

## Urban Transportation and Health – Through the Youth’s Lens

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**Abstract:** **Introduction:** Modern transportation makes a significant impact on human health in multiple ways - air and noise pollution, road traffic accidents and being a major contributor to global warming. The resultant health impacts range from mild irritability to cardiovascular disorders and cancer, but 'are we aware and ready to act for the same'? **Objectives:** To document knowledge, attitude and practices regarding urban transportation and its impact on health among youth. **Methodology:** A cross-sectional study conducted on conveniently selected medical and paramedical students of Gujarat, through snowball sampling. Data collected through Google form; analysis done in Excel. **Results:** A total of 201 students (mean age 20.2± 2.96 years) participated in the study. Majority of the students (83.6%) believed that urban transportation affects human health, air pollution being most worrisome (76.9%). Almost all believed in the adverse impact of noise on mental health and sleep with 96% considering road traffic as the major cause of community noise. Only 27.7% were using public transport for frequent commute. Nearly half of the students owned a vehicle, two-wheeler being the commonest (74.31%). A total of 91% responded affirmatively on contributing towards climate change mitigation with 34.7% having the opinion that their personal efforts in curtailing climate change will not make any difference. **Conclusion:** Despite of good knowledge improvement in practice and attitude is needed, like the mode of commute, owning a vehicle, irregularity in getting their vehicles serviced and also the importance of individual efforts in dealing with the burning issues of global warming.

**Keywords:** Urban transportation, health, air pollution, noise pollution, climate change.

### INTRODUCTION

"The UN World Organization estimates that more than 4 billion people live in urban area globally," which comes to the fact half of world's population live in urban area.(Ritchie, H. *et al.*, 2018) Urban population in India reported in 2022 was around 35.9%. Which means approximately a third of the total population live in India in cities.(Population, U. *et al.*, 2024)The urban population of Surat, which is one of the fastest growing cities in the world, in the year 2022 was 7.3 million.(Population, Y.S, 2023)

Urbanization refers to the process of population shifting from rural areas to urban areas. Urban transportation plays vital role in modern cities as it enhances economic growth, tourism, culture exchange, public health, quality of life, mobility option for those who cannot afford private vehicle, emergency service etc.

It is well documented and accepted that climate change poses significant risks to human health in various aspects such as extreme heat, stronger hurricanes, wildfires, flooding, and the spread of diseases, with vulnerable populations facing the highest risks.(Mukrimaa, S. S. *et al.*, 2016) And the modern transportation is a major contributor in climate change along with a significant impact on human health in multiple ways, like air pollution, noise pollution, road traffic accidents. (Tainio, M. *et al.*, 2021)

Air pollutants like particulate matter, oxides of nitrogen, ozone, carbon monoxide, and benzene have been linked to serious health issues, including cardiovascular and respiratory disease, cancer, adverse birth outcomes, and higher death rates in exposed populations. Old and poorly-performing diesel vehicles in many developing countries are significant contributors to particle emissions, especially "black smoke" from trucks and buses. (Dora, C. *et al.*, 2011)

Noise pollution can lead to various health issues including hearing damage, sleep disturbances, stress, anxiety, cardiovascular problems and in children it may be associated with delayed reading age. In the United States, the second leading cause of death among adolescents and the fourth leading cause of injury is due to accidents.(Ivey-Stephenson, A. Z. *et al.*, 2020)

Excessive noise from traffic can lead to stress, sleep disturbances, hearing loss, and impaired cognitive function. Young people living in busy urban areas often express frustration over the constant noise exposure and the need for quieter and more peaceful environments. The health impact ranges from mild irritability to cardiovascular disorders and cancer, but are we aware and ready to act for the same!

