

Article

Therapeutic Qualities and Sustainable Approach to Heritage of the City. The Coastal Strip in Gdańsk, Poland

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Abstract: In this paper, the case of the Coastal Strip in Gdańsk is presented. Gdańsk has natural and cultural heritage of great value and is included on Tentative list of UNESCO World Heritage List as “Gdansk—Town of Memory and Freedom”. The Coastal Strip is a rare example of landscape with natural dunes located within walking distance from densely populated residential districts. Therefore, the economic pressure for urban development is extremely strong. At the same time, the rise of social awareness about potential consequences of urbanization brought numerous efforts by local activists and researchers to prevent further development of the Coastal Strip. This study consisted of assessment of therapeutic qualities of The Coastal Strip using a conceptual framework—a universal standard for health promoting places. The results demonstrated that The Coastal Strip is a health-promoting place, thus adding new research-based evidence against plans for urban development of that area.

Keywords: Gdańsk; The Coastal Strip; environmental justice; preservation of heritage; therapeutic landscapes; public health; urban sustainability

1. Introduction

In this study, the case of The Coastal Strip in Gdańsk, Northern Poland is presented [1,2]. The Coastal Strip is a rare example of coastal landscape with natural dunes within walking distance from densely populated residential districts. It is a favorite recreational destination for not only local inhabitants but also tourists. Therefore, the economic pressure for urban development is extremely strong, as the market prices of apartments in this area are among the highest in the country. At the same time, people are increasingly aware of health promoting values of natural landscape and cultural heritage of the city. Thus, the plans for urban development of the Coastal Strip are raising social disapproval. Numerous studies concerning ecological and social values of that space were published. The Civic Project Development of the Coastal Strip in Gdansk was proposed in 2010 [1,2].

This case report investigates the therapeutic qualities of Gdańsk Coastal Strip. The assessment of therapeutic qualities was conducted with the conceptual framework of the universal standard of health-promoting places created by author. This case report can be used to justify the demand to protect the Coastal Strip from further development.

Literature Review

There is a plenty of evidence that environment affects human health [3,4]. Environment could be health-promoting and even therapeutic [5–9]. Gesler defined *therapeutic landscapes* as places where “physical and built environments, social conditions and human perceptions combine to produce an atmosphere which is conducive to healing” [6]. Researchers provided examples of places that have potential to

promote healing, for examples Lourdes in France, Epidauros in Greece, or Bama in China [5–7,9]. At the same time, Gesler and Conradson draw attention to the fact that the perception of therapeutic properties of the landscape is highly subjective and depends on the social context of the place [7,10].

Numerous researchers from various fields, e.g., environmental psychology, medicine, sociology, architecture, and urban planning, have described the main qualities of *therapeutic landscapes* [3,4,6,8]. However, a need for implementation science was determined. The universal standard for health-promoting places, developed by the author, could be used to evaluate the therapeutic qualities of any open green space [11].

Carlson recalls the “*four-level structure of theory*” proposed by Moore, Tuttle, and Howell (1982) which involved theoretical orientations, organizational frameworks, conceptual models, and explanatory hypotheses [12]. Referring to the “*four-level structure of theory*”, the universal standard is the conceptual model, based on theoretical orientations, organizational frameworks, and explanatory hypotheses captured during the literature review and field research.

As people are becoming aware of the benefits of everyday contact with nature, researchers from various countries are pointing to the uneven distribution of access to green spaces. [13,14]. Urban green space can provide multiple health, environmental, social, and economic benefits, but people with lower socio-economic status are often deprived of possibilities of every day contact with nature within walking distance [15]. Many researchers revealed the disparities regarding urban greenery and socio-economic status and called for access to natural landscapes for everyone [16]. People are increasingly demanding the right to the city and environmental justice [17].

The study reported in this paper was influenced by efforts to stop the urban development. The risk of deterioration of large scale open green space of the Coastal Strip Gdańsk should become important factor in decision making.

