Prevalence of Diseases among People Living Near a Landfill in Kolkata: An Exploratory Survey

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Abstract

Background: A dumping ground at Promod Nagar near Noapara is a major source of pollution in Kolkata city of India. Local residents have reported extreme unbreathable condition created by landfill pollution. The purpose of our study was to conduct a survey on the prevalence of diseases among the residents staying near the Noapara landfill of Kolkata city. Methods: Participants of the study were 509 individuals (256 male and 253 female), age ranged from 4 months to 88 years (mean age 39.56 ± 21.10) residing within 1 km from Noapara dumping ground at the northern part of Kolkata city. Self-constructed schedule was designed to collect information related to different chronic and acute diseases participants have faced. Door to door survey was conducted in the households near to the dumping ground. Results: The result of the study showed that people were suffering from chronic diseases such as heart diseases, hypertension, diabetics, gastric problems, gallbladder problems, stomach problems, asthma, respiratory problems and eye problems. Among acute health issues, there were cold, cough, fever, breathing & respiratory symptoms, allergy, skin problems, vomiting, etc. Conclusion: Chronic health problems such as hypertension, diabetes, gastric problems, eye problems, asthma, and gallbladder problems were prevalent among the residents. Acute problems such as cough, cold, breathing & respiratory symptoms, fever, vomiting, allergy, skin problems were also widespread among the people living near the Noapara Landfill in Kolkata.

Keywords: Pollution, Landfill, Kolkata, Health, Disease

1. Introduction:
Improper waste disposal system has always been a problem for metropolitan cities in developing nations like India. This problem is also aggravated by rapid urbanization and expansion of cities. Some areas that used to be the outskirts of the city decades ago were selected for landfill areas during that time. However, since the expansion of the urban regions, individuals began to settle around these landfill areas, which are presently parts of the city. Delhi is well-known for its High Air pollution level whereas, Kolkata does not catch attention of media regarding pollution. One of the reasons behind lower media attention may be lower monitoring of Air Pollution assessment as in Kolkata Pollution measuring machines are lesser than other metro cities in India. One of the pollution monitoring stations is placed at RabindraBharati University, and this station constantly observes the most inadequate air quality among other stations of Kolkata city. A News Article in India Today (1) affirmed how Kolkata became the most polluted city of India, beating Delhi. In this article, a comparison of Air Quality Index (AQI) was made between RabindraBharati University of Kolkata to Ashok Vihar of Delhi from 15th November 2018 to 18th November 2018. In all the occurrences, AQI of RabindraBharati University was weaker than Ashok Vihar. As the University campus is impressively green, the explanation behind the most elevated pollution in the city may be clarified by the presence of a dumping ground near the monitoring station. The dumping ground is at Promod Nagar near Noapara Metro Station. The place is clearly visible from Belghoria Expressway between Kolkata Airport and Dakshineshwar. Five hundred tonnes of waste is dumped here by several municipalities like South Dum Dum, North Dum Dum, Baranagar etc. White and black smoke is easily visible coming out from the garbage hills. According to the report of some of the Bengali TV news channels like News Time (2) and Calcutta News (3), Plastic Waste, Electronic wastes are also burnt in this landfill area. Although the state government promised a biogas plant for better waste management of this site, the project has been delayed. Troubled by the unbreathable condition, locals complained to National Green Tribunal, and the case is ongoing.
Lahiri et al.\(^4\) confirmed that children in Kolkata suffer from lung disease more than rural children outside the city. Samanta et al.\(^5\) demonstrated that the air quality of Kolkata is worst during the winter. Chakraborty\(^6\) studied the risk of airborne diseases on professionals in Kolkata who are exposed to vehicular pollution. There have been several studies on waste disposal related problems in Kolkata City. De & Debnath\(^7\) mentioned deficient segregation and treatment of solid waste management in Garia, Kolkata, open garbage dumping near households, and health risks associated with people living nearby. Maiti et al.\(^8\) conducted a case study evaluating the impact of leachate on surface and groundwater quality of Dhapa, Kolkata. However, studies conducted on Pramod Nagar in Kolkata are scarce. People are living in very close proximity to this landfill site. Hence, it was needed to explore the health status of people living close to the landfill site of Pramod Nagar, Noapara, in Kolkata. Thus, this study's objective was to conduct a survey on the prevalence of diseases among the residents staying near the Noapara landfill of Kolkata.

2. Material & methods:

Data were collected for a total of 509 participants (256 male and 253 female). The age of participants ranged from 4 months to 88 years (mean age 39.56 ± 21.10). Adult family members provided information for participants below 18 years. People who were residing near (within 1 km) Noapara Landfill site were only selected for the study. Convenient sampling was used to collect data from the participants. Researchers approached participants while visiting their homes in the targeted area, and door to door survey was conducted.

Self-constructed schedule was designed to collect information from participants. Schedule was used instead of questionnaires because many of the participants were illiterate and unable to read and write. In case they were unaware of what their health problem was called, researchers asked for their medical report. The schedule collected information on chronic and acute health problems faced by participants during the year of data collection. Participants recalled any chronic and/or acute health problem that they have experienced during the past year.
3. Results and Discussion:

The respondents (N=509) of the study reported several chronic and acute health issues. Among the chronic health issues heart diseases, hypertension, diabetes, gastric problem, gall bladder problems, stomach problems, asthma, respiratory problems, and Eye problems were most widespread. Cold, cough, fever, breathing and respiratory symptoms, allergy, skin problems and vomiting were found to be most prevalent acute health issues as reported by participants.