Every year, approximately 1.5 lakh people die in India due to road traffic accidents. Approximately 67% of total accidental deaths occur in the youth

population.(Ministry of Road Transport, 2021) According to World Youth report, (2020) the 1.2 billion youth aged 15 to 24 years, comprises 16% of the global population.(Researchers, Y. A, 2020)

It has been acknowledged globally that to education plays a crucial role in promoting action against climate change. It helps people learn about and tackle the effects of the climate crisis, by giving them the tools and mindset to make a difference.(Change, C, 2022) Global efforts have been made to tackle climate change and reduce emissions. The 2018 Katowice Climate Change Conference demonstrated nations' commitment to limit global temperature rise to below 1.5°C. Going beyond this threshold could worsen the occurrence of extreme weather events, making it crucial to understand the complex relationship between climate change and these events.

Moreover, between 2001 and 2011, India saw a surge in its urban population, growing from 286 million to 377 million. According to the 2011 census, India had three cities with populations exceeding 10 million and 53 cities with over 1 million residents. These cities play a crucial role in the country's economy. The top 10 cities, which make up to 8% of the total population, contribute 15% of the GDP, while the remaining 53 cities contribute 31% of the GDP. This trend suggests that the urban population is expected to reach 600 million by 2031, accounting for almost 40% of the nation's population.(IIHS, 2015)

And one of the major challenges that will emerge with massive urbanization will be those related to modern transportation.

Considering the above-mentioned scenario, this study is an endeavor to document what is today's youth's understanding, attitude and practices about urban transportation, human health and climate change.

## MATERIALS AND METHODS

The study was started with a small group of participants who were asked to refer others from their social network who meet the study's criteria, forming a chain of referrals, and structured questionnaire was used to gather data on climate change knowledge, practices, and attitudes. Hence, snowball sampling method was used to collect data.

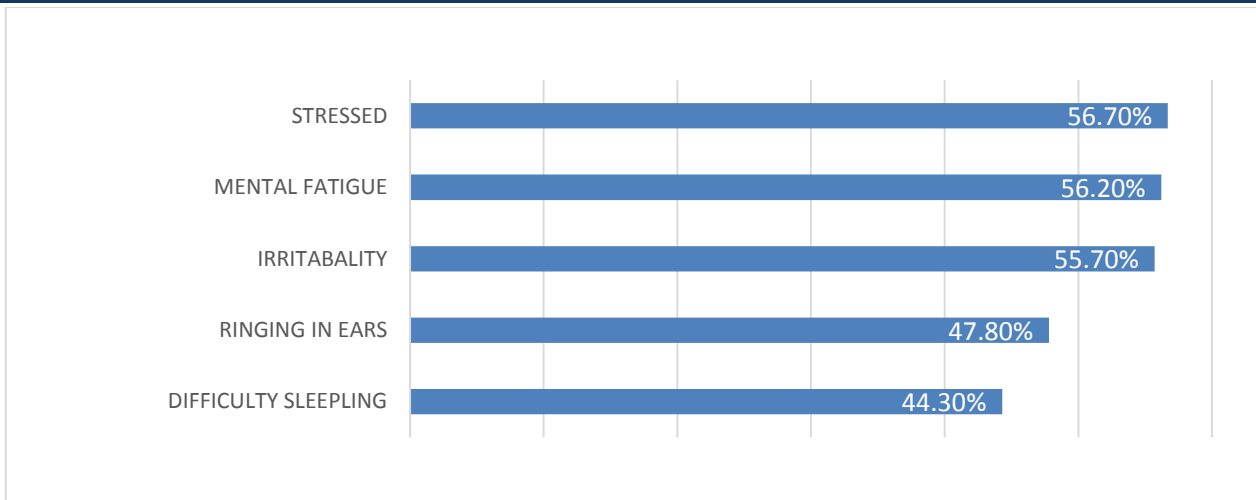
A total of 201 medical and paramedical students aged between 19 to 24 years from Gujarat were involved in the study. Individuals who did not provide their consent were excluded. Data collection for this study was conducted using a Google Form questionnaire, which comprised of multiple-choice questions related to specific domains of knowledge, practices and attitudes. The 7 items for knowledge in the tool assess the participants' understanding or awareness of a particular topic. The 4 items for attitude their opinions, beliefs, or feelings towards the climate change. Lastly the 6 items for practices focus on their behaviors. The collected data was analyzed using Microsoft Excel.

