DESIGNING NON-STRESSED PSYCHOLOGICAL PUBLIC SPACES

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Abstract

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ABSTRACT: Stress is considered the most nervous impact that affects human life due to pressure from many reasons, one of the external factors is the Built environment. The public space as a surrounding context plays a main effective role in human psychological mood whether negative or positive. The paper aims to evaluate urban public spaces, especially from the users' activities in relation to stress factors, these applied through public spaces in Tripoli city, Lebanon. The methodology will be through an analytical study using observation and a questionnaire to measure the types of users' activities in public spaces and their sense of pressure and stress. The results of this study are important to develop a methodology to design non-stressed psychological public spaces.

KEYWORDS: *Psychological stress, Public spaces, Social interaction, human perception, urban life*

1. INTRODUCTION

In recent years, there has been increasing interest in studying the effect of city life on human health and quality of life. One of the most problems that surrounds the human being is the psychological stress, which defined as "The non-specific response of the body to any demand made." According to Dr. Hans Selye, who is considered the leader of research and theories of modern psychological stress (Ellison & Maynard, 1992; Selye, 1974, 1977). These responses have enormous costs on the different fifth dimensions of human health: physical, Mental, emotional, spiritual, and social (Hjelm, 2010). Stress effects on most body organs, especially on physical health. It leads to heart diseases, blood pressure, Stomach upset and headache. While aggressive behaviors, Concentration Problems and hyperactivity in Children have considered some of the impact of stress on mental health which refers to the cognitive aspect of health. Depression that could lead to suicide is the main stress impact on emotional health which related to the person's mood and spiritual health which is the sense of overall purpose in life. Finally, stress effect the social health may be appearing in increasing of divorce cases, Lack of productivity and unjustified violence. In addition, people spend a large percentage of their budget each year on entertainment, recreation, psychotherapy, drugs, treatment, seminars, and books to reduce stress. (Ellison & Maynard, 1992)

Stress affects everyone. In fact, modern times have been called as the "age of anxiety and stress". (Coleman, 1976; Qureshi et al., 2012) Stress reasons divided into internal and external stress. The internal reasons come from inside of human and determine the body's ability to respond to external stress, which are related to the surrounding environment, whether natural or built environments that refers to "man-made surroundings that provide the setting for human activity, ranging from the large-scale civic surroundings to the personal places" (Gregory, 2009). This continuous process goes through human perception to perceive external stimuli from the surrounding environment using the different senses, as a basis for tangible or intangible reaction, affecting human mood.

Fig. 1. Urban public stress as main research focus.
Reference: (Authors, 2018)

Therefore, one of the main factors that affect human mental health is the dealing with the built environments, especially on the level of urban public space. Therefore, the main purpose of this paper is to study the urban stress factors from the point of human sensory experience in relation to the urban public space from the point of users' activities, aiming to evaluate a specific urban public space in Tripoli,
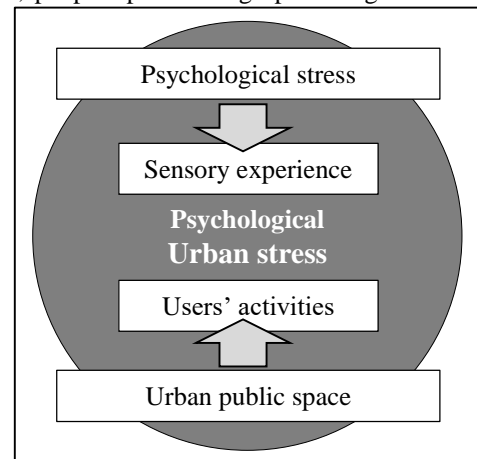
Lebanon as a showcase, to develop a designing methodology for non-stressed psychological public spaces. As shown as Fig.1.

2. PSYCHOLOGICAL URBAN STRESS – BACKGROUND

Globally, there is rapid increase in urban population, according to UN- World Urbanization Prospects, more than fifty percent of people lives in cities, rather than the rural areas, it's expected by the year 2050 that 64% of the world's population will be moved to urban cities (Desa, 2014). This phenomenon, called urbanization that refers to shifting people from rural to urban areas for many reasons such as better quality of service in education and health care, availability of housing, work and entertainment, in addition to the spread of the transportation network.

The rapid growth of population in cities often is random urban growth associated with poverty, environmental pollution and pressure on local infrastructure, leading to many problems such as overcrowding, traffic jam, increasing of crime rates, noisiness. In recent years, many studies found that the living in urban areas has a risk factor in the mental health of inhabitance (Trivedi, Sareen, & Dhyani, 2008), especially stress and depression.

