Design criteria of a healing blue-way water related experience using healing landscape

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ABSTRACT

This paper is a attempt to fill a knowledge gap in the field of blue-ways and healing landscapes. Since mental health is the fulcrum of human behavior, there is a pressing need to develop a design method for improving mental health. This research aims to look at rivertreams in a different way identifying the concept of blue-ways and how to integrate river streams with their surrounding urban setteings and riverfronts landscape to create a comprehensive healing river journey.

Keywords: Blue-ways, blue mind effect, Design for mental Health, Healing Landscape, Riverfronts.

INTRODUCTION

Rivers have always held a great deal of promise for city life. River cities have deteriorated dramatically over time as a result of urban sprawl, resulting in contamination of river streams and damage to their biological corridor. Recently, designers have begun to recognize the importance of urbanism adjacent to rivers, resulting in various frameworks for the design of urban riverfronts specifically and waterfronts in general (Ripple, 2014). However, when dealing with waterfront concepts, it misses the direct connection with water bodies, relying solely on visual connection. In the past rivers were treated as a way of transportation, it was always value dregarding to their benefits intransit system and the economic revenue from extractive products but less value was put on how useful the instream can be (Turner, 1995).However, nowadays communities began to give an attention to the wealth that can be obtained from the river streams that contributes in the emergence of the blue-ways concept.

The fast-paced speed of life, as well as the industrial-biased style of urban development process, have detrimental effects on human mental health and cause stress, necessitating a fundamental shift away from high-tech approaches to urban development-oriented areas to nature-oriented settings, as stated by (Joe Dispenza, 2014) "there is a significant need to change from the old paradigm of being created to master nature to let nature master our life". Also, (Nichols, 2015) stated that "rivers are great asset for healing aspect contrarily of what was thought that large water bodies have a less healing effect than small ones but on condition that there is a direct

connection with those large water bodies' through water-based activities such as kayaking, surfing, and canoeing". Furthermore, many studies have indicated that even minimal exposure to nature reduces stress levels (Kahneman *et al*., 1999). It is also believed that humans are naturally attracted to the green hues of plants and blues of water as opposed to the grays of concrete and other unnatural materials (Wilson, 1984).

Blue-way is defined as a new way to enjoy waterfronts by generating a water-based journey instead of only a land-based one. Blue-ways have been defined as a network of multi-activity recreational trails and locations, whose primary goal is to create a wonderful recreational system that allows tourists to take a tour of the city (Turner, 1995). The main components of blue-way systems, according to the comprehensive definition, are the trails, whether they are water-based or land-based trails, the trailheads, which are the access sites for water trails and should have some service facilities, and there are two main types of trailheads, major and minor trailheads, the focal points that attract blue-way visitors The focal points that attract blue-ways visitors, and finally the blue-way facilities that serve blue-ways visitors such as rest rooms, entertainment areas, and nature-based tourism amenities (David, 2014). The design attributes for a land-based experience of healing-landscaped blue-way system has been studied by Abd El-Hady and Abdulghany (2021).This study aims at finding the design criteria of a healing blue-way water- related experience using healing landscape that can be applied in urban areas of Egypt.

METHODOLOGY

The methodology is built around three frames**,** Theoretical frame to show previous literature to get to the main definitions and components of blue-ways systems, moreover the relationship between healing and river existence. The analytical frame to analyze the water-based experience of international blue-way case studies from a healing water - based environment perspective to establish the paradigm in dealing with river streams.

Both frames will give:

- Blue-way system components, design criteria, different design objectives of the water - based journey of a blue-way system.
- Healing water-based environment design criteria and their different related design objectives.

The application frame in which the researchers present the results of both previously mentioned frames to a sample of experts in the field in a form of a questionnaire to extract the applied framework of healing water-based experience of a blue-way system that can be applied in urban regions of Egypt.

RESULTS AND DISCUSSION

1.The relation between healing and blue-ways

1.1. Generic overview of blue-ways

1.1.1. Designing of blue-way system

Many factors go into creating a good blue-way, including choosing an appropriate location in terms of water trail type, city focal points, and their sorts. In general, the blue-way system should be accessible, represent the character of the city, enjoysafety, respect the innatefeatures of its ecological system, and create a unique experience for its users. Each of the aforementioned criteria can be attained through specific objectives (Olowu *et al*., 2014).

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1.2. Healing Blue-Ways Notion

Healing blue-way is more like a healing experience than a healing design of a specific site,. Thus healing touch should be included in each component of the blue-way system associated with each journey to extract a paradigm for healing blue-way.

- The healing blue-way system is composed of two healing journeys:
1. Healing water-based journey achieved in water trail activities.
2. Healing land-based journey achieved in,
   I. Riverfront corridor.
   II. Focal points have three types:
   a. Special habitat or protectorate.
   b. Public landscape settings.
   c. Historical focal point.