The therapeutic qualities are difficult to evidence. Therefore the universal standard for health-promoting places may serve as justification tool according to Lincoln and Guba evaluative criteria of credibility, generalizability, reliability, and confirmability [18]. Local community could use it to justify the call for protection of health promoting places endangered by urban sprawl.

2. Materials and Methods

2.1. Case Study. The Coastal Strip in Gdańsk

The coastline of Gdańsk (The Coastal Strip) is selected as the case study (Figure 1) for the following reasons. Gdańsk is a historic city and its coastline is perceived as cultural and natural heritage. Gdansk—Town of Memory and Freedom is included on Tentative list of UNESCO World Heritage List. [19] The Coastal Strip has important natural, cultural, and social qualities. Sandy beaches and natural dunes—younger ‘yellow’ coastal dunes and older ‘grey’ dunes overgrown by seaside forest are located next to densely inhabited popular districts. (Figure 1) The dunes are populated by surprising richness of species. Many of them are rare and endangered (e.g., *Arhenia Spathulata* and *Epipactis Atrorubens* (Dark Red Helleborine) [1,2]. Moreover, small patches of well-preserved natural habitats mentioned in the Annexes of the European Union Habitats Directive, e.g., psammophilic vegetation with *Koeleria Glauca*, can be found there [1,2].

There are numerous places of cultural heritage—historic seaside parks: Brzeźno Park and Jelitkowo Park, relicts of fisherman villages, cemeteries, historical buildings, as well as remains of coastal artillery.

The coastline is a favorite place for recreational activities and is highly popular among holiday seekers during summer season. The pedestrian and bicycle promenade along the beach stretches from Gdańsk to Sopot and even further to Gdynia. It is a favorite path for family walks.

It is a place for physical activity, mental regeneration, and organizing social events. Sadly, today this place is endangered by sprawling urban development.



Figure 1. Outlines of Gdańsk Coastal zone. Source: Google maps, 2020.

The coastal zone is a subject of strong economic pressure for further development [1,2,20–22]. As it is one of the most demanded locations (Figure 2), plans for new development, upscale apartments, or hotels are created. On the other side, numerous efforts to prevent urban development of the Coastal Strip were undertaken by local activists and researchers from Gdańsk universities and institutions [1,2,21]. The Civic Project Development of the Coastal Strip in Gdansk presented sustainable proposals for development [2]. The social movement is very active, with social media presence (e.g., www page, Facebook, etc.) The local spatial development plans are being constantly monitored [2].

