Motivational Perception of Inpatient's Preference for Hospital Ward's Fenestration

*Elisha, Y. V., Iliya, K. V. and Tsaman, G. T. Department of Architecture, Faculty of Environmental Sciences Modibbo Adama University Yola, Nigeria *Correspondence email: <u>vahyalayawat@gmail.com</u>

Abstract

The study of inpatient experiences in hospitals is often associated with feelings of keenness, unreliability, and insecurity, reflecting poor well-being. Recognizing the impact of healthcare facility design on inpatients' well-being, this paper focuses on the underexplored aspect of ward fenestration design. Utilizing laddering interviews within the Mean-End Chain (MEC) framework, this research analyzes inpatients' perceptions, preferences, and motivations related to ward fenestration. The content analysis of the data reveals that attributes such as Maintenance, Durability, aesthetics, Location, Climate, and Trend are crucial forward fenestration preference. Seven motivating user values: "comfort," "social status," "public appreciation," "security," "pleasure," "uniqueness," and "culture" drive these preferences. The study emphasizes the importance of prioritizing hospital ward fenestration design to create a healing environment that directly influences patients' recovery and safety.

Keywords: Inpatient well-being, Healthcare facility design, Ward fenestration, Mean-End Chain (MEC)

INTRODUCTION

Architectural design significantly contributes to the promotion of health and well-being within healthcare facilities and is now recognized as an integral aspect of delivering high-quality health services (Clancy, 2008; Sadler *et al.*, 2011). Advances in hospital technology and methodologies place significant demands on the design quality of care environments (Bromley, 2012), aligning with increasing expectations from patients and staff. These environments are expected to be person-centered, welcoming, accessible, and supportive of privacy and security (Vischer, 2008).

Al-Rajhi *et al.* (2010) characterize hospitals as diagnostic and treatment environments where activities like care promotion, health education, training, and research are conducted. The importance of maintaining health and comfort in hospital settings is paramount, with a recognized impact on patient satisfaction, psychological well-being, and physical health (Sadek & Nofal, 2013).

Patients are the central focus of every hospital, and ward design prioritizes their health and safety (Mohd, 2014). Patient safety encompasses considerations in design to facilitate patient transfer or

movement, minimize accidents (e.g., rounded corners), incorporate devices preventing falls, implement controlled ventilation and air filtration systems to curb infections, and utilize ecofriendly and easily decontaminated materials. A well-designed indoor environment in hospital wards can attract, retain, and enhance the healing process for patients (Zborowsky & Kreitzer, 2008), creating a cozy and agile atmosphere (Husein & Sazgar, 2020). The design and arrangement of hospital ward interiors should address the emotional needs of patients (Salonen *et al.*, 2013).

Various architectural elements influence the indoor environments of hospital wards, starting from the construction of the building and extending to elements like color, light, furnishings, and other details (Kembel *et al.*, 2014). Fenestration, a crucial architectural element, significantly impacts the indoor environment of wards. Fenestration, in the context of this paper, specifically refers to windows—their arrangement, proportioning, and design.

While the significance of fenestration in workplaces, schools, and residential buildings is recognized in field research (Lowden, 2019; Brunsgaared *et al.*, 2012; Ellsworth-Krebs *et al.*, 2019), there is a notable gap in understanding the temporal dimension and holistic approach to inpatient experiences with fenestration in hospital wards.

Moutinho (2000) defines motivation as a state of need or condition driving individuals toward actions leading to satisfaction. Exploring patient motivation towards preferences for ward fenestration is a critical but underexplored issue, hindering a comprehensive understanding (Bosch & Lorusso, 2019). This paper aims to fill this gap by investigating inpatient desires for fenestration in hospital wards and understanding the motivations behind specific element attributes. The analysis is based on data collected from Modibbo Adama University Teaching Hospital in Yola, Adamawa State, Nigeria.

The Means-End Chain (MEC) Model

The Means-End Chain (MEC) model, originally developed by Jonathan Gutman in 1982 for merchandized products, has proven to be a valuable framework in the fields of architecture and urban design over the past few decades, as highlighted by Tania *et al.* (2006). This research work is firmly rooted in the MEC model. Gutman (1982) defines MEC as a model aimed at elucidating how the selection of a product or service contributes to the attainment of desired end states. Initially introduced to qualitatively understand consumer motives, MEC interviews were designed to provide a hands-on description of how to conduct, analyze, and utilize them (Muylle & Weijters, 2008). Kaciak and Cullen (2006) assert that MEC has remained a popular and continually evolving research domain since its introduction. The original structure of the MEC model comprises variables or constructs such as Attributes, Consequences, and Values (refer to Fig. 1).



