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RESEARCH ARTICLE

A STUDY OF THE CITIZENS' ATTITUDE TOWARDS AIR POLLUTION DERIVED FROM VEHICLES IN MASHHAD AND AN ASSESSMENT OF THE EFFECTIVE FACTORS IN CONTROLLING IT (A CASE STUDY IN DISTRICT 1 AND 9 IN MASHHAD)

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ABSTRACT

The aim of this research was to study the effects of different parameters such as age, gender, and education on public awareness and culture in regard to air pollution from vehicles, its sources, and its problems in Mashhad. Using the quantitative research method and questionnaires, this research sampled 150 people living in Khayyam and Malek Abad areas (as the clean and unclean areas respectively). The results indicate that most people in this study have no particular information about air pollution from vehicles and the ways to reduce it. Moreover, it has been found that improving the culture is the key to unanimity among the authorities, organizations, and people for environmental protection. By using their scientific and practical insights, senior and middle managers, the authorities, and experts in environmental issues are expected to try to analyze the need to educate citizens in order to place Iran among the developed and advanced countries of the world in this regard.

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INTRODUCTION

The environment consists of various resources being threatened by factors like technological advance, per capita income, rapid population growth, and high standards in a way that environmental protection is seriously paid attention to by governments. Since the air has a high capacity of holding pollutants and is directly related to human's everyday life, environmental problems become especially important (Babaie, Javaherdshty, and Chahar Balesh, 2001; Rezaei and Khosravi, 2011). Air pollutions is defined as any change in the features of the components of the environment in a way that the previous applications become impossible, and interests of the living things are directly or indirectly endangered (Babaie et al., 2001). Volcanic activity, forest fires, and sandstorms are some of the most important natural sources of air pollution while population growth and urban development, fossil fuel combustion, vehicles, different industries, residential and commercial buildings, and burning agricultural remains are the

artificial causes of it (Tavakoli, 2011). In a study by Qobadi, Hesami, Sohrabiniya, and Amid (2006), the roles of fixed and moving (vehicles) sources in producing pollution in Iranian cities were determined to be 10-15% and 85-90% respectively. Therefore, according to them, it can be said that vehicles are one of the main sources of pollution in Iranian cities, and the highest percentage of this pollution comes from cars. CO (carbon monoxide), NO₂ (Nitrogen dioxide), SO₂ (sulfur dioxide), ozone (O₃), and carbohydrates and floating particles (PM₁₀, PM_{2.5}) are some of the most important air pollutants, responsible for urban air pollution, and dangerous to human health (Qobadi et al., 2006; Perkins, 1994). The researches done in the last two decades show that there is a close and consistent relationship between exposure to air pollutants and health problems (Morapha, Doloo, and Hashemi, 2011) as air pollutants mostly affect the cardiovascular and respiratory systems. The harmful effects of air pollution on animal and plant health and the destruction of monuments is really profound, and acid rain, the depletion of the ozone layer, and global warming and its effects on the ecosystem and finally on human beings are also studied and discussed by scientists (Mir Bagheri and Qaderi, 2010). In this regard, different solutions like discarding old cars, manufacturing new cars, improving fuel quality, improving public transportation, safety

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inspections, traffic management, organizing industries and other sources, developing landscapes, monitoring pollution and health, general program management, teaching concepts, and improving environmental culture can be considered as solutions to reducing air pollution and its harmful effects on the environment (Salem and Ostad Hossien, 2004; Allah Vardi Zadeh, 2004). Culture is identified as the main factor and engine of sustainable development in environmental protection. Accordingly, if environmental ethics include human's ideal behavior towards natural, social and cultural environments, environmental improvement will be achieved (Ajdari, 2003). Some positive steps taken in different cities to deal with problem include the attempt made by the authorities in Esfahan to triple bicycle stations (bicycle sharing system) and lanes, information dissemination and raising public awareness of teaching and introducing environmental concepts in Ahwaz, using bikes as a means of transportation in Ahwaz, increasing rapid transfer routes and discarding old cars, establishing NGOs to educate people in Hamedan, and adding environmental topics to the school curriculum in Horomozgan (Forootan Kia, Poorturkarony, and Hossein Zadeh, 2011; Hatami Nejad and Ashrafi, 2009; Allah Vardi Zadeh, 2004; Astan and Ranjbar Zarrabi, 2011; Zarerei, Haj-Hosseini, and Karimi, 2011).

