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Vehicles and Noise Pollution Measurement and their Effects on Public and Mental Health on Qom Citizens

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Abstract
One of the most important issues in today's urban world is increasing use of cars and its noise pollution, which is now one of the most important affecting pollutants on health and quality of lives of residents in urban areas. Noise pollution effects on various aspects of human and the community health as well as the high cost of treatment, thus more studies in this field is needed. Hence the importance of this study is to measure noise pollution caused by traffic and its impact on public health and mental health of the citizens in Qom. The study method was field studies and library. The data obtained over a period of three months regularly studies from the streets of Qom and using the B & K-2230, Quest-2900 and dosimeter. Overall, the results indicate that almost in all streets, noise pollution rate is higher the standard level. Among these the Imam Khomeini Avenue, 19 Day, Eram, and Enghelab streets have more noise pollutions. Noise pollution reflects is determined by field studies. Analyzing the questionnaires distributed among residents of adjacent streets, the results show that there are mild to severe illness and eventually decrease mental and general health of nearby residents in the streets.

Key Words: *noise Pollution , traffic, public health, mental health, Qom.*

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1. Introduction

In spied of many positive changes through the history, today's world sees some unexpected things. (Motesadi and etal,2006:13).Today human environment facing issues such as compacting urban areas, increasing population and expanding industry, causes loss of comfort and often disrupted everyday life (Mashhadi, 1386: 54). One of the most important issues is increasing process of using vehicles and their noise pollution which influence the citizen life. (K. Stoilova & T. Stoilova:1998,399) and (Hunashal & Patil, 2012:448). Increasing cities and using machine in various Affairs of life, noise pollution influence many parts of human life particularly make trouble on some groups such as children, and elders, mental patients, pregnant women, and in general all people (farshidianfar and Oliyazadeh,2011:17). The stimuli (noise pollution) can often reduce respiratory rate and blood saturation, increased heart disease, loss hearing, poor sleep quality, sleepiness, discomfort and behavioral changes (Zonouzi and etal,2006: 130).), (Nassiri et al,2007: 46),(Alizadeh etal,1388:48) and (Abbasi etal, 2010: 1268). That is why that Robert Koch, discovered the TB bacillus in the nineteenth century; considered noise pollution the most important problem of future issues (Rashidi,2001: 36) while "noise pollution and its effects on human health, is almost a forgotten issue in many developing countries" (Rubhera & etal, 1999:81). In total, due to the physiological and psychological effects on human, the sound of vehicles is one of the main pollution sources (Sazgarnya etal, 2005: 21), (Maryaryad et al, and 1386: 110). The paper investigate noise pollution caused by urban traffic and its impact on the public-mental health of Qom citizens where nowadays deal with population increasing which led to vehicles increasing and finally have a beheld the noise pollution.

Research methods and procedures

The paper is descriptive. The first step was performed according to the city map and coordination of the Deputy provincial traffic, which identified the heavy traffic streets. As well as coordination with the city traffic Department in theoretical; traffic times for selected paths were determined (21-16) and measured, evaluated and studied for 3 months. Measured points was over 200 meters distances (this is not a standard distance; several studies done in order to select this distance). According to World Health Organization (WHO) in order to measure the noise level, best distance for placement of the device is between 3.5 m from the wall and 0.5 meter from the sidewalk. In all streets except 20-meter free and Imam Khomeini St. the distances were standard. B & K-2230, Quest-2900 and the dosimeter device is used to measure the noise severity. In second step, 380 questionnaires were prepared based on the Cochran model and were distributed randomly between residents, businesses, merchants of the main streets. The questionnaire included personal information and the impact of noise on people, check sonic major complications, and also check the public health status and residents' satisfaction. In total, importance of the research is doubled, because of expanding issue, its long-term consuming and also high number of motorcycle in this city. Motorcycles in Qom are a source of noise pollution which is main source of environment noise pollution distribution due to move all over place. According to the Health Organization standard, standard sound in air is 55 decibel in residential areas on day and 45 decibel at night; in commercial - residential area is 60 decibel on day and 50 at night; in commercial area is 65 decibel on day and 55 at night (Manori, 2001: 40)., The article start date to review and assessment of noise pollution with the indicators and standards, caused by urban traffic and its impact on the mental health of the public and citizens in Qom.