As this study focuses on healing water-based experienceof a blue-way system the notion of a healing environment Water trail itself which is the main theme of blue-ways is not a tangible element that would have somedesign principles and others to be transformed into healing but the trick is in the experience of meandering in water trails through different features of the city,but this journey should follow some principles to achieve the healing effect

1.2.1. The relation between healing and water environment

Through various theories, such as the blue mind theory, which is a trendy branch of the mindfulness landscape that results in the meditative state of calmness, peace, unity, and a general sense of satisfaction with life, research has proven the strong relationship between healing effect and water trail activities. It primarily considers water-based activities as a key for well-being and health. As a result, neuroscientists have begun to look at the effect of being connected to huge bodies of water in studies that have shown that being connected to water lowers stress hormone levels and improves mental health (Tadhg, 2019).

Based on the blue mind theory, a study published in the American Journal of Occupational Therapy in 2014 found that surf therapy improved symptoms of PTSD (post-traumatic stress disorder) and depression, both of which have a negative impact on human mental health(Nichols, 2015).Furthermore, in the year 2020, healing by water is at the forefront of all therapeutic modalities, and urbanites are turning to surfing, diving, and float treatment as new-wave remedies to wash away the stresses of the previous year and reconnect with their blue mind (Tadhg, 2019).

Referring to Rebecca Lawton and Peter Winn's experiences, both of wthem were geologists and river guides, they have a wealth of knowledge regarding the healing effects of waterways and river journeys. "People respond strongly to water, whether it is a fountain in a healing garden, a river, or a shoreline," Winn said (Rebecca, 2017)

Since the 1960s, Winn has been leading expeditions down the Colorado River in the Grand Canyon, where he has witnessed people's radical transformations after kayaking trips through rivers. He has noticed that the longer the trip, the more healing occurs, and he claims that healing triggers almost without exception. He observed a disabled military former soldier who was an army communications expert who had returned from a severe war in Iraq full of shrapnel turning this expert into a dejected person who had lost his ability to do even simple math while leading a kayaking river trip organized by a team called team river runner for sixteen days,he spoke fluently and at length at the end of the journey, and his spirit was restored; afterward, his wife wrote to thank the crew and the river for bringing her husband back (Rebecca, 2017).

In the 1970s and 1980s, Rebecca also worked as a Grand Canyon River Guide. She also saw dramatic improvements

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following river expeditions like the 14-day trips she conducted. Passengers traveled to Lees Ferry, Arizona, for a kayaking excursion to get away from their fast-paced lives and obligations. They forgot about life in a matter of days as they immersed themselves in the natural world, from river access to trekking and hiding in secret grottoes and waterfalls.The passengers and crew might be on the river within three days,' says Louise Teal, a Colorado River guide and author. 'People don't only recover physically down there; they also make life-altering decisions.' They change careers, get married or divorced, and eventually become river guides (Rebecca, 2017). From what was previously mentioned, the researchers extract the design criteria of a healing water journey as well as the blue-way design criteria.

Table 1. Abstracted healing blue-way design criteria

Healing water environment design criteria	Blue-way design criteria
Provide different experience.	Location Enriched by local culture, heritage, arts, and visitor attractions
Provide sense of belonging.	Safety.
Provide sense of inclusion.	Accessibility
Provide sense of reconnection with origins.	Reflect the character of the city.
Provide a long water journey.	Respect the ecological system of the place.
Provide sense of exploration of waterscapes.	Provide different experiences.
Provide different water activities.	Apply a sustainable development plan.
Provide different experience.	Being active in nature.
	Exploration of waterscapes.
	Service providers enabling easy access for all.
	Multi-activity trail options.

Source: (Researchers after Rebecca, 2017; Olowu *et al*., 2014)

2.Healing blue-way design criteria (HBC)

There are twenty-four criteria of healing blue-way system, considering different types of focal points, and healing environments, and different healing experiences. As this study focused on water-based experience, the following table shows a combined list of blue-way design criteria (15 criteria).

Table 2. Merged healing blue-way design criteria of a water-based experience

Criterion code	Design criterion
HBC1	Engagement with nature.
HBC2	Sense of control.
HBC3	Opportunities for social interaction.
HBC4	Opportunities for physical activities.
HBC5	Accessibility.
HBC6	Sense of place. (Genius loci) (Location Enriched by local culture, heritage, arts, and visitor attractions).
HBC7	Sense of belonging.
HBC8	Relies on interaction through the senses.
HBC9	Design for mental health.
HBC10	Safety.
HBC11	Reflection of city's character.
HBC12	Sustainable development strategy.
HBC13	Multi-activity trail options.
HBC14	Respect the natural system of the place.
HBC15	Provide different experiences.

Source: (Researchers after Rebecca, 2017; Olowu *et al*., 2014)

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While reviewing literature, each criterion can be obtained by some objectives in terms of healing water environment design objectives and blue-ways design objectives. Table (3) shows the extracted healing water environment objectives and the water-based journey of blue-way system design objectives.

