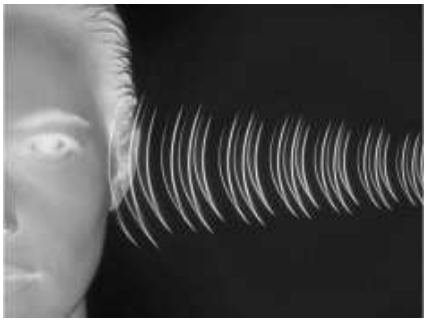
Noise and Health



Noise has the potential to act as a stressor. As such, it has the potential to adversely affect physical and mental health. This article examines some of the research that has linked noise and different types of health problem.

Noise and Physical Well-Being

The most direct way in which noise threatens health is through noise-induced deafness. Exposure to noise at sufficient levels causes permanent damage to the auditory system, leading to loss of hearing. Research by Veitch and Arkkelin (1995) indicates that by 1991 over 10 million US citizens had a noise-related hearing difficulty. Data collected in the UK in the late 1990s suggest that around 500,000 people in the UK have significant hearing difficulties (e.g. deafness, tinnitus) as a result of exposure to noise at work. However, the British Health and Safety Executive report that the incidence of new cases of noise related deafness in the UK has been falling for several years (Health and Safety Executive, 2002). This may indicate that health and safety regulations have had the effect of reducing exposure to harmful noise in the workplace. However, as previously discussed, noise in the environment from traffic, aircraft and other sources has been increasing steadily and is likely to continue to do so. Cassidy (1997) predicts that an increase in urban noise of 1 dB per year will eventually lead to the majority of city dwellers becoming deaf unless efforts are made to curb the growth in noise pollution.

A different way in which noise can affect health is through its effect on sleep. A sufficient amount of uninterrupted sleep is generally recognised to be necessary for adequate physical and psychological functioning (Dement and Vaughn, 1999). Noise from outside the house may be a factor in between 10 and 20 per cent of cases of chronic sleep disturbance (Berglund et al, 1999).

Noise has been linked to a variety of other health problems including birth defects and miscarriages (Veitch and Arkkelin, 1995), stomach ulcers (Jerkova and Kremorova, 1966) and immune dysfunction (McCarthy et al, 1992). A number of studies have linked chronic noise exposure to an increased risk of heart disease. The relationship seems to be strongest for noise in occupational settings. Passchier-Vermeer (1993) found that workers exposed to high levels of noise for between five and thirty years had higher blood pressure and were significantly more at risk for **hypertension** than a control group. However, evidence regarding general environmental noise is less convincing and relatively few studies have found more than a weak association between, for example, aircraft noise and cardiac problems (Berglund and Lindvall, 1995). Unfortunately for researchers, a wide range of variables are now known to contribute to disorders such as heart disease, including genetics, diet, alcohol consumption, personality and so on. Since all of these variables interact it is extremely difficult to isolate the contribution of any one variable, such as noise, to the health problem being studied.

Noise and Accidents

As previously discussed, noise can have a detrimental effect on cognitive processes such as attention and memory. As a consequence of this, noise is a potential contributing factor in accidental injuries. The research appears to support his view. Tarnopolsky et al (1980) found that people living in areas with high levels of aircraft noise were more likely to suffer minor accidents in the home. Similarly, Nakajima (1986) identified noise as a contributing factor in traffic accidents in Japan.

Accidents in the workplace can happen for a huge variety of reasons but human error is frequently a contributing factor. Noise could increase the tendency of an individual to make errors in two ways. The noise may cause some cognitive deficit, leading to an error as described above. Alternately, noise may impede communication between individuals, leading to an accident as the result of the loss or distortion of important information. Research in the workplace has supported a relationship between noise and accidents. For example, Noweir (1984) compared accident rates in three factories and found that where noise levels were high there was an increase in both the number and the severity of workplace accidents.

One problem with research of this type is that it can be difficult or impossible to separate out the effects of noise from other factors that might accompany it. The fact that accidents are more frequent in noisier settings might simply be because noisy machinery tends to be more dangerous than quieter machinery. Or, as Cassidy (1997) points out,

factories that are not concerned about noise reduction may also be less concerned about adhering to health and safety regulations. Therefore, whilst it is likely that noise contributes to accidents in the workplace, it is currently impossible to say to what extent.

Noise and Mental Health

Noise is not a primary cause of mental health problems. However, it may have a role in accelerating or exacerbating the development of mental problems in those predisposed to them for other reasons. Herridge (1974) found a higher rate of hospital admissions for psychiatric disorders in noisy areas near Heathrow airport. Other large-scale studies suggest that chronic noise exposure is associated with a variety of mental health indicators including increased consumption of sleeping pills and tranquillisers and increased mental hospital admission rates (Berglund et al, 1999).

However, the relationship between noise and mental health is not a strong one. Stansfeld et al (1996) carried out a **longitudinal study** of nearly 1800 men aged 50-64 years living in Wales. Participants attended a screening clinic to assess their mental health status. Their noise exposure levels were assessed based on average traffic noise at their home address. A follow up assessment five years later did not show a direct relationship between noise exposure and mental health problems, although it was noted that men living in the locations with the lowest noise also had the lowest levels of psychiatric disturbance. A slight association between noise exposure and anxiety and depression was found. Stansfeld et al concluded that although some groups may be vulnerable to the mental health effects of noise (e.g., children and the elderly) it does not generally contribute to mental health problems to a significant degree.

Further research has supported this conclusion indicating that people already diagnosed with depression may be unable to cope with high noise levels, which thus may exacerbate their condition (Institute for Environmental Health, 1997).