



Emergency Architecture as an Active Approach for Homeless in COVID-19 Epidemics

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Abstract

In the beginning of year 2020 COVID-19 pandemic has strongly threaten all the world. By time with many calls for staying at home we still find numbers of people staying in street without any shelters "homeless" living in vulnerable conditions suffering from deprivation of social and urban rights and contributing in spread the epidemics. UN Habitat statistics estimated 150 million (1 out of 65) people around the world living without shelter and suffered neglecting and discarded. Most countries and governments hurries to take a drastic measure to fight the novel coronavirus (COVID-19) and seeking to face the social and economic problems and try to re-correct some social conditions that the homelessness phenomenon where the homeless and street children have been neglected. This research considers one of the socio architecture and epidemiological studies that focus of homeless categories and deals with the effect of the spread of the homelessness phenomenon with the outbreak of COVID-19 epidemic. The data were collected on a one-to-one basis through semi-structured interview for some responsible persons and numbers of some street homeless it also deals with the study of the factors associated with this spread and the impact of different phenomena or variables on them and the research submits an emergency architecture and urbanization solutions depends on integration methodology in the framework of humanity concept and sustainability with surrounded urban to reduce the spread of the epidemics and control over.

Keywords: Emergency – Architecture -Homeless - COVID19- Epidemics.



1. Introduction

The homeless phenomena considered a very complicated development issue, affecting human society all over the world. The statistics survey by the United Nations in 2015 were estimated that about 150 million people were homeless around the world and 1.6 billion lived without adequate housing and suffered from unaffordable housing. This number has escalated in recent years; and become a global norm for increasingly demand of permanent, or even temporary shelter.

Many indicators show that the homelessness phenomenon is increasing and exacerbating day by day the virus spread more easily among the vulnerable homeless population. Furthermore, the social and economic arrangements of social distancing had been changed to increase the distances between inhabitants compared to pre-pandemic times [1]. That addressing this phenomenon must have a comprehensive plan and a clear strategy to deal with the problems in a comprehensive manner and on the basis of the social and economic interrelations surrounding them. The homeless group represented in the recent period an expected threat at the national, Arab and international levels, especially with the outbreak of the COVID 19 epidemic, where this category has become a source of danger carrying the epidemic and moving with it, but roaming the streets and more vulnerable to infect and transmission from there comes the role of emergency architecture to put an urgent solutions to deal with this phenomena in the framework of sustainability and integration methods with surrounded urban.

The data were collected on a one-to-one basis through semi-structured interview for some responsible persons and numbers of some street homeless for finding an answers for many questions as: - why did you leave your home? Since what do you living in street? What's the most obstacle which facing you? Do you try to find a temporary or permanent solution for current situation?

2. Definition and Classification of homelessness

There are many guidelines has been set up to define global homelessness where the homelessness phenomenon is one of the social and human phenomena that mankind suffers from it. In 2005, the number of homeless people around the world was estimated to over 100 million (1 out of 65) people around the world living without shelter. As for the Arab world, the number of homeless people in the streets without shelter about 20 million People (Global homeless statistics, 2017), where homeless groups often congregate in city centres, railway stations, and slums. Statistics also indicate that between 16 and 22% of the homeless often suffer from fitness and mental disabilities, and many of them have been subjected to various types of oppression, despair and persecution or violence, which led them to leave

the house and leave the social fabric of the family in a state of frustration, fear, panic and disconnection... while nearly one billion people live in slums, or as refugees in temporary shelters, and they lack adequate housing, as most of the homeless were in the past in Western countries of men (50-80%). The terms cover "homeless, houseless, roofless, shelter-less people, and pavement dwellers... heathers have defined homelessness as featuring a lack of a right of access to secure and minimally adequate housing, variously described as rooflessness (living rough), and houselessness.