Also in other countries, railroad transportation, bus-based transportation, public transportation, bicycling, and walking are widely common (Tajdar and Akbari, 2008). Unfortunately, most of the population in Iran is facing serious challenges of environmental culture with unprecedented dimensions, scales and complexity. Environmental pollution is at a critical stage, and understanding the concepts and modern methodologies have not been yet able to suitably change into practical environmental culture in Iran. Although Article 50 in the Constitution declares the importance of environmental protection very beautifully and comprehensively, and even other rules and regulations were made and enforced from the same Article, environmental protection has just become a cliché because environmental pollution has directed the country towards critical conditions as a result of educational shortcomings in environmental awareness, the lack of a sense of responsibility throughout the society, the lack of proper social morality, and, in a nutshell, related cultural poverty (Adhami and Akbarzadeh, 2011; Ajdari, 2003). Since it is necessary for people and the authorities to think of and study the role of education as one of the human's basic needs to reach development, the present research aims to study the role of education and awareness as the first effective step to raise public awareness and provide information on environmental protection and reducing environmental pollution especially the pollution from vehicles in Mashhad. This research also aims to study the effects of some parameters, namely area type, age, gender, and education, on reducing air pollution in Mashhad.

MATERIALS AND METHODS

This research has tried to determine the effective factors in citizens' environmental awareness of air pollution from vehicles in Mashhad. The present study is a descriptive-analytic one, meant to be applied, using quantitative data collection methods, and it is mainly based on library and field research. Given the lack of precise organizational information and statistics, a questionnaire was developed using the

information and indices collected in the library studies, researches, and theoretical writings; its validity was examined and finally proved by university experts and professors. This field research was then done through face-to-face (direct) questionnaire administration following the closed type to collect data. Without any limitations in the level of education, age and gender, the sample in this research includes all the residents living in Khayyam and Malek Abad areas (as the clean and unclean areas respectively) in Mashhad. The independent variables include the level of education, age and gender, and the dependent one is public awareness of air pollution from vehicles. One thousand questionnaires, distributed among citizens through random sampling, were filled out in this study. Prior to completing the main questionnaires and in order for studying the issue more closely, 150 ones were completed to examine the validity and reliability. In the end, the questionnaires were collected, grouped, and coded, and then different statistical techniques and methods like descriptive analysis (percentage and frequency) and deductive analysis (the multivariable Chi-squared test) along with SPSS and Excel computer programs were used to analyze data and purify or categorize information.

RESULTS AND DISCUSSION

The Relationship between the Involved Factors and Public Awareness of Air Pollution from Vehicles

The Level of Public Awareness of the Effects of Vehicles on Air Pollution

Area

The results indicate that 88% of the people involved in this study are aware of the effects of vehicles on air pollution, and it can be said that the null hypothesis is not rejected due to the significance level of χ^2 . So there is not a significant relationship between the observed and expected frequencies and the results are random (the results have not been shown). In other words, people are highly aware of air pollution in both target areas, which can be a result of an excessive increase in pollution in those areas over the last few years, its greater tangibility, and relative public awareness of air pollution (Firuz Zare and Ghorbani, 2011).

Age

The hypothesis about public awareness of the effects of vehicles on air pollution being related to age is significantly proved according to its significance level i.e. awareness is directly related to age. This result is not random and can be generalized to the whole sample (Table 1), and it confirms that people's experience, sense of responsibility, understanding, and social knowledge of environmental issues like air pollution increase as they get older i.e. people's knowledge and understanding of pollutants goes up by age, and they can better judge whether to show protective behavior or not as their sense of responsibility goes up, too. Consequently, people's attitude towards protecting the environment changes throughout their life (Adhami and Akbarzade, 2011).