Table 3. The proposed open list of design objectives for healing water-based experience of the blue-way system.

Objective code	Proposed design Objectives	System-related
H1	Provide non-motorized (self-handled) water-based trails such as kayaking.	River healing environment
H2	Provide long river trips.	
H3	Provide journeys that connect the user with the history.	
H4	provide different water-based trails such as kayaking, canoeing, diving, surfing, and paddling trails.	
H5	Provide Water trails that allows experiencing the culture, history, and heritage.	
H6	Provide journeys that connect the user with nature.	
B1	Provide obstruction management system to alert water trailusers with updates regarding obstructions,water data, current water levels, and other safety information.	Blue-way system (Water-based experience)
B2	Provide on water navigational signage such as mile markers and directions.	
B3	Provide off water navigational signage such as trail heads signage and focal points locations signage.	
B4	Provide access site signage viewed from water at each access site.	
B5	Each trailhead should include a kiosk sign featured with three panels. Two panels of water trail information such as difficulty level and point of interest. one panel is a map of a specific route.	
B6	If the trailhead is connected with a focal point provide a signage panel for focal point information.	
B7	Provide Access points rather than major or minor located at maximum intervals of 6 miles.(Between 2 and six miles).	
B8	Provide ADA launch points at major trailheads.	
B9	Provide barrier-free routes connecting launch points with existing facilities in the riverfront corridor.	
B9	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing, and paddling.	
B10	Provide parking near launch points.	
B11	Provide meandering water trails that go through distinguished settings of the city rather than landscape scenery or historical sites.	
B12	Provide technical support pavilions.	
B13	Provide moveable or elevated restrooms and lockers at access sites to be protected from flooding.	
B14	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeals to those with limited skills or prior experience.	

Source: Researchers after (Rebecca, 2017; David, 2014).

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3.Healing blue-way case studies

The researchers have chosen three case studies that consider the healing water-based experience of a river journey and how to take benefit from river activities into raising the healing effect of the whole journey. The analysis of these three case studies is shown in Table (4).

Table 4. Analysis of the water-based experience of urban healing blue-ways three case studies at at Ireland, St. Clair County and Miami, Florida, US .

	Ireland case study	St. Clair County case study	City of Miami
Site (Location)	Ireland 	St. Clair County 	Miami, Florida, US
Description	It applies the comprehensive paradigm of the blue-way system, taking into consideration the parallel land-based healing journey through riverfront land-based activities.	It is treated as only a riverfront system and the connection with the water body is an indirect visual connection considering only the land-based healing experience.	It applies the comprehensive paradigm of the blue-way system, taking into consideration the parallel land-based healing journey
Design Objectives Analysis	it provides a unique experience through wandering within a charming landscape and natural vistas of 160 Km of shoreline trails around Lough Dreg Lake in the center of Irelands' hidden heart and different habitats and wildlife. It provides long journeys that compromise different users levels. It provides different facilities such as restrooms and support pavilions to guarantee safety through the system. It Providesnon-motorized multiactivity water trails such as kayaking, canoeing, diving, surfing, and paddling.	The blue-way system runs through the coastal villages of Port Huron, Marysville, St. Clair, Marine City, and Algonac in St. Clair County, and most of these communities constitute a focal point in itself for paddlers. each community manifests at least one access site where paddlers can easily access both the nearby water trail and downtown. It provides long journeys that compromise different users levels. It Promotes both *discover the blue* brand and *leave no trace* principle. **With both** multiactivity non-motorized water trails and waste management systems.	The creation of a chain of mangrove islands to create habitats for new species and provide shelter for native species also provide a natural barrier to control strong water currents, therefore, providing easier water trails for their users It Promotes the *leave no trace* principle. the development plan applies a sustainable strategy by making benefit of unused pocket parks to maximize interaction with water through adding access points to the water. It provides water journey that reflects the character of the city.
	Regarding trailheads, it provides both types of trailheads minor and major ones. Tending to add major trailheads with all facilities and ADA access sites when trailhead connects more than one water trailwhen the location provides an easy, non-obstructive access to water trail.	Regarding trailheads, it provides minor and major types of trailheads. Tending to add major trailheads with all facilities and ADA access sites when trailhead connects, water trail, and when the trail is long. Each trailhead has adequate parking lots. It provides direct short connecting	It provides different types of access sites rather for motorized activities or nonmotorized activities As it is featured with a dense waterfront corridor It supports motorized access sites when there is no space for a trailhead zone with its service facilities onshore.

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	Each trailhead has adequate parking lots. It provides direct short connecting pathways from the community to water access.	pathways from the community to water access.	Access sites are always near to parking area. It provides direct short connecting pathways from the community to water access.
	the main goal was to conserve the natural mode and ecological touch of this blue-way system. It provides both onshore and offshore signage system	It provides signage system and movable structures of trailheads facilities. As it meanders within forests and natural settings, it supports a woody debris management plan. It provides offshore signage system	Creating a continuous living shoreline to act as the buffer layer for the waterfront to protect shores from erosion
Findings	The water journey reflects the natural character of the city.	The water journey reflects the natural character of the city. Possibility for water trails extensions to meet coming developments along the waterway.	The direct connection with water is mostly non-motorized.

