Author's response to reviews

Title: Prevalence of hearing loss induced by high sound pressure levels among people working with sound systems and general population in Brazil: a cross-sectional study.

Authors:

Regina P El Dib (re.lucci@terra.com.br)
Edina MK Silva (edinaksilva@terra.com.br)
Jose F Morais (jfmorais@pucsp.br)
Virginia FM Trevisani (vmoca@uol.com.br)

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Prevalence of hearing loss induced by high sound pressure levels among people working with sound systems and general population in Brazil: a cross-sectional study

Regina El Dib

Date: 23th November 2007.

Subject: 1st Reply to Referee’s comments

Note: The amended passage from the article was copied and pasted to this letter. I marked all changes in the text article in red color. Besides that, the answers regarding Peter Rabinowitz’s questions about the control group are finding in the end of this document and the amended passage is also in the manuscript in red color.

Dear Dr J. A. Le Good,

Thank you very much for the comments and suggestions made by both referees. It was very relevant for the quality of our study. I tried to address all the suggestions in the article. Please, let me know if you still have any doubt.

Sincerely yours,
Regina El Dib

INTRODUCTION

Comments ET1 and ET2: I corrected the words highlight in red color suggested by the reviewers. Besides that, I change some words in this first paragraph. Please, see below.

Amended passage: Music is present in our daily activities since the most ancient nations, establishing a link between the human being and the arts through the senses and pleasures. However, if we use music in a wrong manner, that is, if we abuse from the duration, intensity and/or periodicity of the music, the noise may become a problem to our hearing function.

Comments ET3, ET4 and ET5: I added and corrected the words highlight in red color suggested by the reviewers. Please, see below.
Amended passage: The induced hearing loss by elevated sound pressure levels (NIHL), excluding cases of acute acoustic traumas, is characterized by the gradual and progressive loss of hearing sharpness. NIHL occupies the second place amongst the most frequent hearing illnesses, being only surpassed by presbyacusis\(^{(1,2)}\) ….. In Brazil, noise has been recognized as ambient pollutant only since March 1991\(^{(3)}\). However, the epidemiologic data about hearing loss in Brazil are scarce and refer to certain activity branches, and therefore, there are no epidemiologic records that characterize the real situation…..

Comments ET6: I delete the following phase:
[phrase delete from the main manuscript] Furthermore, 28% of interviewed workers in a research reported that they are exposed to sufficiently elevated occupational noises in at least ¼ of their work time and that they need to increase the intensity of their voices to maintain a conversation in an environment between approximately 85 and 90dB\(^{(5)}\).

Comments ET7: Please, could you provide me the reference that I can update this percentage and the number of people exposed to noise during their work period because I tried again to find it in WHO and I only found the same reference that I cited in this article. I appreciated very much your help. Thank you.

Comments ET8: Thank you. I already changed to sensorineural.

Amended passage: Generally, NIHL is sensorineural, bilateral, symmetrical and irreversible. Those bearing the illness are likely to present a prolonged history of exposal to high noise levels (> 85dB/8hours/day), sufficient to cause a loss in the level and configuration observed in the audiological tests.

Comments ET9 and ET10: I changed the average between 5 to 20 years. Besides that, I change the word exposal to exposure everywhere as the reviewer suggested us.

Amended passage: Hearing loss is likely to have had gradually developed in a period between 5 to 20 years of exposure everywhere, in general\(^{(7,8)}\).
Comments ET11 and ET12: We replace the word soundmen to mixers and we delete the word audio operators.

Amended passage: Recently, there has been arising a general concern with the prevalence of NIHL caused by excessively amplified sound activities in leisure settings. Among those activities, we highlight the exposal of musicians, sound technicians, mixers, operators and editors of videotape and microphone operators exposed to intense and long lasting music.

Comments ET13: Sorry. We delete this phrase.

[phrase delete from the main manuscript] As technology and science advance in the manufacturing and creation of devices and machines to serve humankind, it also must advance our knowledge about the functioning of our body and the possibilities of prevention and protection against these elements which are the result from continuous and desired development.

Comments ET14: Thank you. We inserted the reference that it was the same reference of the phrase deleted.

Amended passage: Moreover, the decaying of the hearing function worsens the quality of life of the individual, and his/her communication, education, leisure activities, enduring economic consequences\(^9\).