## RESULTS

A total of 201 youth participated in the study. Out of them 128(63.7%) male and 73(36.3%) female. The mean age of participant observed was  $20.2 \pm 2.96$  years.

On enquiring about their understanding of impact of urban transportation on human health almost all (99.05%) agreed that urban transportation does make an impact on human health one way or the other. According to majority, 83.6% participants the impact of health is majorly due to air, pollution, noise pollution and accidents together.

Further on asking about which symptom they feel most after exposure to traffic for long hours, the most frequent response was 'feeling stressed' as shown in the figure 1. This was closely followed by experiencing 'mental fatigue' for 56.20% and irritability for 55.70%.



**Figure 1:** Symptoms felt after exposure to long traffic hours

To assess their knowledge about the potential health hazards of breathing polluted air, it was observed that majority (72.4%) were aware about getting some lung problem, followed by frequent attacks of asthma (68.3%) and frequent allergies (62.8%) as shown in table 1. Additionally, 62.8%

reported frequent allergies as a health hazard. Heart problems were reported by 45.2% of the respondents. A total of 34.2% reported blood-related problems as yet another potential health hazard of inhaling polluted air.

**Table 1:** - Perceived health hazards of breathing polluted air

	n	%
Frequent asthma attacks	136	68.3%
Frequent allergies	125	62.8%
Heart problem	90	45.2%
Lung problem	144	72.4%
Blood related problem	68	34.2%
Cancer	57	28.6%
None of the above	3	1.5%

To assess their practices in relation to transportation, the participants were asked about their most preferred mode of commute, ownership of a vehicle, fuel they utilized, etc as shown in table 2. It was observed that the most common mode of commute is by private two-wheeler, with 38.31% of people using their own motorcycles or scooters. Following closely is the private four-wheeler, with 15.92% of people using their cars for transportation, while, 27.36% of the individuals rely on public transport, such as buses or trains. Some institutions provide transportation facilities, which 4.98% of people avail. Lastly, only 7.46% of individuals prefer the eco-friendly option of cycling using bicycles.

In the transportation system, out of the 201 participants, 109(54.23%) owned a vehicle, while the remaining participants did not own any. Among the respondents, the frequency of individuals owning a bicycle is 8(7.34%) of the total population. This suggests that a small portion

of the surveyed individuals owns a bicycle for their transportation needs. The category of four-wheelers has a frequency of 20, (18.35%) of the respondents. Again, a relatively smaller number of individuals own a four-wheeler. The majority of the respondents, with a frequency of 81(74.31%), own a two-wheeler, implying that a significant portion of the surveyed individuals owns a two-wheeler, such as a motorcycle or scooter, for their personal transportation.

A total of 73 (66.97 %) participants used petrol as the major fuel. Electric-powered vehicles usage by 10.09% of the respondents indicates an eco-friendly option in the surveyed population. 73 (66.97%) respondents reported that their vehicles are less than 10 years old. This indicates that a majority of the surveyed individuals have relatively new vehicles. There was a single participant who ‘never’ got servicing done for the vehicle. Out of the total respondents, 79 (72.48%)

individuals adhere to a regular servicing schedule for their vehicle

The participants were asked whether they feel motivated to cut down their contribution after

going through the question to which, 183(91.04%) agreed,17(8.46%) will think about it & one participant denied.