Table 1. The relationship between age and public awareness of the effects of vehicles on air pollution

Group	Feature	Frequency		Statistic χ^2
		Yes	No	
1	15-25	41	14	10.550
2	25-35	39	10	
3	Above 35	39	7	
Total		119	31	150
Significance level				< 0.05

Gender

The null hypothesis is not rejected according to the χ^2 test, so there is not a significant relationship between gender and awareness of the effects of vehicles on air pollution. In other words, awareness is independent of gender (the results have not been shown). Women's responsibility to improve the quality of life, to participate in making major decisions on development and socioeconomic growth, and to teach environmental issues have made women play a more prominent role than men in bringing up future generations, but women tend to have education and jobs as their main goals due to high costs of living, expectations, and inflation in today's society, unfortunately preventing them from their main and basic role in life. The result is that women, when compared to men, are equally aware of environmental problems (Samadyar and Samadyar, 2011).

Education

Given the results of the χ^2 test and a reliability level of 95%, it was revealed that there is no significant difference between the level of education and public awareness of the concept of pollution and the effects of vehicles on it (the results have not been shown). The level of education is an important socio-cultural parameter and closely related to the other aspects of a person's social life. A higher level of education is an important and influential factor in the awareness of and openness to environmental education. However, there is not a significant difference among people with different levels of education in terms of their awareness of the effects of vehicles on air pollution, which is due to the excessive rise in air pollution, making it an everyday issue, and also due to people's irresponsibility (Golzardi, Suroor Amini, Vazan, and Suroor Amini, 2011).

Public Awareness of Air Pollution in Mashhad

Area

According to Table 2 and the significance level of χ^2 , the null hypothesis is rejected with a reliability level of 95%. So it can be said that there is a significant difference between the observed and expected frequencies, and the results are not random. In other words, people's recognition of the pollution in their areas was accurate, which is due to the presence of Malek Abad Garden and the prevailing wind in this area. Also most people live in houses in Malek Abad, which helps maintain air quality in that area while the presence of several intersections and heavy traffic in Khayyam, as the unclean area, have increased the air pollution which is further intensified by high-rise buildings blocking winds in this area.

Table 2. The relationship between the living area and public awareness of air pollution in Mashhad

Group	Feature	Frequency		Statistic χ^2
		Too much pollution, but it is not significant	Low pollution and the prevention is necessary	
1	Malek Abad	60	18	9.770
2	Khayyam	42	30	
Total		102	48	
Significance level				< 0.05

Age

The null hypothesis is not rejected according to the χ^2 test, so that the hypothesis about public awareness depending on age is not accepted, and it can be said that there is no significant relationship between these two variables (the results have not been shown). Generally, people's understanding and awareness goes up as they get older and more educated, leading to heightened sense of responsibility and attitude toward air pollution.

Since the prerequisite to having a positive attitude is training, and since changing someone's attitude is made possible just through relying on training, it can be said that people are constantly exposed to training throughout their education and life, which raises their awareness of environmental pollution (Tajdar and Akbari, 2008; Ghadimi, Phami, and Asadi, 2012). Nonetheless, higher levels of air pollution and its substantial effect on the society has caused it to be seriously covered by the media and the authorities, leading to an increase in public awareness and fading any significant difference between education levels and age.

Gender

Based on the results of this research, it can be concluded that 62% of people have a sound judgment about the air around them, and the results of the χ^2 test indicate that the null hypothesis, with a reliability level of 95%, is not rejected (the results have not been shown). The damage to the environment is mostly invisible in today's world, and it takes a long time for its destructive and deadly effects on human health and nature to appear.

Therefore, tomorrow will be too late to take measures to prevent damages to the environment (Momeni, Saraphy, and Ghassemi, 2008). Most men and women thus believe that there is too much air pollution and it should be prevented; however, women, due to their higher precision and sensitivity, consider it to be too much. Overall, some serious policies should be adopted to reduce air pollution.

Education

Given the results of the χ^2 test and a reliability level of 95%, it is found that there is no significant relationship between the level of education and public awareness of air pollution and the effects of vehicles on it (the results have not been shown).

The Relationship between the Involved Factors and Public Awareness of Air Pollutants Sources

Public Awareness of the (Natural and Artificial) Air Pollutants Sources

Regarding Table 3 and the rejection of the null hypothesis, it is proved that there is a significant relationship between the living area and public awareness of air pollutants sources, divided into natural and artificial, with a reliability level of 95%. This result is not random and can be generalized to the whole sample. Forsat (2005) states that environmental abnormalities like cancer have been developing roots in every part of our planet. Since the unsystematic use of vehicles is defined as a kind of abnormality, the pollution from this source has disrupted and interfered with the relationship between humans and the environment.

