

Improving healthcare value: integrating medical practitioners into hospital design in developing countries

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Abstract

The cost of healthcare is a burden in most developing countries, and this is exponentially increasing in the context of population growth, pandemics, and rapidly evolving medical necessities. A customized healthcare typology should rely on data collection and architectural requirements, before moving to aesthetically compelling designs, so hospitals in low-resource or developing countries will not mimic their Western counterparts. The greatest bearing that improves the patient's outcome and well-being would engage a productive interaction between the hospital designers and the medical practitioners, this will also allow for evidence-based hospital planning. As the author of this short report, I use the best of my experience as a physician and healthcare planner to translate a successful interaction with multinational designers building hospitals in Rivers State, Nigeria.

Introduction

Most developing countries are affected by a sort of healthcare turmoil as rapidly growing populations and aging groups put more pressure on the medical system, thereby, unmasking the healthcare point line deficiencies and the typologies of their facilities. This continuous struggle is outlined by the lack of sustainable means for expansion, but mostly by economic governance, funded development, and the scarcity of resources.

Adaptivity through the merging of archetypes with the local environment and medical needs

In challenging conditions, it is important to embrace a seamless balance between a myriad of factors for economic evidence-based hospital planning. To answer this, a hybrid model for good design principles should rely on a multidisciplinary collaboration between the featured architectural team,

engineers, and healthcare practitioners. It is important to understand the indigenous culture tightly knit to the community, the natural environment of the facility, the disease epidemiology, and the frequent medical encounters in that area, as well as many other metrics that only medical staff would advocate for a shaped design solution, thus improving the patients' experience and the staff's post-occupancy adeptness.

Such a blend of expertise would contribute to a flexible archetype, a sustainable economic and practical design that resembles the area and fits its essentials. Before moving to aesthetically compelling designs, the complex healthcare typology will be subdivided according to data collection and architectural requirements, so hospitals in low-resource or developing countries will not mimic their Western counterparts. In other words, designs should capture the local and national dynamics rather than being a duplicate of standard layouts implemented abroad. This rule also applies to other scenarios such as the renovation of a health institution or its expansion due to demographic factors or the occurrence of a new pandemic, as in COVID-19 case. This interdisciplinary attention would avoid redundancy and obsolete layouts, moving forward.

A healthy design will rely on environmental analysis, collected through interviews and on-ground assessment. It can be surprising to see how much input doctors, nurses, and the rest of the medical staff can provide, sometimes showing little sketches to back up their ideas. Small interferences like that can summarize years of practice or mirror a patient-centered experience. The concluded design will be an active understanding of the sociocultural norms and particular medical needs, thereby a solution that enhances these attributes.

A certain infrastructure may limit the implementation of a standard design and this is common in developing countries. For example, it would be difficult to maintain an energy-intensive air-conditioned facility where frequent power outages will cause a monetary setback for generator usage. The solution is a customized design typology that includes climate analysis and alternative ventilation strategies. Natural wind aeration, ceiling fans, window distributions, or openward layouts are used to accommodate that challenge, and here comes the importance of the hybrid integration of medical practitioners in such decisions. Airborne transmitted diseases have different epidemiology as compared to Western countries; for example, Tuberculosis prevalence and spread are more common, as are many other viral-related illnesses, such as COVID-19 or Ebola. That feedback will better adapt the ward planning

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Key words: hospital design, developing countries, medical caregivers, health outcome.

Conflict of interest: the author declares no potential conflict of interest.

Availability of data and materials: data and materials are available from the corresponding author upon request.

Received for publication: 20 January 2023.
Accepted for publication: 24 May 2023.

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Licensee PAGEPress, Italy
Healthcare in Low-resource Settings 2023; 11:11183
doi:10.4081/hls.2023.11183

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before building the hospital or expanding a specific space, moving toward a more decentralized layout with partial or completely isolated rooms and individualized ventilation.¹ When pandemic infections are not a major concern, as in some specialized centers that only get precise referrals, for example, women's health and wellbeing centers, other variables account for the care delivery. With skyrocketing birthrates, the healthcare system in developing countries is focusing more on delivery and pediatric services, which is lowering mother and infant mortality. This should be done along with an increase in the medical staff-to-patient ratio and amenities to accommodate that, which is a serious challenge in rural areas.

Patient-centered care and well-being: natural light, noise reduction, mobility spaces

The input of the medical practitioners will also help when it comes to building a facility in a highly prevalent area for traffic accidents and major injuries. This feedback will shape the emergency department layout

into an easily accessible area that facilitates the unloading of major casualties and includes wider aisles and a larger storage shelf area, in addition to a triage room that helps in a better allocation based on the severity of each case.

