

Health Impacts of Environmental Noise Pollution on Urban Community

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ABSTRACT

One of the major causes of adverse health hazards particularly in urban cities is the environmental noise pollution. Quality of life is severely affected by urban noise. Noise levels, being very high in cities, can cause serious and long-term harmful effects to human health. It causes irritation, annoyance and headache as well as disturbs sleep. There can be permanent hearing loss if continuously exposed to noise levels of 85dB or above. There is a risk of cardiovascular disease, stroke, diabetes and hypertension. Different sources of noise pollution are generally considered as community noise and industrial noise. Community noise originates from different sources such as road traffic, neighbours, recreational activities, building construction and demolishing, noisy sports, loudspeakers, fireworks and many others. Industrial noise comes from machinery noise, workers voices, trucks loading/ unloading/ deliveries and others. A case work was undertaken to investigate the effects of environmental noise pollution due to various sources on human health. It was found that about 53% of urban population sometimes experience general disturbance such as irritation, annoyance and headache while about 8% to 18% experienced it frequently. About 42% to 47% of urban population sometimes experience disturbance during conversation, concentrating, reading, studying, relaxing and other activities. Hypertension and loss of sleep were experienced sometimes by about 32% to 36% of the population. In general the urban population is continuously affected by various kinds of noise pollution. Further, urban community being not much aware about adverse health impacts of noise, its control is overshadowed by the control measures of air and water pollution. To reduce the noise pollution, it is suggested to maximise public awareness about its ill effects on human health wherein the significant role has to be played by government and NGOs.

Key Words: *Noise, noise sources, community noise, health impacts*

I. INTRODUCTION

Although everyone enjoys silence yet noise has always been with the human civilization. Any unwanted sound due to human activities becomes an environmental noise as it disrupts quality of life and affects public health. In general noise has been identified as unwanted sound that is often subjective and varies across individuals. Therefore, the assessment of environmental noise is a highly complex issue. Environmental noise is also known as noise pollution. Among the policy makers and general public there has been a growing concern about serious health impacts of environmental noise. Population growth, urbanization, technological developments, and industrialization are the main contributors for exposure to environmental noise and the consequent health hazards. Present century mankind has been plagued by variety of natural and man-made ills, environmental noise being one of them [1]. No places on the earth are free from noise, be it our homes or educational institutes, transportation, public places like theaters, restaurants and parks, social and religious places along with commercial and industrial areas. Others areas include like noisy neighborhood, sports arena, barking pets, call centers, telephone exchanges, etc. As per World Health Organization "Noise must be recognized as a major threat to human wellbeing". A revision in 2017 of Environmental Noise 49/2002/CE Directive [2] by European Union observed that noise being an area of greater concern and thereby affecting human health. It causes several serious health hazards - sleep disorder, annoyance, hypertension and heart related cardiovascular diseases [3-5]. Noise from vehicular traffic is another prominent contributor of environmental pollution which causes several health hazards [6]. It also causes such effects as annoyance, sleep and concentration problems as well as increases the risk of ischemic heart disease and ischemic coronary illness or stroke [7-9]. The effect of noise on audition is well recognized. Occupational noise exposure for mechanics, locomotive drivers, telephone operators etc. leads to have their temporary or permanent deafness as a result of continued exposure to high noise levels [10, 11]. Also long time exposure to loud music and ear phone music can cause hearing loss [12, 13]. Sound is among the significant environmental factors which affects individuals' performance and productivity. Individuals' performances were decreased when they were exposed to sound level of 110dB [14]. There are several other noise pollution sources which cause health hazards to human beings. These includes home appliances, sound systems, loud speakers, earphones, cell phones, airplanes, air-coolers

and air-conditioners, factories, grinders and mowers, drills, etc. Although hospitals and educational institutions needs to be free from noise pollution, yet silence is rare inside the hospitals which affects critical patients, new borns and mothers admitted in ICU's, wards and OPD's [15, 16]. Even animals are not spared by noise pollution effects as they seem to become irritable, quieter and move away from the noise sources [17].