2.1 What is Psychological urban stress?

At first, psychological stress as definition is 'any emotional, physical, social, economic or other factor that requires a response or change. Stress can lead to a variety of psychological responses as anxiety'. (Funnell, Koutoukidis, & Lawrence, 2008). Another definition, that stress is the way of human body responding to any kind of demand or threat, whether it is real or imagined, it is a way of human body's defence in danger case. The nervous system alerts the body by increasing the heartbeat and releasing some hormones as adrenaline and cortisol. The human body rapidly turns to maximize power in response for emergency action. This automatic process known as the "fight-or-flight" reaction or the "stress response". Thus, stress is not bad in all cases; it could be a condition to meet the challenge as an exam or a presentation called 'Eustress' or positive stress. However, if it becomes chronic stress, it will affect health with need of a treatment help called 'distress 'or negative stress. (Smith, Segal, & Segal, 2013)

One of the main factors that have a significant impact on mental health is human surrounding environment, especially the built environment which is the man-made environment, including the urban context from surrounding buildings and urban public spaces which are the main research focus. Therefore, urban stress as a general terminology is related to the relation between the urban context and the impact on the human condition, it is more related to the worsening of urban environment quality caused by the increasing of urban population density as a result of urbanization. (Steiner, Martonakova, & Guziova, 2003). This condition leads to the worsening of the mental health condition of people through urban living. Therefore, the city is a place where the most common stressful experiences happen.

2.2 Stress factors

Psychological Stress is a human body condition caused by stimuli called stressors that can be divided into two types: (Funnell et al., 2008)

1. External stressors: all factors that affect human from the surrounding environment, these factors could be studied through the major components of the environment based on the process of its creation or evolution, these factors are divided into words main categories: (Rajakumar & Selvaraj, 2017)

   a) Natural Stressors: it includes all living or non-living things that occur naturally on earth, such as climate as high or low temperatures, rain, wind and humidity, natural resources as green areas, water and air, in addition to the natural disasters such as fires, floods and earthquakes.

   b) Human-made Stressors: which includes all things that created by human, divided into three main stressors categories.

   - Physical stress: which are tangible factors, in general called the built environment, including the urban context, architectural building and urban public spaces with all their physical elements.

   - Non-physical stressors, which are intangible factors, including civilization, community, and economic factors.

   - Social stressors. These factors are more related with human interaction and communication with other people for example, issues such as peer group pressure, social isolation, life changing events, demands of study, family and work, in addition to the interaction with the surrounding environment including overcrowding, noise, the traumatic effects of accidents, pollution, traffic jam, all issues under everyday living.

2. Internal stressors: which are emanated or comes from within the human body including two main categories:
    a) Feelings: means anything that can be experienced via human senses, such as touch, smell, sight, hear and taste. Feelings also are mental experiences of body states and reactions to emotions, and often influenced by personal experience, beliefs, and memories such as hungry, hot, cold, disturbance, and Sense of balance.
    b) Emotions: which are arising from human body's reaction to external stimuli, programmed into our genes over many, many years of evolution. These emotions are the main Stimulus that leads to stress.

2.3 Human sensory experience as a stress response

The sensory experience is essential for human to understand and perceive the surrounding world, using the five main senses: touch, sight, hearing, smell and taste. These senses play a role model to receive external stressors, transferred it to the brain to take an action.

The stress process begins from feelings using the five senses to reach emotions based on the previous experience leading to the stress response, which realized in most cases by increasing the blood pressure, fast heartbeat and unusual behavior. There are eight primary emotions with their gradation levels, according to theory of emotion by Robert Plutchik. (Plutchik, 1991) as follows: anger, fear, sadness, disgust, surprise, anticipation, joy, and trust.

The intensity of emotions, which is the gradation levels from high strong to low emotion. As for example: fear goes from apprehension to terror, surprise goes from distraction to amaze,

Fig. 2. Pletcher's wheel of emotions. Reference: (Plutchik, 1991)

sadness goes from gloominess to grief, disgust goes from dislike to loathing, anger goes from annoyance to fury, anticipation goes from interest to vigilance, the joy goes from serenity to ecstasy, and trust goes from acceptance to admiration. As shown in Table.1.

For example, when a person feels a noise using his sense of hearing, it will translate it into the emotion of annoyance and anger that leads to stress. (Everly & Lating, 2013) these emotions summarized by the Pletcher's wheel of emotions as shown as Fig. 2.
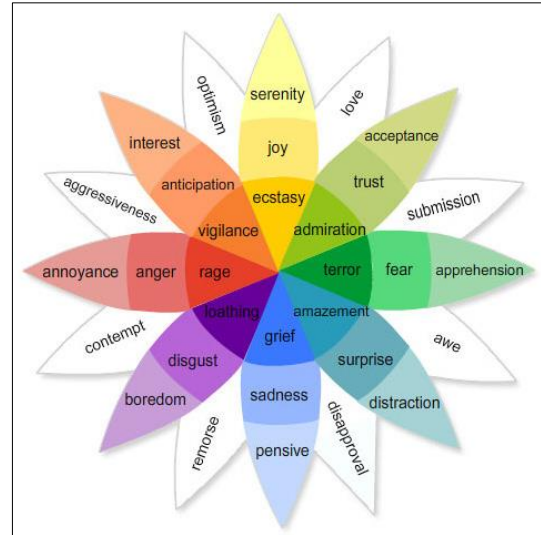
Table.1 Relation between internal and external stressors. Reference: Authors based on (Plutchik, 1991)