Finding and results

The results of the studied streets are shown in the following table. As noted in table 1 sound

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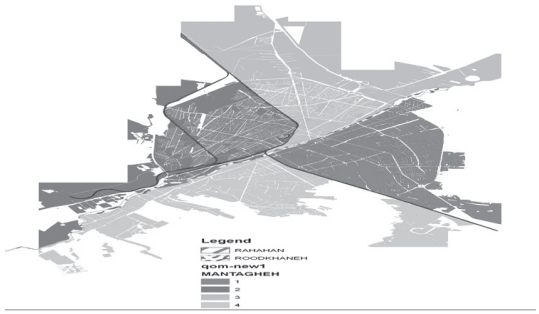




Figure 1. The four districts area and studied streets in Qom
Resources: (Qom municipality and writers 1392)

Street / noise levels	DB (A)	DB (C)
Eram Street	2/2±2/80	3/3±6/84
Dey 19 Street	2/3±6/82	1/4±1/83
Moalem Blvd	1/4±1/82	2/5±2/83
Saheli Street	2/3±5/79	5/3±3/82
Imam Khomeini	2/4±6/86	5/5±6/88
20 meter azad	8/3±6/81	7/3±5/82
Enghlab Street	7/4±8/79	2/7±6/81
Source: (Writers Studies, 1392)		

Table 1. Measurement of noise level in the Streets

level in most streets is higher than standard degree, particularly in Eram, Imam Khomeini, 20 meter free, Enghelab, 19Dey, Saheli, and Kashani street. Other parameters examined in this study are the rate of 1L, 10L, 50L and 90L, which results are shown in Table 1. As it clears the index of 50 Land 90L are above standard that shows high rate of sound in Qom city and traffic situation. The indicators are on 19Dey, Eram, the Imam and Kashani streets.

As it shows in table 1 sound level in most streets are higher than standard degree in Qom. The results identify that most of the noise pollution are on the Imam Khomeini, Kashani, 19Dey, and 20 meter free streets; Imam Khomeini street among them, have more density and passing car due to its special situation as one of the main points of entry in the north. The street has much more traffic on holydays due to the large volume of travelers especially in Tehran; the issue increase noise pollution and hurt residents' health. Other parameters are 1 L, 10 L, 50 L and 90 L, which results are mentioned in table 2. As it shows in above table 90L and 50L have high level which shows a high level of noise and traffic problems in the city.

The indicators in Imam Khomeini, 19Dey, and 20-meter free and Saheli streets because of being city center streets released the highest amount of sound. 20meter free is far from center and its high noise pollution is for leading to the station and the most populous district area in the city. Studies on the street show that many traveling buses moving from this street towards Tohid Square, Amini Bayat Square, and Sheikh Abad and create many noise pollution. Another part of the study, the index Leq3 in 228 people living in nearby streets, 32

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Street	1L	10L	50L	90L
Eram Street	2±5/80	9/3±81	2/7±81	2/4±5/80
19 Dey street	8±6/79	7/7±8/79	2/3±85	2/4±4/81
Moallem blvd	2/3±80	2/4±1/80	2/3±5/79	2±5/78
Saheli street	8/3±5/80	2±2/78	2/5±5/83	2/8±5/81
Imam Street	7±5/79	2/1±5/81	2±5/83	2/8±8/83
Enghelab street	5/±83	08±5/80	2/3±5/77	5±02/81
20 meter free	2/7±82	2/5±5/78	2/3±8/84	2/9±5/80

Table 2. Parameters of 1 L, 10 L, 50L and 90 L in Qom city on first quarter 1392, Source: (Writers Studies, 1392).

