

# Controlling Offenses on Health Care Personnel through Environmental Design of Healthcare Environments

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## Abstract

There has been an alarming rise in assaults on doctors in the last few years. Violence, as we know it, is no longer restricted to the dark streets but has entered the portals of environments considered as healing. An environment that was once considered safe has no longer remained so, especially for healthcare providers. Healthcare environments are symbols of society as they are designed through discussion amongst various actors bringing in their own set of priorities. For the designers, it symbolizes an edifice for healthcare delivery, whereas the healthcare providers look at it as a place of healing. Various studies have looked at the measures to reduce this conflict in terms of management and awareness creation but few studies have tried to understand this through the perspective of spatial and environmental design. There has been strong empirical evidence though, which shows the influence of design attributes on the users' well-being in healthcare environments.

This study was aimed at understanding the effect of various spatial attributes on the healthcare providers' feeling of comfort in the healthcare environment. The study was conducted through qualitative interviews with healthcare providers in which a recurring theme with respect to space characteristics that emerged was regarding the doctor-patient conflicts and the sense of insecurity that it gave rise to and the contribution of design to the same. This was then further explored to understand the concepts of privacy and visibility with space syntax analysis. The findings identified the environmental attributes and spatial configurations that could help to reduce the sense of insecurity amongst healthcare providers.

**Keywords:** Healthcare environments, assaults on doctors, environmental design, spatial attributes, visibility.

## 1. Introduction

There has been an alarming rise in assaults on doctors in the last few years. Violence, as we know it, is no longer restricted to the dark streets but has entered the portals of environments considered as healing. An environment that was

once considered safe has no longer remained so, especially for healthcare providers. Various news articles have also reported on this in recent times. Various articles published in medical journals also have reported on the increasing incidence of assaults in India both in rural as well as urban areas (Ghosh, 2018; Ambesh, 2016). Ambesh (2016) in his article has also mentioned the Indian Medical Association's report on the fact that nearly 75% of doctors experience some form of workplace violence. Various reasons have been cited for the same such as decreasing trust between doctors and patients, unrealistic expectations, miscommunication, decreased tolerance, etc. Apart from this, some studies have also identified some environmental design factors like, inadequate lighting, design that restricts vision, poorly designed escape routes, overcrowding, and easy public access to influence workplace violence (Begum & Rani, 2019; OSHA, 2016). A study titled "Workplace Violence in the Health Sector" jointly conducted by the International Labour Organisation (ILO), International Council of Nurses (ICN), World Health Organisation (WHO), and Public Services International (PSI) resulted in the preparation of guideline that provides strategies for reducing this (Wiskow, 2003). The current study was undertaken to understand the design factors and spatial characteristics that impact the comfort of healthcare providers in their workplace. This paper limits itself to emergency areas that experience the highest incidences of workplace violence in a hospital.

## 2. Literature Review

Though the OSHA guidelines for preventing workplace violence have elaborately talked about the management and employee training aspects, limited stress has been given to the environmental design aspects. Various studies have attempted to research this aspect to gather evidence of environmental design contribution to safe environments. The study by McPhaul K. et al. (2008) conducted an environmental evaluation of healthcare facilities and used CPTED as an approach to categorise the risk factors. The study revealed aspects like visual connection, accessibility, and security affect the feeling of safety in these environments. Visibility was a factor that was mentioned in a few studies which greatly influenced the feeling of security (Gharaveis, 2017; El-Hadedy & El-Husseiny, 2021).