Human sensory	Internal stressors				External stressors
	Feeling (examples)	Low emotion (1)	Emotion (2)	Hi-emotion (3)	(Examples)
Sight	Scary vision	Apprehension	Fear	Terror	Unsafe zones
	Sudden vision	Distraction	Surprise	Amazement	Landmark design
Taste	Smelling bad	Pensive	Sadness	Grief	Cleanness
Touch	Touching texture	Boredom	Disgust	Loathing	Garbage
Hearing	Hearing noise	Annoyance	Anger	Fury	Traffic jam
	Seeing signs	Interest	Anticipation	Vigilance	Wayfinding
Smell	Beautiful vision	Serenity	Joy	Ecstasy	Designed spaces
	Smelling good	Acceptance	Trust	Admiration	Green area

3. URBAN PUBLIC SPACES

'Are Pedestrians Invisible in the Planning Process?'

According to this question asked by Lars Gemzøe (2001), there is a priority concern in all major cities with solving traffic problems and the movement of vehicular, Availability of parking lots, and the street gradation typology from local streets to highways. This process requires a lot of gathering data and analysis before making decisions to facilitate the flow of vehicles within specialized departments. However, people in the

planning process are almost invisible, from gathering data on pedestrian movement and their activities in urban public spaces, where people are staying and enjoying public life.

Now, Society is changing from a car-oriented city towards a city for people, this become one of the most important topics that aims to connect built environment to people's quality of life and create healthy communities through designing successful urban public spaces where the public can access spaces without any restrictions. From ancient ages, urban public space designed to support the social life and political dialogue; it was in the central of old cities near ruling palace or worship places, in the last three decades, the definitions of public space evolved in relation to their ownership, control, access and use. (Karaçor, 2016)

There have been several attempts to study the typologies of public spaces to classify public space related to its' characteristics. One of them, according to Carmona (2010) study to classify urban public spaces through four main categories, positive, negative, ambiguous, and private spaces, as shown as Table.2.

Table.2 classification of urban public space. Reference: -(Carmona, 2010; Karaçor, 2016)

A. Positive spaces		
1. Natural/semi-natural urban space	Natural Spaces within urban areas	Rivers, natural features, waterfront.
2. Civic space	The traditional forms of urban space	Streets, squares, promenades.
3. Public open space	Managed open space	Parks, gardens, commons, urban forests, cemeteries.
B. Negative spaces		
4. Movement space	A space dominated by movement needs	Main roads, pedestrian paths, railways.
5. Service space	A space dominated by servicing requirements	Parking areas
6. Left over space	The space left over after developing, often designed without function.	Modernist open space
7. Undefined space	Undeveloped space	Redevelopment space.
C. Ambiguous spaces		
8. Interchange space	Transport stops and interchanges	Metros, bus interchanges, railway stations, bus/tram stops.
9. Public 'private' space	Public external space privately owned	Business parks, church grounds
10. Conspicuous spaces	Public spaces designed to make strangers feel conspicuous	Cul-de-sacs.
11. Internalized 'public' space	Formally public and external uses internalized	Shopping/leisure malls.
12. Retail space	Privately owned but publicly accessible exchange spaces	Shops covered markets, petrol stations.
13. Third place spaces	Semi-public meeting and social places, public and private	Cafes, restaurants, libraries, town halls, religious buildings.
14. Private 'public' space	Publicly owned, but functionally and user determined spaces.	Institutional grounds, housing estates, university campuses.
15. Visible private space	Physically private, but visually public space	Front gardens, gated squares.
16. Interface spaces	Physically demarked but publicly accessible interfaces between public and private space.	Street cafes, private pavement space.
17. User selecting spaces	Spaces for selected groups, by age or activity	Skate parks, playgrounds, sports fields/grounds/ courses.
D. Private spaces		
18. Private open space	Physically private open space.	Urban agricultural remnants, private woodlands.
19. External private space	Physically private spaces, grounds and gardens	Private sports clubs, parking courts.
20. Internal private space	Business or private space	Offices, houses, etc.

3.1 Key attributes for successful urban public spaces

According to the established criteria in the 'What Makes a Successful Place?' developed by the Project for Public Places (PPS), that any place - especially urban public space- has four Key attributes to study or evaluate with different tangible and intangible aspects, as shown as fig. 3. (PPS, 2000; Ramlee, Omar, Yunus, & Samadi, 2016)

1. Access and linkages: the accessibility factor for public space from the connections with the surrounding context by using visual and physical solutions. This factor includes all access paths to locate public space, whether for pedestrian or vehicles beside the visual connection.

2. Comfort and image: the comfort factor and the image of the public space through the perceptions about safety, cleanliness, availability of seating areas and weather protection, and using recreational features as green areas and water features.

3. Sociability: the quality of being sociable through the public space. This factor is difficult to measure; however, it is important to achieve to encourage people to engage in social interaction activities.