The United Nations has defined the homelessness and classifies it into two categories, the first category, which includes those residing in the streets and those without a roof, indicating their lack of minimum adequate housing conditions, and the second category is secondary homelessness and includes those who do not have stable housing and permanent movement between different types of housing as temporary shelters [1].

The American Psychological Association also proposed a definition of homelessness that occurs when people lose to a safe, stable, and suitable place for housing, as well as those who do have not a shelter, or their live in temporary places, or tents. The definition also includes those who live in crowded or in cheap houses because of their limited resources Economic [2].

In fact, the references refer to that is no clear methodology for counting the homeless and determining their special needs, and therefore the number of homeless people in most cities is an estimate number. the homeless category variable according to their levels were divided to three geographical categories: (the main state of homelessness) or those who live in streets, parks, public space and under bridges move between places (the second case) or those who move between temporary shelters and emergency accommodations (the third case) or who live in inappropriate places such as cemeteries and under stairs or places that do not have a private bathroom [3].

The legal definition of homelessness varies from Country to country, or between different jurisdictions in the same region or country. According to the UK homelessness charity "Chrysiēs", housing is not only a physical domain, it provides its residents with roots, identity, safety and a sense of belonging, and is a place of emotional well-being [4].

The causes and conditions that lead to homelessness are varied and complex. Issues like domestic abuse, addiction, financial hardship, eviction, disabilities, and mental illness can contribute to or cause an often-sudden change in living situations that can leave adults, children, families, or veterans without shelter, food, or medical care. For example, the total number of homeless in Canada is about 30 thousand people distributed by 14.4 thousand for urgent accommodation, 2880 people without shelter in the street live in parks and on the street, and 7350



people live in temporary shelters in hospitals, prisons or temporary housing, while 4464 people have to live in shelters. And violent environments which suffered from persecution as fig. (1)

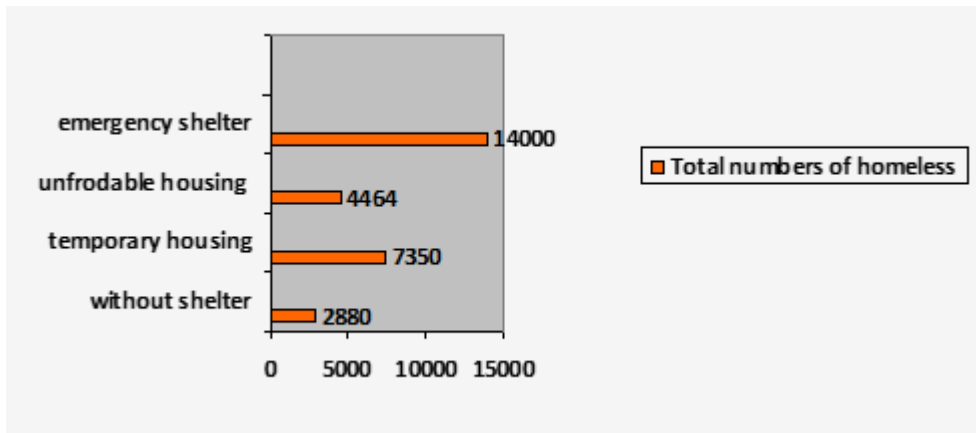


Fig. (1). show the classified total numbers of homeless in Canada

3. Urgent call for Staying at home in covid19 crises

Absence the home considers an obstacle through category of people we need a home as a necessary demand in our life. The “home” is a place where a person is able to establish meaningful social relations with others through participate them in his own space, or where the person is able to hold an own private zone. ‘Home’ should be a place where a person is able to define the space as their own, where they are able to control its form and shape. This may be through control of activities and of defining their privacy in terms of access to their space [5].

