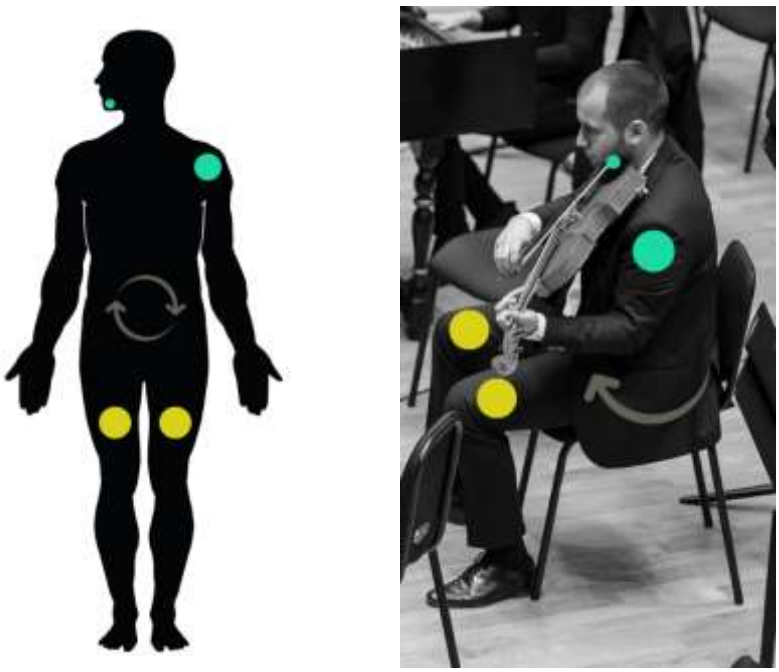

Figure 1 Graphic presentation of a human body and the common points where problems occur in sitting position. The same points are presented on a real example observed in the Macedonian philharmonic.

Even though the presented studies are conducted from a medical point of view, the results are valuable for us and for the research purposes of this paper. Through the conducted analysis we conclude that the most common problems that occur while sitting on the chairs and holding a sitting posture are problematic positioning of the feet, the rotation of the pelvic part, right rotation of the pelvic part, the head is bent and turned to the left, and the shoulders and elbows are in constant elevation (Medoff, 1999).

Issues of individual and gender-related anatomical variability, the use of improper chairs, the execution of extra-musical activities that produce muscle tension, the quality of the instruments used and the conditions of the room, with low lighting and temperature, are also important factors (Ostwald, 1994).

Hagberg (Hagberg, 2005) argues in his study conducted on 407 music students, based on a questionnaire among pianists and violinists, that violinists have twice as much risk of developing pain in the neck, right shoulder and left forearm; violists and violinists have a higher incidence of pain in the neck, shoulder, elbow and forearm than pianists. In order to locate the critical points where pain occurs while playing a string instrument, we have to acquire these kinds of information related to the performance of the body and the parts that are most used.

Figure 1 shows graphic representation of the human body and the critical points where problems occur. The yellow points are showing the problematic positioning of the feet in sitting position, the rotation of the pelvic part while the shoulders are in constant elevation.

The chairs analyzed in most of the cases as in our study, lack adjustment devices, except the rotating chairs for cello, so in this case the body has to adapt to the postural requirements involved in playing the violin (Petrus, 2005).

Conclusions

Musicians who play the instrument in a standing position can use the whole body, musicians in a sitting position cannot use their legs and knees to compensate for the asymmetrical moves the body takes in playing. A good chair should be reimbursed to maintain the most favorable position of the body where the bulk of the weight is prevalent in the ischemic tuberculosis or bone for sitting. Several metrological approaches have been conducted in this field in order to find out the negative effects that professional musicians have and occur in the musculoskeletal system.

The function and design of the chairs for the benefit of musicians is to provide comfort in sitting with professional musicians. Providing comfort and avoiding defects in the upper body position when playing the instrument, causing non-germanic static back pressure and non-ergonomic movements.

The research and explanation of the basic concepts related to the problem of sitting position in the symphony orchestra and product design suggestions give a precise representation of the considered and used solutions in relation to the different types of seating positions and the terminology relevant to the design for which it is intended i.e. for the type on the job position.

The choice of material is one of the most important factors in the design of chairs for specific seating positions, that is, musicians, because the concept of furniture creation supported by the appropriate material corresponding to the functional purpose makes the perfectionism and comfort of the work posture. When placing material that is not appropriate to the form, the idea of the design loses its meaning.

Bibliography

1. **Klein-Vogelbach (2000):** Klein-Vogelbach S, Lahme A, Spirgi-Gantert I. Musikinstrument und Körperhaltung—Eine Herausforderung für Musiker, Musikpädagogen, Therapeuten und Ärzte. Gesund und fit im Musikeralltag. Berlin, Heidelberg: Springerverlag; 2000.

2. **Zaza (1997):** Zaza C, Farewell VT. Musicians' playing-related musculoskeletal disorders: an examination of risk factors. Am J Ind Med. 1997.

3. Foxman (2006): Foxman I, Burgel BJ. Musician health and safety: Preventing playing-related musculoskeletal disorders. AAOHN J. 2006**.**

4. **Fry H (1988):** Fry HJ. The treatment of overuse syndrome in musicians. Results in 175 patients. J R Soc Med. 1988.

5. **Costa (2003):** Costa C. Quando tocar dói: análise ergonômica do trabalho de violistas de orquestra [dissertação] Brasília: Universidade de Brasília UnB; 2003.

6. **Hagberg (2005):** Hagberg M, Thiringer G, Brandström L. Incidence of tinnitus, impaired hearing and musculoskeletal disorders among students enrolled in academic music education: a retrospective cohort study. Int Arch Occup Environ Health. 2005.

7. **Abréu-Ramos (2007):** Abréu-Ramos AM, Micheo WF. Lifetime prevalence of upper-body musculoskeletal problems in a professional-level symphony orchestra: age, gender, and instrument-specific results. Med Probl Perform Art. 2007.

8. **Medoff (1999):** Medoff L, Hallberg K. Movement Training as an important factor in the training of the young violinist. Medical problems of performing artists. 1999.

9. **Ostwald (1994):** Ostwald PF, Baron BC, Byl NM, Wilson FR. Performing arts medicine. West J Med. 1994.

10. **Petrus (2005):** Petrus A. Produção musical e desgaste musculoesquelético: elementos condicionantes da carga de trabalho dos violinistas de uma orquestra [dissertação] Belo Horizonte: Universidade Federal de Minas Gerais; 2005.