4. Uses and activities: users' activity factor in public space, which play a role model to create a vivid space full of attractions through a multi-layer activity to attract all people of all ages. These activities need to be occurring in a friendly social environment.
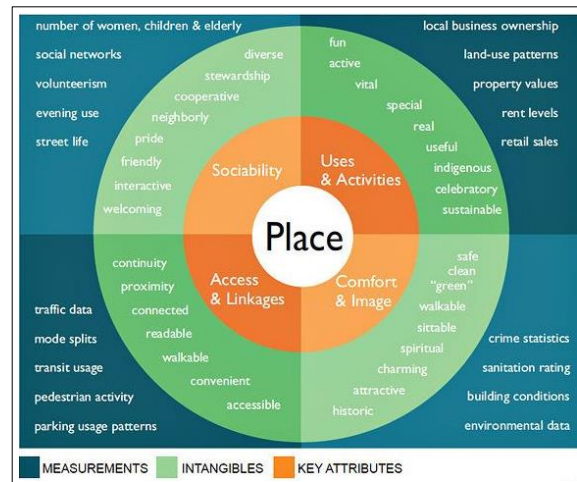

Fig. 3. Key attributes for successful Public spaces. Reference: Based on
https://www.pps.org/article/grplacefeat

3.2 Users' activities in urban public space

According to Gehl (2011), there are three types of outdoor activities in public spaces, related to various requirements of physical spaces; they are as follows:

a) Necessary activities: the essential activities that people must engage through the public space all over the year under nearly all conditions as walking to work or school, waiting for a transport, shopping for a food, etc. These activities influenced only slightly by the environmental conditions.

b) Optional activities: activities that users can choose in appropriate time and place as sitting at a pavement cafe, sunbathing, standing around, etc.; These activities are related to the exterior environmental conditions.

c) Social activities: all activities that depend on existing people in public space, these activities including children at play, discussion between people, and passive contacts through seeing and hearing others, etc.

4. METHODOLOGY

The Research methodology is depended on two main methods to measure the stress factors on a selected urban public space in Tripoli City, Lebanon, the first method is the observation, analysis study based on the result of the current study and the second method is a questionnaire survey.

4.1 Selection of the study area

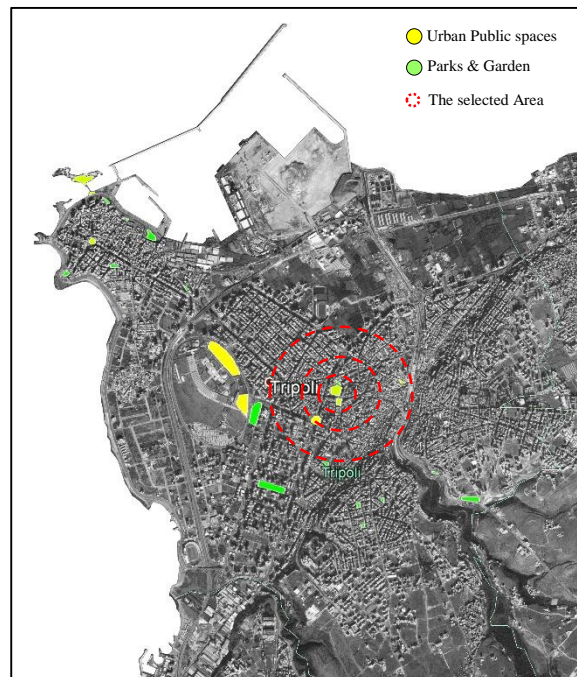According to Harb (2016), Lebanese cities appear to be lacking in public spaces, in terms of

Fig. 4. Public spaces in Tripoli, Lebanon, and the selected case study.
Reference: Authors based on Google earth

parks and gardens. Especially, Tripoli which is considered the second largest city in Lebanon and the capital of the North Governorate, located 85 kilometers north of Beirut. The research depended on selecting El-Tall Square "Sahet El-Tall" as main historic urban public space located in the heart of Tripoli city, as shown as Fig.4.