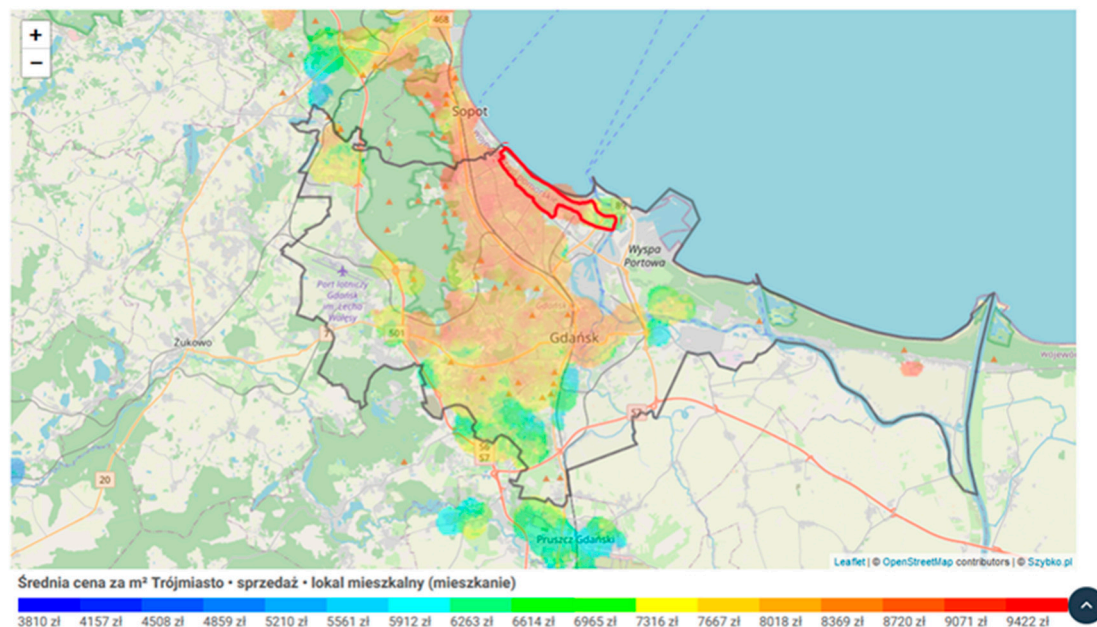
2.2. Method and Data Collection

The main objective of this study was to find additional evidence to justify the social demand to protect the open green areas of The Coastal Strip from further urban development. The research question was whether The Coastal Strip is a health-promoting place? To answer this question, a conceptual framework for a universal standard of health-promoting places (Table 1) was used. It was created to consolidate the therapeutic attributes described by researchers and unify evidence into a ready-to-use tool. The tool organizes therapeutic attributes and allows for assessment and comparison.

The health-promoting qualities were divided into five categories: Sustainability, accessibility, amenities, design, and placemaking [11].

Table 1. A universal standard for health-promoting urban places. Source: Author.

1. Sustainability	2. Accessibility	3. Amenities	4. Design	5. Placemaking
1.1 Place Area Location Surrounding urban pattern 1.2 Environmental characteristics Soil quality Water quality Air quality Noise level Forms of natural protection Green and Blue Infrastructure 1.3 Biodiversity protection Parts of open green space not available to visitors Native plants Native animals Natural maintenance methods 1.4 Sustainable water management Rainwater infiltration Irrigation with non-potable water 1.5 Parks of Second (New) Generation 1.6 Urban metabolism 1.7 Ecological energy sources	2.1 Distance to park 2.2 Sidewalk Infrastructure- Width of sidewalk Evenness of surface Lack of obstructions Slope Sufficient drainage 2.3 General conditions of walkways Maintenance Overall aesthetics Street art Sufficient seating Perceived safety Buffering from traffic Street activities Vacant lots 2.4 Traffic Speed Volume Number and safety of crossings Stop signs On-street parking 2.5 User Experience Air quality Noise level Sufficient lighting Sunshine and shade Visibility of nearby building 2.6 Public transport stops 2.7 Sufficient Parking	3.1. Psychological and physical rejuvenation Natural Landscapes Green open space Presence of water Places to rest in the sun shade Places to rest in quiet and solitude 3.2. Promotion of Physical Activities Sports and recreational infrastructure Community gardens Addressing the needs of people with disabilities 3.3. Catering for basic needs Safety and security (presence of guards, cleanliness, maintenance, etc.) Places to sit and rest Shelter Restrooms Drinking water Food (possibility to buy food in the park or in the closest vicinities)	4.1. Architectural design Human scale Focal points and landmarks Structure of interior connections Framed views Long vistas (Extent) Pathways with views Invisible parts of the scenery (Vistas which engage the imagination) Possibility to watch other people Possibility to see wildlife 4.2. Salutogenic design Optimal levels of complexity Engaging features Risk Mystery/Fascination Movement 4.3. Sensory stimuli design Sensory stimuli: Sight Sensory stimuli: Hearing Sensory stimuli: Smell Sensory stimuli: Touch Sensory stimuli: Taste Sensory path	5.1 Enhancement of Social Contacts Organization of events Meeting places for groups 5.2 Human perception -spiritual & symbolic Sacred places Works of Art Monuments Culture and connections to the past Thematic gardens Personalization

**Figure 2.** Spatial distribution of market retail value in Gdańsk. Average price per square m of apartments in Gdańsk [zł = polish zloty, pln]. The Coastal Strip, marked in red, is among the most expensive zones. Source: [22].

Three methods of research were used to develop the conceptual framework of the universal standard (Figure 3). The first method was a literature review in search of space characteristics linked to therapeutic qualities. Based on this research the draft for the universal standard was developed.