Table 3. The relationship between the area of living and public awareness of (natural and artificial) air pollutants sources

Group	Feature	Frequency		Statistic χ^2
		Yes	No	
1	Malek Abad	23	52	535.02
2	Khayam	18	57	
Total		41	109	150
Significance level				< 0.05

Given the results of the χ^2 test and a reliability level of 95%, it has been found that there is no significant relationship between the three variables age, gender and education and public awareness of air pollutants sources and the effects of vehicles on them (the results have not been shown). It is clear that people's awareness, sense of responsibility, knowledge, and experience goes up over time, and men are generally more aware of such issues than women. Using vehicles was more limited in the past due to people's economic and social conditions, but using a vehicle is very common these days as a result of misplaced excitement, the lack of appropriate culture and the development of roads, causing heightened public awareness of air pollutants sources.

The Relationship between the Involved Factors and Public Awareness of the Solutions to Reducing Air Pollution

Public Awareness of the most Effective Solution for Reducing Air Pollution

The null hypothesis is rejected according to the results of the χ^2 test and table 4 i.e. there is a significant difference between gender and public awareness of the effective factors in controlling air pollution.

Table 4. The relationship between gender and the awareness of the most effective solution for reducing air pollution

Group	Feature	Frequency				Statistic χ^2
		Use of public transport	Create more green space	Even and odd projects	More educated people	
1	Man	37	5	10	24	21.961
2	Woman	34	5	15	20	
Total		71	10	25	44	150
Significance level						< 0.05

Owing to their important and prominent role in families, women chose educating as the primary and most effective step in reducing air pollution. Their next priorities were creating and developing landscapes, using public transportation, and odd-even traffic limitations while men, because of their physical and mental preoccupation, consider educating and using public transportation to be more effective than odd-even traffic limitations and developing landscapes, which they think is a very time-consuming process. People's sense of responsibility to protect the environment increases as they get older and more educated, yet we should consider the role of the youth who are more educated and even more successful than older and less educated people, the fact that can potentially decrease development costs.

However, the role of educating and finding practical solutions has been disregarded and not emphasized any further. Educating about and publicizing the air pollution issue can be so effective that more attention and focus is bound to be directed towards educating and training programs in different areas, leading to an increase in the awareness of the positive and negative consequences of the environmental protection (Firuz Zare, Borji, and Shakeri Ravesh, 2011). Generally, 95% of the people involved in this study believe that air pollution can be reduced just through educating and publicizing, and using public transportation, which means that most people think of educating as a practical and effective measure in reducing air pollution. Trying to turn the environment into a comprehensive concept for the whole people, we inevitably have to lay the foundations by educating the public. First, we should be aware of the position and value of the environment, and then monitor the authorities and experts' programs along with playing our part as the main protectors of the environment and not being involved in destroying the environment (Karimi and Liyaghaty, 2008).

Public Awareness of the Effects of the Solutions Suggested By the Authorities

Table 5 indicates that public awareness is gender-dependent, and the relationship between these two is significant. Generally, people, regardless of the living area, age, gender, or education, find the odd-even traffic limitations more useful than heavy traffic tickets and gasoline rationing. If a norm like educating is approved by most people in the society, people will follow it, but, unlike the present theories, the three norms including odd-even traffic limitations, gasoline rationing, and traffic tickets, set by the government, were not accepted by the public as an effective and practical measure. It can be due to the fact that the creation of such norms in a society is done by the overall structure of the government, and since people do not usually look positively at the performance and plans, and

Table 5. The relationship between gender and the awareness of the effectiveness of the solutions proposed by the government

Group	Feature	Frequency			Statistic X^2
		The odd and even license plates	Rationing of Gasoline	Pay fine	11.388
1	Man	55	7	13	
2	Woman	35	17	23	
Total		90	24	36	150
Significance level					< 0.05

Table 6. The relationship between the living area and public awareness of the effects of fuel type on air quality

Group	Feature	Frequency			Statistic X^2
		Regular gasoline	Premium Gasoline	Hybrid	
1	Man	23	18	28	6.183
2	Woman	40	6	35	
Total		63	24	63	150
Significance level					< 0.05

Table 7. The relationship between the living areas and public awareness of the effects of fuel type on air quality