Comments ET15: We rephrase the objective. Please, see below what do you think about it and let us know. Thank you very much.

Amended passage: Thus, the study purposed to gauge the prevalence of induced hearing loss by elevated sound pressure levels upon sound professionals and compares it with the control group with no occupational noise exposure.

Comments ET16: We state the total number of participants included in the study and we also inserted the number of excluded participants and the main reasons for it.

Amended passage: This research was approved by the Ethics Committee of the Federal University of São Paulo. Transversal comparative study between two groups: sound professionals and non-sound professionals. The sample consisted of 177 participants: 82 people working with sound systems and 95 members of the general population.
Following these criteria outline above, we excluded 19 patients in the sound professionals group because 11 of them were exposure to sound activities less than five years and eight patients were less than 19 years old. Regarding the control group we excluded seven patients because six did not fill the inclusion criteria regarding age and, one patient due to presence of excess earwax.

Comments ET17: I am sorry. We also excluded participants in the control group that were exposure to another kind of work as manufactury, bus driver, etc. Please, find the rephrase below.

Amended passage: We also excluded from this group workers exposed to high industrial noise, bus driver, etc.

Comments ET18: Thank you, we delete the short phrase “popularly known as”.

Amended passage: We considered as exclusion criteria, sound professionals and non-sound professionals with the use of individual sound amplifier devices (hearing aids)…

Comments ET19: We corrected the word ‘hearing passage’ to ‘ear canal’.

Amended passage: …individuals with reduction of the external acoustic ear canal and the presence of excess earwax (otorrhoea).

Comments ET20 and ET21: We corrected the words as suggested. Thank you!

Amended passage: The evaluations and questionnaires were applied in the Centro Cochrane do Brasil, in the Record TV Broadcasting Network and in Cultura TV Broadcasting Network, São Paulo, Brazil. For carrying out the audiometric examinations we used portable acoustic booths. We considered as silent room, the ambient everywhere with noise levels varying between 55 and 60 dB, according to the Technical Standard of Administrative Rule no. 3214 of the Ministry of Labour and Workplace Safety Office\(^\text{10}\).

Comments ET22: We corrected the word as suggested.

Amended passage: We verified the hearing level of the participants in the following frequencies: 250Hz, 500Hz, 1000Hz, 2000Hz, 3000Hz, 4000Hz, 6000Hz and 8000Hz. Moreover, we performed the speech audiometry\(^\text{11}\).

Comments ET23: Sorry. I did not understand what sentence you suggested us to skip. Please let me know it. Thank you.
Comments ET24: Sorry. We would like to keep the following term ‘Hearing loss by elevated sound pressure levels’ (NIHL) as suggested by the Health Minister of the work. Please, see reference below:


Comments ET25: We corrected the word as suggested.

Amended passage: It was requested from the sound professionals a 14-hour hearing rest, according to the Technical Standard of Administrative Rule no. 19 of the Ministry of Labour and Workplace Safety Office, dated April 22\textsuperscript{nd}, 1998\textsuperscript{(4)}. We applied a questionnaire about the hearing habits, correlated complaints and we surveyed data from the participant (clinical history and time of exposure to sounds). It was also carried out a visual inspection of the ear canal of the participants through otoscope, to eliminate the presence of obstructions that would alter the examination’s result\textsuperscript{(10)}.

Comments ET26: We understand that when we have to calculate the sample size we must to use only one outcome to perform it, usually it is the primary outcome of the study. That’s why here in the sample size session we did not report anything about tinnitus, but we calculate our sample size based on the NIHL.

Comments ET27: Thank you. We already corrected it.

Amended passage: Kolmogorov-Smirnov test.

Comments ET28: I think it was missing some punctuations and words. Please, see if now it is better.

Amended passage: Table 1 shows a predominance of individuals within the age group between 25 and 35 years old in the sound professionals group (40.2\%) and in the
non-sound professionals group (54.7%) but without significant statistical difference between the frequencies of the age ranges (all age ranges presented \( p > 0.05 \)), and neither between the age averages \( (p = 0.122) \). As to the ratio of female professionals \( (p = 0.718) \) in the study groups…

Comments ET29: We already changed the word and explain in the method session about how this was queried.

Amended passage: In relation to the **music listening habits**, it was not found any significant statistical difference between the two studied groups.