Studied St. (decibel)	Eram St.	19 Dey St.	Kashani St.	Saheli St.	Imam Khomeini St.	20 meters Free	Enghelab St.
Standard acoustic (decibel)	60	60	60	60	60	60	60
Measured sound	83.7	82.4	80.8	81.9	84.8	79.7	81.02

Table 3. comparing the sound in studied streets with noise pollution standard in Iran. Source: (Writers Studies, 1392).

cases of traffic police at intersection of heavy traffic and 45 of the shopkeepers were examined. The dosimeter was used to determine the relationship of the device and parameters were measured. The study and measured time was often between 18 hours. The results of the survey indicate that the average Leq levels in residents of streets in three months have been 1/1 ± 77, 7/9 ± 80the traffic police, and 8/5 ± 78 in shopkeepers. So it is clear that traffic police officers deployed in the heavy traffic intersection streets of the city are simply being exposed to noise.

The street noise pollution compared with standard acoustic (decibel)

The result shows that all studied streets in Qom are higher than Iran standard level (decibel) in noise pollution measuring hours (21-16).

Imam Khomeini, Eram, Dey19 streets are in worse situation than other streets, as it shows in table 3; Such a situation will certainly make the most negative effects on nearby residents life quality. Another important issue is motorcycle distribution through the city. Knowing that motorcycles are major sources of noise pollution in the city, Authors counted motorcycles during studies and the result is on blew table.

Noise pollution in Qom streets in connection with Motorcycles

Motorcycles traffics were the issue which was important and also interesting to the authors. Writers investigating, counting and observing, during the studies of different streets in Qom, shows that more than 88 percent of motorcycles are Honda which are the source of noise pollution (having unsuitable and nonstandard horn and exhaust). It is clear for the authors that these motorcycles are the main causes of noise pollution in Qom streets.

table 4 shows that Imam Khomeini St. having the most number of motorcycles and also noise pollution is one of main road in Qom. This is a problem even in many sidewalks where are for pedestrians, thus, besides noise pollution it makes sidewalks unsafe for citizen. Then, 20 meter free in elastration area

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Street	Eram St.	19Day St.	Kashani St.	Saheli St.	Imam Khomeini St.	Free 20 meters	Enghelab St.
Number of passing motorcycle/ a minute	17	16	19	17	23	21	18
Number of passing motorcycle/ an hour	1020	960	1140	1020	1380	1260	1080

Table 4. Number of motorcycles through the Qom city the streets.Source: (Writers Studies, 1392).

		Headache	Depression	Anxiety and insomnia	nervous Tics	Aggression	Weakness and hearing loss
Eram St. residents	Frequency	201	225	192	58	118	47
	persent	25.9	59.2	50.5	15.3	31.5	12.3
19Dey St. residents	Frequency	303	284	202	188	147	53
	persent	79.7	74.7	53.1	49.47	38.8	13.9
Moallem blvd residents	Frequency	155	148	193	144	161	60
	persent	40.78	38.9	50.78	37.9	36.42	15.7
Saheli St. residents	Frequency	201	187	166	184	181	14
	persent	52.9	49.2	43.6	48.4	47.6	3.7
Imam Khomeini St. resident	Frequency	309	329	342	351	307	103
	persent	81.3	86.5	90	92.6	80.7	27.1
2o meter zad residents	Frequency	236	258	288	270	219	26
	persent	62.1	67.8	75.8	71.05	57.6	6.8
Enghelab St. resident	Frequency	285	243	233	241	184	51
	persent	75	63.9	61.3	63.4	48.4	13.4

Table 5. Effects of noise pollution on residents' various diseases in the streets, Source: (Writers Studies, 1392)