Overall exposure of urban community to noise must be reduced. However, sometimes lack of sufficient knowledge about noise and its ill effects on humans along with no well defined criteria hampered the control of environmental noise. Prevention must be taken to avoid unwanted sound. For this, mitigation solutions can be undertaken by installation of acoustic barriers. Also noise control methods taking into account green economy [18], recycling [19], better management of traffic [20], new pavements [21], technologically improved vehicles and tires [22] must be adopted. In the present work adverse health impacts of environmental noise pollution on urban community have been studied and preventive measures suggested.

II. RESEARCH METHODOLOGY

The present work is based on a sample survey of respondents from an urban city. Data for the present work were collected in Faridabad, India. Faridabad is one of the most populous urban cities in the Indian state of Haryana having a population of more than 2 Million. It is also one of the leading industrial centre which is near Indian capital New Delhi. The main objective of the present work was to analyse the impacts of environmental noise pollution due to various sources on human health and to suggest the preventive measures about noise pollution in urban areas. Questionnaires were distributed to urban population and filled questionnaire were collected and analyzed.

III. DATA ANALYSIS AND INTERPRETATIONS

How often you experience the following problems due to noise pollution during last 1 year?

Q1. General disturbance (irritation/annoyance)

Table 1: General disturbance experienced due to noise pollution

Question 1	Not at all	Sometimes	Frequently	Very frequently	Daily	TOTAL
Number of respondents (Out of 324)	46	172	58	26	22	324
Percentage of respondents	14.2	53.1	17.9	8.0	6.8	100

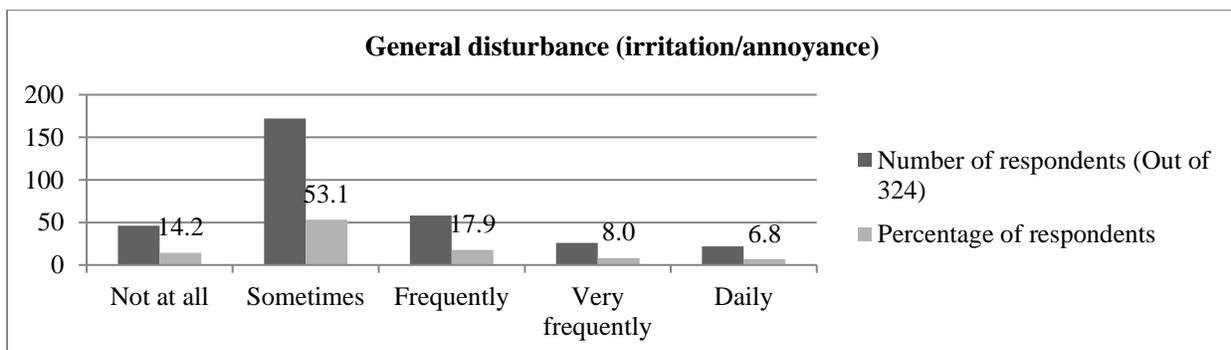


Fig. 1. General disturbance experienced due to noise pollution

Interpretations: General disturbance (irritation/annoyance) appears to be the major concern as it is being experienced at some point of time by about 53% of the urban community while 18% face it frequently. Thus it can be inferred that noise due to road traffic in residential community of all the cities studied is a major source of noise pollution.