Group	Feature	Frequency			Statistic X^2
		Regular gasoline	Premium Gasoline	Hybrid	
1	15-25	19	12	24	
2	25-35	25	5	21	9.183
3	Above 35	25	6	13	
Total		69	23	58	150
Significance level					< 0.05

Table 8. The relationship between education and public awareness of the effects of fuel type on air quality

Group	Feature	Frequency			Statistic X^2
		Regular gasoline	Premium Gasoline	Hybrid	
1	Under diploma	6	7	7	
2	Diploma- Bachelor	59	11	42	22.16
3	Postgraduate	8	5	5	
Total		73	23	54	150
Significance level					< 0.05

Table 9. The relationship between age and public awareness of information dissemination as a solution by the authorities

Group	Feature	Frequency		Statistic X^2
		No	To some extent	
1	15-25	20	33	
2	25-35	36	16	8.432
3	Above 35	23	22	
Total		79	71	150
Significance level				< 0.05

Table 10. The relationship between age and public awareness of the consequences of the travels made by tourists in the pollution of Mashhad

Group	Feature	Frequency			Statistic X^2
		Very low	The average	High	
1	15-25	5	24	27	
2	25-35	10	24	16	9.417
3	Above 35	7	26	11	
Total		22	74	54	150
Significance level					< 0.05

Table 11. The relationship between gender and public awareness of the consequences of the travels made by tourists in the pollution of Mashhad

Group	Feature	Frequency			Statistic X^2
		Very low	The average	High	
1	Man	14	45	16	13.233
2	Woman	7	31	37	
Total		21	76	53	150
Significance level					< 0.05

generally the statements of a government, they tend to defy any norm approved by the government even if the proposed norm is correct and acceptable. Also such a norm will not be effective and widely accepted since it has been proposed by a structure which is not so although a norm like odd-even traffic limitations may become well-established over time when people themselves find it correct and beneficial (Ghadimi *et al.*, 2012).

Public Awareness of the Effects of Fuel Type on Air Quality

The null hypothesis is rejected according to the results of the χ^2 test and tables 6, 7 and 8, meaning that there is a significant difference between the observed and expected frequencies. Generally, people use the ordinary gasoline as the fuel of their vehicles, which can be because of its lower price. It means that if the authorities do not take any measures like lowering the price of high quality gasoline, preventing fuel trafficking into the country, and mixing low and high quality gasoline, air pollution will worsen day by day until it harms everyone. A great deal of fuel is wasted every day in Mashhad because of heavy traffic and long traffic jams. Extensive researches on transportation in Mashhad have revealed that about 2,883,300 liters of gasoline is wasted in Mashhad every day owing to the lack of smooth traffic. At the same time, about 360,830 kg of CO, 56,510 kg of unburnt carbohydrate, and 11,840 kg of nitrogen oxides are estimated to be emitted by vehicles in Mashhad every day. Therefore, we can help the economy of the country and the issue of air pollution through different ways like using natural gas vehicles, regular safety inspection, using Euro4 standard gasoline, replacing regular gasoline with super gasoline, fighting against fuel trafficking, and using green means of transportation like the bike (Yazdanpanahi and Maleki, 2011).

Public Awareness of Information Dissemination as a Solution by the Authorities

According to previous studies, it has been found that people believe what has been done by the government so far to reduce air pollution was insufficient both in quality and in quantity and requires more funds for meticulous planning. 60% of the participants in this research think that no serious measures have been taken by the government yet; therefore, the hypothesis about the independence of the relationship between public awareness of the solutions to air pollution reduction and the living area, gender, and the level of education is not rejected as there is no significant relationship between them although people's experience and awareness apparently go up as they get older, making the actions done by the authorities more noticeable to them (the results have not been shown). It can be thus said that there is a significant relationship between age and public awareness of the solution to air pollution reduction. The dissemination of information by the related officials and experts in the city hall can play an important role in improving people's attitude towards the concept and sources of pollution, its solutions, and the influential cultural factors. Such dissemination is only made possible through accurate recognition and information, so those officials and experts should develop their scientific and practical skills through in-service training, seminars, conferences etc, and information dissemination and clear and understandable training are very important in this regard. Lack of interest is one of the

important factors preventing people from protecting the environment as making people interested in this issue can be the first step in attracting public attention. It can be evidently said that if specific education is provided for people of different ages, good results will be obtained (Firuz Zare *et al.*, 2011).