**Table 2: -** Distribution of population according to transportation related domains

	n	%
<b>Mode Of Transportation</b>		
Private Two-Wheeler	77	38.31%
Private Four-Wheeler	32	15.92%
Vehicle Polling	12	5.97%
Public Transport	55	27.36%
Transport Facility Provide by Institution	10	4.98%
Bicycle	15	7.46%
<b>Type Of Vehicle Owned</b>		
Bicycle	8	7.34%
Four-Wheeler	20	18.35%
Two-Wheeler	81	74.31%
<b>Type Of Fuel Used</b>		
Diesel	11	10.09%
Electric	11	10.09%
Gas (CNG)	7	6.42%
Petrol	73	66.97%
None Of Above	7	6.42%
<b>Duration of ownership of the vehicle</b>		
Less than 10 yrs	73	66.97%
More than 10 yrs	36	33.03%
<b>Frequency of servicing the vehicle</b>		
Never	1	0.92%
On Schedule	79	72.48%
Seldom	3	2.75%

Following assessment of their knowledge and practices, further investigation was done about their willingness and approach towards individual efforts to mitigate further air pollution and climate change (Table 3). It was interesting to note that, more than half (65.2%) of the respondents,

believed that effective action against climate change necessitates the participation of everyone. Only a single participant disagreed with the notion of climate change being a significant issue or its association with human activities.

**Table 3:-**Knowledge regarding contribution of the participants in mitigating climate change and its Impacts

	n	%
Agree, but not possible	17	8.5%
Agree, if every one act to gather	131	65.2%
Agree, I can do my bit	50	24.9%
Disagree	1	0.5%
Don't know	2	1%
Total	201	100%

While documenting the ways suggested by them in which youth can contribute towards reduction of air pollution, the majority of respondents (69.23%) showed willingness to contribute towards reducing

air pollution by adopting multiple approaches. These include spreading awareness, using alternative modes of transportation, using public transport, and opting for good quality fuel.

**Table 4:** Various ways by which youth can contribute towards reducing pollution due to urban transportation

	n	%
By spreading awareness, by using bicycle or waking whenever possible, by using public transport at least ones a week. By using good quality fuel for my vehicle even when cheaper option available	126	69.23%
By spreading awareness	19	10.44%
By using bicycle or waking whenever possible	16	8.79%
By using good quality fuel for my vehicle even when cheaper option available	11	6.04%
By using public transport at least ones a week	10	5.49%

## DISCUSSION

The study aimed to assess the level of knowledge; attitude and practice to climate change among selected youth in Gujarat. The data presented in this study provides valuable insights on the way today’s youth looks at the issue of urban transportation and it’s impacts on human health and the environment along with the significance of individual and community efforts to mitigate the same.

The majority (99%) of participants agreed that urban transportation has a significant effect on human health, primarily through air and noise pollution and accidents. In contrast to this, the findings of the study at College of Nursing and Public Health, Columbus, Ohio, USA by Polivka, *et al.*, (2021) suggests that knowledge concerning the health-related impacts of climate change by respondents was minimal, with 19% identifying no impacts.

In a similar vein, the respondents in Ghana exhibited a high level of knowledge regarding the impact of global warming on human health in a study by Odonkor, *et al.*, (2020). These impacts on health are further corroborated by the reported health problems among respondents, with lung problems being the most prevalent issue followed by asthma attacks and allergies.

The study also highlights that a significant portion of respondents own private two-wheelers, indicating the popularity of this mode of transportation, with majority (66.97%) using petrol fueled vehicles. In a study by Tiwari, *et al.*, (2019) electric vehicle was owned by only 0.2 % participants whereas in the present study the number goes up to 10 %.(15) However, public transport is also widely used, suggesting that people are open to alternative options.

Many are willing to contribute to mitigating climate change through various means, such as spreading awareness and using eco-friendly modes of transportation. Regarding vehicle maintenance, a significant majority of respondents service their

vehicles on schedule, emphasizing the importance of regular upkeep for vehicle longevity and optimal performance.

Overall, the survey shows a positive attitude among respondents towards taking actions to reduce their contribution to air pollution. Many express their willingness to adopt sustainable practices and modes of transportation, which bodes well for efforts to improve urban transportation's impact on human health and the environment. Almost 70% of youth wanted to contribute spreading awareness, by using bicycle, public transport, good quality fuel etc. In the study by Baldwin, *et al.*, (2022) 28% of respondents reported that they are currently engaging in group action to raise awareness or promote change in the environment and 47% plan to do in the future.