Table 2: Various health impacts experienced due to noise pollution

Percentage of respondents	Not at all	Sometimes	Frequently	Very frequently	Daily	TOTAL
General disturbance (irritation/annoyance)	14.2	53.1	17.9	8	6.8	100
Disturbance in concentrating and studies	13.6	42.6	21	17.3	5.6	100
Disturbance in conversations	38.3	38.9	13.6	5.6	3.7	100
Disturbance with listening TV, radio, music	36.4	38.3	13	5.6	6.8	100
Disturbance in reading, relaxing or other activities	24.1	47.5	13	8.6	6.8	100
Disturbance in daily work	42	38.9	13	2.5	3.7	100
Headache	34	53.1	8	2.5	2.5	100
Hypertension	56.8	32.7	5.6	3.1	1.9	100
Loss of sleep/insomnia	52.5	36.4	8	0.6	2.5	100
Stress	51.2	34	6.2	4.9	3.7	100
Hearing loss	76.5	17.3	2.5	2.5	1.2	100

Interpretations:

Besides general disturbance (irritation/annoyance), disturbance in concentrating and studies is being experienced at some point of time by about 43%, frequently by 21% and very frequently by about 17% of the urban community. Reason being that for concentrating on any work including studies one needs the perfect silence.

Disturbance in conversations and disturbance with listening TV, radio, music appears to be another area which affects about 39% of the urban population as it again requires low levels of acoustic interference.

While reading and relaxing disturbance due to noise pollution was experienced by about 47.5% of people at some point of time while 13 % of urban population experienced it frequently.

About 39% of the population of Faridabad city was experiencing interference at some point of time in their daily work.

Headache may be considered as another adverse health impact factor which is being experienced sometimes by about 53% of the urban community.

Hypertension and loss of sleep along with stress can also not be ignored as about 36% of urban population is being affected by it.

IV. RECOMMENDATIONS

Complete avoidance of noise pollution may not be possible as it is present everywhere, but several preventive measures can be taken to reduce it. To avoid the damage to public health, action must be taken to reduce noise to the lowest possible levels. To further minimize the adverse health impact of noise pollution on urban population, noise levels are to be controlled by government and pollution control authorities. There are a variety of strategies suggested for mitigating environmental noise pollution.

- Action should be taken where possible to reduce noise at the source itself. In case of road traffic, noise can be reduced by designing quieter engines, limiting of vehicle speeds, maintaining of roadway surface texture, diverting heavy duty vehicles and use of traffic controls for smooth traffic flow.
- Use of noise barriers around noise pollution sources. It will decrease the noise by blocking the path of sound waves to the receiver.
- Vehicles emitting high noise levels should be restricted or diverted.
- Blocking the path of noise by tree plantation across noise sources and urban colonies.
- Replacing diesel vehicles by battery operated vehicles.
- Noise creating commercial activities should not take place near residential colonies.
- Minimum distance must be maintained between residential community and the areas such as traffic lanes, railroad lines as well as airports and industrial zones.
- Noise can be reduced around the hospitals, educational institutions and residential areas by planting large number of trees.
- Raising public awareness through Pollution Control Authorities by informing the general public about adverse impacts of noise on human health.
- Vulnerability to loud sound levels for longer durations must be avoided.

V. CONCLUSION

The adverse health impacts of environmental noise pollution on urban community are compelling issues all over the globe. Noise levels are beyond limits particularly in urban areas. The present study revealed that about 53% of urban population sometimes experience general disturbance such as irritation, annoyance and headache while about 8% to 18% experienced it frequently. About 42% to 47% of urban population sometimes experience disturbance during conversation, concentrating, reading, studying, relaxing and other activities. Hypertension and loss of sleep were experienced sometimes by about 32% to 36% of the urban population. There has been a continuous rise in the hearing loss related patient. To reduce the noise pollution, the government must now work on devising new noise pollution standards. Like air pollution, 24 x 7 monitoring of ambient noise levels for every city. For abatement of noise, researcher must focus to control the noise levels at the source itself. It's high time that the public is made aware about ill effects of noise pollution on human health. To implement noise abatement policies, people and authorities should have basic knowledge about environmental hazards of noise pollution and its need to be controlled. For this, noise should be necessarily included in school curricula and scientific institutes should be established to study about acoustics and noise control. Taking into account the human health, government, State Pollution Control Boards and NGOs must have elaborate and systematic plan of action to contain adverse health effects of environmental pollution.

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