Studies have shown that the most affected areas within the healthcare settings are the emergency departments and critical care areas (El-Hadedy & El-Husseiny, 2021; Aljohani et al., 2021; Baydin, & Erenler, 2014). To understand the role of environmental design in reducing workplace violence various approaches have been used, Crime Prevention Through Environmental Design (CPTED) being one of the more preferred one (El-Hadedy & El-Husseiny, 2021; McPhaul K. et al., 2008; Saleh et. al., 2015). The principles of CPTED as developed by Jane Jacobs (1961) followed by Oscar Newman (1973) and the modern concept by Crowe (1999) talk about territoriality, controlling access, surveillance, and management. These principles have been considered while evaluating the environmental design factors. Spatial analysis related to visibility and connectivity has been extensively explored through space syntax analysis a concept developed by Bill Hillier in 1984. Various studies have shown the relationship between various space syntax measures and crime in different settings (Summers L.,2017; Nubani, L., & Wineman, J., 2005).

## 3. Methodology and Methods

4 hospitals were chosen for the study. All the hospitals chosen were multi-speciality hospitals in an urban area. During the face-to-face qualitative interviews, it was realised that the healthcare providers expressed a concern related to assault on doctors in all these hospitals ranging from verbal altercations to physical damage. Most of these incidences happened in the emergency areas or critical care areas and hence these two settings were identified for further study. The spaces were mapped and visually assessed, and plans of the same were prepared for further analysis. The plans and drawings were transferred to AutoCad and prepared for analysis as per the format required for the software “Depthmap” (Turner, 2001). The grid for all the plan layouts was 40 cm x 40 cm which was chosen as it is sufficient to cover all the required spaces and understand the spatial structure. The factors of connectivity, visibility, and integration were analysed further.

## 4. Results and findings

The images from space syntax analysis were analysed and the following results were obtained. The following factors were analysed to understand spatial characteristics: connectivity, visibility in terms of visual step depth and visual integration.

Klarqvist (2015) simplifies some of the measures and concepts used in space syntax as follows:

- Depth – is understood as the “*least number of syntactic steps needed to reach one space to another*”.
- Connectivity – the “*number of immediate connections*” with each other.
- Integration – “*average depth of a space to all others in the system*.”

The movement of users, their communication, and their performance were dependent on factors like visibility and accessibility (Sailer K. et al., 2009; Sailer K., 2007; Rashid and Zimring, 2003). Visibility was an important factor in spatial layouts. With these concepts in mind, the emergency areas were analysed based on connectivity, visual integration, and visual connectivity. In all the figures below, red indicates higher values of connectivity and integration while blue indicates the lowest values of connectivity and integration.

Case 1:

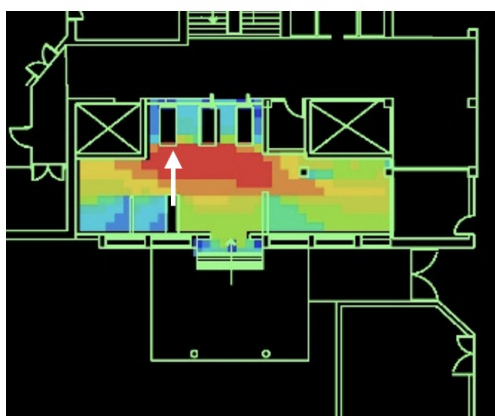
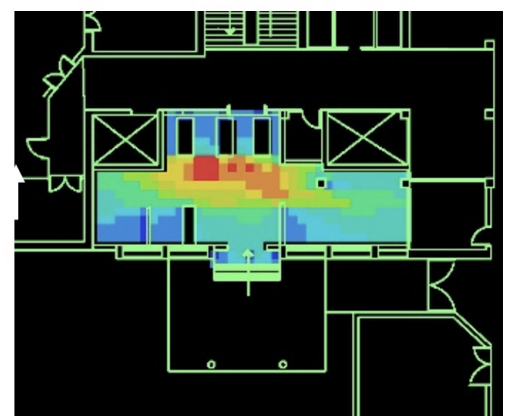