El-Tall zone area is considered the most active and dynamic space in the city, due to its' relation and accessed from the old and new city, its genuineness Othman heritage characteristics, from the famous landmark, Sultan Abdul Hamid clock tower, its public Garden, Nawfal Place and many other Othman and Colonial buildings which together considered as Classical Lebanese Architecture. It could notice that El-Tall Square divided into three public spaces: Al-Manchieh central Park with its pentagonal formation and radial landscape that leads to five entrances related to the main streets, El-Tall Square and Tripoli Municipality garden. As shown as Fig.5.
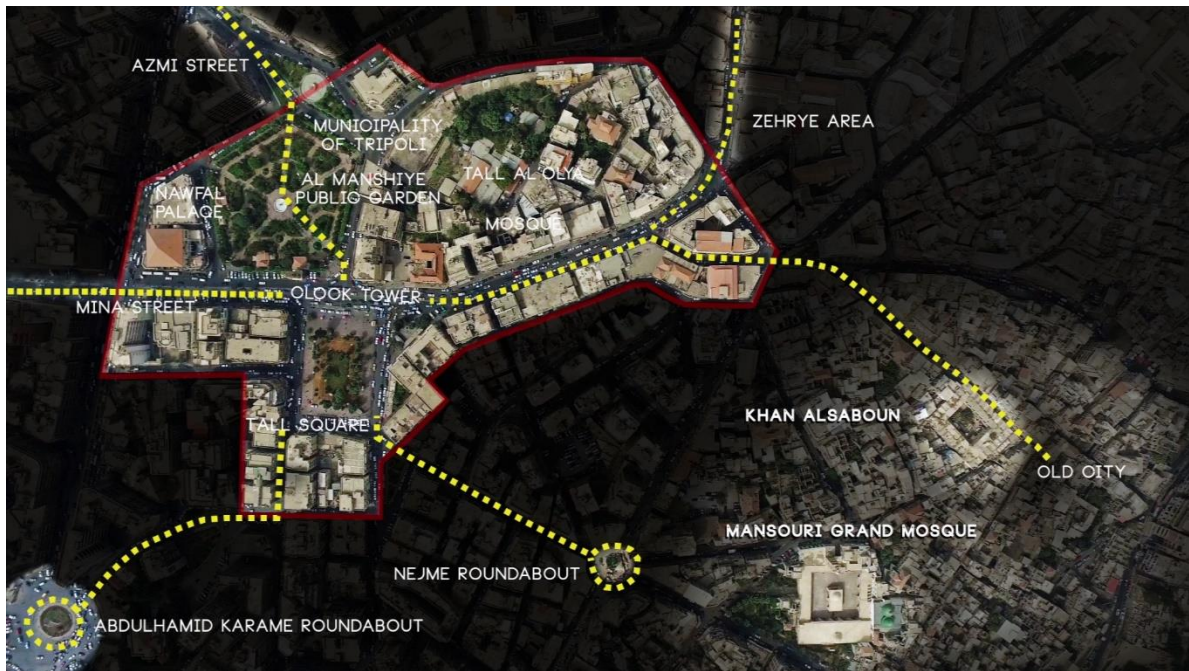

Fig. 5. Tripoli El-Tall Square with its relation to surrounding context
Reference: Tripoli Municipality website, El Tall area development project, http://www.tripoli.gov.lb

4.2 Case study analysis

Based on the current study to investigate the relation between the stress factors and the urban public space, it applied to the selected case study, which is the El-Tall zone area through the following points:

1- Urban public space analysis: first, this part includes the classification analysis of El tall urban space, which contains different types of spaces as shown in Fig. 6.

Fig.6 classification of El-Tall Urban Space. Reference: Authors based on (Carmona, 2010; Karaçor, 2016)

Second, the urban space analysis of vehicle and pedestrian's movement, green area and water features, activities and noise, these impacts on users' feeling mood tested by the authors, as shown in Fig. 7. As initial results, there are a strong relationship between stress level and the urban context. The stress level increased with the random vehicle movement and noise level from it and street vendors as shown in Fig. 7 (a, d, e and f). However, the stress level decreased within the green areas and water features with low noise level as shown in Fig. 7 (c, e and f).
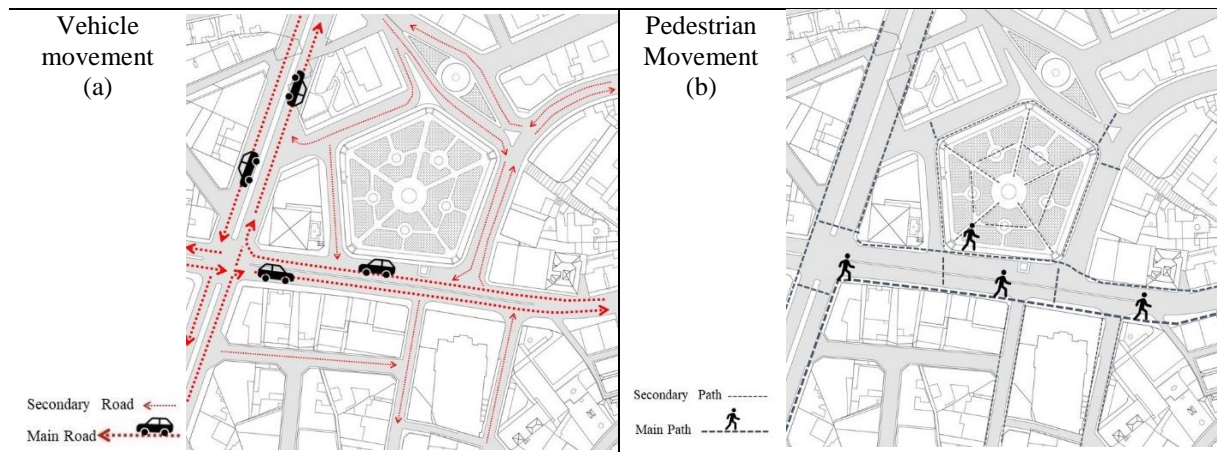
Fig. 7. Urban analysis for Tripoli El-Tall urban space
Reference: Authors

