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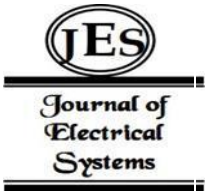
Evaluating Research on Landscape Architecture and Disability in Scopus Publications



Abstract: - The so-called Universal Design is mainly characterized by a broad understanding of space and the needs of people with disability to join urban life; in this connection, landscape architecture is responsible for generating ergonomic-sensitive exterior spaces for public and private use to help meet disabled people's needs in the interaction between the artificial and natural environments. The objective of this study was to explore articles from credible Journals of Landscape Architecture and Disability in the Scopus Publication Journal. This study employed a qualitative method and a meta-study strategy to review 148 research articles in 74 journals on Landscape Architecture and Disability published from early 2020 to the end of 2023, emphasizing such keywords as *Disability, Landscape, Green space, Garden Park, Greenery, Space, Trees,* among others, available at https://www.sciencedirect.com. Findings of articles on landscape architecture and disability mainly featured such elements as sustainability, landscape, environmental psychology, passive defense, historical research, design processes, tourism, physical studies, and environmental perception; these articles, meanwhile, used modern design techniques to meet disability sustainability in landscape elements. The methodology of the articles consisted mainly of a 60% quantitative section (35% survey, and 25% experimental) and a 40% qualitative section (16% case studies, 14% review articles, 7% ethnographic studies, 2% descriptive-analytical, and 1% individual studies). The articles' variables were mainly composed of abstract/subjective, concrete, mediator/relational, observational, and affected variables at rates of 31, 31, 30, 6, and 2%, respectively. The articles were found to apply three scientific, experimental, and psychological processes, the findings of which could serve as a comprehensive guide to prospective research on the role of disability in landscape architecture.

Keywords: landscape architecture, disability, review research, Scopus articles

I.INTRODUCTION

As a social phenomenon, disability is an inseparable part of social life (Greenboim-Zimchoni, 2023). Meanwhile, accessibility is a vital basic human right for the disabled to join urban life (Sirel & Sirel, 2018:11). Despite technological advancements and the increasing number of incidents, the number of the disabled is on the rise annually and is placing a burden on society (Jones, 2022). As estimated by the U.N., a growing number of disabled people are living in less developed nations (Mogaji & Nguyen, 2021). Disability undermines the individual's ability to perform his daily life activities and disrupts routine activities that encompass complicated behaviors (Namkung & Carr, 2020). Disabled people are more likely to develop mental complications, which would be associated with psychological pressure, depression, loss of employment and social benefits, changing lifestyles, and social isolation and rejection (Emerson, Fortune, Llewellyn & Stancliffe, 2020). An executive functional capacity is key to human daily activities, as focus on reduced competencies could be associated with mental disorders such as depression (Gonzalez et al., 2010 & Mialet et al., 1996), and obsessive-compulsive disorders (Koch & Exner, 2015).

A constructed environment increasingly affects one's mental health (Wang, Li, 2023), and the general landscape architectural educational program supports a comprehensive approach to landscape architecture design and environmental engineering (Staniewska, 2021).

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** Article taken from the Landscape Architecture PhD proposal titled: Explaining the components of light pollution in urban passages on the stress of locomotor disability by defining their mental experiences

Landscape designers should know the physical, ecological, social, and psychological dimensions of the environment (Zube, 1986). Many scholars believe that landscape is a social necessity (Thompson, 2014; Beatley, 2000; Murphy, 2005), which contributes to generating part of public and social spaces (Hope, Ness, Friesinger, Topor, Dag Bøe, 2023) and constituting the art of the social environment (Dixon, Hunt, 1992). Meanwhile, the relationship between culture and nature and their bond is so critical that influences the human experience in landscape (Jacobs, 1991; Olin, 1998; Spirn, 1984). Landscape serves as a factor for building and enriching culture (Corner, 1991:1), featuring social and cultural values (Corner, 2006), and representing a cultural product (Cosgrove, 1984).

Today, it is globally acknowledged that physical barriers should be removed to make environmental spaces more accessible for the disabled (Council of Europe, 2003). The philosophy behind the universal design approach suggests that as a totality, the physical environment can be used by all similarly without any adjustments (Sirel & Sirel, 2018). A universal design fundamentally emerged to criticize problems facing disabled people's current accessibility, though it widely accepted the idea of an equal design for all (Mishchenko, 2014).

II.METHODOLOGY

To meet its goal of landscape and disability worldwide, this qualitative study used a descriptive-analytical method to review the published articles. All articles from early 2020 to the end of 2023, available at https://www.sciencedirect.com, comprised the statistical population.

As the term green space is historically divided into two words, i.e., *green* and *space*, with the former describing the latter (Warren, 1973) and it may convey numerous senses and prompt authors to refer to various things (Lucy Taylor & Dieter F. Hochuli, 2017), this term may be widely regarded as areas for public access or vegetation such as lawn, plants, and trees (Lachowycz & Jones, 2013). For this, keywords such as *Disability, Landscape, Green space, Garden Park, Greenery, Space,* and *Trees,* among others, were extracted and screened from available articles to cover the objectives of all articles representing landscape and disability. After the subject under consideration was identified, the articles were divided into eight categories. To identify the articles' methodologies, the Abstract and Method sections of each article were examined to categorize the type of method in each article. As given in Table 1, the eight subjects under study concern landscape architecture and disability, which contain their sub-categories.

Table 1: Categorization of article subjects related to landscape architecture and disability

No.	Subjects	Secondary subjects
1	**Sustainability**	Climate, accessibility, social, local communities, environmental, public transportation
2	**Landscape**	Parks, gardens, traditional neighborhoods, jungles, nature, pedestrian zones, traditional city, water spaces, vegetation, artificial scenery, residential density, green street spaces
3	**Environmental psychology**	Emotional geography, environmental quality, mental health, depression, anxiety, perceptual
4	**Passive defense**	Environmental degradation, road damage, air pollution, heat waves, earthquakes, dust, typhoons, wars
5	**Historical research**	National mediation, forward-looking, cohort, systematic
6	**Design processes**	Visual processing, user interface, visual interface design, training, robots
7	**Tourism**	Travels, attractions, urban environment, therapeutic landscapes
8	**Physical studies**	Cognitive health, phenomenology, space syntax

Theoretical Foundations

Disability

Defining disability has been one of the trickiest tasks for man (Linton, 1998). The term *disability* has transformed into a short or encompassing phrase involving various aspects of disability (WHO, 2001). The term disability is

applied to represent all conceptual components on a disability-disease continuum that influences the individual, and also to represent the results of environmental impacts that generate constraints or barriers to the individual (Altman, 2014).

Sustainability and Disability

Sustainability embraces various aspects of fabric as well as social and cultural models, with social sustainability featuring three components of development, bridge sustainability, and maintenance sustainability (Suzanne, Harvey & Jennifer, 2011). In sum, social sustainability is a condition that helps improve life in society and is a process through which societies can meet this condition (McKenzie, 2004:7). Social sustainability is aimed at meeting the present generation's needs without eliminating the future generation's abilities to meet their needs (Drolet & Julie, 2015). The literature on disability sustainability reflects social reactions by so-called non-disabled people to disabled people's abilities (Wolbring & Rybchinski, 2013). The disabled community helps provide a cultural-ablism structure (Wolbring, 2012) and influences all sustainability discourse, especially social sustainability discourses (Landorf, Brewer & Sheppard, 2008).

Landscape and Disability

Landscape is a critical component of sustainable urban development (Motealleh, Parsaee & Sheybani, 2017). For this, it is difficult to provide a comprehensive and exact definition of human activities in the environment, especially in the form of architecture and landscape architecture (Adib, 2012). Landscape architects help create artistic installations to feature abilities to tackle problems in a wider scope than other related disciplines (Gazvoda, 2022). The way the environment and landscape are interpreted differs by the observant and his perception of the environment and landscape (Misthos, Krassanakis, Merlemis & Kesidis, 2023). Thus, landscape can be defined as how humans view and perceive a specific environment through a perspective, and how they transform it from a perfectly natural state into a man-made space (Makhzoumi & Pungetti, 1999).

Environmental Psychology and Disability

As a branch of psychology, Environmental Psychology relates and analyzes the reciprocal relationship between human experiences and actions, as well as physical and social features (Canter & Craik, 1981). Intercultural environmental psychology is concerned with the integrated and conscious cultural understanding of relations between humans and their environments (Tam & Milfont, 2020). Characterized by three components of fabric, meaning, and activity, environmental quality is aimed at meeting user comfort in various dimensions, namely space, perceptions, and visual (Farboud & Shahhoseini, 2020; Mousavi Samimi & Sadraei Tabatabaei, 2020; Mousavi Samimi & Shahhosseini, 2021) and non-visual (Ramprasad & Subbaiyan, 2017; Shahhosseini, 2014; (Shahhosseini, Kamal & Maulan, 2014) preferences.

Passive Defense and Disability

As a discipline, Crisis Management generally falls under strategic management and specifically deals with strategic control (Mitroof et al., 1978). Passive defense refers to a set of non-armed measures that increases deterrence, reduces vulnerability, continues necessary activities, promotes national sustainability, and facilitates crisis management against threats and military actions (Mohammadzadeh, Nabizadeh & Abdullahi, 2023).

Historical Research and Disability

Historical research concerns the regular collection and objective evaluation of past event data to test hypotheses that relate to their causes, implications, and trends, which would help explain and predict present and future events (Gay, 1981:432). For Mitchell, the historical geography study is concerned with studying the geography of the past and linking it with human matters (Mitchell, 1954). By the late years of the 20th century, the historical geography workgroup of the American Association of Geographers was mainly tasked with researching the environment, rustic and urban sceneries, and border region developments (Denis, 1991).

Design Process and Disability

Design is a decision-making procedure that helps generate novel ideas and solutions for resolving problems (Verganti et al., 2020). The term design is mostly defined concerning its principles, which bring into existence the plan and serve as a philosophical viewpoint that expresses the practice of design, such as design thinking or

user-led approaches (Trocin, Stige, Mikalef, 2023). Design thinking involves theories, models of design methodologies, psychology, and education to help strengthen organizational innovation (Dorst, 2011).

Tourism and Disability

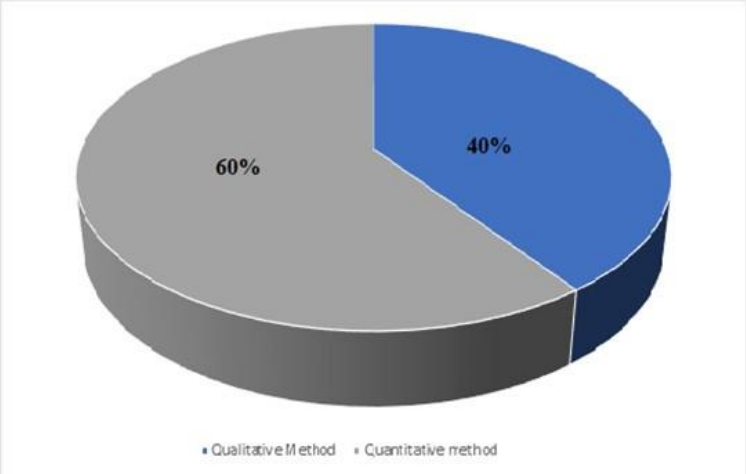
Urban areas embrace a wider concept involving cities, towns, and suburbs (Davis, 1995). Social participation is key to environmental governance because it facilitates and promotes a sense of ownership in social decision-making and social development matters (Musavengane, 2019). The majority of recreational and entertainment activities outdoors depend on the natural environment, social trends, and socio-political conditions (Job and Paesler, 2013, Pröbstl and Haider, 2013). Disability tourism is one of the special types of tourism and is seen as one of the relatively new developments in tourism, represented by the form of disabled people tourism (Burnett & Bender-Baker, 2001), no-barrier tourism (Foggin & Cameron & Darcy, 2004), global tourism (Darcy, 2006), and lately accessible tourism (Darcy & Dickson, 2009) (Buhalis & Darcy, 2011).

Physical Research and Disability

Physical research usually serves as a guide for researchers to help them better focus on their scope of studies (Akanbi, 2015). The city's physical-spatial development is a process in which the city's fabric grows and urban activities and uses are transformed (Bemanian, 2008). An available constructed environment for people with special needs not only provides free access to social-cultural amenities and special services but also provides technical and material, as well as social, mental, and educational services (Kokhan, Nadeina, Garov & Sarandev, 2022).

Methodology of Landscape Architecture and Disability Research

Research methodologies are generally coded by data type into two quantitative (survey and experimental) and qualitative (case study, ethnographic, individual, future research, descriptive-analytical, and review studies) groups (Shahhosseini, Khandani & Kurehpaz, 2022). To identify the articles' methodologies, the Abstract and Method sections of each article were examined to categorize the type of method in each article. Numerical data indicate that the number of quantitative and qualitative studies is almost equal, suggesting that research in the two areas requires both methods mentioned above. According to the research, as exhibited by Graph 1, the articles published in Scopus have employed a quantitative research method with 88 articles (60%) and a qualitative research method with 60 articles (40%), respectively. As shown in Table 2, which exhibits a smaller categorization, 51 articles pertain to surveys and 37 articles to experimental studies using quantitative research methods. Also, the table shows that 24 case studies, 21 reviews, 10 ethnographic, 3 descriptive-analytical, and 2 individual studies fell under the qualitative research method. On the other hand, subjects of sustainability, landscape, psychology, passive defense, and historical research constituted the landscape architecture and disability research with 33, 29, 33, 15, and 13 articles, respectively, with the remaining subjects given in Table 2.



Graph 1: Methodology data in Landscape Architecture and Disability Articles (Sources: Authors)

Table 2: Statistical percentage and type of methodology used in the Landscape Architecture and Disability Articles

Categorization		Sub-sets	No. of articles	Percentage	Total No. of articles	Total percentage
1	Quantitative	Survey	51	35%	88	60%
		Experimental	37	25%		
2	Qualitative	Case study	24	16%	60	40%
		Review	21	145		
		Ethnographic	10	7%		
		Descriptive-analytical	3	2%		
		Individual	2	1%		

Table 3: Statistical data of methodologies in landscape architecture and disability research (Source: authors)

No.	Articles' central subjects	No.	Quantitative	Qualitative
1	Psychology	33	22	11
2	Sustainability	33	12	21
3	Landscape	29	18	11
4	Passive defense	15	11	4
5	Historical research	13	9	4
6	Design Process	10	8	2
7	Tourism	8	2	6
8	Physical research	7	6	1
Total		148	88	60

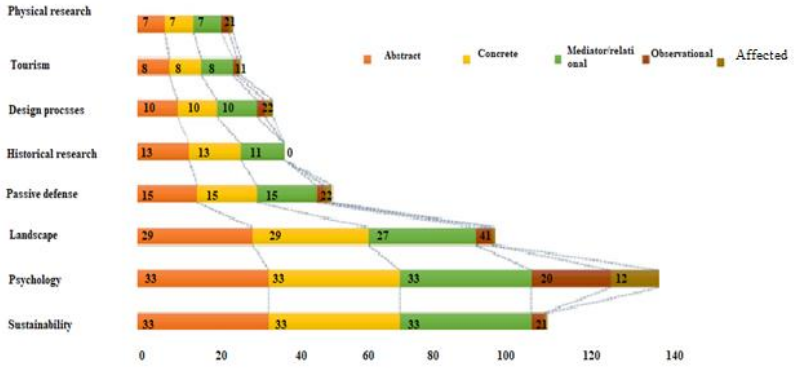
The researcher must understand how certain variables of a study are interrelated (Kaur et al., 2019). For this, it is critical to provide a true understanding of the variables to be properly used and to extract significantly related results from them (Kaur & Mittal, 2021). A variable is an entity that can take on different values among people or at different times (Ahuja, 2015); condition (s) to be observed, manipulated with, and controlled for (Kerlinger, 1995), or attribute (s) and qualities that represent differences in magnitude and in dimension (Dooley, 2008), or part (s) of experimental conditions that can change or take on characteristics under various circumstances (McBurney, 2007). It is thus important to turn concepts into variables to be measured (Kumar, 2015).

Table 4: Statistical data of variables in landscape architecture and disability research subjects

Articles' central subjects	Variables						
	Abstract	Concrete	Mediator	Observational	Affected	Related to the subject	%
Sustainability	33	33	33	3	1	103	21%
Psychology	33	33	33	20	12	131	27%
Landscape	29	29	27	4	1	90	18%
Passive defense	15	15	15	2	2	49	10%
Historical research	13	13	11	-	-	37	7%
Design processes	10	10	10	2	2	34	7%
Tourism	8	8	8	1	1	26	5%
Physical studies	7	7	7	2	1	24	5%

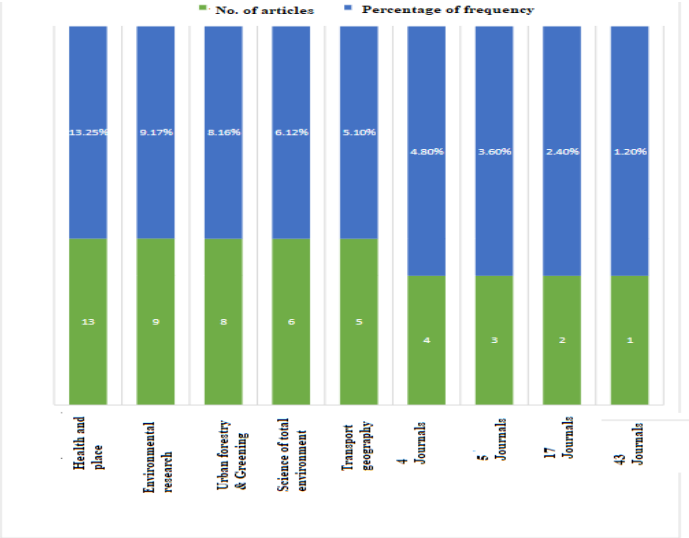
Total of each variable	**148**	**148**	**144**	**34**	**20**	**449**
Total percentage of each variable	**31%**	**31%**	**30%**	**6%**	**2%**	

An abstract variable is manipulated by the experimenter to measure its effect on the concrete variable (Aishwaryaet et al., 2019). The mediator and observational variables are selected for the study to determine if they affect the relationship between the abstract variable and the concrete variable. The difference between the observational variable and the mediator variable is that if the effect of the observational variable is minimized, it will be eliminated or remain constant, while the mediator variable will be examined (Mulay, 1980). The affected variable, on the other hand, is a variable that is hypothesized to exist but cannot be observed and is assumed to explain the relationship between abstract and concrete variables (Kerlinger, 1995).



Graph 2: Frequency of variables of articles' central subjects in landscape architecture and disability (Sources: Author

As exhibited in Graph 3, a review of the articles published in journals showed that 74 journals pertain to landscape architecture and disability, the majority of these fell under five journals: Health and Place with 13 articles, Environmental Research with 9 articles, Urban Forestry & Urban Greening with 8 articles, Sciences of the Toral Environment with 6 articles, and Transport Geography with 5 articles, respectively. Table 5 gives the journals and their subjects of interest.



Graph 3: Frequency percentage of Landscape Architecture and Disability Journals (Source: Authors)

Table 5: Statistical Data of Landscape Architecture and Disability Journals

No.	Journal titles		Areas of study	No. of articles
1	**Health & Place**		Role of place in perceiving health and healthcare	**13**
2	**Environmental research**		Globally applied and human issues in a wide range of environmental disciplines	**9**
3	**Urban Forestry & Urban Greening**		Urban and suburban wooden and non-wooden vegetation	**8**
4	**Science of the Total Environment**		Multi-disciplinary natural sciences	**6**
5	**Journal of Transport Geography**		Geographical dimensions of transportation, travel, and focus on mobility	**5**
6	**1**	**Landscape and Urban Planning**	Landscape science related to planning, designing, and aligning social and environmental values	**4**
	2	**Disability and Health Journal**	Global health, quality of life, specific health conditions	**4**
	3	**International Journal of Disaster Risk Reduction**	Environmental and engineering sciences, urban studies, geography, social sciences	**4**
	4	**Journal of Environmental Psychology**	Theoretical and practical dimensions, methodology in all human-environment interaction	**4**
7	**1**	**Research in Developmental Disabilities**	All dimensions of growth problems	**3**
	2	**Research in Transportation Business & Management**	Trade and transportation management	**3**
	3	**Transportation Research Part D: Transport and Environment**	Transportation, the environment, from local impacts to global impacts	**3**
	4	**Cities**	Planning problems, urban reconstruction, protection of the neighborhood and urban design, migration and international job migration, urban policies	**3**
	5	**Journal of Transport & Health**	Interventions and policy-making for improving population health	**3**
8	**1**	**Journal of the American Medical Directors Association**	Provider healthcare following long-term and acute diseases	**2**
	2	**The Arts in Psychotherapy**	Mental health and creative artistic issues	**2**
	3	**Transport Policy**	Improving the quality of transportation policies and strategy analysis	**2**
	4	**City, Culture, and Society**	Urban economics, social inclusion, social sustainability, cultural technology	**2**
	5	**Transportation Research Procedia**	Social sciences; transportation research	**2**
	6	**Social Science & Medicine**	Articles and theories about health issues	**2**

	7	**Wellbeing, Space, and Society**	Social science disciplines	**2**
	8	**Transport Reviews**	Transportation planning, economics, management, safety, and sustainability	**2**
	9	**Journal of Hospitality and Tourism Management**	Common research conducted between the university and the industry	**2**
	10	**Applied Geography**	Geographical approaches to meet human problems on a spatial scale	**2**
	11	**Journal of Affective Disorders**	Affective disorders, neurological sciences, genetics, biology	**2**
	12	**International Journal of Hygiene and Environmental Health**	Human exposure to the environmental, chemical, and physical impacts	**2**
	13	**Ecotoxicology and Environmental Safety**	Ecotoxicology and environmental safety	**2**
	14	**Building and Environment**	Science of building, urban physique, human interaction with the internal and external environments	**2**
	15	**The Lancet Planetary Health**	Sustainable human civilizations in Anthropocene, safe and good-for-all space	**2**
	16	**Environmental International**	General health, environmental epidemiology	**2**
	17	**Archives of Gerontology and Geriatrics**	Experimental aging and clinical and social aging	**2**
9	Travel Behavior and Society/Geriatric Nursing/Case Studies on Transport Policy/Ocean & Coastal Management/Mental Health and Physical Activity/Environmental Impact Assessment Review/Mobilities/Applied Ergonomics/International Journal of Child-Computer Interaction/Robotics and Autonomous Systems/Transportmetrica A Transport Science/Journal of Structural Geology/Safety Science/Procedia Computer Science/International Journal of Human-Computer Studies/Computers, Environment and Urban Systems/Archives of Physical Medicine and Rehabilitation/Technology in Society/Patient Education and Counseling/SSM - Qualitative Research in Health/ SSM - Population Health/Current Opinion in Environmental Sustainability/Journal of Sport and Health Science/Psychiatry Research Communications/Journal of Destination Marketing & Management/ Habitat International/International Journal of Hospitality Management/ Enfermería Clínica (English Edition)/ International Journal of Law and Psychiatry/International Journal of Paleopathology/Global Transitions/Transportation Research Part F: Traffic Psychology and Behavior/Geoforum/Utilities Policy/Biological Psychiatry Global Open/Science/Environmental Pollution/Public Health/Environmental Science & Policy/Land Use Policy/Journal of Building Engineering/Political Geography/Transportation Research Interdisciplinary Perspectives		**1**

III.RESULTS

All articles published from early 2020 to the end of 2023, along with their keywords, totaled 139, with Landscape Architecture and Disability articles, available at https://www.sciencedirect.com, falling under 8 areas of sustainability, landscape, environmental psychology, passive defense, historical research, design processes,

tourism, and physical studies. Meanwhile, the research mainly used novel techniques to examine environmental perception to meet disability sustainability in landscape elements. As revealed, articles were found to employ both quantitative and qualitative methodologies almost similarly. In a smaller categorization, it was determined that the quantitative method involved survey and experimental studies at rates of 37% and 22%, respectively, showing a total of 59%. In contrast, the qualitative method, however, involved case studies, review, ethnic, descriptive-analytical, and individual studies, at rates of 17%, 14%, 7%, 2%, and 1%, respectively, showing a total of 42%. Also, the exact analysis of Landscape Architecture and Disability articles revealed that they had applied three scientific, experimental, and psychological research processes. As stated, a review of the articles in the published journals revealed that 74 journals pertained to landscape architecture and disability, falling under five journals: Health and Place with 13 articles, Environmental Research with 9 articles, Urban Forestry & Urban Greening with 8 articles, Sciences of the Toral Environment with 6 articles, and Transport Geography with 5 articles, respectively.

Graph 5: Three research processes in the Landscape Architecture and Disability articles (Source: Authors)

IV.CONCLUSION

The selected articles provided information about areas of study, study focus, research processes and methodologies, variables, definitions, causes, and journals of Landscape Architecture and Disability. In this connection, a universal design process is required to design urban landscapes and spaces based on the real perception of the concept of disability and its relationship with landscape architecture. The findings of this study could well serve as a guide for prospective research that focuses on the role of disability in landscape architecture.

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