

The relationship between air traffic noise and its induced annoyance in the southwest area in Tehran, Iran

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Abstract

Introduction: Noise pollution in urban areas has been recognized as a major problem. Since hearing damages are the main concern of noise exposure, other physical and psychological effects should not be ignored. Noise-induced annoyance and consequently its side-effects, such as fatigue and loss of concentration, would increase the probability of human errors occurrence and occasionally irreversible occupational accidents. This matter show the importance of noise exposure level from the standpoint of both community health and workplace safety.

Material and Method: This cross-sectional study was conducted to investigate the annoyance caused by air transportation noise in tehran, 2014. In this sense, a sample of 200 individuals were selected from residential and nonindustrial noise-exposed population in four southwest regions in Tehran. Following, the study questionnaires including annoyance (Recommended based on ISO 15666-2003), visibility of airplane, noise perception, and demographic variables were distributed and completed by the participants. Data obtained from Integrated Noise Model (INM) and geographic coordinates of measurement stations, recorded by Glocal Positioning System (GPS), were entered into the GIS software in order to estimate air traffic noise.

Result: The present study showed that the equivalent sound level of all regions during night, the day average sound level only in the Simetry Jey area, and the average night noise level in all regions except Dorahi Ghopan were more than the acceptable level; and the most percentage of people with high annoyance was belonged to night annoyance rate. On the other hand, the correlation between day level (DL) and day annoyance rate ($P=0.01$, $R=0.142$), night level and night annoyance rate ($P=0.004$, $R=0.334$), and Day-Night Average Sound Level (DNL) and the day-night annoyance rate ($P<0.0001$, $R=0.235$) were obtained statistically significant.

Conclusion: Adopting management strategies for reduction of number of night flights or engineering measures such as improving construction to decrease the rate of receiving noise by exposed people can have a positive considerable effect on declining noise pollution and individuals' annoyance rate.

Key words: Air Traffic Noise, Integrated Noise Model, Noise Annoyance

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