[method session] We applied a questionnaire about the **music listening habits** (we asked if the participant goes to disco and/or if they listen walkman or iPod at least one time per week, previous or actually)…

Comments ET30: We already changed the word and explain in the method session about how this was queried.

Amended passage: Table 2 shows the distribution of the participants of the sound professionals group, according to the hours worked per day, time worked as a professional and use of **hearing protective device**.

[method session] … **music listening habits** (we asked if the participant goes to disco and/or if they listen walkman or iPod at least one time per week, previous or actually), use of hearing protective device (we considered the use of hearing protectors if the participant from the sound professional group reported the use of it at least 20% of the total of time of their work. For example, nine years working as sound professional and only two years using hearing protective device \( (9 \times 20\% = 1.8) \). In this case, we did not considered the use of hearing protection)…

Comments ET31: Thank you very much. We already modified as you suggested us.
Amended passage: On table 2, one may observe a predominance of sound professionals who work between 6 and 12 hours per day (57.3%). The majority of participants bear as time worked between 5 and 14.9 years. However, it is observed that the majority of sound professionals do not use auricular protectors.

Comments ET32: (The same as comments ET24): Sorry. We would like to keep the following term ‘Hearing loss by elevated sound pressure levels’ (NIHL) as suggested by the Health Minister of the Work. Please, see reference below:


Comments ET33: We replaced to the methods session. Thank you.

Comments ET34: We replaced to the results session. Thank you.

Comments ET35: Sorry, did you refer about the Nudelmann 2001? If so, please, could you provide me the current reference that I can update my results.

Comments ET36: Reference checked!

Amended passage: 108 and 110 dB.

Comments ET37: Changed to NIHL.

Amended passage: In accordance with Santos & Morata (1999)\(^{(29)}\), factors such as gender and age have been described as worsening factors for NIHL.

Comments ET38: Changed to tinnitus.

Amended passage: This results was already expected and corroborates with the results from various studies carried out with musicians from street carnival blocks, DJs, symphonic orchestra musicians and others, which described as the most frequent complaints reported tinnitus and dizziness\(^{(17-28)}\).

Comments ET39: We would like to keep with these informations if you do not mind because it is mapping the knowledge of hearing loss somehow.

Comments ET40: Changed to SNHL.
Comments ET41: We checked the spelling of the word ‘preconised’ and it seems correct.

Answers regarding Peter Rabinowitz’s questions

Major Compulsory Revisions

1) The control group (non-sound professions) was selected by invitation. The participants of this group were doctors, students and employments from the Federal University of São Paulo, Brazil, and they did not know about possible presence of hearing loss. (please, find in the text of the manuscript this passage).

2) Sorry, we did not see these issues (educational, economics and other socioeconomic factors) because we were not evaluating some kind of intervention to promote the wearing of hearing protections. Instead of it, we were only evaluate the hearing loss in a cross-sectional study.

3) Yes, we do asked for each participant about possible ototoxic exposures. Please, see the data added in the manuscript in table 1 and below:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sound Professionals</th>
<th>Non-sound Professionals</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=82</td>
<td>n=95</td>
<td></td>
</tr>
<tr>
<td>Ototoxic exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>42</td>
<td>84</td>
<td>88,4</td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
<td>11</td>
<td>11,6</td>
</tr>
<tr>
<td></td>
<td>51,2</td>
<td>88,4</td>
<td></td>
</tr>
</tbody>
</table>

*aChi-Square Test

Minor Essential Revisions

4) We already change the word ‘exposal’ to ‘exposure’. I am sorry for this mistake. In fact, the manuscript was revised by native English who lives in Brazil. However, as I am living now in Canada I will try to find someone to do it for me. Sorry again for it.

5) We already changed the noise measure values to results and not discussion section. Thank you again. We based the 8 hour time average following the reference of Nudelmann AA, Costa Eada, Seligman J, Ibañez RN. PAIR: perda auditiva induzida por ruído. Vol. II. Rio de Janeiro 2001.

6) Yes, that’s right. Our findings is a little higher compared with others studies such as Cunningham, 2006 (39% and 9%). Maybe we can attributed this results because most of the sound professional worked or work in open shows events, in other words, in places where the sound is extremely higher. I added this information on the manuscript.