The crises of the current epidemics have raised awareness about how vulnerable people are without housing – “just stay home” is the simple solution for prevent the spreading of COVID epidemics for the most vulnerable people, and it’s a reminder that hundreds of thousands of people around the world doesn’t have any shelter but still this option form an obstacles through many people and many cities for example housing is not an option in Rio de Janeiro, which has an estimated 15,000 homeless people....As the global COVID-19 pandemic continues to impact our communities, stay-at-home order has created unintended challenges for some of the most vulnerable among us. Many are facing increased risk and few options to seek help or plan for getting a suitable shelter.

The pandemic’s immediate effects on our surrounding environment became clear as early as March 2020. As daily life came to a standstill with the

worsening of the Corona epidemic crisis, most countries of the world are preparing to face the dangers arising from the deterioration of social and economic relations among the residents and try to control them, as well as correcting some social conditions that exist in them, such as the phenomenon of homelessness to limit the spread of the epidemic and the ease of control over. Fig. (2) Show the number of injuries in world countries- May 2020.

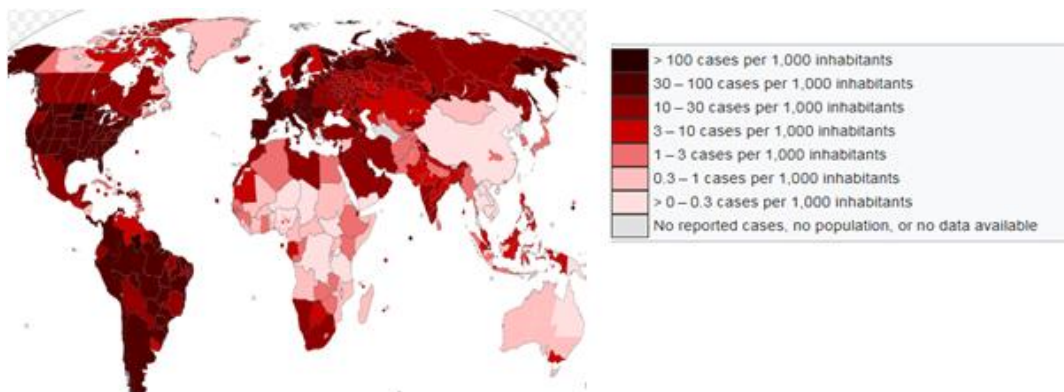


Fig. (2). Number of injuries in world countries- May 2020

Homeless individuals and families not only lack permanent shelter, they also lack the psychological and emotional connection to place that is fundamental to our sense of identity they called also “placelessness.” [6] Defines placelessness as “a lack of place-based identification and a lack of emotional attachments to particular places”. According to recently available numbers in the National Alliance for Homelessness that 567,715 people in 2019. Which has had a dramatic impact on COVID-19 pandemic, those numbers could potentially be much higher in 2020 and 2021. Where homeless individuals already suffer from chronic medical conditions at a rate much higher than housed individuals, and the pandemic has put the most vulnerable members of an already vulnerable population at greater risk.

4. Global Experiences for Urgent Solutions in world cities

Capitals and big cities around the world had record high level of injuries where London recorded more than a fifth of all COVID-19 deaths in England. Madrid also recorded more than a third of coronavirus deaths in Spain [7]. New York, has accounted for at least 15 percent of all coronavirus deaths in the United States as fig. (3), The effects of COVID-19 have caused immense harm to those living in dense cities especially in poorer areas, while prompting those living in high-density luxury to reconsider city living standard.



Fig. (3). show the homeless in the street in Los Angeles

Many cities now put a rule for nightly shutdown and sleeping outdoors and taking the chances in getting the temporary shelters for homeless [8]. where Many homeless people now uses the city's barracks-style group shelters for camping for fear of contracting the coronavirus as staying at subways as de facto shelters in many countries as New York , Soul as fig(4) .The new York city estimated that 1,670 people were living in the subway... and sometimes they stay in some dumpsters that they got blankets and stuff all inside the dumpsters, but they can close it, and it shields them, and they get up in the morning, it shields them from the wind and the cold and the rain, but it still unsafe and unhealthy solution... Others head into the subway system, entering tunnels and desolate corners of stations [9].

