



Knowledge and Awareness on air pollution as a risk factor for Alzheimer's Disease and Dementia- A Survey

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ABSTRACT

Dementia is a syndrome where the memory deteriorates, thinking changes, behaviour changes, etc. It can get developed from Alzheimer's disease and mainly affects elderly people. The fine particulate matter present in the air can increase the risk of cardiovascular problems which can lead to dementia. The main aim of this research is to understand the knowledge and awareness of people on the topic of air pollution linked to dementia. A survey was designed to analyse the result. The questionnaire was prepared in Google Forms- website and was distributed to 100 participants. The questionnaire was based on dementia and air pollution and its relation. The data was then collected and statistically analysed using SPSS software. 71% of the participants were aware that both air pollution and dementia are increasing factors of global risk. And only 77% of the participants were aware of the term 'dementia'. Awareness must be spread on dementia and its link with air pollution, especially among elderly people. Awareness must be created on a larger scale of population, and also the public's opinion on dementia and its link with air pollution must be known for further future studies.

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INTRODUCTION

Air pollution is increasing day by day and is one of the major factors of global risk. Air gets polluted usually by either traffic or contamination of the air

by physical, chemical or biological agents which are discharged artificially (Choi and Kim, 2019). Pollutants such as particulate matter, carbon monoxide [CO], nitrogen dioxide [NO₂], were seen as factors which affect dementia (Li, 2019). Dementia is a syndrome where the memory deteriorates, thinking changes, behaviour changes, etc. It can get developed from Alzheimer's disease and mainly affects elderly people (Peters, 2019). Few of the symptoms which can be seen in dementia are forgetfulness, memory loss, mood swings, etc. Dementia is also a rising factor for global risk (Wu, 2015). The relation between air pollution and dementia is yet to be found with proper and accurate evidence as particulate matter present in the air can affect the brain and cardiovascular system which can lead to stroke problems, mental disorders, Alzheimer's disease, neurological disorders, etc. (Azarpazhooh and

Hachinski, 2018).

In a previous research article, the authors were not able to clearly pinpoint the evidence that can be assured as causative agents for the association between dementia and exposure to fine particulate matter from vehicle exhaust and wood-burning (Oudin, 2018). In another research article, participants who were highly exposed to air pollution were more likely to be diagnosed with diseases like Alzheimer's disease and vascular dementia (Oudin, 2016). In another research article, it was noticed that cardiovascular patients were more prone to dementia. And up to date, there is no cure found for treating dementia. And also, it was noticed that air pollution had a negative impact on human health (Grande, 2020). It was also found that there is no relation between traffic-related noise pollution and dementia (Andersson, 2018; Carey, 2018; Paul, 2019). In this research article, the relation between air pollution and dementia and about each individually, the knowledge is to be spread around the public to help prevent serious cases as air pollution and dementia are increasing factors of global factors.

Previously our team had conducted numerous research (Devi and Sethu, 2018), survey-based studies (Iyer et al., 2019; Ilankizhai and GayatriDevi, 2016), review based studies (Baheerati and Devi, 2018; Timothy et al., 2019). Now we are focusing on epidemiological surveys. The idea for this stemmed from the current interest in our community. The main aim of this study is to spread knowledge and awareness of air pollution linked to dementia.

MATERIALS AND METHODS

A survey was designed based on awareness to analyse the result. The questionnaire was prepared in Google Forms- website and was distributed to 100 participants. The study population included people above the age of 17 years. The questionnaire was based on dementia and air pollution and its relation. The participants were explained about the study in detail. The questions were carefully studied and the corresponding answers were marked by the participants. The data was then statistically analysed using SPSS software. Chi-square test was used as inferential statistics.

RESULTS AND DISCUSSION

There were a total of 100 participants who took part in the survey [100%]. When the participants were asked if they were aware of dementia or had they ever heard of dementia, 77% were aware while the remaining 23% were not aware [Figure 1]. And also

when asked if dementia is a communicable disease, 83% told no [Figure 2].