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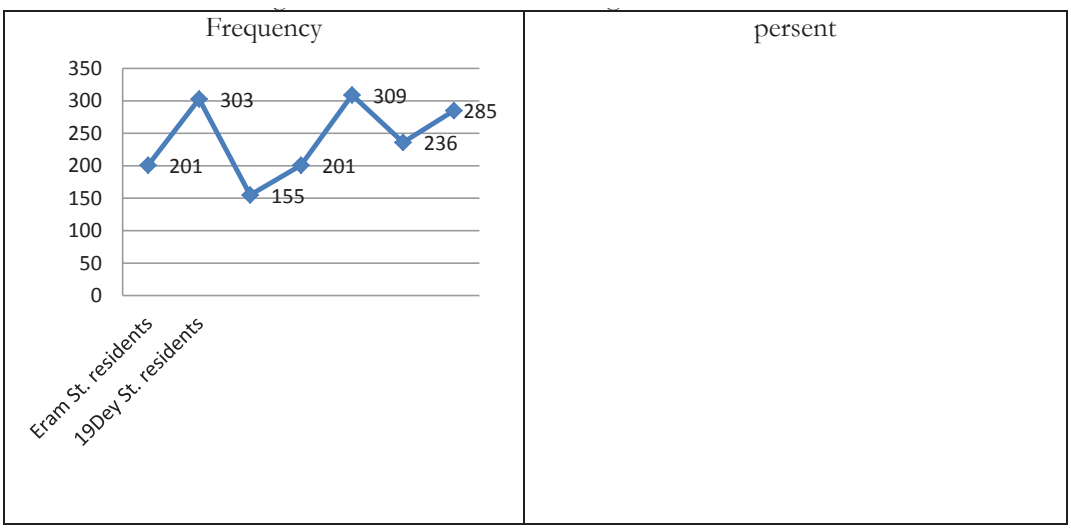
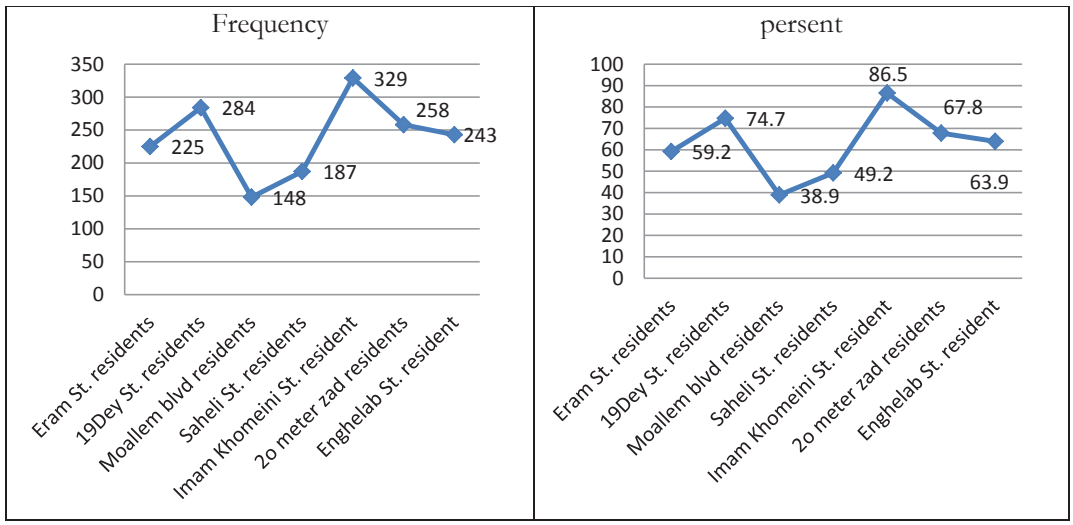


Figure 2. The residents Headache degree in Studied Streets. Source: (Writers Studies, 1392)

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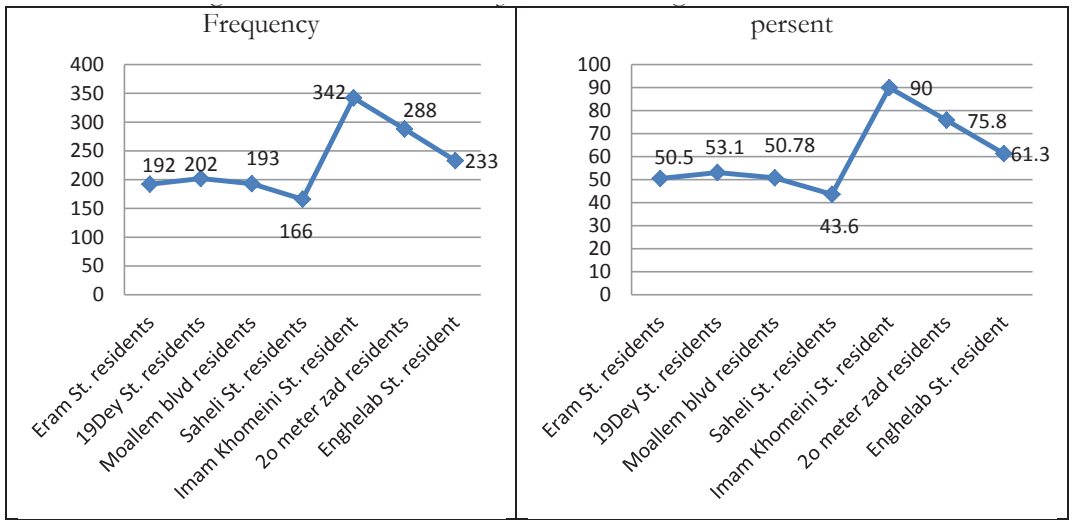