Figure 1: Structure of MEC (Source: Gutman, 1982)

It delves into the connection between consumers and products by constructing a simple associative network encompassing concrete and abstract product attributes, functional and psychological

consequences associated with product use, and consumers' instrumental and terminal values. Attributes are viewed as the intrinsic and physical features, properties, or characteristics defining a product or person (Zinas, 2014). Consequences, as defined by Coolen and Hoekstra (2001), encompass every direct or indirect result of a person's behavior. Lin (2002) suggests that consequences represent the feelings a consumer experiences after product consumption, ranging from positive benefits to negative perceived risks. Values, identified as life's drivers, guide an individual in all their actions (Zinas, 2014).

The linkage between consequences and values holds essential significance in the MEC model. This linkage is twofold: firstly, a particular product must be consumed or used to achieve a desirable consequence; secondly, there exists a linkage between consequences and the attributes of goods (Coolen *et al.*, 2002). While the original purpose of MEC was to link consumers' values to their choice behavior in marketing and consumer research, it has gained popularity in various other domains such as architecture, urban design, advertising, information technology, and organizational management (Rugg *et al.*, 2002). MEC employs the laddering technique for data collection, analysis, and interpretation (Jusan, 2007).

Laddering Technique

Laddering is a qualitative interviewing technique utilizing a semi-structured approach to extract respondents' perceptions on the attribute-consequence-value (A-C-V) elements (Jusan, 2007). Described as a face-to-face, individual, in-depth, semi-structured interviewing format, it employs directed probes, notably the "why is that important to you?" question, with the explicit aim of establishing linkages across attributes (A), consequences (C), and values (V) (Costa *et al.*, 2004).

This technique, valuable for identifying pertinent attributes and life values in a specific product domain and exploring the intricacies of consumers' cognitive structures within that domain, can be effectively combined with a questionnaire to elicit responses from inpatients regarding their perceptions and motivations. Researchers (Coolen & Hoekstra, 2001; Costa *et al.*, 2004; Tania *et al.*, 2006; Jusan, 2007) emphasize the use of content analysis as the fundamental analytical procedure in a means-end study.

METHODOLOGY

Elicitation of Hospital's ward attributes

A laddering interview was conducted with twenty (20) inpatients at Modibbo Adama University, Yola Teaching Hospital. Respondents were selected based on four criteria: firstly, they must be aged between 18-60 years (active age) in male and female medical and surgical wards. Secondly, they must have spent more than a month in the ward receiving treatment. Thirdly, they must desire to stay for a while, and fourthly, they must be willing to participate in an interview. The sample was intentionally diversified in terms of age, gender, and different wards to obtain a wide range of experiences. Interviews were conducted with each participant in a relaxed and conducive atmosphere. Two methods of recording were employed simultaneously: digital voice recording using an Infinix S phone with 4.00 gigabyte RAM and 64.00 gigabyte ROM capacity, and note-taking. Digital recording facilitated immediate review of the data after the sessions, with interviews averaging 45 to 55 minutes and breaks ranging from 5 to 10 minutes. Refreshments, including Five Alive soft drink and Faro water, were provided during breaks as incentives. Roulston (2010) emphasized the portability and convenience of digital recording devices.

Note-taking complemented digital recording as "On-site data processing," aiding the interviewer in summarizing information to stay connected with the data collection (Jusan, 2007). The recorded interviews were transcribed into textual data and underwent content analysis, a research method using procedures to derive valid inferences from texts (Weber, 2004). Manual analysis followed stages outlined by various researchers (Coolen & Hoekstra, 2001; Tania & Jusan, 2007) in alignment with the MEC model's requirements. The fundamental elements of the study's analysis included "word," "sense of sentence," and "sense of phrases" as proposed by Jusan (2010).

RESULTS AND DISCUSSION

The findings from laddering interviews are shown in table 1. The data from these interviews were initially transcribed from voice recordings into textual format. Subsequently, they were categorized into attributes, consequences, and value elements, as outlined in the table. The numbers in parentheses denote the frequency of mentions for each categorized element. For example, the attribute "maintenance" was mentioned 18 times, while the attribute "durability" was mentioned 10 times.