Whereas there is definitely some scope of improvement in attitudes and practice regarding climate change, a study by Falaye, *et al.*, (2016) indicates that knowledge of issues related to climate change is low among students, while their attitudes are slightly favorable.

It's essential to consider these findings when formulating policies and initiatives to promote sustainable urban transportation and enhance public health. Encouraging the use of eco-friendly modes of transportation and raising awareness about the impact of individual actions on air pollution can lead to significant positive changes for both human health and the environment.

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## CONCLUSION

It can be concluded that while the knowledge of the subject is at par, there are areas where improvement is needed in terms of practices and

attitudes. These areas include the mode of commute, owning a vehicle, irregularity in getting vehicles serviced, and a portion of individuals undermining the importance of individual efforts in addressing global warming.

## REFERENCES

- Ritchie, H. & Roser, M. "Urbanization: All our charts on Urbanization." (2018): 1–29.
- Population U, Total O. "India - Urban Population (% Of Total) India - Urban Population (% Of Total)." (2024): 2022–5.
- Population, Y.S. "Surat Population age wise." (2023): 2022–4.
- Mukrimaa, S. S., Nurdyansyah., Fahyuni, E. F., Yulia, C. A., Schulz, N. D. and Ghasan, D. et al. "Climate change impact." *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 6 (2016): 128.
- Tainio, M., Jovanovic Andersen, Z., Nieuwenhuijsen, M. J., Hu, L., de Nazelle, A. and An, R, et al. "Air pollution, physical activity and health: A mapping review of the evidence." *Environ Int*, 147 (2020): 105954.
- Dora, C., Hosking, J., Mudu, P. and Fletcher, E. R. "Urban Transport and Health." *Sustainable transport: sourcebook for policy makers in developing cities* (2011): 60.
- Ivey-Stephenson, A. Z., Demissie, Z., Crosby, A. E., Stone, D. M., Gaylor, E. and Wilkins, N, et al. "Suicidal Ideation and Behaviors Among High School Students - Youth Risk Behavior Survey, United States, 2019." *MMWR Suppl*, 69.1 (2020): 47–55.
- Health co-benefits of climate change mitigation-Transport sector green economy in the.
- Ministry of Road Transport and Highways, G. "Road Accidents in India." (2021): 19; 65.
- Researchers, Y. A., Youth, M. and Network, A. "UNESCO with, by and for youth arrow UNESCO Youth Community on social media arrow \_ forward arrow \_ forward." (2020): 1–6.
- Change, C. "Education is crucial to promote climate action Climate change education for social transformation Climate change education events at COP Education for sustainable development." (2022): 1–6.
- IIHS. "Challenges and Recommendations: IIHS RF Paper on Urban Transport." (2015): 42.
- Polivka, B. J., Chaudry, R. V. and Mac Crawford, J. "Public health nurses' knowledge and attitudes regarding climate change." *Environ Health Perspect*, 120.3 (2012): 321–5.
- Odonkor, S. T. and Sallar, A. M. "An Assessment of Public Knowledge and Potential Health Impacts of Global Warming in Ghana." *Biomed Res Int*, (2020): 2020.
- Tiwari, V., Aditjandra, P. and Dissanayake, D. "Public Attitudes towards Electric Vehicle adoption using Structural Equation Modelling." *Transp Res Procedia*, 48(2018): 1615–34.
- Baldwin, C., Pickering, G. and Dale, G. "Knowledge and self-efficacy of youth to take action on climate change." *Environ Educ Res* (2022): 1–20.
- Falaye, F. and Okwilagwe, E. "Assessing the Senior School Students' Knowledge, Attitude and Practices Related to Climate Change: Implications for Curriculum Review and Teacher Preparation." *J Int Soc Teach Educ*, 20.1 (2016): 43–53.

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