Figure 3. The residents' depression degree in Studied Streets. Source: (Writers Studies, 1392)

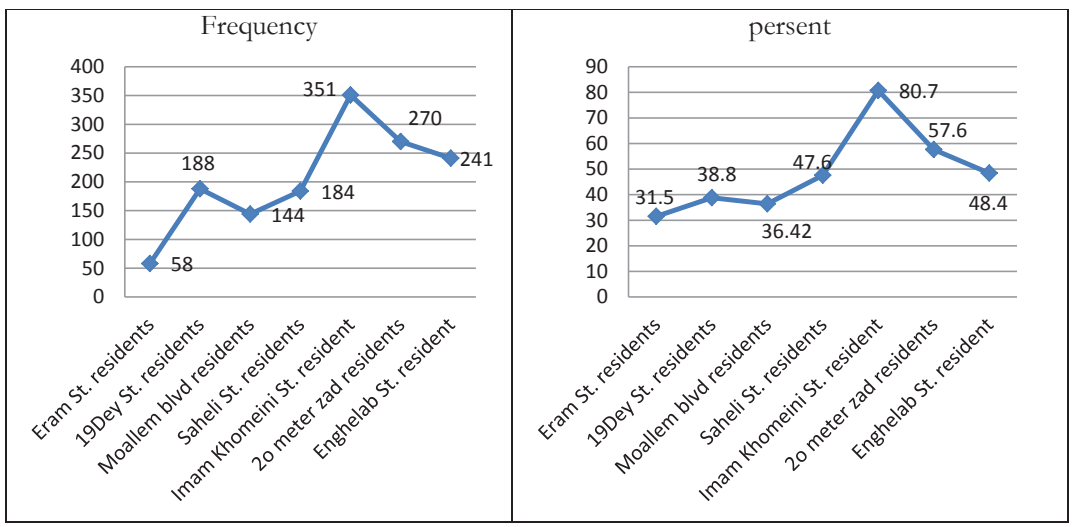


Figure 4. The residents' Anxiety and insomnia degree in Studied Streets. Source: (Writers Studies, 1392).

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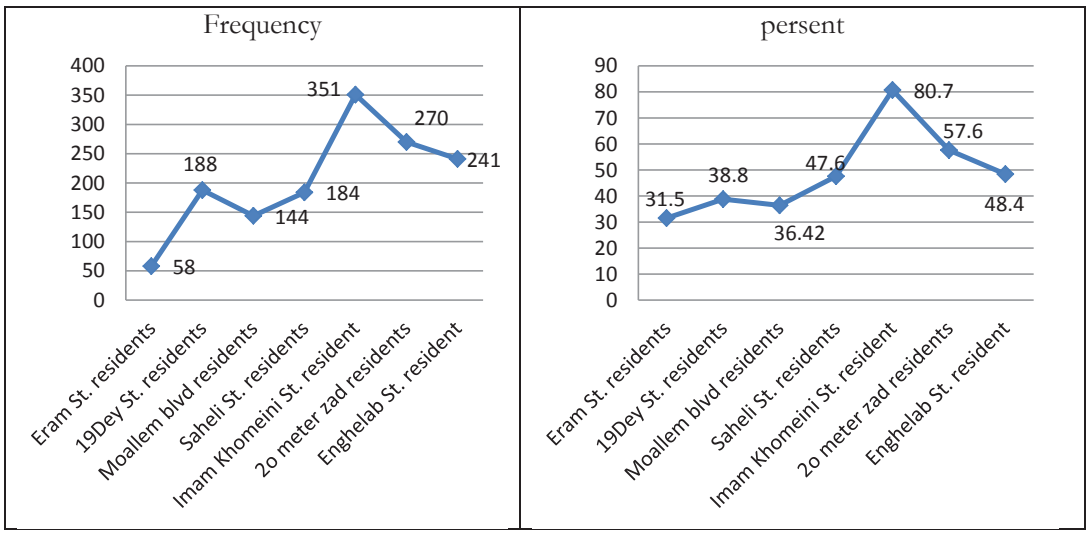