Source: (EDSA planning and landscape architecture, 2014; Blue-ways Ireland, 2019; Blueways of St. Clair Strategic Plan, 2019).

The researchers established an initial evaluation of the previously mentioned design objectives, stating that when the objective is achieved in the three cases, it is strong when it is achieved in two cases, it is medium, and when it is only achieved in one case, it is weak. The comparison between the three case studies is shown in Table (5).

Table 5. Case studies' comparison according to the achieved objectives of healing blue-way in terms of land-based experience.

Objectivve code	Ireland	St. Clair County	Miami	Weight
H1	√	√	√	Strong
H2	√	√		Medium
H3	√			Weak
H4	√	√	√	Strong
H5	√	√	√	Strong
H6	√	√		Medium
B1				Not existed
B2	√			Weak
B3	√	√		Medium
B4	√	√		Medium
B5	√	√		Medium
B6	√	√		Medium
B7	√	√	√	Strong
B8	√	√		Medium
B9	√	√	√	Strong
B10	√	√	√	Strong
B11	√	√	√	Strong
B12	√	√	√	Strong
B13	√	√		Medium
B14		√		Weak
B15	√	√		Medium

Source: (Researchers after; EDSA planning and landscape architecture, 2014;Blue-ways Ireland, 2019; Blueways of St. Clair Strategic Plan, 2019)

√ achieved
Not achieved

Different design objectives have been added to the open list of healing water environment design objectives and blue-way system design objectives as a result of the empirical study analysis; the researchers provide the updated list with those additional objectives in Table (6).

Table 6. The updated proposed open listof design objectives for healing water-based experience of blue-way system.

objective code	Proposed design Objectives	System-related
H1	Provide non-motorized (self-handled) water-based trails such as kayaking.	River healing environment
H2	Provide long river trips.	
H3	Provide journeys that connect the user with his history.	
H4	Provide different water-based trails such as kayaking, canoeing, diving, surfing, and paddling trails.	
H5	Provide Water trails that allows experiencing the culture and heritage.	
H6	Provide journeys that connect the user with nature.	
B1	Provide obstruction management system to alert water trail users withupdates regarding obstructions,water data, current water levels, and other safety information.	Blue-way system (Water-based experience)
B2	Provide On water navigational Signagesuch as Mile Markers and Directions.	
B3	Provide off water navigational Signage such as trailheads signage and focal points locations signage.	
B4	Provide access site signage viewed from water at each access site.	
B5	Each trailhead should include a kiosk sign featured with three panels. Two panels of water trail information such as difficulty level and points of interest. one panel is a map of a specific route.	
B6	If the trailhead is connected with a focal point provide a signage panel for focal point information.	
B7	Provide access points rather than major or minor located at maximum intervals of 6 miles.(Between 2 and six miles).	
B8	Provide ADA launch points at major trailheads.	
B9	Provide barrier-free routes connecting launch points with existing facilities in the riverfront corridor.	
B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing, and paddling.	
B11	Provide parking near launch points.	
B12	Provide meandering water trails that go through distinguished settings of the city rather than landscape scenery or historical sites.	
B13	Provide technical support pavilions.	
B14	Provide moveable or elevated restrooms and lockers at access sites to be protected from flooding.	
B15	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeals to those with limited skills or prior experience.	
B16	Possibility for water trails extensions to meet coming developments along the waterway.	
B17	Provide a major trailhead when the trailhead connects more than one water trail.	
B18	Provide a major trailhead when the riverfront corridor allows to add a trailhead with its facilities.	
B19	Provide a major trailhead when it servesa large community of residents.	
B20	Provide a major trailheadwhen it is the access site to a vital focal point.	
B21	Provide a major trailheadwhen the location provides an easy, non-obstructive access to water trail.	
B22	Provide a major trailhead when the trail is long.	
B23	Apply correct bank stabilization techniques.	
B24	Provide a major trailhead when the trail is long.	

Source: (Researchers after Rebecca, 2017; David, 2014; Olowu *et al*., 2014; EDSA planning and landscape architecture 2014;Blue-ways Ireland, 2019; Blueways of St. Clair Strategic Plan, 2019).

proved ☐
added ▨

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Each healing blue-way design criterion of water-based experience may be obtained by a collection of design objectives of healing landscape and blue-way systems, as shown in the table (7).

Table 7. Matrix of healing blue-way design criteria and corresponding design objectives in water-based experience.