The categorized attributes led to the identification of consequences deduced from the respondents, along with the motivating values. These motivating values were recognized to correlate with Schwartz's motivational value domain, including Hedonism (H): pleasure, enjoying life; Power (P): social power, wealth; Traditions (T): modesty, devoutness; Security (S): family security, cleanliness; Achievement (A): success, ambition; Benevolence (B): helping, true friendship; Universalism (U): social justice, unity with nature; and others, as posited by Jusan (2007), Coolen *et al.* (2002), and Coolen and Hoekstra (2001). Furthermore, Figure 1 shows the links and connections between these attributes, consequences and value elements as collected from respondents. It shows the relationship that exists between these elements.

Table 1 indicate that the attribute 'maintenance' was mentioned 18 times concerning the preference for hospital ward fenestration. This implies that the motivating views were consequences such as 'easy to clean' and 'easy to open,' mentioned 10 and 8 times, respectively. Respondents expressed the need for fenestrations to be easily opened in emergencies or instances of involuntary vomiting and liquid spillages. Additionally, fenestrations should be easy to clean for maintaining a healthy environment. The ultimate benefit derived from this choice was comfort, categorized under benevolence (B) in the value domains.

Furthermore, 'durability,' mentioned 10 times by respondents, appears to be influenced by the desire for easily operable fenestrations. For durability to be sustained in the lifecycle of fenestrations within hospital wards, there is a need for them to be 'easily opened' by inpatients,

considering that some may not be feeling strong enough to operate a more complex type. The ultimate value derived from this choice is comfort, aligning with benevolence in the Schwartz value domain.

	Attributes	Consequences	Values	
1	Maintenance (18)	- Easy to clean	(10) -	Comfort(B)
		- Easy to open	(8)	
2	Durability (10)	- Easy to open	(10) -	Comfort (B)
3	Aesthetics (15)	- Simplicity (4)) –	Social status (P)
		- Improves bui	lding (6) -	Public appreciation (A)
		- Appealing to	the eyes (5) -	Comfort (B)
			-	Security (S)
4	Location (13)	- Good view (2	-	Comfort (B)
		- Allows more	air (4) -	Pleasure (H)
		- Allows more	light (3) -	Security (S)
		- Improves bui	lding (2) -	Public appreciation (A)
		- Simplicity (2)) –	Social status (P)
5	Climate (16)	- Allows more	air (5) -	Public appreciation (A)
		- Convenient (3) -	Uniqueness (U)
		- Allows more	light (4) -	Security (S)
		- Improves bui	lding (4) -	Comfort (B)
6	Trend (8)	- Simplicity (2)) –	Public appreciation (A)
		- Improves bui	lding (6) -	Security (S)
		_	-	Social status (P)
			-	Culture (T)
			-	Comfort (B)

Table1: Categorization of elements mentioned.

From Figure 2 (HVM), it can be observed that the attribute 'aesthetics,' with 15 mentions, is influenced by consequences such as fenestrations being 'appealing to the eye,' 'simple,' and 'improves the building,' mentioned 5, 4, and 6 times, respectively. This suggests the respondents' need to feel visually comfortable during their probable short stay in hospital wards. The attribute 'aesthetics' shows a direct link to public appreciation (achievement) and an indirect link to motivating values like pleasure (hedonism), comfort (benevolence), security (security), and social status (power).

Additionally, 'location,' viewed in terms of the positioning and orientation of fenestrations, is another attribute influencing the choice of hospital ward fenestration. It is linked to having a good view (mentioned twice by respondents), 'allows more light' (mentioned thrice), 'allows more air' (mentioned 4 times), 'improves the building' (mentioned twice), and 'simplicity' (mentioned twice). Patients expressed a desire to feel connected to the surrounding environment, potentially easing the feeling of confinement in hospital wards. Research indicates a preference for views of nature in various environments, from housing to hospitals, offices, and prisons (Aoul, 2012). The attribute 'location' has an indirect link to almost all the value attributes deduced in this study, ultimately connected to pleasure (hedonism), comfort (benevolence), uniqueness (universalism), security (security), and public appreciation (achievement).



Figure 2: Hierarchical Value Map (HVM), courtesy Zinas and Jusan (2014).

The attribute 'climate,' mentioned 16 times by respondents, is motivated by consequences such as 'improving the building' and 'allowing more light,' each mentioned 4 times, 'convenience' with 3 mentions, and 'allowing more air' with 5 mentions. The values derived include comfort (benevolence), uniqueness (universalism), security (security), and public appreciation (achievement). This expresses the respondents' desire to stay connected with the natural surroundings outside, as natural views have been shown to foster recovery from stress by eliciting positive feelings and reducing fear.

