

A SYSTEMATIC REVIEW OF SPATIAL CONFIGURATION AND COMMUNICATION RELATED STUDIES IN HOSPITAL SETTINGS

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ABSTRACT

Hospitals are designed to provide efficient healthcare delivery. This has facilitated a lot of research on the spatial configuration of hospitals and the subsequent effect on the delivery of healthcare. Also, research has shown the relationship between the spatial configuration of hospitals and some physical and social outcomes in the hospital environment which contribute in one way or the other to healthcare delivery. Recently, research has pointed out that most errors in healthcare delivery in Nigeria have been attributed to errors in communication. Thus, this study sought to conduct a systematic review of relevant literature on spatial configuration and communication-related concepts in Hospital settings. The systematic review was guided by the following protocols namely: the theoretical framework (approach and focus), the methodology and the findings. Results, divided into two major categories research in spatial configuration and communication. This included a focus on the relationship between space and communication-related concepts and the influence of space on communication-related concepts. Also, this paper found that communication as a concept in Hospital settings can be interpreted into three subcategories namely social (Culture and social interactions), psychological (User Groups) and Technical (work processes and Healthcare outcomes). This paper concluded that most of the studies reviewed had focus on the technical aspects of communication and or its relationship and influence on the spatial configuration of Hospitals with a more comparative approach to gathering, analysing and interpreting data. This paper recommends that the focus of spatial configuration and communication-related studies should shift to the social and psychological categories in the Hospital environment to build and develop more robust and evidence-based theory.

Keywords: Spatial configuration, Communication, Space syntax, social network.

INTRODUCTION

Research on the design of Hospitals has generated a lot of interest in the last two decades. This is partly because of the focus studies have placed on the spatial configuration of hospitals and their relationship to healthcare delivery. Many studies on the spatial configuration of hospitals have focused on the effect of spatial configuration on health care delivery (Pachilova & Sailer, 2020; Ogunola, 2015). A lot of work has highlighted the relationship of spatial configuration to many outcomes that contribute to efficient healthcare delivery (Fay *et al.*, 2019). For example, research has been carried out on how the spatial configuration in hospitals are related

to patient falls, medication errors, patient confidentiality and privacy, stress, depression, organisation commitment, organisation performance, job satisfaction and social interaction (Cai and Zimring, 2017). Also, the social interaction within and among professionals in the healthcare institution especially with regards to the efficient delivery of healthcare has come under intense investigation. Both fields in design and medicine have highlighted the contribution of efficient social interaction or otherwise known as communications in delivering healthcare. In the last decade, researchers have pointed out the immense influence of the hospitals' spatial configuration on communications within the hospitals. (Scott, 2017).

In the hospital environment, communication is multi-faceted. One good explanation for that is the different players in the Hospital institution all saddled with the responsibility of delivering efficient healthcare. For example, the hospital houses several professionals like doctors, nurses, pharmacists, technical staff and specialists who have to work harmoniously to deliver healthcare within the same spatial configuration (Spatial layout). This presents a communication complex and many questions have been tailored towards how the spatial configuration has contributed to enhancing or easing this communication complex.

The design of hospital spaces promotes easy accessibility, easy movement and easy communication between health workers and between health workers and patients. From an architecture point of view, the design of a hospital can either enhance or limit the level of communication between health workers and between health workers and patients. When communication is impeded or distorted as a result of the design it could lead to poor healthcare service delivery which translates to increased mortality (Tahir, Haming and Bijaang, 2018; Ogunola, 2015). Barasa, Molyneux, English, and Cleary (2017) noted that communication in a hospital environment is complex because of the different categories of professionals which create communication problems (Sari 2017; Scott, 2017).

Recently a survey in the Ahmadu Bello University teaching hospital showed that 36% of the errors committed in the delivery of Healthcare were traced to poor communication (Jamoh, Abubakar, & Isa, 2018). Besides, a follow-up survey of the Ahmadu Bello University teaching hospital design revealed that it has contributed negatively to the daily communication patterns among medical personnel and between medical personnel and patients. This has resulted in poor service delivery which accounts for over 20% of the mortality rate recorded in the hospital in the last year

(Okonofua, Ntoimo, Ogu, Galadanci, Abdus-Salam, Gana, & Randawa, 2018).