The rule prohibits people from staying in subway stations for more than an hour or after a train is taken out of service, and ban homeless for staying and sleeping in stations. Now after corona virus cries, they were enacted on an emergency basis solution and made it a permanent solution in last year 2019-2020. Where the pandemic was caused to empty the subways of commuters, and many workers are died so the system shut down every night from 1 a.m. to 5 a.m. for cleaning. the city is also providing an alternative plan for housing the homeless by adding hundreds of private rooms in special hotels to the shelter system [8].



Fig. (4). the homeless people sleeping inside the subway in Seoul.

It's nearly impossible for homeless people to maintain social distance. The Centre of disease control and prevention recommends 110 square feet per person for people housed together during the outbreak [10]. Most homeless shelters don't have that kind of space. Which caused for increased the risk of communicable diseases and spreading the epidemics. Some shelters are rearranging the spaces between tents of homeless farther apart. In Las Vegas, and los Anglos people are sleeping in parking lots, confined to white painted rectangles spaced six feet apart where San Francisco has set up several tents for the homeless, to protect its 8,000 homeless people, where there are now about 80 tents neatly spaced on a wide street near San Francisco City Hall, and this camp is part of the "Sleeping Safe Village" that opened last week The area between the city's Central Library and the Museum of Asian Art is monitored around the clock and provides clean water, meals, showers and trash cans as fig.(5).



Fig. (5). an aerial view of San Francisco's first temporary sanctioned tent encampment for the homeless on May 18, 2020 where urban distance no less than 6 feet



5. The current situation in Egypt

There are no accurate statistics that monitor this phenomenon in terms of their numbers, age groups, places of gathering, businesses they engage in, and their social conditions, as it is a complex phenomenon that suffers from the most marginalization.

There are many statistics and ratios that have been monitored by non-governmental institutions or through individual studies depending on field studies and there are at least 12 million Egyptians including 3 million children, distributed in many governments mainly in Cairo which occupies large number of homeless then Giza, Qaliubiya, Alexandria, Menoufiya, Sharqeya, Suez, Beni Suef, Minya, and Assiut, according to the ministry of social solidarity.

They carry on just as they always have – sleeping under bridges, on sidewalks, near closed stores. But now they've lost vital shelters, like the places of worship that spared them from the cold and even allowed them to use their washrooms, forcing them to turn to the streets and the people there.

Lastly, the number of homeless in Cairo were recorded at 700 thousand, and the "UNICEF" estimated street children at 500 thousand children, while sources in the Ministry of Social Affairs estimated the number of those placed in juvenile care institutions at 565 thousand children, and these groups constitute renewed tributaries of the phenomenon of homelessness and loitering in the streets in Egypt [11].

The paper holds an interview with sample of homeless, the sample selected from various category of homeless in age, statue and culture background to answers the research questions and stand on the current situation and the cause of spreading this phenomenon.

The survey estimate that poverty was the major reason of homeless where population living below the poverty line exceeded 30%, While comes the escaping from social circumstances and searching for a job as fig, (6) then comes the people who suffered from mental or physical disorder and some losses their family in early stage of childhood and stay in streets.

