

ABSTRACT

Environmental noise considered as a concern of public health and environmental health issues. Several studies show that environmental noise exposure leads to annoyance, cardiovascular disease, hearing loss, sleep disturbance, and tinnitus. Transportation is known as the main source of environmental noise. Railway noise that exceeds environmental quality standards can cause both auditory and non-auditory effect. The purpose of this research was to analyze the influence of railway noise intensity on hearing loss as an auditory effect as well as blood pressure and sleep disturbance as a non-auditory effect of housewives living around the railroad.

This research was an analytic observational, used a cross-sectional design. The samples were 40 housewives, taken by simple random sampling. The measuring of noise level took place in 25 houses using Sound Level Meter. Hearing loss measured by the whisper test. Blood pressure measured by sphygmomanometer. Sleep disturbance measured by questionnaires. Those data were analyzed statistically using Chi-Square, Mann Whitney, and Multiple Logistic Regression.

The results of day-night noise measurements (L_{SM}) was 66.6 dBA which means it has exceeded the standard of noise level set for a residential area (55 dBA). The results showed a significant influence between noise intensity ($p=0.028$; $OR=6.909$) on hearing loss, noise intensity ($p=0.028$; $OR=6.909$) on blood pressure, and noise intensity ($p=0.003$; $OR=18.000$) on sleep disturbance. The most influential variable on hearing loss and sleep disturbances are the intensity of railway noise ($p<0.05$). Meanwhile, the most influential variable on blood pressure was salt consumption ($p = 0.012$; $Exp (B) = 0.086$).

The conclusion of this research is railway noise can influence neither auditory effect nor non-auditory effect on housewives living around the railroad. Control efforts such as resident settlement distance arrangement (at least 6 meters away from railroad) and soundproofing installation are needed to minimize the risk of noise.

Keywords: railway noise, auditory effect, non-auditory effect, housewives

ABSTRAK

Kebisingan lingkungan merupakan masalah bagi kesehatan lingkungan dan masyarakat. Beberapa studi menunjukkan bahwa kebisingan lingkungan mengarah pada permasalahan seperti perasaan terganggu, penyakit kardiovaskular, gangguan pendengaran, gangguan tidur, dan tinnitus. Transportasi dikenal sebagai sumber utama kebisingan lingkungan. Kebisingan kereta api yang melebihi baku mutu lingkungan menimbulkan efek auditori maupun efek non auditori. Penelitian ini bertujuan untuk menganalisis pengaruh intensitas kebisingan kereta api terhadap efek auditori berupa gangguan pendengaran permanen serta efek non auditori berupa tekanan darah dan gangguan tidur pada ibu rumah tangga yang tinggal di pemukiman sekitar rel kereta api Kelurahan Sukosari Madiun.

Penelitian ini merupakan penelitian observasional analitik dengan pendekatan *cross sectional*. Sampel penelitian yaitu 40 ibu rumah tangga, didapatkan dari *simple random sampling*. Intensitas kebisingan diukur pada 25 rumah responden menggunakan *Sound Level Meter*. Gangguan pendengaran diukur menggunakan tes bisik. Tekanan darah diukur menggunakan sphygmomanometer. Gangguan tidur diukur menggunakan kuesioner. Data penelitian dianalisis menggunakan statistik *Chi-Square*, *Mann Whitney*, dan *Multiple Logistic Regression*.

Hasil pengukuran intensitas kebisingan siang malam (L_{SM}) sebesar 66,6 dBA telah melebihi baku tingkat kebisingan yang ditetapkan untuk kawasan pemukiman yaitu 55 dBA. Hasil penelitian menunjukkan adanya pengaruh yang signifikan antara intensitas kebisingan ($p=0,028$; $OR=6,909$) terhadap gangguan pendengaran, intensitas kebisingan ($p=0,028$; $OR=6,909$) terhadap tekanan darah, dan intensitas kebisingan ($p=0,003$; $OR=18,000$) terhadap gangguan tidur. Variabel yang paling berpengaruh terhadap gangguan pendengaran dan gangguan tidur adalah intensitas kebisingan kereta api ($p<0,05$). Sementara itu, variabel yang paling berpengaruh terhadap tekanan darah adalah konsumsi garam ($p=0,012$; $Exp(B)=0,086$).

Kesimpulan dari penelitian ini adalah intensitas kebisingan kereta api berpengaruh terhadap efek auditori dan non auditori pada ibu rumah tangga yang tinggal di pemukiman sekitar rel kereta api. Upaya pengendalian yang perlu dilakukan antara lain pengaturan jarak pemukiman minimal 6 meter dari pinggir rel kereta api dan pemasangan peredam suara pada rumah penduduk.

Kata kunci : kebisingan kereta api, efek auditori, efek non auditori, ibu rumah tangga