Fig No. 1: Connectivity

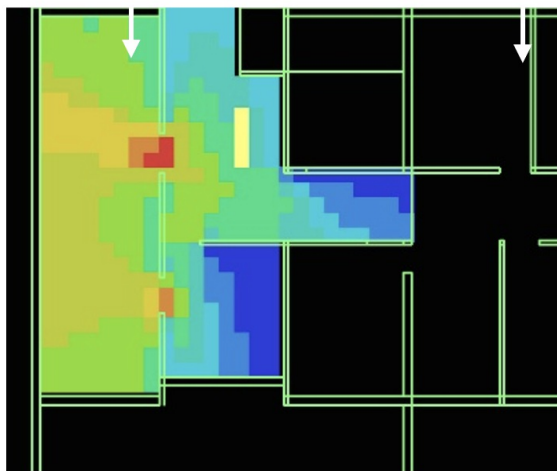
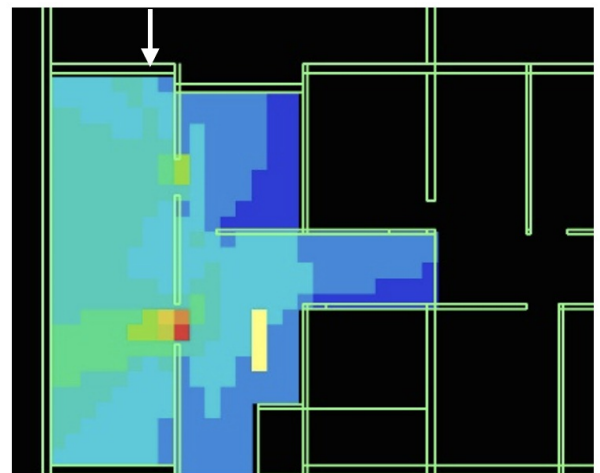


Visual Integration

**Figure 1.**

In case 1, the waiting area is outside the entrance to the emergency as indicated by the arrow. The emergency has a single entrance and exit for all users, healthcare providers, patients, and caregivers. The patient beds are in the space having the highest connectivity as well as highest visibility making it easy for surveillance but also visually accessible to the waiting area. Though there is access control, it also makes it difficult for healthcare providers to escape in case of possible violence. Based on this analysis it was concluded that the interface between the inside and the outside was the most vulnerable area which was also validated by the healthcare providers through interviews.

Case 2:

**Fig. No. 2: Connectivity****Visual Integration****Figure 2.**

In case 2, the entrance to the emergency is as indicated by the arrow in fig. no. 2. The treatment area is partitioned off from the waiting area and thus the highest connectivity is seen at the entrance to the treatment area. Though surveillance is reduced due to lower visibility, there is higher access control. This hospital has reported fewer incidences of assault as compared to case 1.

Case 3:

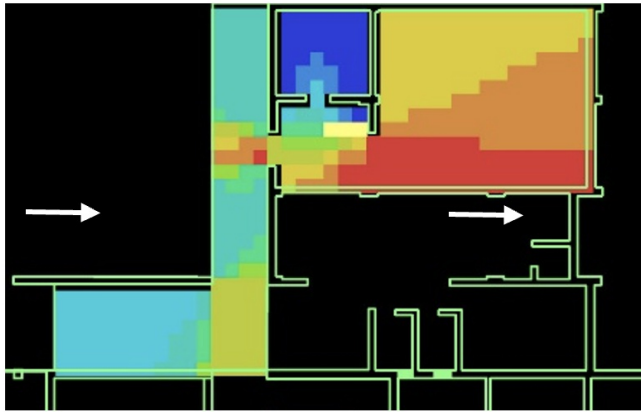
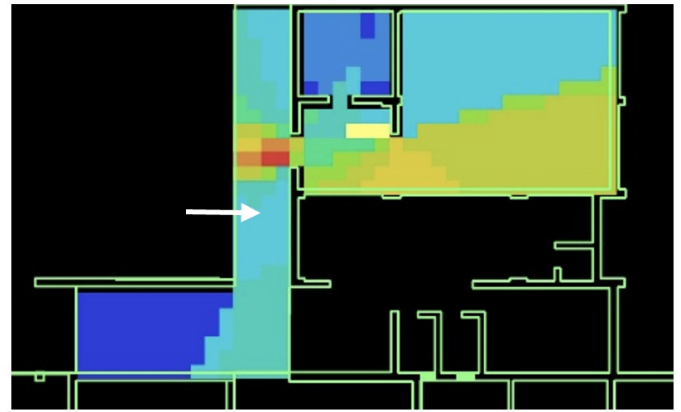


Fig. No. 3: Connectivity



Visual Integration

Figure 3.