2- Users' activity analysis in Tripoli El-Tall urban space: There are many different activities in El Tall urban space, it's divided into three main types: First, necessary activities as walking, waiting and shopping, second optional activities as sitting, standing and watching others and social activities through the discussion between people as shown in Fig. 8.
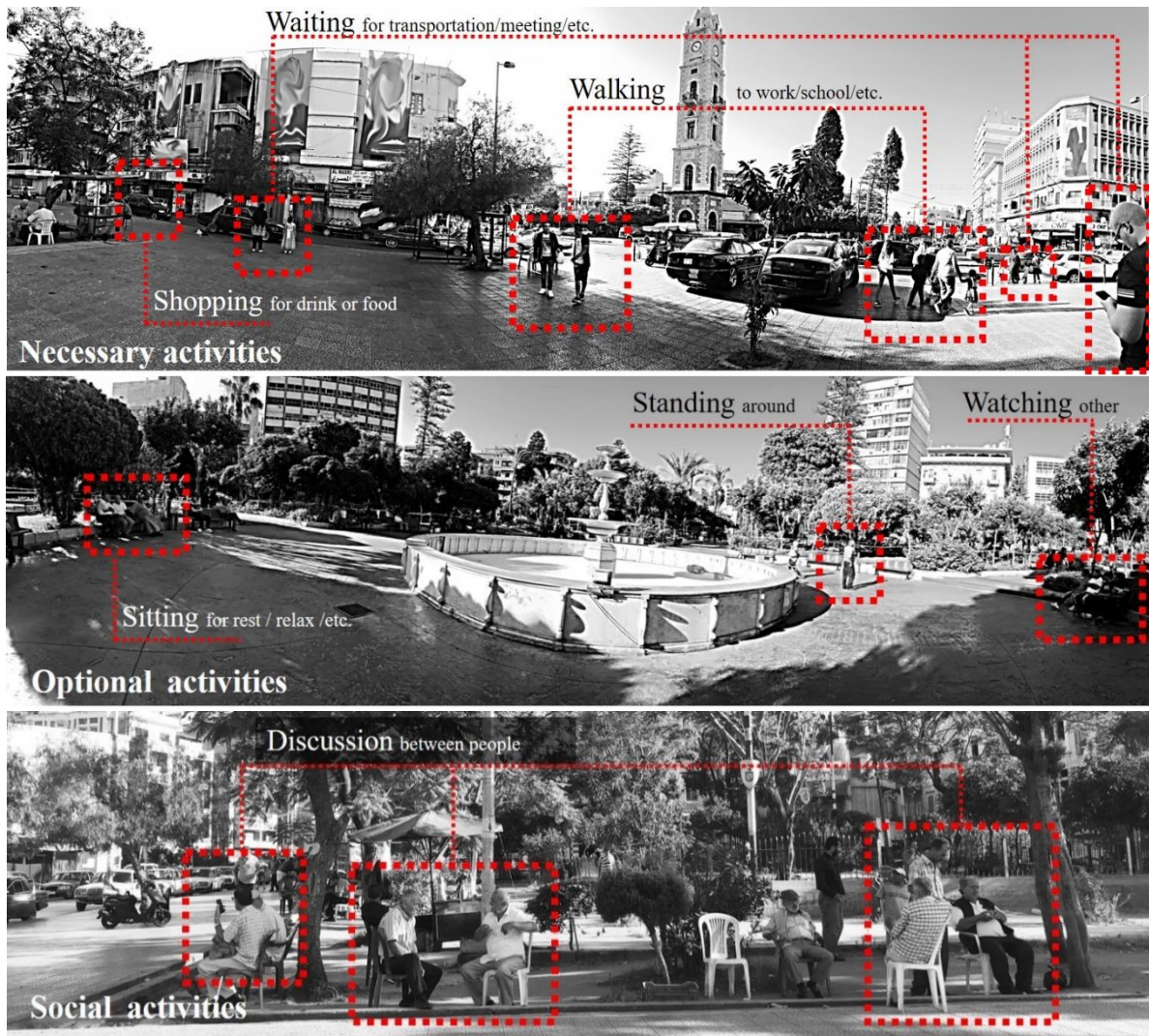
Fig. 8. Users' activities analysis in Tripoli El-Tall urban space.
Reference: Authors

4.3 Questionnaire

The paper used an online questionnaire survey based on Google Form directed to local residents and users of the El Tall public space in Tripoli, aiming to adopt their perceptions and experience through dealing with the selected urban space, to measure the psychological stress level through attention and annoyance factors, and identifying the main stressors that affect space users. The sampling technique was a random simple determined by using a sampling calculation with a confidence level (90%) and standard error (10%) in related to Tripoli population size. A total of 65 respondents completed the survey from Tripoli and surrounding context during June and July 2018. The survey divided into three main sectors: personal information, dealing with El Tall Public space and measurement of Stress factors. The analysis results were reached by using IBM SPSS statistics v20 as follows:

a) Personal information: including gender, age group. As shown in Table. 3.