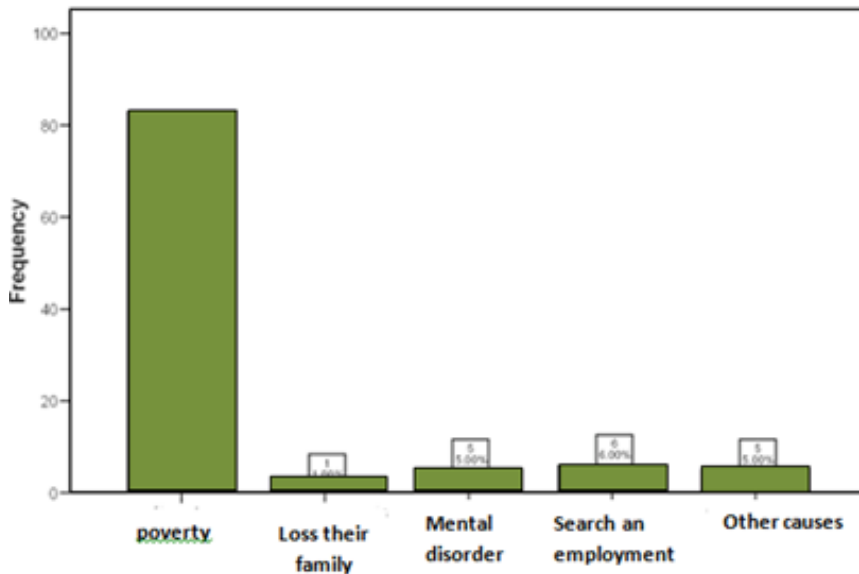


Fig. (6). show the different causes of homeless phenomena

Those people are suffering from a state of homelessness of all kinds, including the inhabitants of the shack and tinsplate, cemeteries and homeless people at the bottom of bridges, garages, shops and cardboard houses who suffer from cold, hunger and dread, according to UNICEF, there are a million children living on the streets in Egypt. The number of homeless people in Egypt who live without shelter is about one million and 200 people, and according to the statistics of the Ministry of Social Affairs 2019, the number of children under 18 years of age is 40% divided into 25.2% whose ages range from (9 to 12 years) followed by the age group of (12 to 18 years old) by 14.7% as fig (7). [12].

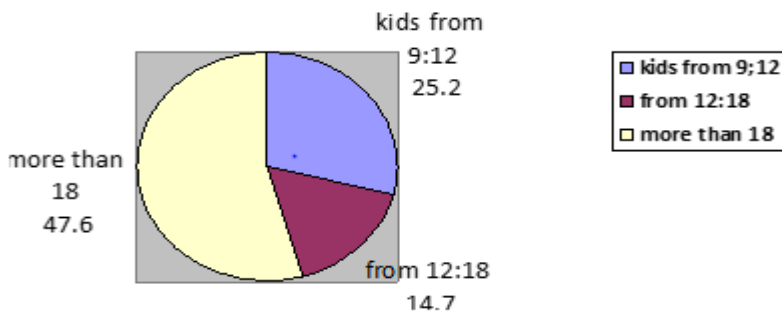


Fig. (7). the percentage of homeless according ages, author



The survey finds the following

Most of homeless are concentrated in Cairo especially in open places, below bridges and public parks, and on the shore of the Nile, and males represent 92%, while the number of females is about 8% and among the most popular places for people to gather without shelter is Ramses Square near the Al-Fateh Mosque, and Sayida Zeinab district on a sidewalk opposite to development work of Maspero Triangle most homeless are concentrated in many districts in downtown as Ramses Square and the garden in the middle of the square, near to Al-Fateh Mosque to use the washrooms, 15 May bridge as fig (8) (9) Giza tunnel heading to the pyramid, in front of the Child Garden in Nasr City and Ammar Ibin Yasr Street beside the Military College and in Dokki district below the University Bridge and Tahrir Street and al-Deweika area According to official statistics, the number of homeless is so related to population density and mostly there is found in informal settlements in Egypt where the number of informal districts is around 1,221 outside city planning, but this does not mean that all of them are equal in living conditions. The largest number of them have turned into small, narrow homes that lack public services such as electricity and water lines, and the accumulation of problems without solving the creation of more critical and needy circles such as residents of cemeteries, slums and nests, and thus these classifications occupy no less than 40 percent of the areas identified by the governmental as areas outside the planning and service coverage.