Criterion code	objective code	objective
HBC1	H1	Provide non-motorized (self-handled) water-based trails such as kayaking.
	H2	Provide long river trips.
	H4	provide different water-based trails such as kayaking, canoeing, diving, surfing and paddling trails.
	H6	Provide journeys that connect the user with nature.
	B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing and paddling.
	B12	Provide meandering water trails that go through distinguished settings of the city rather landscape scenery or historical sites.
HBC2	H4	Provide different water-based trails such as kayaking, canoeing, diving, surfing and paddling trails.
	B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing and paddling.
	B15	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeal to those with limited skills or prior experience.
HBC3	H2	Provide long river trips.
	B15	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeal to those with limited skills or prior experience.
HBC4	H1	Provide non-motorized (self-handled) water-based trails such as kayaking.
	H2	Provide long river trips.
	H4	provide different water-based trails such as kayaking, canoeing, diving, surfing and paddling trails.
	B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing and paddling.
	B15	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeal to those with limited skills or prior experience.
HBC5	B7	Provide access points rather major or minor located at maximum intervals of 6 miles.(Between 2 and six miles).
	B8	Provide an ADA launch points at major trailheads.
	B9	Provide barrier-free routes connecting launch points with existing facilities in the riverfront corridor.
	B11	Provide parking near to launch points.
	B17	Provide a major trailhead when the trailhead connects more than one water trail.
	B18	Provide a major trailhead when the riverfront corridor allows to add a trailhead with its facilities.
	B19	Provide a major trailhead when it serves large community of residents.
	B20	Provide a major trailheadwhen it is the access site to vital focal point.
	B21	Provide a major trailheadwhen the location provides an easy, non- obstructive access to water trail.
	B22	Provide a major trailhead when the trail is long.
	B23	Apply correct bank stabilization techniques.

HBC6	H3	Provide journeys that connect the user with his history.
	H5	Provide Water trails that gives an opportunity to experience the culture, and heritage.
	H6	Provide journeys that connect the user with nature.
	B12	Provide meandering water trails that go through distinguished settings of the city rather landscape scenery or historical sites.
HBC7	H3	Provide journeys that connect the user with his history.
	H5	Provide Water trails that gives an opportunity to experience the culture, and heritage.
	B12	Provide meandering water trails that go through distinguished settings of the city rather landscape scenery or historical sites.
HBC8	H1	Provide non-motorized (self-handled) water-based trails such as kayaking.
	H6	Provide journeys that connect the user with nature.
	B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing and paddling.
	B12	Provide meandering water trails that go through distinguished settings of the city rather landscape scenery or historical sites.
HBC9	H1	Provide non-motorized (self-handled) water-based trails such as kayaking.
	H2	Provide long river trips.
	H3	Provide journeys that connect the user with the history.
	H4	provide different water-based trails such as kayaking, canoeing, diving, surfing and paddling trails.
	H5	Provide Water trails that gives an opportunity to experience the culture, history and heritage.
	H6	Provide journeys that connect the user with nature.
	B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing and paddling.
	B12	Provide meandering water trails that go through distinguished settings of the city rather landscape scenery or historical sites.
HBC10	B1	Provide obstruction management system to alert water trail user withthe updates regarding obstructions,water data, current water levels and other safety information.
	B2	Provide On water navigational Signagesuch as Mile Markers and Directions.
	B3	Provide off water navigational Signage such as trailheads signage and focal points locations signage.
	B4	Provide access site signage viewed from water at each access site.
	B5	Each trailhead should include a kiosk sign featured with three panels. Two panels of water trail information such as difficulty level and point of interests. one panel is a map of specific route.
	B6	If the trailhead is connected with a focal point provide a signage panel for focal point information.
	B8	Provide an ADA launch points at major trailheads.
	B13	Provide technical support pavilions.
	B15	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeal to those with limited skills or prior experience.
	B23	Apply correct bank stabilization techniques.
HBC11	H3	Provide journeys that connect the user with the history.
	H5	Provide Water trails that gives an opportunity to experience the culture, and heritage.
	B12	Provide meandering water trails that go through distinguished settings of the city rather landscape scenery or historical sites.
HBC12	B16	Possibility for water trails extensions to meet coming developments along waterway.
	B23	Apply correct bank stabilization techniques.
HBC13	H1	Provide non-motorized water-based trails such as kayaking.
	H4	provide different water-based trails such as kayaking, canoeing, diving, surfing and paddling trails.
	B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing and

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		paddling.
HBC14	B23	Apply correct bank stabilization techniques.
HBC15	H1	Provide non-motorized (self-handled) water-based trails such as kayaking.
	H4	provide different water-based trails such as kayaking, canoeing, diving, surfing and paddling trails.
	H5	Provide Water trails that gives an opportunity to experience the culture, history and heritage.
	H6	Provide journeys that connect the user with nature.
	B10	Provide multiactivity water trails such as kayaking, canoeing, diving, surfing and paddling.
	B12	Provide meandering water trails that go through distinguished settings of the city rather landscape scenery or historical sites.
	B15	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeal to those with limited skills or prior experience.

