PRELIMINARY RESULTS OF A STUDY OF LEVELS OF NOISE POLLUTION AND ITS HEALTH IMPACTS DUE TO SCHOOL WESTERN BANDS

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Unwanted sound is called noise and surpassed noise can course harm to humans. The level of harm is determined by noise parameters like L_{Aeq} (equivalent continuous sound pressure level), L_{Cpeak} (peak frequency), exposed duration, dominant frequencies of noise spectrum etc. If exposure is large and long mental or physical weakness would be severe. According to literature noise may affect to tinnitus, hearing loss, sleep disturbances, hypertension, high stress level etc. Especially, there are no mechanisms to recover the hearing cells in ears if they get damaged. Therefore, when engaging with noise emitting activities, especially children, the level of noise has to be monitored carefully. The aim of this research is to analyse the above noise parameters of school western bands where children are exposed largely to heavy noise in more sensitive frequencies as players or close audience for long time durations. The perceived sound level is measured by equivalent continuous sound pressure level (L_{Aeq}). B&K hand held analyser Type-2250 (IEC 61672-1; 2002 Class1) was used to measure the $L_{Aeq}$and analyser was suitably calibrated. The emitted sound pressure levels were measured separately for Snare drums, Side drums, Cymbals, Euphonium, Flute, Trumpets, Clarinet and Trombone for 5 minute period each for the analysis of frequency spectrum. All instruments together were played for 30 minute period in the near free field when taking measurements for analysis of L_{Aeq}. Measurements were taken randomly from 20 school bands in Southern province in Sri Lanka.

The result revealed that the band players and audience closer than 5 m from the band are exposed to L_{Aeq} of (100.2 $\pm$ 4.7) dB of wide range of frequencies during the 30 minute period. The recommended value by National Institute for Occupational safety and Health (NIOSH) for same time period is 97 dB (A). The average of L_{Cpeak} values of all 20 measurements was (135.8 $\pm$ 1.8) dB. According to the WHO guidelines, the permissible sound pressure level of any kind of sound for school children shouldn't exceed the recommended value of 120 dB. This level of sound could course permanent deafness among the school children and reduce their cognitive effects: performance in reading, concentration, memory and attention. The frequency spectra recorded from all 20 bands shows common peaks at 80, 125, 160, 250, 630, 1000, 1250, 4000 and 16000 Hz. The recorded L_{Aeq} vales at all above frequencies were in the range of 90-103 dB except at 630 Hz, where the range is from 85-90 dB. Therefore, all players of the band have been exposed to this high noise. The immediate impact on them is Temporary Threshold Shift (TTS) of hearing and that would take 20-40 minutes of recovery time. However, this exposure may cause Permanent Hearing Shift (PHS) and it will not recover with time.

Keywords: Health impacts, Noise parameters, Permanent Hearing Shift