Regarding the attribute 'trend,' mentioned 8 times, it is directly linked to culture (traditions) and public appreciation (achievement). Trend has indirect links to other value attributes like comfort (benevolence), security (security), and social status through consequences such as simplicity mentioned twice and 'improves the building,' mentioned 6 times.

The frequency of mentioned elements linking fenestration attributes to perceived values are shown in table 2. The preference for these elements is driven by several factors, with 'location' (the positioning and orientation of openings) and 'climate' being prominently mentioned. These factors are motivated by the values of 'public appreciation' and 'comfort,' aligning with the value domains of Achievement and Benevolence, respectively. This aligns with Aoul's (2012) findings that access to fenestration has physical and psychological benefits, impacting health, psychological wellbeing, motivation, and potentially productivity.

The corresponding figure beside each element indicates the frequency of linkage. For example, 'climate' has a frequency of linkage of 03.02, meaning it has 3 indirect mentions and 2 direct mentions (sum total of both).

Additionally, the content element value 'public appreciation' is observed to have a frequency of linkage of 04.02, indicating 4 indirect mentions and 2 direct mentions. These motivational factors primarily involve everyday activities and concerns, supporting Lindberg et al.'s (1987) identification of main interviewing factors between values and preferences for fenestration attributes.

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Code	Content	Frequency of	Code	Content	Frequency of
	Element	Linkages		Element	Linkages
	Attributes			Attributes	
01	Maintenance	00,02(02)	07	Pleasure	02, 00 (02)
02	Durability	00, 01 (01)	08	Comfort	05, 00 (5)
03	Location	04, 02 (05)	09	Uniqueness	02, 00 (02)
04	Climate	03, 02 (05)	10	Security	04, 00 (04)
05	Aesthetics	02, 00 (02)	11	Social Status	03, 00 (03)
06	Trend	01, 02 (03)	12	Culture	00, 01 (01)
			13	Public	04, 02 (06)
				Appreciation	

Table2. Summary of meducines of menuolied clements mixing autioutes to values	Table	2: Summary	v of frequencies	of mentioned	elements linking	attributes to values.
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The results reveal that for the abstract attribute 'maintainability,' respondents expressed a desire for a comfortable environment as the primary motivation. They reasoned that a comfortable environment enhances health and the healing/recovery process, potentially reducing the duration spent within the hospital space and saving resources. Choosing fenestration that promotes comfort, among other values, becomes significant for patients within hospital walls.

Values from the Benevolence domain, such as 'helping' and 'true friendship,' are linked to this attribute of 'comfort.' Additionally, respondents expressed a strong motivation for a relatively secure environment, linking it to elements like 'allowing more light' and 'allowing more air.' These, in turn, contribute to improving the entire building, enhancing comfort, security, and public appreciation. Such healing environments, providing comfortable, attractive settings with home-like surroundings, have been shown to be therapeutic interventions in stress reduction (Ansar, 2014).

CONCLUSION AND RECOMMENDATIONS

In summary, it is evident that inpatients prefer fenestrations that enhance comfort, considering their frail state. Additionally, they seek fenestrations that enhance security during their stay within hospital walls. Furthermore, inpatients express a preference for fenestrations that portray uniqueness, contributing to public appreciation while considering their cultural and social backgrounds, providing a sense of pleasure. Therefore, it is crucial for hospital wards to be designed and planned to maximize the livability of inpatients through fenestrations that offer comfort and facilitate the recovery process, aligning with Anaker *et al.*'s (2017) assertion that a high-quality physical environment promotes health and well-being.

A hospital ward lacking planning to address challenges like discomfort may become undesirable for prospective inpatients, impacting their willingness to stay for the expected recovery period. Components of a healing environment are best defined as those nurturing and restoring balance to the mind, body, and spirit through each of the five senses (Ansar, 2014). Thus, it is vital for hospital wards to prioritize fenestration in their planning, as these spaces aim to create physical environments directly impacting patients' recovery and safety (Ansari, 2014). The cumulative impact of such planning is the maximization of person-environment congruence (PEC), minimizing the risks of hospital ward design failing the test of use. Moreover, raising awareness

about design quality in healthcare architecture, supported by evidence, is essential to designing healthcare environments effectively (Anaker *et al.*, 2017). In conclusion, there is significant research potential in the area of hospital ward interior space quality and the reasons for inpatients' preferences regarding certain fenestration types in ward spaces.

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