Aim

This study introduces a framework for a Psychological-Based Code Compliance Checking BIM System for Healthcare facilities (with focus on Thailand as a case study).

The paper identifies the key components of the framework (e.g., the best-fit psychological factors, the architectural design parameters of healthcare facilities and their BIM requirements (platform, elements, supplement data, simulation engine, and attributes) in relation to the psychological factors.

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Methodology of Evidence-Based Design and Mental Health Facilities

The methodology adopted to develop the proposed framework is based on the linkage between building design of healthcare facilities and the socio-economic factors affecting the usage of a building considering societal cultures.

Design choices informed by EBD:

Buddhism is a key factor that impacts Thai socio-economic interactions, societal paradigm, and building usage.

The Healing Environment (i.e., hospital design features and its effect on healing patient) design choices are based on design patterns found through the Evidence-Based Design methodology.

Prapromkunaporn (2008), Ulrich et al. (2008), Vorasirisuvimon (2017)

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BIM-Based Code Compliance Checking Systems

Table 1. Selected psychological factors and architectural design parameters (Singharajwarapan and Motawa (2023))

Psychological factors	Architectural design parameters
1. Stress	1. Natural Light
2. Satisfaction	2. Nature view
3. Depression	3. Single Patient Room
4. Pain	4. Acoustical Quality
5. Sleep Quality	5. Thermal Comfort
6. Length of stay	6. Effective Layout / Spatial Disorientation
7. Medical Consumption	7. Family Zoning
	8. Patient Control Choice

Table 2. Architectural design parameters and their BIM related requirements

Architectural design parameters	BIM properties Requirement
1. Natural Light	Room Geometry Room Schedule Building Envelope Geometry Building Orientation *Weather Data File (Non-BIM data)
2. Nature view	Room Geometry Room Schedule Building Envelope Geometry Building Orientation Site Geometry Nature Element
3. Single Patient Room	Room Geometry Room Schedule Label Single Patient Room Label Critical Room
4. Acoustical Quality	Room Geometry Room Schedule Building Envelope Geometry Building Orientation Building structure Building Floor system Label Noise Generator Material Properties (Ceiling Finish, Floor Finish, Wall Finish)

Architectural design parameters	BIM properties Requirement
5. Thermal Comfort	Room Geometry Room Schedule Building Envelope Geometry Building Orientation Building structure Building Floor system Material Properties (Ceiling Finish, Floor Finish, Wall Finish) Thermal Load *Weather Data File (Non-BIM data)
6. Effective Layout / Spatial Disorientation	Room Geometry Room Schedule Label Single Patient Room Label Patient Room Label Critical Room
7. Family Zoning	Room Geometry Room Schedule Label Single Patient Room Label Patient Room Label family seat/area
8. Patient Control Choice	Room Geometry Room Schedule Label Single Patient Room Label Patient Room Label Patient controllable element

Conclusion

The study investigation established that the relationship between the psychological factors and design parameters are to be developed as checkable building rules by correlation analysis yielding discrete/non-discrete and qualitative measurements.

While the collected data to develop the framework is Thai focused and only considers the Thai idiosyncrasies, the approach can be applied within other geographical and/or cultural recontextualization.

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Thank you

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