Figure 5. The residents' nerves tics degree in Studied Streets. Source: (Writers Studies, 1392)

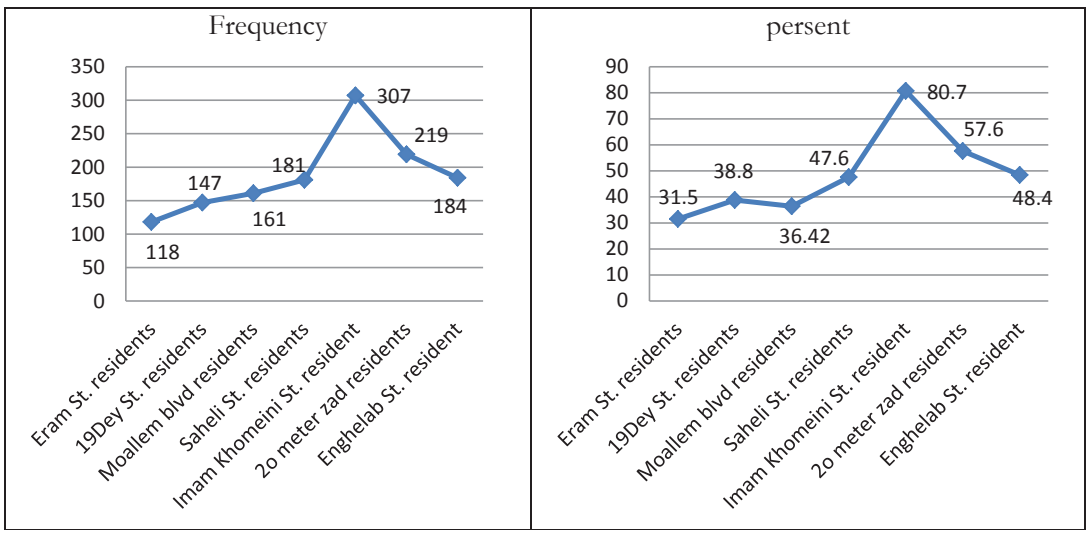


Figure 6. The residents' Aggression degree in Studied Streets. Source: (Writers Studies, 1392).

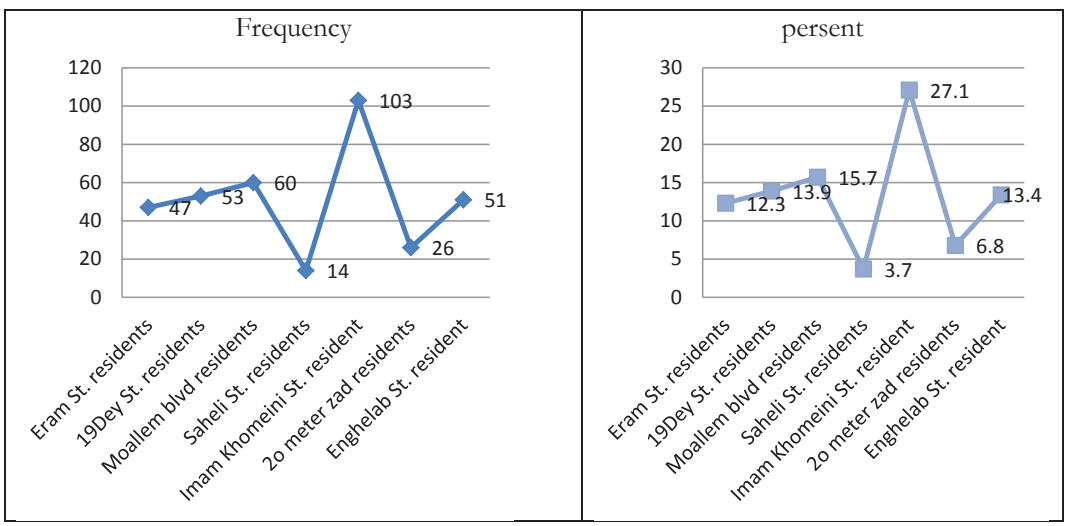


Figure 7. The residents' weakness and hearing loss degree in Studied Streets. Source: (Writers Studies, 1392)