Fig. (8). homeless sleep on 15 may bridge



Fig. (9). homeless in Ramses Square and under 6th October bridge

- According to the interview of numbers of homeless and the analysis their needs and demands the survey refers to the homeless have bad need to emergency solution and urgent shelters to protect them from different crises and climate change.
- Many homeless need to a personal motivation to improve their life.
- Some homeless seeking to find a simple job for gain a daily wage.
- They need a social and support care for facing the crises in their life.
- The inadequate house is an obligatory need for completes a decent life.

6. Sustainable Emergency Architecture and urban solutions:

From crises come solutions. From urban chaos come the role of emergency architecture and the role of planners and designers to offer immediate and effective solutions especially when facing emergencies such as natural disasters, warfare or pandemics. In these circumstances the priority is usually to solve the problems around housing for homeless and found an affordable shelters to prevent them from staying on streets and public places and find a suitable way of creating



structures and infrastructures more quickly, easily efficiently suiting both the circumstances and the location in which they will be implemented.

The architects and planners begin to help and reimagine how temporary or emergency structures can efficiency work to contribute in solving the problem where the emergency shelters can offer great opportunities for emergency structures. The temporary shelter plays an important role in responding to different architectural requirements and many crises there is now a huge demand for temporary architecture and urban solution in responding to COVID 19 epidemics.

There are a variety of solutions to temporary structures adapted to the type of disaster (refugee migration, earthquakes, pandemics, etc.) that can best address the affected population and homeless.

6.1 shelter- Cart

Cart: It is an expandable aluminium wheel with two parts of polyester cloth and the sides are made of neoprene to provide warmth and insulation when expanding the shelter, the diameter of the aluminium ring is 50 cm, and the length of about 3.50 m, its advantage is that the wheel can be moved anywhere easily and the fabric can It carries 250 pounds of personal items, and the design provides many configurations where the wheel can be placed in a half-open way to be used as a chair or open completely as a long sleeping tube, and it can also be combined with other units to create a connected residential complex as fig.(10)

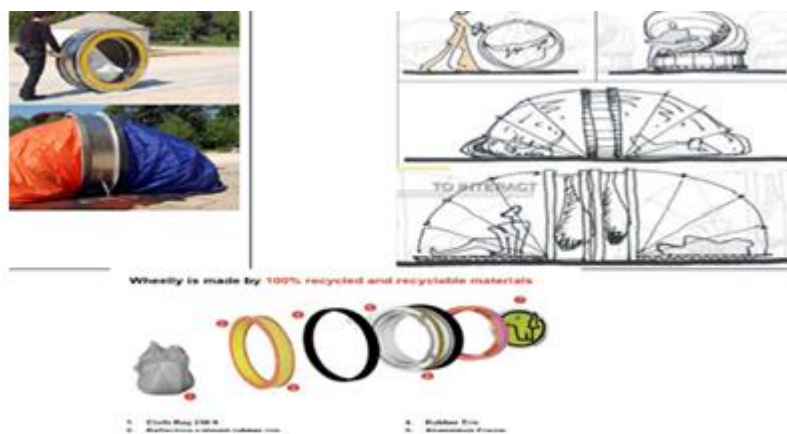


Fig. (10). Show the components and methods of installing a shelter cart

It's Made out of PVC cover or polypropylene easy to transport and set up requires only one person, the shelter can form many shapes and provide relief for up to 4 people, while rainwater can be collected from the folds as fig. (11). While it doesn't include a utility hook-up, beds or renewable energy generation, it does provide a quick roof. Apart from emergency usage of the shelter, it can be used as a temporary shelter.



Fig. (11). the tent can fold and collected

6.1. Accordion tent

It is inspired from musical instrument that take up small spaces when Full compressed but becomes large when expanded where the side poles are pulled and extended as shown in Figure (12), and Its PVC cover is always attached to the frame, preventing the fabric from becoming dirty or damaged from contact with the ground. The tent is considering more durability of the membrane during folding with removable sides for more flexible event spaces. It is characterized by its small size and light weight when transporting [13].



