

## Abstract

**Introduction & Background:** Hearing loss is one of the most challenging problems confronting medicine. It may affect the victim's personality adversely enough to lower the quality of life. According to WHO global estimates on prevalence of hearing loss, 2012 about 10% of the adult population in the Asia Pacific region is suffering from hearing loss. However, the prevalence of hearing loss in Malaysia according to various studies has reported that it is more than the WHO estimate. High prevalence rates of mild hearing loss among the primary school children revealing poor academic performance has been reported from Malaysia. Therefore, hearing screening should routinely be carried out. Hearing impairment is most accurately measured by a clinical pure-tone audiogram. This method however is not suitable for large-scale, population-based epidemiological studies since requires the study participants to visit a clinic, trained personnel and sound proof room etc. An alternative approach to measuring hearing ability is self-estimation through questionnaires. With advances in computer technology, low-cost computer-based hearing screening test has been developed. The evolutions of eHealth and telemedicine have shifted focus from patients coming to the hearing clinic for hearing health evaluation towards the possibility of evaluating the hearing status remotely at home. **Aim:** To determine the hearing status of adults by comparing audiometric findings and internet-based hearing screening test among adults to establish the validity of internet based hearing test. In addition to assess the potential risk factors associated with hearing loss by using questionnaires. **Methods:** This cross-sectional study was done at AIMST physiology laboratory, Faculty of Medicine. A total of 256 participants (18 to 40 years of both genders) were recruited from AIMST University by simple random sampling method, of which 245 had completed all the procedures. The procedures followed were in accordance with ethical standards. The study was carried out by using PTA (pure tone audiometry), two internet-based speech-in-noise tests – internet test (1) (HearCom Digit Triplet Test offered by MED-EL) and internet test 2 (Speech in Noise Test by National Health Service), and survey questionnaires. The internet-based hearing tests were done by an Asus Vivo book laptop, running Windows 8.1, and a pair of Pioneer SE-MJ721-k headphones. Results of PTA, internet tests and questionnaire data were compared and analyzed using SPSS. **Results:** The prevalence of hearing loss was 26.1% with PTA and 5.3% with internet test 1 and 47.3% with internet test 2. Pearson correlation coefficients were calculated

in order to establish the amount of association between the different tests. Among two internet-based hearing screening tests, internet test 1 is significantly correlated with PTA averages ( $p < 0.05$ , 2-tailed) and the correlation coefficients showed weak association between the different tests. However, there were few limitations such as noise levels of computers and the surrounding environments and unstable internet network, the validation study showed small difference between the internet test 1 and PTA results. **Conclusion:** Though an internet-based hearing test cannot replace a clinical pure-tone audiogram, it is a feasible screening tool for hearing ability in a large-scale population considering for Malaysian population. The study showed a significant correlation between audiograms and internet-based hearing tests and significant differences with associated factors as evaluated by using an extensive questionnaire including questions about attitudes towards noise. This study suggests that internet-based hearing test is feasible to screen for hearing status online and the data are of great value in applications and for advance studies.