The second method was on-site field observation in selected parks in Europe and USA. Over 100 parks were studied. The third method—theory triangulation—was used to integrate the synthesized results of the literature review and field research in order to develop the final ready-to-use version of the universal standard.

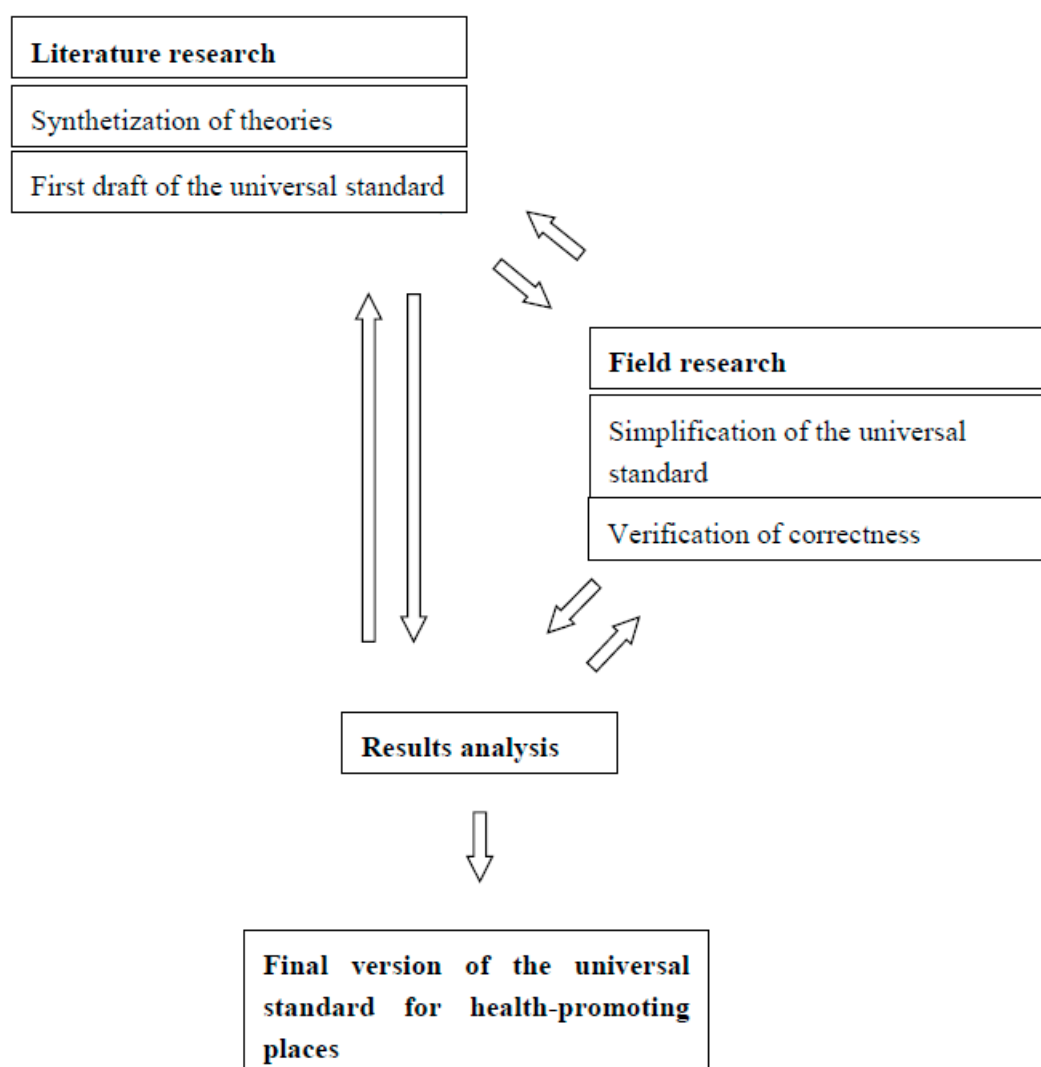


Figure 3. Scheme of the theory triangulation. Source: Author.