When it comes to the patient's comfort and quality of life, both for inpatient and ambulatory care, storytelling is countless. Especially when evidence-based medicine backs up the input of the medical practitioner. By providing access to natural light, through abundant windows in closed critical areas or regular wards, an overall agreeable healing environment will pay for a better well-being and outcome. As part of a non-pharmacological approach for hospital-related delirium or mental status fluctuations, a controllable lighting feature or the use of daylight shading devices will also help to regain a physiologic circadian rhythm.² This condition is a real challenge for medical caregivers, and it is through their feedback and experience that designers can optimize the layout. Many other metrics can be better understood when such collaboration occurs; this positively impacts patient-centered care.

Noise reduction especially in critical care units is essential. It can be achieved by minor technical fitments related to the patient's room and surrounding space, but also by redesigning the staff working areas and break room access. A watchful decentralized working station can be considered in line with the standard guidelines for hospital design. It is also very important to communicate with the practitioners concerning the choice of the medical equipment in the pre-commissioning phase, as some have a threshold for beeping and buzzing and should be fixed according to the on-ground team.³

Additional scientific data has proven the need for the early mobilization of high-risk patients, whether in critical care units, regular medical floors, or post-operative care units.⁴ This will minimize the muscle wasting in their catabolic state and also reduce the occurrence of delirium, which will improve their outcome and shorten their hospital stay. The medical staff along with physiotherapy personnel are best positioned to advocate for dedicated spaces and hallway changes to reach that purpose. A standard design where the bed is the focal point and the room is built around it will be modified to accommodate minor rehabilitation activities or a small porch can be added to the room where the patient will have space for movement. Some efficient modifications were also pledged for in medical lit-

erature, such as adding measurement signs and walking aids along corridors, which will assist the patients during their activity.

Customized furniture and palliative care regulations

Also, medical practitioners can be directly engaged in furniture and amenity selection. For example, in units that care for lung diseases, a practical input is about having a splash-free sink and a sputum basin right next to it, this is in line with infection control directives. Another input would be having chairs with adequate reclining angle, so patients can breathe better. This also concerns the examination room where elderly people with limited functional status can be evaluated on these recliners. Doctors will also determine the exact position of the examination couch and the wall-mounted diagnostic sets in a specific consultation room to ease the physical examination of the patient. In developing countries, nursing homes or chronic care facilities are scarce. With the growing geriatric population, the philosophy and need for palliative care are becoming prevalent. According to studies, unfortunately, the risk of falls is not only limited to the patient's room: one-fifth of falls occur in diverse spatial areas.⁵ To create a safer environment for the patients, special consideration and insight call for collaboration between the healthcare designer and the caregivers. It also positively develops comprehensive hospital signage, whether directional or informational, as part of the wayfinding system that will assist the geriatric population in seeking medical care.

Staff-centered modifications to cut burnouts

A big neglected topic concerns staff-centered care where designs prioritize the patient's comfort and discretion. Multiple published medical data reviewed the burnout of hospital staff, which may affect the care delivery and overall outcome. With increased stress due to work overload, infectious pandemic constraints during COVID-19, or scarce hospital amenities, staff members are more vulnerable to physical, mental, and emotional exhaustion.⁶ This leads to job discontent and poor productivity. Some healthcare designers have moved to a decentralized model where smaller work areas are dispersed throughout the ward, individual care is better provided,

and nurse stations are on wheels, with less noise and within walking distance. This model is supported by easy access to break rooms or even the inclusion of small alcoves that have reclining chairs and smartphone chargers, enough to revitalize the nursing staff. With the current medical practice, the need for computer access is crucial, and it can be attained in large multidisciplinary workspaces or lounges where medical staff can also interact and rest.

Future trends in healthcare set-up

A better understanding of the medical trends over the years will leave a lot of unsolved challenges for the healthcare system in developing countries, as it will be even more difficult to cope with the rapid pace of technology and visionary development process. The provided medical care can be shifted to a more flexible universal design where patients of different ages and abilities can be better served. Another path to improve wellness and health would focus on a strong infrastructure for medical home care, keeping the hospital setting only for acute critical cases.

References

1. Stiller A, Salm F, Bischoff P, et al. Relationship between hospital ward design and healthcare-associated infection rates: a systematic review and meta-analysis. *Antimicrob Resist Infect Control* 2016;5:51.
2. Lee HJ, Bae E, Lee HY, et al. Association of natural light exposure and delirium according to the presence or absence of windows in the intensive care unit. *Acute Crit Care* 2021;36:332-41.
3. De Lima AE, Silva DCDC, de Lima EA, et al. Environmental noise in hospitals: a systematic review. *Environ Sci Pollut Res* 2021;28:19629-42.
4. Zang K, Chen B, Wang M, et al. The effect of early mobilization in critically ill patients: a meta-analysis. *Nurs Crit Care* 2020;25:360-7.
5. Anderson DC, Postler TS, Dam TT. Epidemiology of hospital system patient falls: a retrospective analysis. *Am J Med Qual* 2016;31:423-8.
6. Mollica RF, Fricchione GL. Mental and physical exhaustion of health-care practitioners. *Lancet* 2021;398:2243-4.