

UNIVERSITI TEKNOLOGI MARA

**A STUDY OF NOISE EXPOSURE AND HEARING
LOSS AMONG WORKERS AT A MANUFACTURING
INDUSTRY**

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Abstract

A Study of Noise Exposure and Hearing Loss among Workers at a Manufacturing Industry

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Excessive noise exposure to the workers at the workplace leads to noise-induced hearing loss (NIHL). Trimming and cutting the panels, repairing defected tools and others were the activities that produced high noise levels in the composite components manufacturing. A comparative cross-sectional study has been carried out to determine the relationship between noise exposures and hearing loss in 30 exposed workers and 30 unexposed workers (n=60). Respondents were selected by stratified random sampling. Noise mapping was done by using sound Digital Impulse Sound Level Meter (D-1405E & D-1422C) Type 2A. Time-weighted average (TWA of 8-hour) personal noise exposures were obtained by using Noise Dosimeter (EDGE Models eg. 3 and eg. 4). A standardized audiometric procedure was done under full supervision of OSH Doctor. Result shown significant difference ($p=0.001$) in noise exposure levels between exposed workers [77.1 to 96.4 dB (A)] and unexposed workers [50.0 to 61.0 dB (A)]. Hearing loss symptoms shown significant differences for buzzing in the ear ($p=0.037$), difficulty to hear in noisy environment ($p=0.024$), raising the voice to communicate ($p=0.024$) and raising the radio volume after work ($p=0.037$). Audiometric testing results had shown that both groups developing NIHL with 46.7% (exposed) and 33.3% (unexposed) respectively. Study also found there is no significant association between noise exposure levels and hearing loss for both groups ($p=0.292$). This is supported by direct observation where 66.67% of exposed workers wore the hearing protective device (HPD) as required. Since evidence indicated that they were symptoms and development of hearing loss, audiometric testing is suggested to be performed within the first six months of employment to reduce the potential of hearing loss.

Keywords: Noise exposure level, time-weighted average (TWA), noise-induced hearing loss (NIHL), audiometric test, Malaysia.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Sound can be measured objectively but noise is a subjective phenomenon. Bridger (1995) defined noise as a sound or sounds at such amplitude as to cause annoyance or to cause interfere in communication (as cited in Mohzani *et al.*, 2007). Noise defined as 'unwanted sound', is perceived as an environmental stressor and nuisance. Exposure to continuous noise of 85–90 dB (A), particularly over a lifetime in industrial settings, can lead to a progressive loss of hearing, with an increase in the threshold of hearing sensitivity. Hearing losses are the most common effects among the physiological ones. It is possible to classify the effects of noise on ears in three groups; acoustic trauma, temporary hearing losses and permanent hearing loss (Atmaca *et al.*, 2005).

Occupational noise is a widespread risk factor, with a strong evidence base linking it to an important health outcome which is hearing loss. Studies showed a strong association between occupational noise and Noise-Induced Hearing Loss (NIHL), an effect that increases with the duration and magnitude of the noise exposure (World Health Organization [WHO], 2004). NIHL is the most serious health effect from occupational noise which results from irreversible damage to the delicate hearing mechanisms of the inner ear. NIHL typically involves the frequency range (pitch) of human voices and thus interferes with spoken communications (Nelson *et al.*, 2005). In addition, NIHL is measured by comparing the threshold risk factor and its health outcomes of hearing at a specified frequency with a specified standard of normal hearing, and is reported in units of decibel hearing loss (dBHL) (Concha-Barrientos *et al.*, 2004).