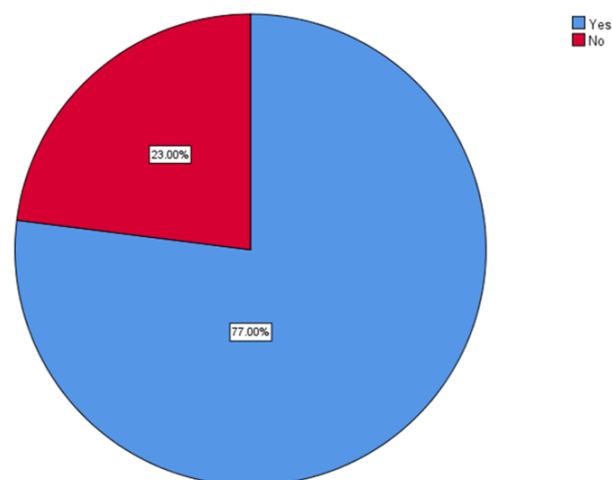


Figure 1: Pie chart depicts awareness of study participants regarding dementia

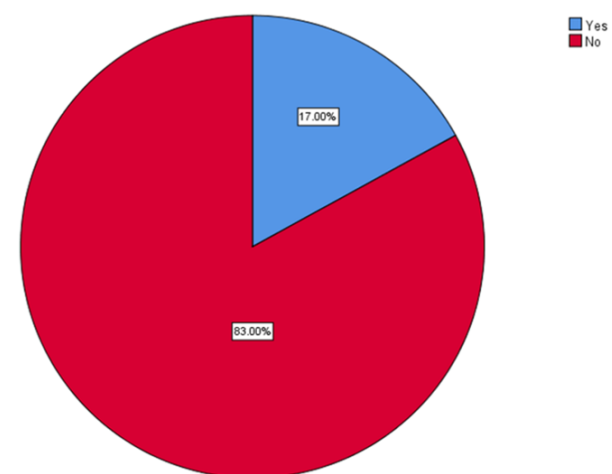


Figure 2: Pie chart depicts the knowledge of study participants regarding dementia as a communicable disease

Almost 71% of the participants were aware that air pollution and dementia were one of the increasing factors of global risk [Figure 3]. It was also noticed that almost 43% of the participants were exposed to high levels of air pollution every day (which can also lead to Alzheimer's disease and dementia) [Figure 4]. 62% participants told that cardiovascular problems could lead to dementia and also 78% participants told that particulate matter present in the air could lead to stress, hypertension which can also lead to dementia [Figure 5] [Figure 9]. 12% told that memory loss is a symptom of dementia, 4% told forgetfulness, 4% told mood swings and the remaining 80% told all of the above-given options are symptoms of dementia [Figure 6]. 62% of the participants knew that there is no cure

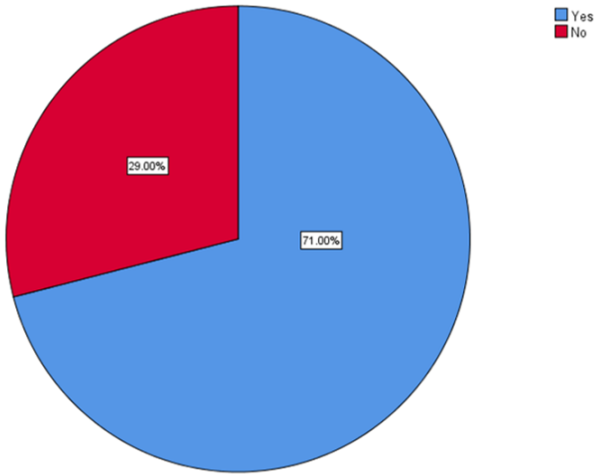


Figure 3: Pie chart depicts the knowledge of study participants regarding dementia and air pollution as increasing factors of global risk

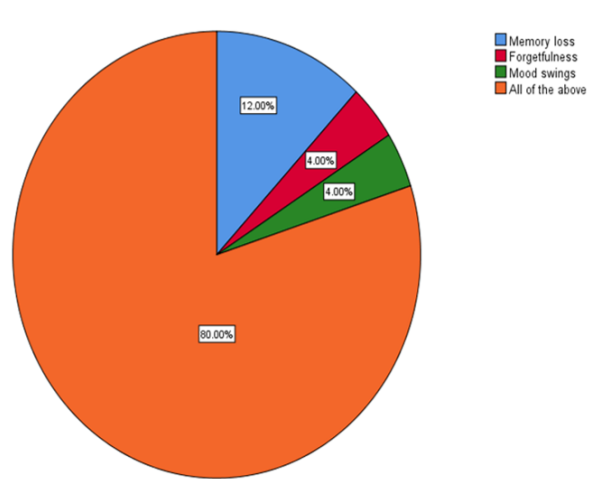


Figure 6: Pie chart depicts knowledge of study participants regarding the symptoms of dementia