Source: Researchers after (Rebecca, 2017; Olowu *et al.*, 2014; Blueways of St. Clair Strategic Plan, 2019; Blue-ways Ireland, 2019)

4.Analysis of the questionnaire results

A questionnaire was created in parallel to the three chosen case study analysis to assess the importance of healing blue-way qualities, illustrating the applicable framework of the water-based experience of the healing blue-way system. This questionnaire included thirty participants, all of them were specialists in landscape architecture and urban planning. The survey was disseminated via WhatsApp, email, and other social media platforms. The findings from the literature research and empirical investigation were used to create the questionnaire. In terms of both healing and design qualities. As previously mentioned, each criterion may be achieved through a set of design qualities in terms of both healing design and blue-way system, thus the questionnaire focused on determining the importance of each criterion's objectives. The results of this analysis was represented in charts (Fig. 1).

The following charts represent the results of the questionnaire showing a collective weight of each design criterion concerning its obtaining set of design objectives.
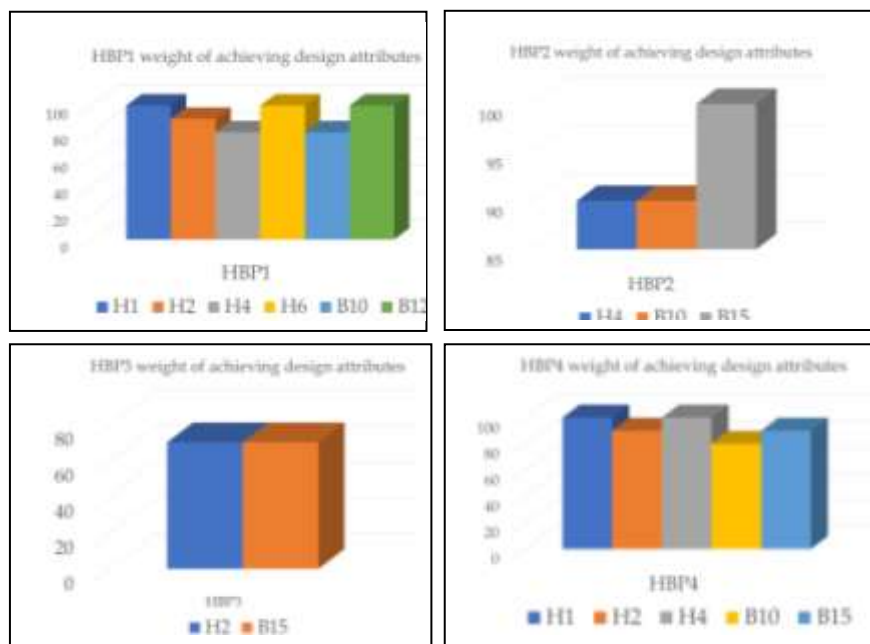
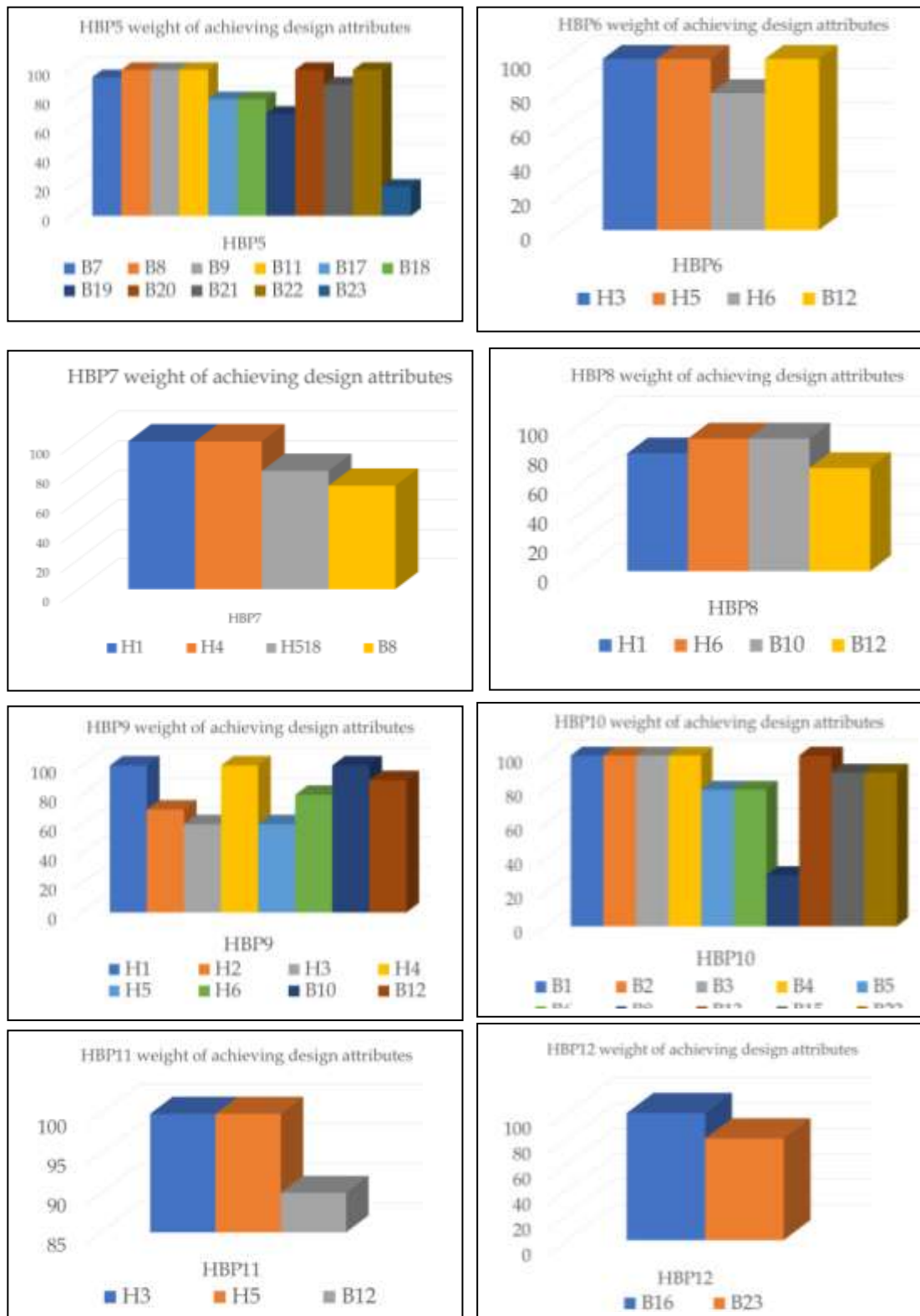Fig. 1. Questionnaire Results. Source resrachers after analysis of questionnaire results