The Effects of Cultural Factors as a Central Solution and a Fundamental Step In Reducing Air Pollution

Public Awareness of the Consequences of the Travels Made by Tourists in the Pollution of Mashhad

The analysis done by the χ^2 test in the involved sample with a reliability coefficient of 95% indicate that there is a significant difference between the two variable of age and gender and public awareness of the effects of tourists in producing pollution in Mashhad. This result is not random and can be generalized to the whole society involved in this research (Tables 10 and 11). Even though the current tourism system in Mashhad has brought about positive economic (employment, income etc) and socio-cultural effects, it has made the city face ecological, socio-cultural and economic instabilities. Due to their greater sensitivity to the cultural affairs in families, women consider the effects of tourism more than what men think of. Moreover, people pay more attention to the environment and become more aware of its problems as they get older (Ghasemi, 2011; Golzardi *et al.*, 2011). However, the information obtained from the χ^2 test implies that people's living area and education does not have a significant role in their awareness of the effects of tourists on air pollution in Mashhad. In other words, there is no significant relationship between people's education and living area and their awareness of this issue (the results have not been shown).

Mashhad draws many domestic and foreign tourists and pilgrims throughout the year especially on some religious and traditional occasions and vacations as about 12 to 20 million people of different economic classes have visited Mashhad in the last ten years (The Department of Cultural Heritage, Handicrafts, and Tourism in the province of Khorasan Razavi, 2011), turning Mashhad into the largest religious megacity and tourist destination of the Islamic World. Imam Reza's holy shrine, as the main tourist center in this city, has overshadowed the other attractions and is regarded as the engine of the tourism system. Since Khayyam and Malek Abad areas are some distance from the holy shrine, their residents are not much aware of the effects of tourists on air pollution (Ghasemi, 2011). Also concerning the relationship between education and the awareness of the role of tourists in air pollution, people mainly care about the financial aspects and the profit made through tourists. If the value of each citizen's time is 7,606 rials (≈ 0.2 dollar) per hour, the cost of the time citizens in Mashhad waste during a day will equals 2,005,211,000 rials ($\approx 63,000$ dollars). It should be also mentioned that this number will be even more on holidays due to the presence of travelers and pilgrims and heavier and more congested traffic, which all increase the wasted time and thus the costs. If we calculate such undesirable costs, the profit made from tourism dips dramatically (Yazdanpanahi, and Maleky, 2011). Furthermore, the local culture will undergo massive changes in addition to an excessive increase in air pollution from the presence of tourists (Shakeri and Bahreh

Bar, 2011). Making and implementing administrative plans is deemed to be necessary more than ever due to various problems caused by tourists in Mashhad. It can be concluded from this research that since pilgrims and tourists need hotels and hostels to stay in, they can be provided with some brochures to help them protect the environment, avoid polluting it, and make the most of the services available. The holy shrine authorities can cooperate through effective cultural measures like widespread advertisement. Mashhad City Hall can provide more trash cans as well as advertisements on the environment and can facilitate transportation through providing tourists and pilgrims with special buses especially on crowded times, also making travelers avoid using their own cars. Tourist can be also given plastic bags for their trash and asked to return them in order to avoid littering and to produce less garbage. Such actions require the participation of all departments, governmental offices (like the city hall), and non-governmental ones (like the holy shrine). The budget for such services can come from tourism revenues and can be spent on their welfare and the services provided for them, services which they and the name of Iran deserve. This can be very effective in urban and regional development which is not separate from the attractions and the religious-cultural tourism function (Momeni *et al.*, 2008).

People's Tendency to use Bicycles

According to the data obtained from questionnaires, it has been found that there is a significant relationship between age and using bicycles, and it can be said, with a reliability level of 95%, that this is an inverse relationship (Table 12). The results of the study on people's tendency to use bicycles for everyday travel indicate that most bikers are teenagers or students, which can be due to several major factors. The first reason is liveliness because riding a bike requires energy provided by physical activity. So teenagers have a larger tendency to use bicycles because they show more energy and liveliness than the elderly and the middle-aged. The second reason is the short distance from homes to the destination, and again, most students travel a short distance and prefer bicycles to other means of transportation (Hatami Nejad and Ashrafi, 2009). On the other hand, most people are aware of the role of bicycles in reducing air pollution but not willing to use it as a means of transportation, which can be attributed to the lack of the culture necessary to use bicycles, the lack of bicycle lanes, shortage of repair shops and parking spaces, and little attention paid by the authorities.