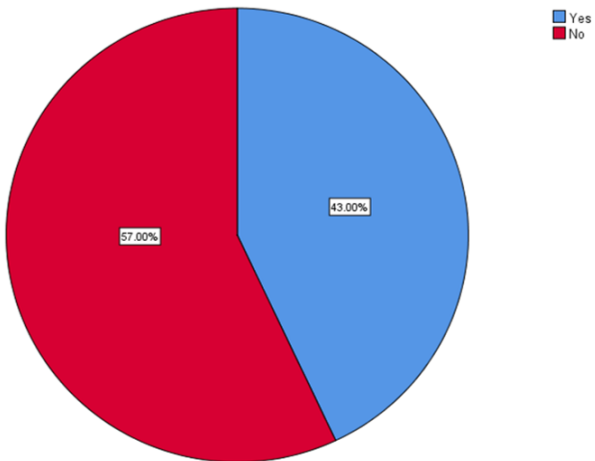


Figure 4: Pie chart depicts the perception of study participants regarding exposure to high levels of pollution every day

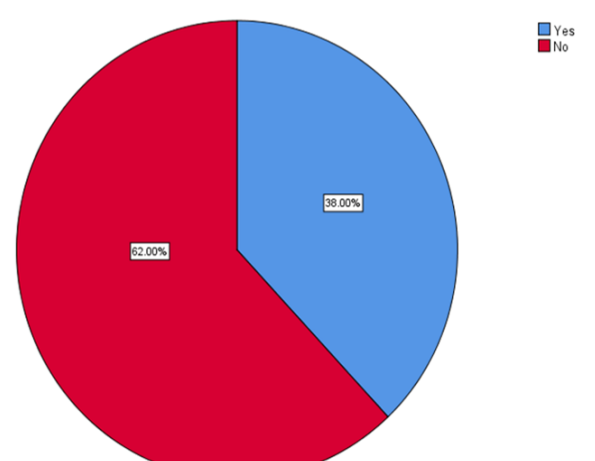


Figure 7: Pie chart depicts awareness of study participants regarding the cure for dementia

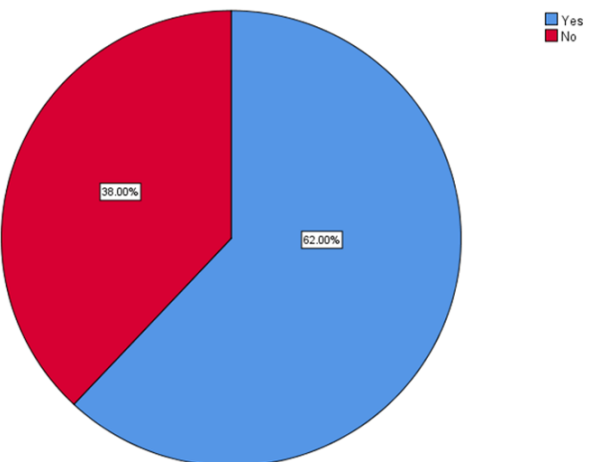


Figure 5: Pie chart depicts knowledge of study participants regarding cardiovascular problems which can also cause dementia

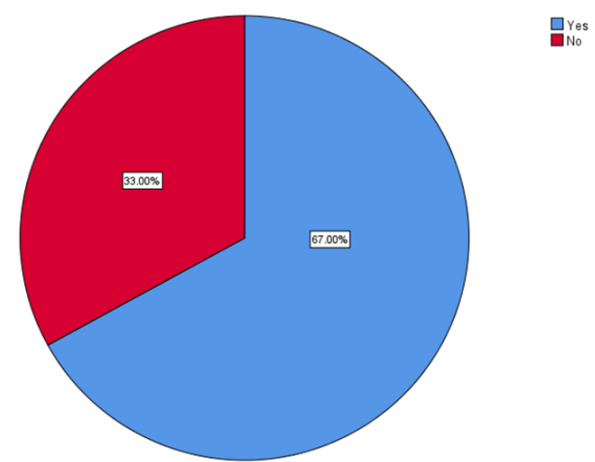


Figure 8: Pie chart depicts the knowledge of study participants regarding dementia having a negative impact on human health

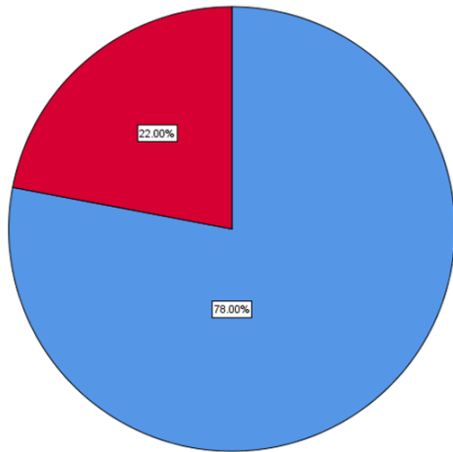


Figure 9: Knowledge of study participants regarding particulate matter present in the air, which can lead to stress and hypertension, which can also lead to dementia