The entrance to the emergency and its waiting is located away from the treatment area as indicated by the arrow in fig. no. 3 above. There is lower connectivity between the waiting area and the treatment area and so is the visual integration. This has led to better access control.

Case 4:

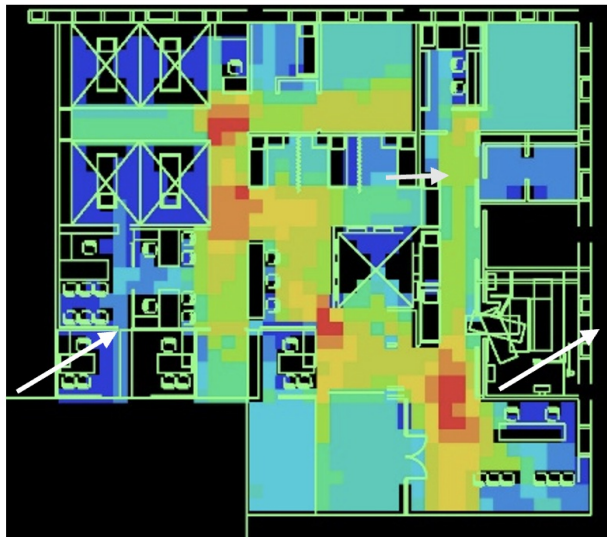
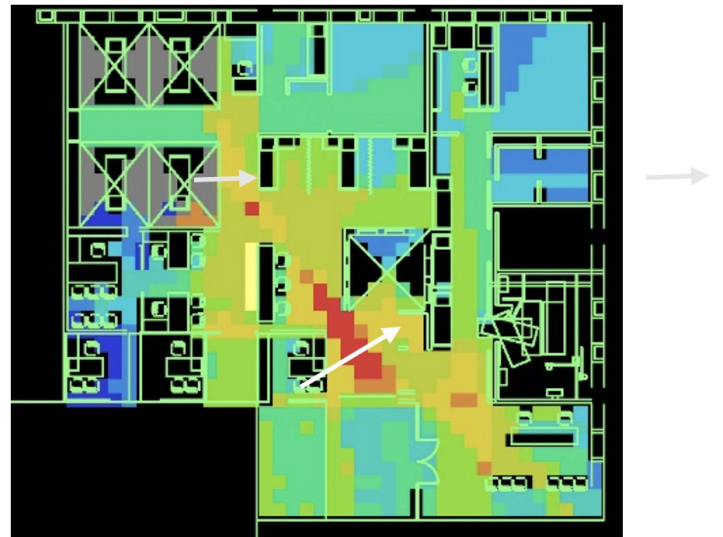


Fig. No. 4: Connectivity



Visual Integration

As seen in Fig. No. 4 above, the emergency area is located away from the entrance of the hospital. The treatment areas have the lowest connectivity as well as visibility from the waiting areas. The entrance to the treatment areas is closed with a door leading to better access control. The healthcare providers interviewed in this hospital felt safe while treating patients in the emergency areas. There was also another exit provided for the healthcare providers thus avoiding contact with the caregivers in the waiting area.