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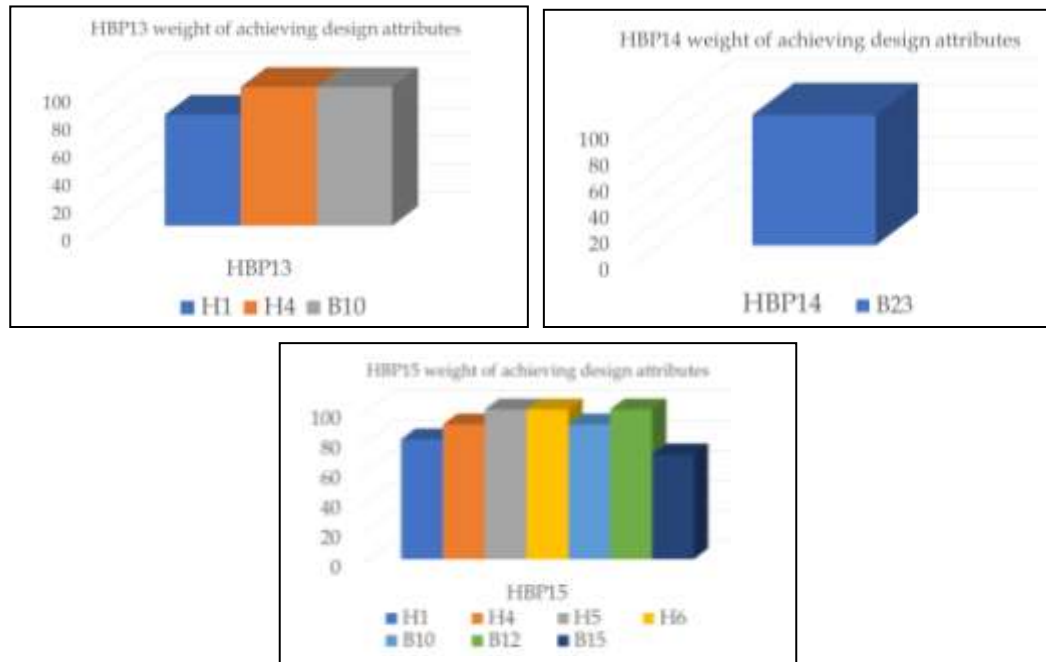Fig. 2. (Cont.) Questionnaire Results. Source resrachers after analysis of questionnaire results

Fig. 3. (Cont.) Questionnaire Results. Source resrachers after analysis of questionnaire results

CONCLUSION

The goal of this study is to determine the factors influence the design of a successful water-based journey of a healing blue-way system. A theoretical background was gathered to show the blue-way design covering the healing water environment design criteria and blue-ways design criteria as well regarding the land-based journey encompass design objectives of each sub-system, followed by an analytical study for three selected case studies to collect more objectives, and finally, a questionnaire was conducted to test those objectives and their relation with the primary design criteria that can be applied in urban areas of Egypt. The following points were concluded from the analysis of the questionnaire by experts:

- there is a great need to maximize safety factors for water users, so hazards along the river must be marked and for a better experience if there is an obstruction along the journey and it is better to provide an alternative land-based trail for users to skip this incidental obstruction.