Table. 3. Survey results regarding gender and age group. Reference: Author

Variable		Age group					Frequency	Percent %
		To 18	18-29	30-44	45-59	Above 60		
Gender	Male	2	20	4	0	1	27	41.5%

Female	0	33	5	0	0	38	58.5%
Total	2	53	9	0	1	65	100%

b) Dealing with El Tall Public space: it realized from analysing the relation between sampling location and times of being in Tall public space, that the sampling residents of Tripoli Municipality are mostly dealing with this Public space, as shown in Fig.9. While, the results about the relation between sampling accessibility and the purpose of being in Tall public space refer to there are a high percentage use transportation to access Tall public space as a transition to move to another place with doing other activities as shopping, walking, sitting, etc. As shown in Fig.10.
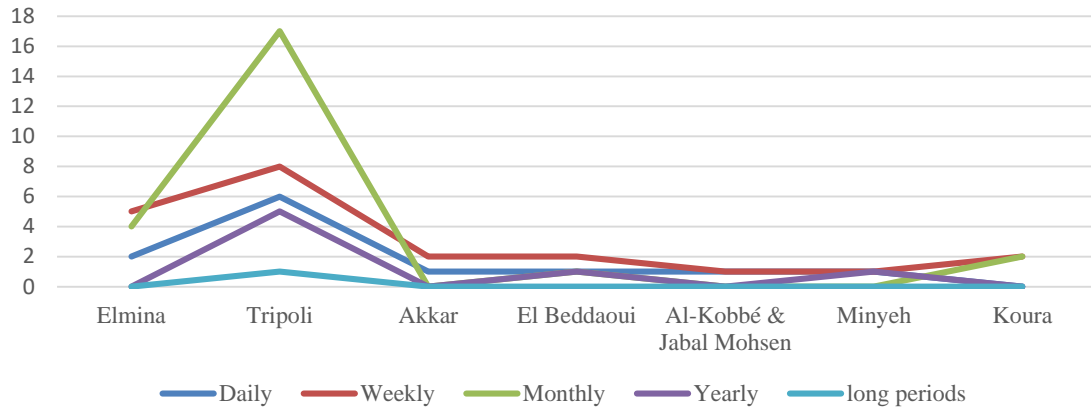

Fig. 9. Survey results regarding location and being in Tall. Reference: Author
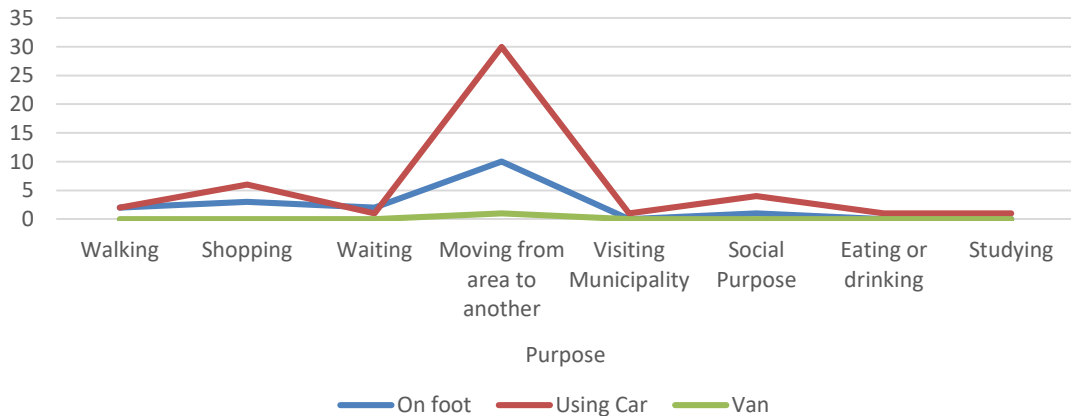

Fig. 10. Survey results regarding accessibility and the purpose of being in Tall. Reference: Author

c) Measurement of Stress factors: through determining the stress level in the study area, it refers most users feel stressed through their dealing with El Tall Public space, this stress mood appeared in measuring levels of attention and annoyance, as shown in Fig. 11.
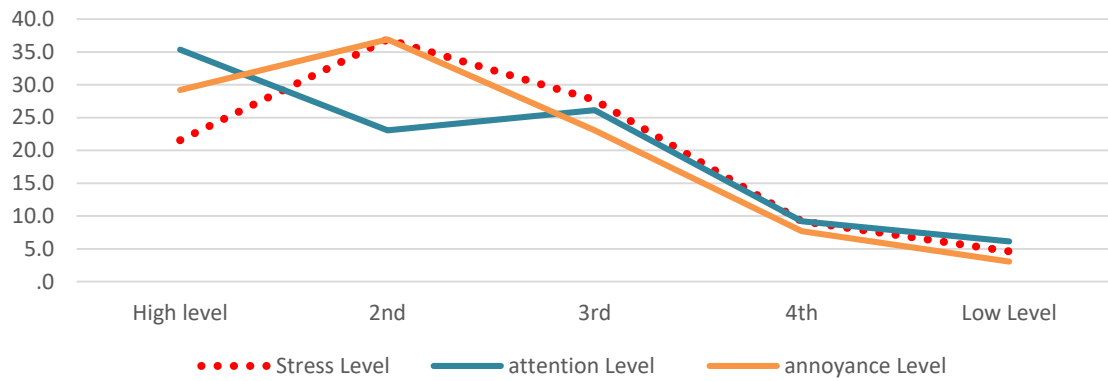
Fig. 11. Users Stress, attention and annoyance Levels in Tripoli El-Tall urban space. Reference: Authors