## 5. Conclusions

The study indicated that the analysis of spatial factors would be helpful in identifying the possibility of workplace violence incidences. The space syntax analysis combined with CPTED principles could help in a better understanding of the environmental design aspects that could help in reducing assault on the healthcare providers. Access control which separated the routes and entries of healthcare providers from the caregivers was seen to be one of the aspects that could result in reducing workplace violence. This is directly correlated with lower visibility and lower connectivity between spaces. The use of glass for doors and partitions was avoided in all the hospitals studied. This also reduced the possibility of injury in case of incidences involving damage to property. The doctors' room in all cases is located in areas having the lowest connectivity as well as lowest visibility which also provides another layer of safety to the healthcare providers. This initial study of emergency areas in hospitals in the Indian context could be further corroborated with a detailed evaluation of the environment as well as a structured survey of healthcare providers to understand their perception of safety.

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## Conflict of Interest

There is no conflict of interest.

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## References

- Aljohani, B., Burkholder, J., Tran, Q. K., Chen, C., Beisenova, K., & Pourmand, A. (2021). Workplace violence in the emergency department: a systematic review and meta-analysis. *Public Health*, 196, 186-197.
- Ambesh, P. (2016). Violence against doctors in the Indian subcontinent: A rising bane. *Indian Heart Journal*, 68(5), 749–750. <https://doi.org/10.1016/j.ihj.2016.07.023>
- Baydin, A. K. E. A., & Erenler, A. K. (2014). Workplace violence in emergency department and its effects on emergency staff. *Int J Emerg Ment Health*, 16(2), 288-90.
- Begum, N., & Rani, P. S. (2019). RISK OF VIOLENCE IN HEALTHCARE. *Advance and Innovative Research*, 6(1),

168.

- Gharaveis, A., Hamilton, D. K., Pati, D., & Shepley, M. (2018). The impact of visibility on teamwork, collaborative communication, and security in emergency departments: An exploratory study. *HERD: Health Environments Research & Design Journal*, 11(4), 37-49.
- Ghosh, K. (2018). Violence against doctors: A wake-up call. *The Indian Journal of Medical Research*, 148(2), 130–133. [https://doi.org/10.4103/ijmr.IJMR\\_1299\\_17](https://doi.org/10.4103/ijmr.IJMR_1299_17)
- Klarqvist, B. (2015). A space syntax glossary. *NA*, 6(2).
- Sailer, K., Budgen, A., Lonsdale, N., Turner, A., & Penn, A. (2009). Comparative studies of offices pre and post—how changing spatial configurations affect organisational behaviours. Royal Institute of Technology (KTH).
- McPhaul, K. M., London, M., Murrett, K., Flannery, K., Rosen, J., & Lipscomb, J. (2008). Environmental evaluation for workplace violence in healthcare and social services. *Journal of Safety Research*, 39(2), 237-250.
- Nubani, L., & Wineman, J. (2005). The role of space syntax in identifying the relationship between space and crime. Proceedings of the 5th International Space Syntax Symposium, Delft (pp. 413–422).
- Rashid, M., & Zimring, C. (2008). A review of the empirical literature on the relationships between indoor environment and stress in health care and office settings problems and prospects of sharing evidence. *Environment and Behavior*, 40(2), 151-190.
- Sailer, K. (2007). Movement in workplace environments—configurational or programmed?
- Saleh, A. S., Saif, N. I., & Sartawi, K. S. (2015). CPTED and workplace violence in Jordanian public hospitals. *Asian Social Science*, 11(4), 336.
- Summers, L., & Johnson, S. D. (2017). Does the configuration of the street network influence where outdoor serious violence takes place? Using space syntax to test crime pattern theory. *Journal of Quantitative Criminology*, 33, 397-420.
- United States. Occupational Safety, & Health Administration. (1996). Guidelines for Preventing Workplace Violence for Health Care and Social Service Workers. US Department of Labor, Occupational Safety and Health Administration.
- Wiskow, C. (2003). Guidelines on workplace violence in the health sector. World Health Organization/International Labour Office, 40.
- United States Department of Labor. OSHA. Safety and Health Topics: Workplace Violence. <https://www.osha.gov/workplace-violence> (accessed on 19/08/2023).