The universal standard was used to assess The Coastal Strip in Gdańsk therapeutic qualities. The evaluation was performed by the author—professional researcher—with a degree in architecture and urban design. The review of existing literature about the Coastal Strip was the first step, followed by numerous site visits, conducted over a couple of years (2013–2019). During those visits, observation, mapping the presence of visitors, and unstructured interviews were conducted.

In this study, The Coastal Strip in Gdańsk was treated as a large-scale urban park of new generation, encompassing smaller public parks and gardens in seaside districts of Gdańsk: Jelitkowo, Brzeźno, and Nowy Port. The park was evaluated using the universal standard (Table 1). Both a thick binary and a detailed assessment were performed.

The thick binary assessment has 2 categories (0, 1):

No, not observed-0

Yes, satisfactory-1

3. Results

The detailed assessment required a written explanation of why the researcher thought that the attribute was present. For better clarity, the results of the assessment are grouped into five tables representing five sections of the universal standard.

3.1. Sustainability

The assessment of sustainability (Table 2) demonstrated that The Coastal Strip can be treated as a modern park of new generation. Those parks are places where the sustainable development goes hand in hand with new forms of biodiversity protection. Moreover, the park is an important place for the local community. (Figures 4 and 5) It has no boundaries and spreads to transform the entire neighborhood into the grid of blue and green infrastructure [23–25].

Table 2. Assessment of Coastal Zone, Gdańsk—part 1, source: Author.

		POINTS
1. SUSTAINABILITY		12/15
1.1 Place		-/-
Area	Approx. 500 ha	
Location	Gdańsk coast line, a strip of coastline approx. 800 m wide and 6 km long	
Surrounding urban pattern	High density residential urban tissue, large scale residential districts	
1.2 Environmental Characteristics		6/6
Soil quality	Sufficient for recreational use. No visible traces of pollution	1
Water quality	The quality of water of Baltic Sea is sufficient for recreational use, e.g., bathing, swimming, etc. (Figure 4) Numerous potable water works which serve the city of Gdańsk area are located in that area.	1
Air quality	Very good [26]	1
Noise level	Low to moderate noise level in areas close to traffic routes [27]	1
Forms of natural protection	No specific legal protection apart from conditions of development specified in local spatial development plans, parts of dune are fenced to discourage cross passing and devastation of fragile ecosystems	1
Green and Blue Infrastructure	Important part of the green and blue infrastructure. The coastal line is composed of the complete dune system with natural fore dunes. The established dunes are covered by coniferous forest (Figures 4 and 5)	1
1.3 Biodiversity Protection		3/4
Parts of open green space not available to visitors	Parts of yellow dunes are fenced for biodiversity protection. The areas of water intake works are fenced.	1
Native plants	Planting is a combination of native and non-native species	1
Native animals	Both native and foreign species were observed	1
Natural maintenance methods	Data n/a	0
1.4 Sustainable Water Management		1/2
Rainwater infiltration	Porous, permeable surfaces	1
Irrigation with non-potable water	Data n/a	
1.5 Parks of Second (New) Generation		1/1
	Yes, The Coastal Strip can be regarded as park of new generation	1
1.6 Urban Metabolism		1/1
	Waste segregation and collection	1
1.7 Ecological Energy Sources		0/1
	Data n/a	



Figure 4. Coastal Zone, Gdańsk, Poland. Sandy beaches are full of holiday makers during summer.
Source: Author.



Figure 5. Coastal Zone, Gdańsk, Poland. Open green space with play areas. Source: Author.

The park was evaluated as sustainable open green and blue area. The result was 12 out of 15 points, because there was no evidence about natural maintenance methods, irrigation with non-potable water and ecological energy sources. However, those issues can be resolved by local authorities and park management.

3.2. Accessibility

The park was assessed as universally accessible to people of every age and special needs.

Maximum of available points 26/26 were awarded. (Table 3) One of the major advantages of The Coastal Strip are attractive sandy beaches and open green space surrounded by forest. (Figures 4 and 5). The paths are comfortable, have even surfaces, and provide interesting views with long vistas (Figures 6–8).