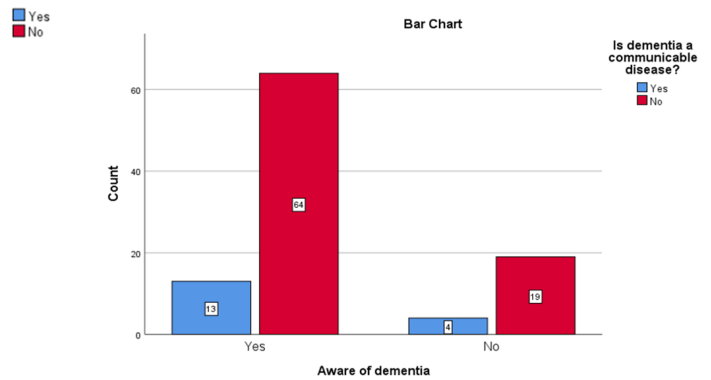


Figure 12: Bar chart represents the association between the overall knowledge of dementia and awareness on the condition being communicable or not

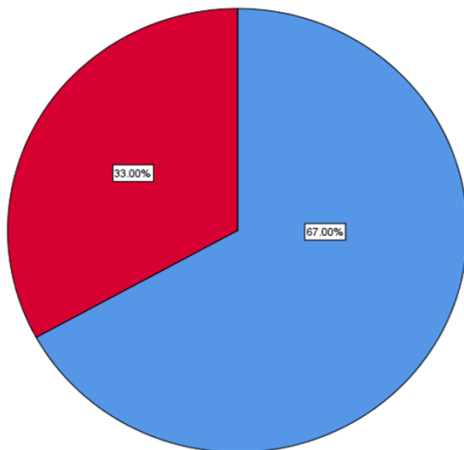


Figure 10: Pie chart depicts the awareness of study participants regarding if Alzheimer's disease is linked with dementia

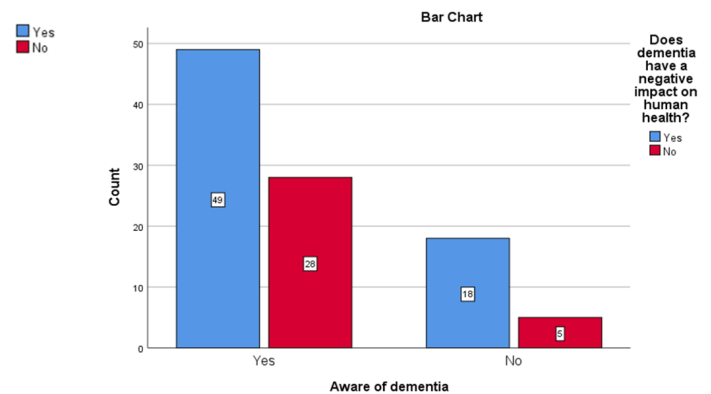


Figure 13: Bar chart represents the association between the overall knowledge of dementia and its negative impact on health

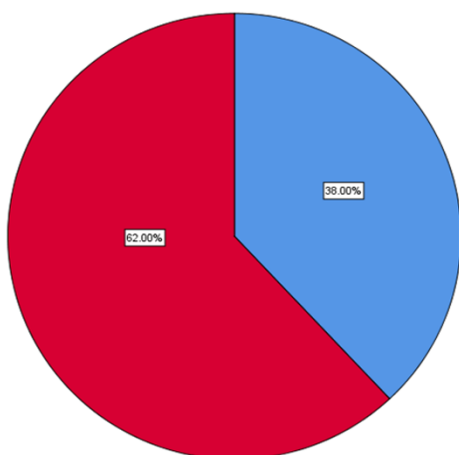


Figure 11: Pie chart depicts the knowledge of study participants regarding noise pollution cannot lead to dementia

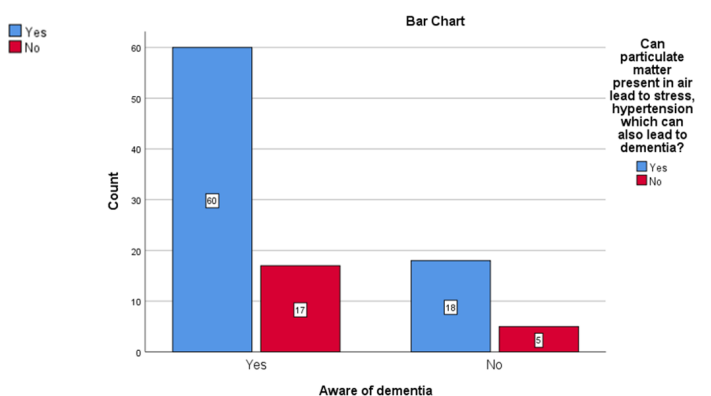


Figure 14: Bar chart represents the association between the overall knowledge on dementia and awareness of the indirect effect of particulate matter