The main factor preventing the use of bicycles is the safety of bikers endangered by cars and motorbikes' dominance over roads. Interestingly, many people believe that if bikers' safety is ensured, people will definitely use bicycles even if they are provided with free gasoline. But for now, biking is a dangerous means of transportation and potential accidents and deaths are an important obstacle to bicycling (Noland, 1995). Moreover, other vehicles have to reduce speed for bikers' safety. In other words, a 30 km speed limit should be set wherever there are bicycles and it should be done for every part and every street of the country (Hatami Nejad and Ashrafi, 2009). As a result, providing necessary conditions for safe biking can be the best achievement in urban and local planning (Garrard, 2007). In this regard, bicycle lanes and biking facilities are two important strategies (Krizek and

Ronald, 2005). Generally, the extensive dissemination of information by the media and the authorities, widespread public advertisement in cities for using bicycles, holding local and regional bike races, offering a reward for office and factory workers, equipping bicycle lanes and improving bikers' safety, building equipped repair stations on bicycle lane, and building appropriate parking spaces can help regular use of bicycles and lead to effective steps in encouraging the public in this regard (Kjellstorm, Van Kerkhoff, Bamer, and Mc Michael, 2003; Carlos and Philips, 2000).

The Reasons for not Using Public Transportation

The null hypothesis is rejected according to tables 13, 14 and 15 and the χ^2 test i.e. there is a significant relationship between the observed and calculated frequencies. Therefore, the residents of Malek Abad consider using personal cars and lack of certain schedules as the main reasons for a reluctance to use public transportation. The same reasons are equally important to people in Khayyam when there were asked why they did not use public transportation. In the last two decades, many developed countries have chosen public transportation as the main strategy in their urban transportation systems because of its myriad advantages like the mass transportation of passengers in a short time, the reduction in fuel consumption and economic benefits at a local scale, the decrease in air and noise pollution, proper safety, greater sustainability, and the potential for optimum transportation management. Given the special advantages of public transportation, using a variety of such systems is the top priority in many cities in developing countries although such strategies have occasionally faced several shortcomings like the lack of a schedule and shortage of facilities. Finally, it can be said that people prefer to use their own cars, and the effects of public transportation on reducing air pollution cannot be identified unless the minor problems mentioned above are resolved.

People's Tendency for Increasing the Dissemination of Information to Improve Culture

In the present research, 88% of the people in the society say that they need the dissemination of information about air pollution through the mass media, billboards, and banners. Given tables 16 and 17, the null hypothesis is rejected i.e. there is a significant relationship between people's age and education and their awareness of the effective cultural factors on reducing air pollution. People are interested in being aware of air pollution levels through the media, which can raise environmental awareness and thus their sense of responsibility, hence it should be especially taken into account and necessary plans should be made.

The dissemination of Information Through the Media from the Cultural Aspect of Air Pollution

The assessment of the sample through the Chi-squared test with a reliability coefficient of 95% indicate that the hypothesis about age being independent of people's awareness of the solutions for reducing air pollution is rejected as there is a significant relationship between them (Table 18). People generally think that the steps taken so far by the media to help the problem of air pollution were not enough due to the big responsibility the media shoulder in this regard.

Table 12. The relationship between age and people's tendency to use bicycles

Group	Feature	Frequency		Statistic X^2
		Yes	No	
1	15-25	10	45	1.095
2	25-35	13	38	
3	Above 35	8	36	
Total		31	119	150
Significance level				< 0.05

Table 13. The relationship between the area of living and the reasons for not using public transportation

Group	Feature	Frequency				Statistic X^2
		Lack of transportation	Citizen rights are not being respected	No specific timeline	Use of Personal Vehicles	
1	Malek Abad	13	11	27	27	1.088
2	Khayam	11	10	28	23	
Total		24	21	55	50	
Significance level						< 0.05