d)   The main stressors that increase Psychological stress level in the study area were in order: traffic jam, overcrowding, noise, visual pollution and space cleanness as shown in Fig.10 (a). In addition to other stressors as the absence of parking area, disorganization of shops and street vendors on pedestrian paths that case overcrowded roads and safety. At another point, the main factors that reduce your Psychological stress in the study area were in order: green area, architectural heritage, the movement flow and water features, as shown in Fig.12 (b).
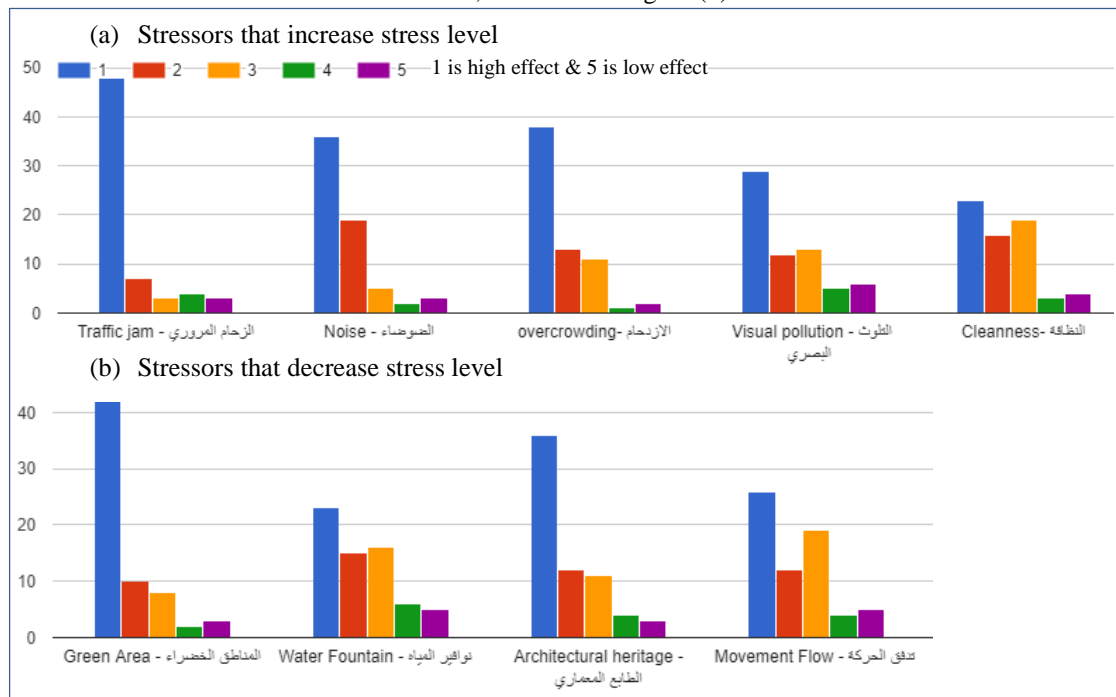

Fig. 12. Main stressors that increase and decrease stress level in El-Tall public space.

5. CONCLUSIONS

Nowadays, Life stressors are considered the main problems that face the mankind, this paper take in study the part of the built environment, especially urban public space with its impact on psychological well-being of space users. This study found that there a relation between Public Space users' activities and their Psychological stress through sensory experience. To reach or design a psychological non-stressed urban public space, it required to know the reasons that cause urban stress, and what are the factors that could reduce stress,

–   There are many external stressors that affect psychological human health in the public urban spaces, these main stressors included in this study are (1) noise produced as for example from traffic jam and street venders with its annoyance effect, (2) Status of permanent attention produced by pedestrian and

vehicle movement flow, sense of safety and overcrowding, and (3) space cleanness and pollution can lead to loathing and sickness.

- The organization of public space, including street furniture, lighting, shading, and movement, has an important role in reducing stress. As vital components of public urban space, green area and water feature are considered the main factors to decrease the stress level for many reasons through the calm psychological effect of green and blue colours, in addition to its role of reducing noise. Separation of traffic between vehicles and pedestrians can determine a space for both movements to be in safe and smooth flow.
- The social dimension of the public space is considered the urban life that enhances the public space, people need to talk, walk, play, eat, drink, watch, etc. These activities make them feel enjoyment and happiness. Therefore, the role of architects, urban space designers and planners is to create an urban life for people as non- stressed psychological public spaces.

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