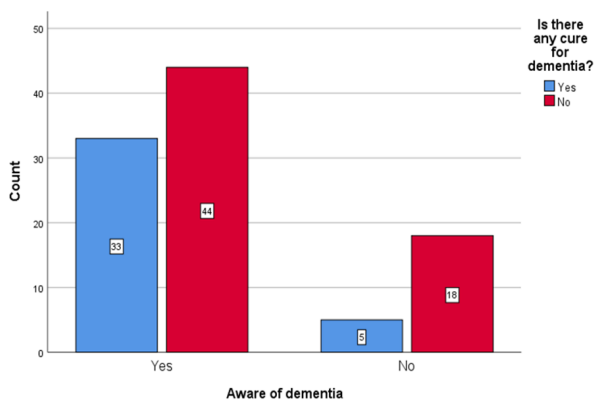


Figure 15: Bar chart represents the association between the overall knowledge of dementia and perception towards a cure

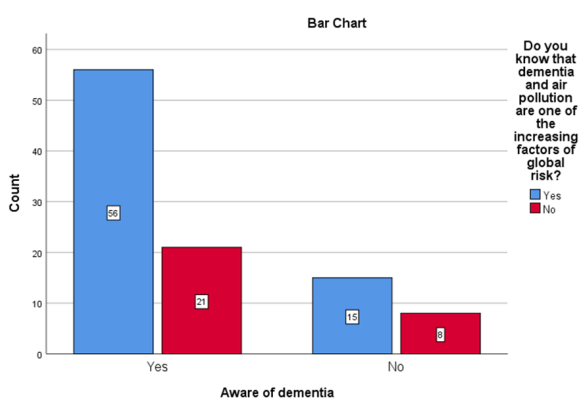


Figure 16: Bar chart represents the association between the overall knowledge of dementia and perception towards global risk

for dementia, while 38% thought that there was a cure for dementia [Figure 7]. 67% of the participants are aware that dementia has a negative impact on human health [Figure 8]. And they are also aware that Alzheimer’s disease is linked with dementia. Whereas the remaining 33% of the participants were not aware that dementia [Figure 10], 67% (shown in blue colour) of the participants told that Alzheimer’s disease is linked with dementia, might lead to Alzheimer’s disease. 38% of the participants thought that noise pollution could cause dementia, but 62% disagreed [Figure 11]. 64% of the participants who were aware of dementia as well as 19% who were not aware of dementia told that dementia is not a communicable disease [Figure 12], an association between the two factors was checked using chi-square test and it was not found to be statistically significant. 49% of the participants who were aware and 18% who were not aware of dementia suggested that dementia had a negative impact on human health, again the association between these two factors was found not to be significant sta-

tistically. [Figure 13]. ‘Particulate matter present in the air can lead to stress, hypertension which can later lead to dementia’, 60% of the participants who were aware and 18% of those who were not aware agreed with the above statement [Figure 14]. 44% of the participants who were aware, as well as 18% of those who were not aware of dementia, told that there is no cure for dementia [Figure 15]. 56% of those who were aware and 15% of those who were not aware of dementia told that both dementia and air pollution were increasing factors of global risk [Figure 16] when the association of overall knowledge was checked with factors like, global risk factor, permanent cure and particulate matter as a risk for systemic condition using chi-square test, it was found to be not significant statistically.

According to previous researchers, they found that air pollution can cause heart stroke, which can later cause dementia, but more evidence was needed to prove it. And also, it was stated that there was no cure found up to date to cure dementia (Choi and Kim, 2019; Grande, 2020). Other researchers have also found good evidence that increased exposure to air pollution can cause dementia, especially among elderly people (Peters, 2019; Wu, 2015). Anna Oudin stated that in case of high exposure to air pollution, it could lead to dementia but Hong Chen stated that even at low levels of exposure to air pollution it could lead to dementia (Oudin, 2016; Chen, 2017).

The limitation of this study is that a larger study must be done to spread knowledge and awareness on air pollution linked with dementia. In the future, a cure must be found to treat dementia. And also preventive measures to reduce air pollution must also be discovered.

CONCLUSION

Dementia is known by many, but the exact cause, its symptoms, its impacts on health is not clear among the public. Awareness must be created on a larger scale of population, and also the public’s opinion on dementia and its link with air pollution must be known for further future studies.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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