- the environmental abuse can negatively affect the environment and the safety factor in terms of river banks and river streams so they proposed to apply correct bank stabilization techniques, woody debris management, and waste management system to guarantee that the water environment is qualified for users.

- With respect to the conditions of locating trailhead zones, all proposed conditions were endorsed but experts don't perceive them as more important than other conditions to provide a trailhead when the trail is long, as it will be satisfying to only add an access area for users in the river bank to access water or get out od it but to make this, it is essential that the riverbank is stable, this take us to the importance of providing correct bank stabilization techniques.

The objective codes, the proposed deign objectives, status and system related extracted from questionnaire analysis are shown in Table (8).

Table 8. Applied framework of healing water-based experience of the landscaped blue-way system.

Objectivve code	Proposed design Objectives	Status	System-related
H1	Provide non-motorized (self-handled) water-based trails such as kayaking.	Base-case	River healing environment
H2	Provide long river trips.		
H3	Provide journeys that connect the user with his history.		
H4	Provide different water-based trails such as kayaking, canoeing, diving, surfing, and paddling trails.		
H5	Provide Water trails that allow experiencing the culture and heritage.		
H6	Provide journeys that connect the user with nature.		
B1	Provide an obstruction management system to alert water trail users withupdates regarding obstructions,water data, current water levels, and other safety information.	Base-case	Blue-way system (Water-based experience)
B2	Provide On water navigational Signagesuch as Mile Markers and Directions.		
B3	Provide off water navigational Signage such as trailheads signage and focal points locations signage.		
B4	Provide access site signage viewed from water at each access site.		
B5	Each trailhead should include a kiosk sign featured with three panels. Two panels of water trail information such as difficulty level and point of interest. one panel is a map of a specific route.		
B6	If the trailhead is connected with a focal point provide a signage panel for focal point information.		
B7	Provide access points rather than major or minor located at maximum intervals of 6 miles.(Between 2 and six miles).		
B8	Provide ADA launch points at major trailheads.		
B9	Provide barrier-free routes connecting launch points with existing facilities in the riverfront corridor.		
B10	Provide multi-activity water trails such as kayaking, canoeing, diving, surfing, and paddling.		
B11	Provide parking near launch points.		
B12	Provide meandering water trails that go through distinguished settings of the city rather than landscape scenery or historical sites.		
B13	Provide technical support pavilions.		
B14	Provide moveable or elevated restrooms and lockers at access sites to be protected from flooding.		
B15	Trails should compromise to different levels for all ages and abilities. Therefore, it should focus on 'soft adventure' that appeals to those with limited skills or prior experience.		
B16	Possibility for water trails extensions to meet coming developments along the waterway.	Added	
B17	Provide a major trailhead when the trailhead connects more than one water trail.		
B18	Provide a major trailhead when the riverfront corridor allows to add a trailhead with its facilities.		
B19	Provide a major trailhead when it servesa large community of residents.		

B20	Provide a major trailheadwhen it is the access site to a vital focal point.		
B21	Provide a major trailheadwhen the location provides easy, non-obstructive access to water trail.		
B22	Provide a major trailhead when the trail is long.		
B23	Apply correct bank stabilization techniques.		
B24	Provide a major trailhead when the trail is long.	Removed	

Source: Researcher after questionnaire results and from (Rebecca, 2017; Kirkaldie, 2017; Olowu *et al*., 2014; EDSA planning and landscape architecture, 2014; Blue-ways Ireland, 2019; Blueways of St. Clair Strategic Plan, 2019).

Recommendations;

To create a successful water-based journey of a healing blue-way it is required to;

1. think if the area is ideal for a healing blue-way system in terms of water trail type, the presence of distinct focal points, and the extent to which the water trail path is distinct and reflects the city's identity.

2. consider each journeyseparately, down to each component of the journey, and then give design interventions for each component to convert it from its baseline scenario into a healing design that has a healing effect on the user's mental health.

3.think of the whole experience of the blue-way system starting with access sites moving to the user's visual and sensory experience ending with focal points representing the destination of the healing blue-way journey.

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اطار منهجي لتصميم تجربة مائية استشفائية باستخدام اللاندسكيب الاستشفائي

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المستخلص

تناقش هذه الورقة البحثية فجوة علمية في مجال العلاقة بين الممرات المائية و الاندسكيب الاستشفائي . ولأن الصحة العقلية هي محور السلوك البشري، فهناك حاجة ملحة لتطوير طريقة تصميم لتحسين الصحة العقلية. يهدف هذا البحث إلى النظر إلى مجاري الأنهار بطريقة مختلفة لتحديد مفهوم الطرق الزرقاء وكيفية دمج مجاري الأنهار مع المناطق العمرانية المحيطة بها واللاندسكيب الخاص بها لإنشاء رحلة نهرية علاجية شاملة.