Table 3. Assessment of Coastal Zone, Gdańsk, Poland—part 2, source: author.

		POINTS
2. ACCESSIBILITY		26/26
2.1 Distance to Park		1/1
	A majority of users walk to The Coastline Strip. Sufficient public transportation with local bus and tramway stops	1
2.2 Sidewalk Infrastructure (Figures 6–8)		5/5
Width of sidewalk	Sufficient	1
Evenness of surface	Good	1
Lack of obstructions	Majority of terrain is accessible, but there are fenced residential complexes and fenced areas around municipal infrastructure	1
Slope	Flat, no significant slope	1
Sufficient drainage	Sufficient	1
2.3 General Conditions of Walkways		8/8
Maintenance	The park is perceived as clean. No visible traces of litter.	1
Overall aesthetics	Good	1
Street art	None	1
Sufficient seating	Yes, multiple benches in popular places, but may be perceived as insufficient in other areas	1
Perceived safety	The park is perceived as a safe place	1
Buffering from traffic	Sufficient	1
Street activities	Yes, occasional events, both organized and spontaneous	1
Vacant lots	Yes, fenced areas around municipal infrastructure	1
2.4 Traffic		5/5
Speed	Slow	1
Volume	Moderate	1
Number and safety of crossings	Numerous possibilities for safe crossing of the street	1
Stop signs	Yes	1
On-street parking	Yes	1
2.5 User Experience		5/5
Air quality	Good	1
Noise level	Low to moderate in places close to traffic lines and crowded beaches	1
Sufficient lighting	Numerous lamps and sufficient lighting along the walking routes for pedestrians and roads, but there are parts of the area that are dark after dusk	1
Sunshine and shade	Yes, sunny open spaces surrounded by trees providing shade (Figures 4 and 5)	1
Visibility of nearby buildings	Part of area adjacent to residential districts has good visibility of nearby buildings, but there are part of the green space (e.g., forest, beaches) with no view of the city (Figures 4–8)	1
2.6 Public Transports Stops		1/1
	There are bus and tramway stops within walking distances	1
2.7 Sufficient Parking		1/1
	Yes, there are numerous parking spots, as well as on-street parking	1



Figure 6. Coastal Zone, Gdańsk, Poland. Vista engaging the imagination. Source: Author.



Figure 7. Coastal Zone, Gdańsk, Poland. Wooden pier over wetlands. Source: Author.

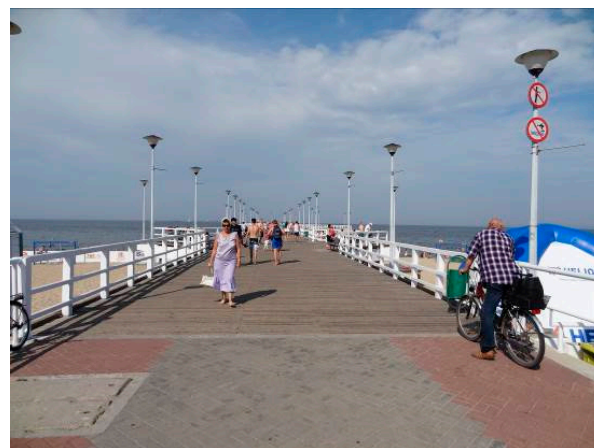


Figure 8. Coastal Zone, Gdańsk, Poland. Wooden pier in Brzeźno. Source: Author.

3.3. Amenities

The recreational infrastructure was assessed as satisfactory. (Table 4) The basic needs of users are satisfied by park infrastructure (drinking fountains, cafes, restaurants, food stands, etc.)—(Figures 9 and 10) Therefore 14 out of 15 points were awarded. One point which was missing were community gardens. However, it is debatable whether they should be introduced.

Table 4. Assessment of Coastal Zone, Gdańsk, Poland – part 3, source: author.