Fig. (12). Show the accordion tent shape and combined method when transporting

6.2. Uber Emergency Shelter

It is a portable housing unit that helps meet immediate needs for shelter, and its characteristics are:

- 1- Easily removable and foldable.
- 2- Made of recyclable materials that give rise to the ability to be reused.
- 3- Ease of disassembling and installing them with simple or without tools.
- 4- It can be used as a basic structure and the ability to improve and apply modern amenities.
- 5- Sufficient areas can be obtained by stacking two units together.



Fig. (13). Show the installation method of the structure on site

This study submits an evaluating for the suggested temporary shelters, in order to make the process of selection easier. The research set an evaluation criterion in the frame of sustainability where take into consideration some basic parameters in design, construction, humanly and sociological necessities required for a temporary shelter and living unit. These criteria derive from the function and size of the structure, design context, type of use - temporary or permanent needs. The table was organized based on a holistic understanding of major primary and required aspects of the design of temporary, multi-functional spaces.

The research makes a Comparative analysis between previous solutions where the suitable choice should be achieved many parameters according to sustainable criteria in design, material, structure, weight, space and Flexibility. The emergency shelters for homeless is based on the concept of home [14]. Proposed solutions seeking to eliminate homelessness from an urban and environmental perspective: [15].

Table (1). Types of Shelter

Types Of Shelter	Shelter- Cart	Accordion tent	Uber Emergency Shelter
Structure “firmness	Less in firmness	Quite fixation and firmness	More firmness
Material “sustainable”	Recyclable - Almost Sustainable	Fixed Unit – standard dimension	Recyclable – replaces some parts
Weight	More light	light	heavy
Space	Need Less area	More space	More space
Privacy	None	Quite privacy	More privacy
Safety & Secure	less	Quite secure	More secure
Integration	More integrated	Rigid in dimension	Less integrated
Flexibility	More flexible	Less flexible	Limited flexible
Manufacturing	Easy and simple	Simple unit	More complex



Efficiency	Less efficiency in use	Quite efficiency	More efficiency
Expandability	Limited	Valid this option	More Expandability