Table 14. The relationship between age and the reasons for not using public transportation

Group	Feature	Frequency				Statistic X^2
		Lack of transportation	Citizen rights are not being respected	No specific timeline	Use of Personal Vehicles	
1	15-25	9	5	22	20	2.322
2	25-35	10	5	17	19	
3	Above 35	6	1	16	20	
Total		25	11	55	59	150
Significance level						< 0.05

Table 15. The relationship between education and the reasons for not using public transportation

Group	Feature	Frequency				Statistic X^2
		Lack of transportation	Citizen rights are not being respected	No specific timeline	Use of Personal Vehicles	
1	Under diploma	7	5	5	12	201.35
2	Diploma- Bachelor	10	5	44	37	
3	Postgraduate	5	6	5	9	
Total		22	16	54	58	150
Significance level						< 0.05

Table 16. The relationship between age and the tendency for increasing the dissemination of information to develop culture

Group	Feature	Frequency		Statistic X^2
		Yes	No	
1	15-25	48	7	0.375
2	25-35	45	5	
3	Above 35	39	6	
Total		132	18	150
Significance level				< 0.05

Table 17. The relationship between education and the tendency for increasing the dissemination of information to develop culture

Group	Feature	Frequency		Statistic X^2
		Yes	No	
1	Under diploma	15	7	6.83
2	Diploma- Bachelor	100	9	
3	Postgraduate	14	5	
Total		129	21	150
Significance level				< 0.05

Table 18. The relationship between age and the amount of information dissemination from the cultural aspect of air pollution

Group	Feature	Frequency			Statistic X^2
		Yes	No	To some extent	
1	15-25	5	20	30	8/432
2	25-35	5	21	16	
3	Above 35	10	23	20	
Total		20	64	66	150
Significance level					< 0.05

They also believe that such steps require more funding for meticulous planning. The area of living, gender and education are some of the important socio-cultural factors that are interwoven with the other aspects of an individual's social life and can be mentioned as the effective factors in awareness and accepting environmental education (Golzardi *et al.*, 2011). The results of this study show that most people tend to be aware of the quality of the air they live in and how to improve it in order to be able to reduce the harmful effects of environmental pollution on their health. In this regard, the media like the TV, the radio, the internet and social networks can play an important role in introducing environmental concepts and improving the culture of the correct use of vehicles as a contributing factor in reducing air pollution.

The media are so important that a society cannot be imagined without books, newspapers, the TV and the like because communication is the source of culture and aids its perfection (Koen, 1998). The history proves that people acquired no elements of cultural progress when they were scattered and a lack of communication prevented exchanging their learning and experience (Saru Khani, 1999). Hence, the mass media, as a part of the society, are influential in forming people's awareness of social facts. Since the results of this research revealed a significant relationship between the effects of the media and environmental awareness at different ages, it seems that improving the environmental culture demands more attention to the organizations responsible for socialization such as the media, and as people are more easily affected and taught when they are younger, improving the culture of environmental protection should be planned in a way that sometime in the future each Iranian considers himself an environmental protector (Forootan Kia *et al.*, 2011).

Conclusion

Environmental protection like air pollution has just become a cliché because environmental pollution has directed the country towards critical conditions as a result of educational shortcomings in environmental awareness, the lack of a sense of responsibility throughout the society, the lack of proper social morality, and, in a nutshell, related cultural poverty. So this study aimed to study the effects of different factors like the area of living, age and education on public culture and awareness of the pollution from vehicles, its sources and problems in Mashhad. The research findings indicate that increasing public knowledge and awareness in this area is a very effective and important step, and many people's behavior in destroying the environment in their cities and communities originates from their ignorance. Hence, improving the culture of environmental protection based on sustainable developments appears necessary. Using public transportation can be encouraged through widespread dissemination of information by the media, decreasing inner-city trips through developing the concept of electronic citizens, extensive advertisement throughout the city, equipping public transportation routes, improving bikers' safety, building equipped bike repair stations on bicycle lanes, and building appropriate parking spaces for bikes. Also developing landscapes can help enjoy a clean environment. Consequently, teaching environmental issues causes the process of education and thus environmental protection to penetrate into the heart of the society, makes the youth - as the future generation - be

educated without bearing extra costs, and institutionalizes the environmental culture.

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