Table 1. Number and Percentage of respondents suffered with various Chronic and Acute Health Problems

<table>
<thead>
<tr>
<th>Chronic Health Problems</th>
<th>Acute Health Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td>N</td>
</tr>
<tr>
<td>Heart Diseases</td>
<td>71</td>
</tr>
<tr>
<td>Diabetes</td>
<td>32</td>
</tr>
<tr>
<td>Hypertension</td>
<td>22</td>
</tr>
<tr>
<td>Gastric Problems</td>
<td>13</td>
</tr>
<tr>
<td>Eye Problems</td>
<td>13</td>
</tr>
<tr>
<td>Asthma</td>
<td>11</td>
</tr>
<tr>
<td>Gallbladder Problems</td>
<td>5</td>
</tr>
</tbody>
</table>
Among the chronic health problems, heart disease affected the most number of people among the respondents, followed by hypertension, diabetes, gastric problems, eye problems, asthma, and gallbladder problems. Cough, cold, breathing & respiratory symptoms, fever, vomiting, allergy, skin problems were the most common acute health problems. Among the respondents 30.45 % (n=154) people were suffered with persistent cold, 26.9 % (n=137) with persistent cough and 17.7 % (n=137) with frequent fever.

As previous studies, our study also indicated that there might be a strong link between living near polluted landfill areas and several diseases. Ozonoff et al. (9), in their study, surveyed a neighborhood exposed to airborne hazardous wastes and found that people have experienced heart problems (irregular heartbeat). Bai et al. (10) shown that there is a link between ambient air pollution and cardiovascular diseases like congestive heart failure (CHF) and acute myocardial infarction (AMI). The present study revealed that 13.9 % of the population under study was chronically suffering from Heart diseases. Halder and Islam (11) conducted a study by interviewing people about their health problems; it was found that hypertension, gastric ulcers, and asthma were prevalent in people residing near the polluted area near Torah River, Bangladesh. Guo et al. (12) investigated...
adverse impacts of raised ambient particulate matters and its relation to emergency hospital visits and found that high ambient particulate matters were linked to hypertension in the Beijing city of China. Chiu et al.\(^{13}\) found that traffic air pollution and petrol station density were risk factors for gastric cancer. Our study found that 4.3 % of the total participants were chronically suffering from hypertension and 2.6 % with gastric problems. In our study, 2.2 % of the population studied was chronically affected by asthma. Pukkala and Pönkä\(^{14}\) reported higher occurrence of asthma in inhabitants who are exposed to landfill. Ozonoff et al.\(^{9}\), in their study, showed that the people exposed to pollution reported about irritation of the eyes and nose. We have found that 2.6 % of the participants in this study were chronically suffering from Eye Problems. In their study, Halder and Islam\(^{11}\) considered cold, cough, fever as a single health problem, and these were common problems faced by people staying near the polluted area of Bangladesh. In our study, 85.5 % of respondents have experienced cold at least once during the previous year, and 30.45 % of the people had a persistent cold. 86.6 % of the respondents in the study have undergone with cough at least one time that year, and among them, 26.9 % of the people had a persistent cough. 50.3 % of respondents in the study suffered from fever at least once or more during the previous year, and 17.7 % have frequently suffered from fever. Haque and Singh\(^{15}\) showed that patients with respiratory ailment exceeded waterborne diseases in Kolkata. In our study, 58.3 % of the total participants suffered from Breathing & Respiratory Symptoms, 4.7% suffered from an allergy, and 3.1% with skin problems. Wardlaw\(^{16}\) presented several evidences that establish all forms of pollution contribute to the prevalence of asthma and allergy and high concentration of air pollutants like sulphur dioxide, nitrogen dioxide, ozone and particulates, may intensify existing allergic disease, asthma. Maheshwari et al.\(^{17}\) investigated effect of landfill on health and found that leachate and its odour may cause irritation of skin, nose & eyes, allergies. Krutman et al.\(^{18}\) confirmed that skin problems are associated with high pollution. There are substantial evidences of health hazards caused by landfill sites. It is highly likely that, in this area, health problems are caused by the pollution created by the landfill site. However, more research works are required in and around this specific site to establish strong causal relationship between different health issues and living near landfill.

4. Conclusion:

The present study surveyed the prevalence of diseases among the residents staying near the Noapara landfill of Kolkata. After surveying prevalent chronic and acute health problems on residents living near Noapara landfill it can be concluded that some of the diseases were prevalent among the targeted population. Chronic health problems such as hypertension, diabetes, gastric problems, eye problems, asthma, and gallbladder problems were prevalent among the residents. Acute problems such as cough, cold, breathing & respiratory symptoms, fever, vomiting, allergy, skin problems were also widespread among the people living near the Noapara Landfill in Kolkata. The study emphasizes the importance of proper waste disposal municipal system and need of better waste management in Kolkata. To avoid residents suffering, the bio gas project's completion as planned by the government is to be implemented soon. Municipal waste segregation is also important, and municipalities must ensure that no plastic waste and electronic waste is dumped and burned for well being of their citizens.

6. Recommendations

I. Further studies can be planned using the interview method for in-depth analysis of lived experience of local people.

II. Laboratory tests for various health risks should be conducted for the people at-risk.

III. Water samples may be collected from nearby water bodies, including the Bagjola canal and measured for water pollution.

7. Acknowledgement

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References:


