

Assessment of Landscape Components in Hospital Environment for General Hospital Buildings in Enugu State, Nigeria

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ABSTRACT

The visible landscape is believed to have effect on human beings in many ways in provision of aesthetics appreciation, good health as well as the general well-being of human. It is observed that some of the hospitals in Enugu State, Nigeria lack landscaping elements which have resulted to unhealthy and uncomfortable environment especially to the patients. This research is aim to assess landscaping elements in hospital environment in order to promote good health in General hospitals in the study area. It begins by looking at the theoretical and conceptual benefits in landscaping and also selectively reviews scientific research on the influence of gardens and plants in hospitals. The method of research employed was the use of interview schedule and structured questionnaire on hospital users. Supportive information about the benefits of landscape on patient's well-being was collected. Availability of landscape components was subjected to 4 point Likert scale to determine the level of landscape elements present in the hospital environment. The result revealed that 83.0% patients like to see greenery around the hospital vicinity, 77.68% patients reported improved mental health and fast recovery from ill health as a result of good landscape, 88.0% reported released from stress and therapeutic benefits. Among all the respondents, 80.5% reported that they liked to spend time in hospital garden in order to view plants which ultimately improve their health. In conclusion, hospital landscape strongly improves patient's health just by viewing green environment around the hospital. Adequate and well planned landscape should be encouraged in hospital design to enhance the health of patients and the comfort of other users.

Keywords: Assessment, Built Environment, Landscape elements, Hospital Buildings, Healing

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INTRODUCTION

The effect of landscape on human health is increasingly recognized as important in research and at the policy level in Nigeria. Landscape and gardens are very important in hospitals for quick recovery of patients.

It improves the quality of life through psychological and physical changes. The main positive effect of landscape on health are short term recovery from stress or mental fatigue, faster physical recovery from illness and long term overall

improvement on patient health and well-being (Mackenzie, 2000 & Jarrot, 2002) [6]. The World Health Organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” According to oxford advanced learners dictionary (2010), landscape can be defined as ‘everything you can see when you look across a large area of land or environment. The American Society of Landscape Architects (ASLA 2017) posited that “Sustainable landscapes are responsive to the environment, regenerative, and can actively contribute to the development of healthy communities. Sustainable landscapes sequester carbon; clean the air and water, increase energy efficiency, restore habitats, and create value through significant economic, social and, environmental benefits (ASLA, 2017)

The investigation of sustainable landscape strategies in hospitals offers tremendous benefits to the people and for the quick recovery of patients in the hospitals. Green areas within the hospital environment are considered not only to be necessary but also beneficial. It improves the quality of life through psychological and physical changes. Patients having view of trees or natural environment through window with their regular treatment reduces the dose of medicine and they recover more quickly as compared to patients who have view of wall (Taylor *et al.*, 2001; Taylor & Kuo, 2009) [8, 9]. It significantly reduces the pain, improves the comfort pleasure and well-being and lower stress level. Psychological development involves an improvement in self-esteem and self-confidence. Working with living plants allows patients to feel a sense of responsibility (Wichrouski *et al.*, 2005) [13]. This research aimed at accessing the landscape components to users in General hospital environments in Enugu State with

view to obtain good health and healthy environment.

REVIEW OF LITERATURE

The belief that plants and gardens are beneficial for patients in healthcare environment is more than one thousand years old, and appears prominently in Asian and Western cultures (Parsons *et al.*, 1994) [7]. Historical data have shown that the design of spaces around hospitals was an important consideration in ensuring that patients could feel comfortable and the landscape design played a very important role on stress relief of patients.

Gardens became less prevalent in hospitals during the early decades of the 1900s. However, as major advances in medical science, it caused hospital administrators and architects to concentrate on creating healthcare buildings that would reduce infection risk and serve as functionally efficient setting for new medical technology. The strong emphasis on infection reduction, together with the priority given to functional efficiency has shaped the design of hundreds of major hospitals internationally. These are now considered starkly institutional, unacceptably stressful, and unsuited to the emotional needs of patients, their families, and even healthcare staff (Ulrich *et al.*, 1991 & Horsburgh, 1995) [11, 3].

Despite the intense stress often caused by illness, pain, and traumatic hospital experiences, little attention was given to creating environments that would calm patients or otherwise address emotional needs (Ulrich, 2001). A growing awareness has developed in recent years in the healthcare community of the need to create functionally efficient and hygienic environments that also have pleasant, stress reducing characteristics. An important impetus for this awareness has been the major progress achieved in mind-body medical science. A substantial body of

research has now demonstrated that stress and psychosocial factors can significantly affect patient health outcomes. This knowledge strongly implies that the psychological or emotional needs of patients be given high priority along with traditional concerns, including infection risk exposure and functional efficiency, in governing the design of hospitals (Ulrich, 2001). It also follows that conditions or experiences shown by medical researchers to be stress reducing and healthful, such as pleasant soothing distractions and social support, must become important considerations in creating new healthcare facilities. Studies have shown that viewing gardens can measurably reduce patient stress and improve health outcomes. This has become a key factor in the major resurgence in interest internationally in providing gardens in hospitals and other healthcare facilities.

Study done by Kaowen & Hungju (2017) [5] reveals that presence of landscape features influences the visit intent of users in different roles in a hospital setting. The study adopted a discrete choice experiment to provide quantitative evidence that indicates the effect and effect size of the landscape features. The objectives of this study are to, firstly, identify the effective landscape features that engage visits; and, secondly, rank the choices of landscape features specific to different user groups based on the effect on the engagement of visits. This study reveals the relevant inclusion and priorities of landscape features for the diverse user groups on a hospital property. In Turkey, (Duzenli *et al.*, 2017) [2] narrated the healing effects of landscape elements to health. The study was done in three hospitals and a landscape evaluation is conducted to explore existing situation of gardens. The study reveals that the rate of satisfaction of landscape elements to users is low in the study areas. The study further states that these gardens are not perceived as tranquil, peaceful,

comfortable and natural and they are not legible. This indicates that hospital gardens were designed without regarding the users' needs and through certain sources.

A study by Heerwagen, (1990) [4] for instance, found that anxious patients in a dental fears clinic were less stressed on days when a large nature mural was hung on a wall of the waiting room in contrast to days when the wall was blank. The restorative benefits of the nature scene were evident both in heart rate data and self-reports of emotional states. In the case of hospitals and other healthcare facilities, there is mounting evidence that gardens function effective and beneficial settings with respect to fostering restoration for stressed patients, family members, and staff (Ulrich, 1999) [12]. This reveals that restoration from stress, including improved mood, was by far the most important category of benefits derived by nearly all users of the gardens -- patients, family, and employees. Likewise, a recent study of a garden in a children's hospital identified mood improvement and restoration from stress as primary benefits for users (Whitehouse *et al.*, 2001) [14].

In Nigeria, study done by (Alao, 2012) [1] at Barau Dikko specialist hospital in Kaduna undertook an Observation method to determine the effects of landscape in healing effect on hospital users. In the survey, it was observed that landscaping in the hospital is poor and unplanned. The study also involves case study approach to look at two different hospitals in Nigeria and the result also shows that the integration landscape elements in the hospital are low.

Landscape Components

Every garden is made up of a variety of physical components combined together to form a garden with style. Landscape components include both hard landscape and soft landscape. These components are

required in hospital landscape design for a cohesive design that is beautiful, functional and have restorative effects on hospital users. These are the basic components of landscape:

Hard Landscape: Hard landscape refers to items that are permanent and do not break down. It has many uses and comes in forms adapted to those uses. Example: Sidewalks and driveways, walls and fences, pavers, rocks, decks and patios, gazebos, Lighting, Garden benches or other seating, Edgings between plants and grass

Soft Landscape: Soft landscape is any component of a garden that is or used to be alive. Ground covers, bushes and trees, plants, grass or ground cover, mulches, Flower gardens are major soft landscaping components

Decor: Decor is what is used to enhance a garden, once the main features have been installed. Water features, statuary, tree hangers, pottery, lighting

Supporting Features: Birdhouses, beehives, feeders, tree houses, trellises

METHODOLOGY

A survey design approach was employed in this study and quantitative data were gathered from the respondents. Questionnaire was developed to get required information through open ended questions. The question was based on the following considerations: patients perception on landscaping in hospital, the opinion of patients about the restorative effect of Horticultural therapy on the health, views of patients on the impacts of gardens or greenery around hospital towards health, opinion of patients about psychological and social effect of hospital landscape on recovery and people's opinion about the present status of plantation and landscape of hospital and their suggestion for its improvement.

In order to guarantee equal representation for each of the hospitals in the study area, stratified random sampling method was adopted in selection of hospitals for study. There are seven (7) general hospitals in 17 Local Government areas in Enugu State. The selection of the hospitals was based on district hospitals in Enugu State which are Uwani, Udi, Agbani, Awgu, Nkanu, Enugu-ezike, and Nsukka General Hospitals.

The sample frame included: 150 users from Uwani General hospital, 72 users from Udi General hospital, 83 users from Agbani General hospital, 65 users from Awgu General hospital, 92 users from Nkanu General hospital, 80 users from Enugu – Ezike General hospital, and 90 users from Nsukka General hospital. This study population of 630 was subjected to Bartlett *et al* (2001) for determining the minimum sample size in the population. The value was reduced to a minimum of 235 showing that 235 is the minimum number of questionnaires that can be administered within the population.

Table 1 shows the sample size distribution of the hospital in the study area. Total of 263 questionnaires were distributed based on the sample population found in each hospital and a correspondent total of 242 were retrieved. The increase of the sample size is to take care of research error. This represents a response rate of 92.0%.

RESULTS AND DISCUSSIONS

A simple question was asked to patients to know their opinion on having greenery around hospital environment. Results are presented in Table 2, which shows that 24.3% respondents of Uwani General hospital, 11.4% respondents of Udi General hospital, 13.4% of Agbani General hospital, 10.4% of Agwu General hospital, 13.4% of Nkanu General hospital, 11.4% of Enugu-Ezike general hospital and 15.4% of Nsukka General Hospital want to see greenery around

hospital vicinity. 83.0% of the total respondents agreed with the statement

while only 16.9% respondents did not agreed with this statement.

Table 1. Sample Size distribution of hospitals.

Respondents Hospital	Total Population	PTP	Sample Size	NOQA	NOQR	PQR
Uwani	150	24	56	60	56	23
Udi	70	11	25	29	26	11
Agbani	83	13	31	35	32	13
Agwu	65	10	24	28	25	10
Nkanu	92	15	35	39	36	15
Enugu-Ezike	80	13	31	35	33	14
Nsukka	90	14	33	37	34	14
Total	630	100	235	263	242	100

Keynotes: PTP = % of Total Population, NOQA= No of questionnaire administered, NOQR= No of questionnaires Returned, PQR= % of questionnaires returned.

Source: Researchers' fieldwork, 2020

Table 2. Respondent view on having greenery area in hospital environment.

Like greenery	Uwani	Udi	Agbani	Agwu	Nkanu	Enugu-Ezike	Nsukka	Total
Yes	49	23	27	21	27	23	31	201
%Yes	24.3%	11.4%	13.4%	10.4%	13.4%	11.4%	15.4%	83.0%
No	7	3	5	4	9	10	3	41
%No	17.0%	7.3%	12.1%	9.7%	21.9%	24.3%	7.3%	16.9%
Total	56	26	32	25	36	33	34	242

Source: Researchers' Fieldwork, 2020

Table 3. Responses from hospitals users' from the study area on fast recovery.

Fast Recovery	Uwani	Udi	Agbani	Agwu	Nkanu	Enugu-Ezike	Nsukka	Total
Yes	44	17	27	18	25	29	28	188
%Yes	23.4%	9.04%	14.36%	9.57%	13.29%	15.4%	14.8%	77.68%
No	12	9	5	7	11	4	6	54
%No	22.2%	16.6%	9.25%	12.9%	20.3%	7.40%	11.1%	22.3%
Total	56	26	32	25	36	33	34	242

Source: Researchers' Fieldwork, 2020

Table 4. Respondent view on stress and therapeutic benefits from landscape in hospital environment.

Stress Release	Uwani	Udi	Agbani	Agwu	Nkanu	Enugu-Ezike	Nsukka	Total
Yes	53	21	25	23	33	25	33	213
%Yes	24.8%	9.8%	11.7%	10.7%	15.4%	11.7%	15.4%	88.0%
No	3	5	7	2	3	8	1	29
%No	10.3%	17.2%	24.1%	6.8%	10.3%	27.5%	3.4%	11.9%
Total	56	26	32	25	36	33	34	242

Source: Researchers' Fieldwork, 2020

Table 5. Respondents view on spending time spent in hospital garden.

Spend Time	Uwani	Udi	Agbani	Agwu	Nkanu	Enugu-Ezike	Nsukka	Total
Yes	50	22	23	15	29	30	26	195
%Yes	25.6%	11.2%	11.7%	7.6%	14.8%	15.3%	13.3%	80.5%
No	6	4	9	10	7	3	8	47
%No	12.7%	8.5%	19.1%	21.2%	14.8%	6.3%	17.0%	19.4%
Total	56	26	32	25	36	33	34	242

Source: Researchers' Fieldwork, 2020

The respondents were also asked “what kind of psychological effect you observe or expect after viewing plants “the objective of this question was to identify the reason which effect on the psychological status of patients. Several options were given for choosing the best option.

Table 3 shows that 22.4% respondents of Uwani General hospital, 9.04% respondents of Udi General hospital, 14.36% of Agbani General hospital, 9.57% of Agwu General hospital, 13.29% of Nkanu General hospital, 15.4% of Enugu-Ezike General hospital and 14.8% of Nsukka General hospital reported having improved mental and fast recovery from ill-health by viewing hospital landscape. 77.68% of the respondents agreed with the statement while 22.3% respondents did not agreed with this statement.

Table 4 shows the views of the respondents regarding to release from stress and therapeutic benefits. The results shows that 24.8% respondents of Uwani General hospital, 9.8% respondents of Udi General Hospital, 11.7% of Agbani General hospital, 10.7% of Agwu General hospital, 15.4% of Nkanu General hospital, 11.7% of Enugu-Ezike General hospital and 15.4% of Nsukka General hospital reported having released from stress and also gained therapeutic benefits by viewing staying in hospital garden. 88.0% of the respondents agreed with the statement while 11.9% respondents did not agreed with this statement. This has been recognized worldwide that long term psychological benefits are achieved from contact with nature. The research showed that the green areas present in hospitals give psychological benefits to the patients and other hospital users. Introduction of green vegetation in

hospitals produce psychological benefits to patients (Honeyman, 2010).

Table 5 also represents the views of the respondents regarding to spending time in hospital garden. The results shows that 25.6% respondents of Uwani General hospital, 11.2% respondents of Udi General Hospital, 11.7% of Agbani General hospital, 7.6% of Agwu General hospital, 14.8% of Nkanu General hospital, 15.3% of Enugu-Ezike General hospital and 13.3% of Nsukka General hospital reported to like to spend time in hospital. 80.5% of the respondents agreed with the statement while 19.4% respondents did not agreed with this statement.

Survey of Landscape Components in Hospitals Under Study

Survey also was carried out to know the level of landscape components in the hospitals under study using the respondents. This is to ascertain the level of landscaping done in the selected hospitals. The data is subjected to 4 point likert scale for analysis to determine the landscape component that is in existence in the hospital landscape design. The landscape components to study include the following: Pavements, Pedestrian walkways, Kerbs and interlocking, water bodies, Trees, Shrubs, Flower, Ground covers or grasses. The data used for the analysis is responses from the number of returned questionnaires.

Table 6 shows the respondents submission on the availability of certain landscape components in Uwani General Hospital. The respondents were presented with 4 options (completely Inadequate, Inadequate, Adequate and Very Adequate) to determine the landscape components present in the hospital. The result of the analysis shows that ground covers or grasses (ranked 1st) with mean value of

2.60 and pavement (ranked 2nd) with mean value of 2.43. The two landscape components have the high level of existence in this hospital while the water bodies is least rank due to its absence in the hospital environment.

Table 7 describes the analysis of landscape components at Udi General Hospital. The analysis revealed that Pavements (ranked 1st) with mean value of 3.230 and Trees,

Shrubs, Flower (ranked 2nd) with mean value of 3.000. This shows that there are a lot of pavements existing at Udi General Hospital. Table 8 show the analysis of landscape components in Agbani General Hospital. The analysis revealed that Pavement (ranked 1st) with mean value of 3.031 and Pedestrian walkways (ranked 2nd) with mean value of 2.781. This shows that there is a lot of hard landscape in the hospital.

Table 6. Survey of landscape components at Uwani General Hospital.

Landscape Variables/ components	Completely Inadequate	Inadequate	Adequate	Very Adequate	Total	Sum	Mean Score	RII	Rank
	1	2	3	4					
Pavement	9	18	25	4	56	136	2.428	0.485	2 nd
Pedestrian walkways	5	29	20	2	56	131	2.339	0.467	3 rd
Krebs, interlocking & gossip chairs	18	12	22	4	56	124	2.214	0.442	4 th
Water bodies	35	21	0	0	56	77	1.375	0.275	6 th
Trees, Shrubs, Flower	12	30	11	3	56	117	2.089	0.417	5 th
Ground covers or grasses	9	19	13	15	56	146	2.607	0.521	1 st

Source; Authors' Fieldwork (2020)

Table 7. Survey of landscape components at Udi General Hospital.

Landscape Variables/ components	Completely Inadequate	Inadequate	Adequate	Very Adequate	Total	Sum	Mean Score	RII	Rank
	1	2	3	4					
Pavement	0	3	14	9	26	84	3.230	0.646	1 st
Pedestrian walkways	4	9	11	2	26	63	2.423	0.485	5 th
Krebs, interlocking & gossip chairs	2	10	9	5	26	69	2.653	0.530	4 th
Water bodies	13	10	2	1	26	43	1.653	0.330	6 th
Trees, Shrubs, Flower	2	4	12	8	26	78	3.000	0.600	2 nd
Ground covers or grasses	2	6	10	8	26	76	2.923	0.585	3 rd

Source; Authors' Fieldwork (2020)

Table 8. Survey of landscape components at Agbani General Hospital.

Landscape Variables/ components	Completely Inadequate	Inadequate	Adequate	Very Adequate	Total	Sum	Mean Score	RII	Rank
	1	2	3	4					
Pavement	2	6	13	11	32	97	3.031	0.606	1 st
Pedestrian walkways	4	8	11	9	32	89	2.781	0.556	2 nd
Krebs, interlocking &	7	10	9	6	32	78	2.437	0.488	4 th

gossip chairs									
Water bodies, fountain	22	8	2	0	32	44	1.375	0.275	6 th
Trees, Shrubs, Flower	6	7	13	6	32	83	2.593	0.519	3 rd
Ground covers or grasses	8	10	9	5	32	75	2.343	0.469	5 th

Source; Authors' Fieldwork (2020)

Table 9. Survey of landscape components at Agwu General Hospital.

Landscape Variables/ components	Completely Inadequate	Inadequate	Adequate	Very Adequate	Total	Sum	Mean Score	RII	Rank
	1	2	3	4					
Pavement	4	8	10	3	25	62	2.480	0.496	4 th
Pedestrian walkways	4	11	6	4	25	60	2.400	0.480	5 th
Krebs, interlocking & gossip chairs	0	6	15	4	25	73	2.920	0.584	3 rd
Water bodies	9	13	3	0	25	44	1.760	0.352	6 th
Trees, Shrubs, Flower	2	3	9	11	25	79	3.160	0.632	2 nd
Ground covers or grasses	1	4	8	12	25	81	3.240	0.648	1 st

Source; Authors' Fieldwork (2020)

Table 10. Survey of landscape components at Nkanu General Hospital.

Landscape Variables/ components	Completely Inadequate	Inadequate	Adequate	Very Adequate	Total	Sum	Mean Score	RII	Rank
	1	2	3	4					
Pavement	9	14	8	5	36	81	2.250	0.450	5 th
Pedestrian walkways	5	11	14	6	36	93	2.583	0.516	3 rd
Krebs, interlocking & gossip chairs	4	6	16	10	36	104	2.888	0.577	1 st
Water bodies	11	14	7	4	36	76	2.111	0.422	6 th
Trees, Shrubs, Flower	8	11	13	4	36	85	2.361	0.472	4 th
Ground covers or grasses	4	10	14	8	36	98	2.722	0.544	2 nd

Source; Authors' Fieldwork (2020)

In Table 9 the analysis of landscape components in Agwu General hospital revealed that ground covers or grasses (ranked 1st) with mean value of 3.240 and Trees, Shrubs, Flower (ranked 2nd) with mean value of 3.160.

Table 10 also describes the analysis of landscape components at Nkanu General Hospital which revealed that Krebs, interlocking & gossip chairs (ranked 1st) with mean value of 2.888 and ground covers or grasses (ranked 2nd) with mean value of 2.722.

Table 11 shows the analysis of landscape components in Enugu-Ezike General hospital. The data revealed that Trees, Shrubs and Flower (ranked 1st) with mean value of 2.909 and Pavement (ranked 2nd) with mean value of 2.788.

Table 12 reveals the data retrieved from the respondents to ascertain the level landscape components in Enugu-Ezike General hospital. The data revealed that Trees, Shrubs and Flowers (ranked 1st) with mean value of 3.059 and Ground covers or grasses (ranked 2nd) with mean value of 2.853.

Table 11. Survey of landscape components at Enugu-Ezike general Hospital.

Landscape Variables/ components	Completely Inadequate	Inadequate	Adequate	Very Adequate	Total	Sum	Mean Score	RII	Rank
	1	2	3	4					
Pavement	3	9	13	8	33	92	2.788	0.558	2 nd
Pedestrian walkways	4	12	8	9	33	88	2.667	0.533	3 rd
Krebs, interlocking & gossip chairs	10	8	7	8	33	79	2.394	0.479	5 th
Water bodies	18	13	2	0	33	50	1.515	0.303	6 th
Trees, Shrubs, Flower	6	5	8	14	33	96	2.909	0.582	1 st
Ground covers or grasses	7	9	7	10	33	86	2.606	0.521	4 th

Source; Authors' Fieldwork (2020)

Table 12. Survey of landscape components at Nsukka general Hospital.

Landscape Variables/ components	Completely Inadequate	Inadequate	Adequate	Very Adequate	Total	Sum	Mean Score	RII	Rank
	1	2	3	4					
Pavement	8	10	11	5	34	81	2.382	0.476	4 th
Pedestrian walkways	6	11	9	8	34	87	2.559	0.512	3 rd
Krebs, interlocking & gossip chairs	13	11	7	3	34	68	2.000	0.400	6 th
Water bodies	9	10	9	6	34	80	2.353	0.471	5 th
Trees, Shrubs, Flower	4	6	8	16	34	104	3.059	0.612	1 st
Ground covers or grasses	6	5	11	12	34	97	2.853	0.571	2 nd

Source; Authors' Fieldwork (2020)

CONCLUSION

The study reveals that natural vegetation play a vital role in health and well-being of patients and other hospital users. The study also reveals through the respondents that gardens and other natural element help to improve patient's satisfaction with the performance of healthcare provider and overall quality of care. This encourages the proper integration of landscaping in the hospital designs to ensure adequate healthy and comfortable environment for the users.

Furthermore, evidences from this study show that there are inadequate landscape components available in the study area which makes the environment very uncomfortable for the users. The study also recommends that garden and other nature helps to heighten patient and family satisfaction with the healthcare provider and the overall quality of care. In addition,

this study suggests that hospital gardens also increase staff satisfaction with the workplace, and can be advantageous in hiring and retaining qualified personnel. Hence, the study identified the potential for hospital gardens to improve medical and economic outcomes, as well as user's satisfaction.

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