ICEH CISA PORTO 2014

3rd INTERNATIONAL CONGRESS ON ENVIRONMENTAL HEALTH 2014

PORTO, 24th to 26th SEPTEMBER 2014

PROCEEDINGS BOOK

EMERGING RISKS AND CHALLENGES ON ENVIRONMENT, HEALTH AND SAFETY

Allied Health Sciences School of Polytechnic Institute of Porto, Portugal

Title:
3th International Congress of Environmental Health: Proceedings Book
3º Congresso Internacional de Saúde Ambiental: Livro de Resumos

Edition:
1st Edition / Book in 1 Volume, 520 pages

Authors / Editors:
Vieira da Silva, Manuela; Oliveira, Rui; Rodrigues, Matilde; Nunes, Mafalda;
Santos, Joana; Carvalhais, Carlos; Rebelo, Andreia; Freitas, Marisa; Xavier, Ana

Publisher:
(ESTSP-IPP)
Scientific Area of Environmental Health of Allied Health Sciences School of Polytechnic Institute of Porto
Área Científica da Escola Superior de Tecnologia da Saúde do Instituto Politécnico do Porto

Design / Layout:
4CS

Local / Date:
Porto / November 2014

ISBN:
978-989-20-5086-7

Legal Deposit:
384046/14

(ESTSP-IPP)
Scientific Area of Environmental Health of
Allied Health Sciences School of Polytechnic Institute of Porto

Rua de Valente Perfeito, 322
4400-330 Vila Nova de Gaia
Porto - Portugal
t. +351 222 061 000
f. +351 222 061 001
e. geral@estsp.ipp.pt
w. www.estsp.ipp.pt

Sound exposure of music students during the classes

Authors: Matilde A. Rodrigues[1], Marta Amorim[1], Manuela V. Silva[1], Cristina Rodrigues[1], Lívia Aguiar[2], Paula Neves[2], AidaSousa[3], Octávio Inácio[4]

1 *Research Centre on Environment and Health, Allied Health Sciences School of Polytechnic Institute of Porto, Portugal*
2 *Department of Environmental Health, National Health Institute, Dr. Ricardo Jorge, Porto, Portugal*
3 *Department of Audiology, Allied Health Sciences School of Polytechnic Institute of Porto, Portugal*
4 *Laboratory of Musical Acoustics, School of Music and Performing Arts of Polytechnic Institute of Porto, Portugal*

Presenting Author: Email: mar@estsp.ipp.pt | Tel.: +351 918 043 393 | Fax: +351 222 061 001

INTRODUCTION:

It is broadly recognized that professional musicians are at risk of developing ear pathologies due to the exposition to loud music in the course of rehearsals and performances (MacDonald *et al.*, 2008; O'Brien *et al.*, 2008; Jansen *et al.*, 2009). However, while much has been published regarding the sound exposure of professional musicians, particularly of orchestral musicians, little is known of the sound exposure of the music students. In fact, it is important to recognize that the musicians' noise exposure may start very early, in the course of their training as students, in the school classrooms and at homes.

Studies about sound exposure of music students and about their hearing pathologies are very scarce and do not contemplate all the important variables to analyze, particularly the influence of the class room, music style and instrument, as well as the class typology. However, they pointed that students can be exposed to high sound levels and Noise Induced Hearing Loss can appear (Phillips *et al.* 2010; Stewart *et al.* 2013). Therefore, this study is an attempt to better characterize this problem. However, it is important to note that the results present in this work are only referent to the first results of a bigger project, where different factors that can have influence on students' sound exposure are being studied, as well as the hearing effects analyzed.

OBJECTIVES:

This study aimed to characterise the noise exposition level in Jazz and Classic music students.

MATERIALS AND METHODS:

Measurements of the noise level were performed at a Conservatory of Music and in a Higher Music School. Evaluations of two groups of Jazz music students and one group of classic music students were performed independently on each school. Twelve students of jazz music style and thirteen students of classic music style were selected based on their chosen instrument and their place on the group/orchestral rehearsal. All the classes were evaluated with an acoustic dosimeter for a two-week period.

RESULTS AND DISCUSSION:

The results showed that the studied students are exposed to high noise levels in the curse of individual instrument classes and group rehearsals. In the classes without instruments practice the noise levels were lower. Other important finding is related with the differences between music styles. In general, the jazz music students are exposed to high noise levels than the classic music students, even in the group classes, were the number of instruments in the classroom was higher in classic music. These results can be related with the use of amplifiers in the course of rehearsals and to the encouragement to play high. The sound levels found for the jazz students in the classes with instrumental practice range between 66.6-99.2 dB(A) for percussion, 72.3-93.9dB(A) for contrabass, 87.9-96.4 dB(A) for vibraphone,82.4-96.2dB(A) for piano, 73.1-96.2 dB(A) for guitar, 88.4-101.6 dB(A) for trombone and finally between98.8-99.1 dB(A) for saxophone. For the classic students musicians, the sound levels range between 86.3-96.5dB(A) for percussion, 73.9-77.0 dB(A) for contrabass, 76.3-88.2 dB(A) for violin, 74.3-87.4 dB(A) for viola, 75.8-85,9 dB(A) for cello, 80.7-88.0 dB(A) for clarinet, 78.6-91.1 for bassoon and 92.0-93.0 dB(A) for French horn. We

also have found high values for the L_{Cpico} for specific instruments. Concerning, the saxophone it was exceeded the higher legal action level and for the piano and percussion it was surpassed the value for the exposition limit. Relatively to the theoretical lessons, the findings obtained showed values between 48,7 e 88,9 dB(A) exceeding once more the recommendation of 35 dB (A) proposed by the World Health Organisation.

CONCLUSION:

The findings of this particular study showed the need of an implementation of risk reduction measurements that would allow a reduction of the noise levels that the students are exposed in their own schools.

REFERENCES:

1. Jansen, E.J.M., Helleman, H.W., Dreschler, W. A., &Laat, J.A.P.M. (2009). Noise induced hearing loss and other hearing complaints among musicians of symphony orchestras. International Archives of Occupational and Environmental Health, 82(2), 153-164.
2. MacDonald, E.N., Behar, A., Wong, W. &Kunov, H. (2008).Noise exposure of opera musicians.Canadian Acoustics, 36 (4), 11-16.
3. O' Brien, I., Wilson, W., & Bradley, A. (2008). Nature of orchestral noise.Journal of the Acoustical Society of America, 124(2), 926-939.
4. Phillips, S.L., Henrich, V.C., & Mace, S.T. (2010). Prevalence of noise-induced hearing loss in student musicians.International Journal of Audiology, 49(4), 309-316.
5. Stewart, B., Beschoner, E., Gopal, K., Chesky, K., & Nelson, P. (2013). Auditory risk assessment of college music students in jazz band-based instructional activity.Noise and Health, 15(65), 246-252.