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(between Tohid square and Shah Ibrahim St.) and Moallem Blvd (between Shohada and Moallem square) have the most motorcycle distribution which increases rapidly on noise pollution. In total, the relation of motorcycle in the city and noise pollution caused by them; it can be said that Qom city has unhealthy situation according to motorcycle distinction. At last we can say that motorcycle distribution is one of the most effects that cause noise pollution. Now there are 325 thousand motorcycles passed in this city. (www.persiankhodro.com).

Qom citizen psychology-public position study related to the noise pollution

Health indicators and provide a public health utilization of citizens as main themes of developing and fostering future generations, is the duty of all governments and states. But today, despite the efforts have been done in the field, psychiatric and public health of citizens have been more at risk due to population growth, mass urbanization and increased use of vehicles which rapidly expand noise pollution. Measuring noise pollution in the main streets of city in order to study the effects of pollution on Public and mental health of Qom citizens, 380 questionnaires was randomly distributed among citizen. The results of study from the sites and different sources shows depression, headaches, anxiety, insomnia, nervous tics and aggression is the most important effects of noise pollution on the exposed community. (Zonouzi et al, 1374: 130), (Nassiri et al, 1386: 46), (Alizadeh et al, 1388: 48) and (Abbasi et al, 1389: 1268). So questionnaires containing five points of the study were distributed to residents in the streets and the results are in Table 5.

Conclusions and suggestions

As it shows in Figure and Charts, psychology and public health of nearby citizen is extremely in bad situation affected by vehicles noise pollution. So that the important and influential issues such as depression, headaches, aggressive and… often directly influenced sound pollution is causing the quality of life and health. If investigate the psychology and public health of nearby citizen and the noise pollution on them and rely on the accuracy of the speech will see that the problem of noise pollution in the city of Qom, particularly motorcycles has direct effect on nervous, psychology and quality of nearby residents life in the busy streets. The citizens' health statuses are worst in Imam Khomeini, 19Dey, and 20 meter free streets. So that more than 80 percent of residents in Imam Khomeini, and nearly 80 percent of subjects in 19Dey Street confirmed their headache as effects of noise pollution. Survey of 20 meter free residents shows that noise pollution is very high in the street and it's most important reason is motorcycle. They think that law cost of motorcycle make it too easy for young to buy more than one motorcycle and move in the streets without regard to the rights of others. Finally, interviewing some residents and citizens 19Dey, it became clear that some mothers and children are not calm and comfortable because of noise pollution. So they decided to sell their house and travel to privacy place. In total, analyzing general and mental health of citizens, using in-depth studies and a relatively long time period study shows that Qom has a high level of noise pollution which has put people's health at risk. So that residents' health in this city is in concerning situation such as headaches, depression, anxiety and insomnia, nervous tics and aggression caused by noise pollution particularly in Imam Khomeini St., 19Dey and Enghelab Street. Obviously perspective and systemic look of streets have high cost of medical expenses, decreased of quality and efficiency in the workplace, especially in family violence and aggression. Finally, threats today's children and future generations and their lofty ideals.

Suggestions

1.Encourage and helping nearby citizens in heavy traffic streets, especially in Imam Khomeini, Enghelab, 19Dey streets to use sound

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insulation and double glazing windows.
2.Dealing with drivers who change the exhaust to increase output sound. (It is important because of large number of motorcycles and always complaining and upset people).
3.Automobile Factories Cooperation to make arrangements in order to provide practical solutions to reduce the noise of vehicles especially motorcycles.
4.Dealing with the drivers who use sidewalks and thus increase noise pollution near residential houses and commercial center.
5.Creating even and odd designs by police in the city, especially on holidays that have many travelers from around the country.

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