		POINTS
3. AMENITIES		14/15
3.1. Psychological and Physical Rejuvenation		5/5
Natural Landscapes	Coniferous forest, dunes and sandy beaches give an impression of a pristine natural landscape	1
Green open space	Numerous extensive grass-covered grounds (Figures 4 and 5)	1
Presence of water	Coast of Baltic sea, rain collectors, ponds (Figure 5)	1
Places to rest in the sun and shade	Multiple places including picnic and play areas	1
Places to rest in quiet and solitude	Multiple places to rest in quiet and solitude	1
3.2. Physical Activity Promotion		3/4
Sports infrastructure	Running loops, bicycle paths, cross-fit stations, boules pitch, skate park	1
Recreational infrastructure	Recreational infrastructure for all age groups	1
Community gardens	No	0
Addressing the needs of people with disabilities	Pathways are wide and even, the majority of the park area is accessible	1
3.3. Catering for Basic Needs		6/6
Safety and security (presence of guards, cleanliness, maintenance, etc.)	Assessed as a safe place during daytime, but difficult to provide sufficient surveillance after dusk	1
Places to sit and rest	Numerous benches in most popular areas	1
Shelter	Visitors may find shelter under tree canopies or inside buildings, e.g., scattered restaurants, cafes, etc. Provisional temporary structures provide shelter during organized events	1
Restrooms	Yes	1
Drinking water	Yes, drinking fountains, refreshment stands	1
Food (possibility to buy food in the park or close vicinity)	Snack bars, food stands, restaurants (Figures 9 and 10)	1

**Figure 9.** Coastal Zone, Gdańsk, Poland. Summer restaurants. Source: Author.



Figure 10. Coastal Zone, Gdańsk, Poland. Summer stands with food and souvenirs. Source: Author.

3.4. Design

The results of the DESIGN section clearly indicate that any type of urban development would hinder the health-promoting qualities of The Coastal Strip (e.g., long vistas, framed views, sensory stimuli, engaging features, etc. (Table 5) (Figures 4–11). Therefore, 19 out of 20 points were awarded. One point was missing—sensory path, which could enhance the sensory experience.

Table 5. Assessment of Coastal Zone, Gdańsk, Poland—part 4, source: Author.

		POINTS
4. DESIGN		19/20
4.1. Architectural Design		9/9
Human scale	Park offers various landscapes, ranging from open space of sandy beaches to cozy places inside the forest	1
Focal points and landmarks	Recognizable landmarks, monuments, sculptures and buildings.	1
Structure of interior connections	A clear structure of interior connections	1
Framed views	Natural frames are created by mature trees	1
Long vistas (Extent)	Park offers numerous extensive vistas	1
Pathways with views	Many paths offer interesting views	1
Invisible parts of the scenery (Vistas which engage the imagination)	Numerous designed vistas which engage the imagination	1
Possibility to observe other people	Plenty of places to watch the activities of other people from a distance.	1
Possibility to observe animals	Plenty of places to see wildlife from a distance.	1
4.2. Salutogenic Design		5/5
Optimal levels of complexity	Yes, the composition of the park is legible, yet offers optimal levels of complexity	1
Engaging features	There are multiple elements which attract attention (Figure 5)	1
Controlled Risk	Several elements offer a subjective feeling of overcoming controlled risk, e.g., wooden platforms over wetlands (Figure 7, wooden pier in Brzeźno (Figure 8)	1

Table 5. Cont.

Mystery/Fascination	Presence of sculptures and monuments draw the attention of users (Figure 11)	1
Movement	Baltic Sea waves, shimmering greenery	1
4.3. Sensory Stimuli Design		5/6
Sensory stimuli: Sight	Colorful leaves in the autumn, flowering trees in the spring	1
Sensory stimuli: Hearing	Sound of sea waves	1
Sensory stimuli: Smell	Flowering trees in the spring	1
Sensory stimuli: Touch	Trees, water.	1
Sensory stimuli: Taste	Refreshment stands, Snack bar (Figures 7 and 8)	1
Sensory path	No	0



Figure 11. Coastal Zone, Gdańsk, Poland. Monument of Arthur Schopenhauer in the Ronald Reagan park. Source: Author.