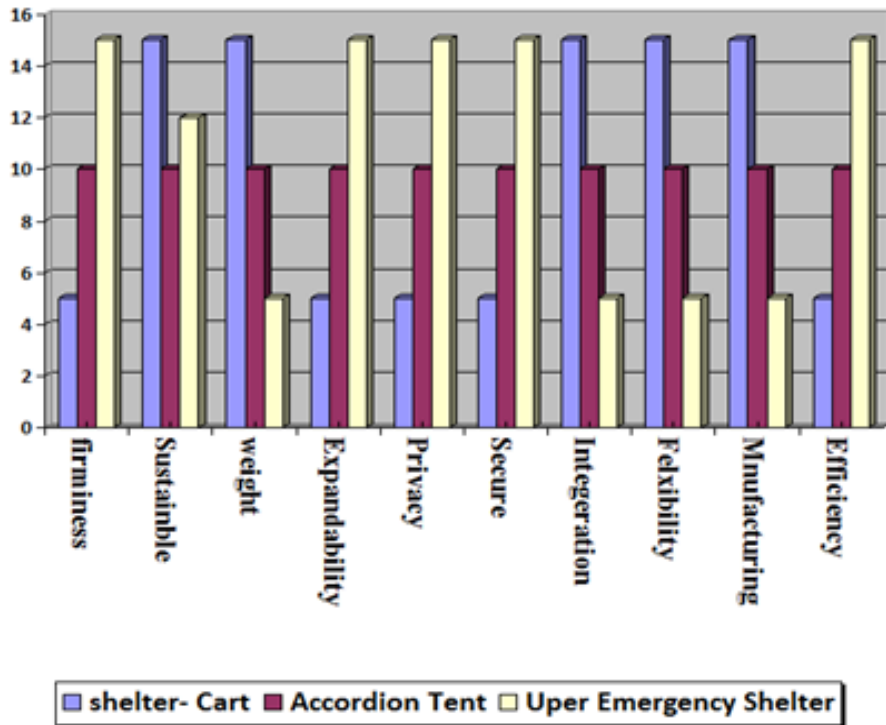


Fig. (14). comparison between different parameters in three types of shelter

The chart summarizes the performance of three types of portable shelter which can use it as a contemporary shelter for homeless through crises and provides temporary overnight shelter for people who experience homelessness typically (but not exclusively) for a period of few days, months or more through crises according to needs, secure, vacant open spaces, crowding and form of urban fabric in city for achieving the integration with surrounded urban as following:

Model (1) shelter – cart is less secure and privacy than other solution but it is more flexible and sustainable in use and more integrated with the site, so we can use it in visible and legal public open spaces, subways and public gardens in safety way for nightly sleep where can collect the units through all over day and leave the space free and clean. While:

Model (2) Accordion tent is quiet light, easy in use and move. we can use it vacant spaces in dense urban fabric and vacant points in market square between blocks where we can use the free walls of building to hold a temporary shelter where opened it through nighty and can folding it with removable sides along a day.

Model (3) Uber shelter is more firmness, privacy, sustainable, flexibility, secure and efficient in use where contain more spaces and Sufficient areas. Moreover, it improves the ability of use and apply modern amenities. We can use it in countryside or vacant spaces adjunct to dense district.

7. Recommendations

From the previous study, we find that is a critical time Intervention (CTI) where in contemporary times, interventionists have changed from a charitable to a rights-based approach, working with people rather than for them, thus giving prime importance to participation and it is still possible to contain this phenomenon, house the homeless, legalize their conditions and contain them, and provide places for overnight stays whether in the context of the city or outside it , by using some light facilities that fulfil some of their needs, Such as safety, secure , privacy and psychological calm, and setting appropriate plans for that to reintegrated them in our society as social and urban level.

7.1 From social intervention level

It is important for the social interventionists to take utmost care of the type, age, form, and degree of intervention they render upon for different types of homeless. For instance, the kind of intervention required by homeless and street people were escaped or lost their family or who suffered from mental or physical diseases from where the degree of intervention would need or desire.

Applied various social policy for integrate the homeless with society and the surrounding environment must be followed, and avoid isolated policy to this category and trying to develop an arranged plans for



reintegrated them in our society, activating their role and rehabilitating them in an appropriate manner.

A social theory maintains that these destitute people gain moral support from social work intervention, helping them to feel that they “belong”, that they “exist”; and to know that they are no longer alone if they are hurt or unwell [16].

Intensifying efforts to solve the problems of the homeless and help them find work to earn a living, by creating institutions for professional training and supervision.

- Make a time-limited approach to case management that is designed to connect people with community supports as they transition into housing.
- Classified this category and placing the elderly and children in care homes to integrate them and prepare them to assume responsibility.
- Guiding parents about the danger of this phenomenon, to take all necessary precautions to avoid falling into this scourge between their children and caring.
- Legalizing their status as a segment of society that cannot be neglected and trying to provide job opportunities such as selling some products in metro stations.
- Develop training programs for this category of all ages in accredited training centers to guide them and rationalize their behavior in the right direction.
- Supportive periodically services are provided via partnerships year-round or seasonal for increasing the awareness of cleanliness and maintaining the safety of place and bodies, following up on mental health, and trying to solve these problems.
- Make a coordinate with different NGOs and for building more shelters for the homeless.
- From urban & architecture perspective:

Studying how is laid out the units in urban and within public areas and the perception of space, which is affected by the design of the physical environment.

- Re-housing the homeless and legalize their conditions inside the urban areas, especially in the heart of the city, by providing temporary places to sleep, such as subway stations after 12 am until six in the morning, with the use of light facilities as shelter for them.

- Finding some temporary shelters that we can make housing for this category as urgent solutions in specific places close to the city.

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