3.5. Placemaking

The aspect of placemaking is very important. The Coastal Strip has a long tradition of being a favorite holiday destination. The historic parks, hotels, restaurants and wooden pier served visitors for decades, if not centuries. Today, that tradition is being reinvigorated with organization of cultural and sport events, e.g., Festival of Arts, Park Runs, etc. Therefore, 7 out of 8 points were awarded, as only thematic gardens could be added to reinforce the place identity. (Table 6) There are numerous points of interest to facilitate the creation of mental maps and wayfinding (Figures 8–11).

Table 6. Assessment of Coastal Zone, Gdańsk, Poland—part 5, source: Author.

		POINTS
5. PLACEMAKING		7/8
5.1 Social Contact Enhancement		2/2
Organization of events	Multiple events, sport challenges, etc.	1
Meeting places for groups	Numerous picnic areas	1
5.2 Human Perception-Spiritual & Symbolic		4/6
Sacred places	Nearby churches	1
Works of Art	Sculptures created during festivals of art	1
Monuments	Monuments of Saint John Paul the II and Ronald Reagan, monument of Arthur Schopenhauer (Figure 6)	1

Table 6. Cont.

Culture and connections to the past	Multiple, monuments, works of art, historic parks, fisherman village, cemeteries, relicts of coastal battery	1
Thematic gardens	No	0
Personalization	No	1

4. Discussion

4.1. The Main Findings of the Research

The binary assessment demonstrated that the coastal zone scored 90%—76 out of maximum 84 points, which is a very good result. This result confirmed that The Coastal Strip is a health-promoting place, important for public health. The loss of such a place would be difficult to compensate in a densely populated area. The scores are high in all five categories. The missing points are limited and could be easily amended. The result indicates that any development of The Coastal Strip should be carefully analyzed. Any fragmentation may hinder the health-promoting qualities.

The results of assessment of therapeutic qualities are confirmed by existing research on coastal landscapes. Coastal communities may attain better physical health due to leisure time spent near the sea, as blue settings offer numerous therapeutic qualities [25–29].

4.2. Future Research Directions

The limitation of the universal standard comes from the subjectivity of individual perception. While the majority of therapeutic attributes can be assessed objectively, some are subjective. The precise methods of comparison cannot be used, as it is impossible to evaluate and compare some therapeutic attributes: i.e., Sensory stimuli, Mystery, Fascination, Risk/Peril, etc. Moreover, the therapeutic experience of green area can vary among individuals. The subjectivisms of assessment could be mitigated only with a more detailed description. Detailed studies, conducted by a team of researchers who discuss and compare the results, would be recommended. It would also be important to repeat the assessment to monitor the health-promoting potential of The Coastal Strip. The results could indicate areas for potential improvement.

The universal standard for health-promoting places could be used to assess the therapeutic qualities of urban open green space in any city.

5. Conclusions

A universal standard for health-promoting places is a conceptual framework to evaluate open green space. It was developed by the author after many years of research. In this study, it was used to evaluate The Coastal Strip in Gdańsk. The results, 76 out of maximum 84 points (90%), demonstrated that The Coastal Strip is a health-promoting place, invaluable for health promotion of local inhabitants and occasional visitors.

The therapeutic qualities are perceived as subjective phenomena and therefore any claims funded on lost therapeutic values are often rebutted as ungrounded or unimportant. The assessment of therapeutic qualities could be used to justify the social demand for limiting plans of further urban development of The Coastal Strip. The protection of natural heritage and public health promotion is a good reason to turn down the prospective short-term economic gains resulting from urban development. The therapeutic qualities could be lost and are difficult, if not impossible, to compensate.

The recognized limitation of this study is evaluation by only one researcher. Although the majority of awarded points are invariable and would not change if the evaluation was performed by a team of researchers, there are still some subjective points. Therefore, further, more detailed studies may require evaluation by a team of researchers and comparison of results. It would be also recommended to repeat the assessment to monitor the health-promoting features.

In this study, The Coastal Strip was chosen, but the conceptual framework of the universal standard for health-promoting urban places could be used to evaluate the qualities of any open public green space.

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