With this background, this paper sought to review, systematically, the spatial configuration and communication-related studies in hospital settings and assess what extant research has conducted and documented about the relationship between spatial configuration and communication in Hospitals. The following section proceeds to conceptualize the major concepts in this paper namely, spatial configuration and communication in the Hospital environment.

CONCEPTUALIZATION

There is a strong link between spatial configuration and communication patterns in spaces and this is linked to how these concepts are interpreted. Like many other institutional buildings, the hospital has its unique building typology that has been developed over many centuries as a result of many factors (Wagenaar and Mens, 2019). Some of these factors include technological development, an increase in demand, scientific innovation to mention a few. This has led to the development of its (hospital) spatial configuration to cater for the dynamic changes throughout these years. These developments in the hospital's spatial configuration have occurred to enhance the operations of hospitals and provide better environments for the delivery of efficient healthcare. Thus, as a result of various research, the spatial configuration in Hospitals provides a range of benefits that are captured in Suvanajata's (2001) positions. Spatial configurations cover four basic dimensions namely, its function, structure, aesthetic and experience. Using a hospital setting as an example, the spatial configuration of space in a hospital has a function, like Treatment and Diagnostics areas, these spaces have a particular structure that guides the sequence healthcare is delivered and this is with unique aesthetics specific to the hospital environment. More importantly, there is an experience that is offered as a result of the function, its

structure, and the Aesthetics of the configured space. Put differently, there is a unique experience offered by a configured space due to its unique function, structure and aesthetics.

On the other hand, the concept of communication in hospitals is often interpreted from its organizational structure. The organizational structure elucidates the way and manner players in an organization should communicate. However, according to Poole, 2014, this does not adequately cater to the way, manner and most importantly, the patterns of communication. Other researchers have preferred to interpret an organization's communication as a subset of the organizational culture (Schiavo, 2013). In other words, the communication among the different players in the hospital environment can be interpreted as social interaction and can be observed by the attitudes, behaviour and values in the hospital environment. This, is a more accurate interpretation of interpersonal communication in the hospital environment as it caters to the dynamic changes over time when people communicate.

METHODOLOGY

With the interpretation of the concepts in the preceding section, the paper used online databases to search for relevant studies in spatial configuration and communication with a focus on hospital settings. The selection of the databases was based on proven records of research in these areas which were based on Architecture and the social sciences. Three databases were used namely, Google Scholar, Medline and SAGE journals. Keywords words used in the search included spatial configuration, communication, behaviour, and healthcare settings.

A preliminary review of the search results highlighted 102related articles which

focused on socially related concepts in healthcare settings. A thorough review of the Abstract highlighted 25 studies that have targeted the investigation of spatial configuration and communication-related concepts in healthcare environments.

RESULT AND DISCUSSION

Table 1 Summary of Review of Spatial configuration and communication-related Studies. outlines research that has focused on spatial configuration and 1 communication-related studies especially in healthcare delivery buildings. To analyse the written data in the reviewed literature a summative content analysis was used. This was important to be able to trace the similarities and differences in the studies under review. To do this, this study examined language intensely to classify texts in categories and most importantly interpret the context of text data through systematic classification.

The criteria used to examine the content were based on;

- i. The Theoretical framework
- ii. The methodology of the Study and
- iii. The major findings

The first criteria, which was a review of the theoretical framework was to highlight the background and interpretation of the major concepts used in the study. In this case, the focus was on how each research interpreted and related the concepts of spatial configuration and communication. Secondly, this study looked critically at the methodology adopted in each of the research reviewed. This was done to build data on the methods, instruments and variables used in spatial configuration and communication-related studies. Finally, the major findings were reviewed critically to assess the focus of these studies in healthcare delivery and possibly highlight the recommendations and proposals for further study.

Table 1: Summary of Review of Spatial configuration and communication -related Studies.

Name	Methodology/Techniques	Findings	Approach/Focus
1 Pachilova&Sailer (2020)	i. Explorative and comparative study of 6 nursing unit wards ii. In-depth study of movement and communication of Healthcare workers iii. 31 selected based on the quality of care iv. Test of these spaces was based on a spatial communication index v. Statistical analysis	i. large viewsheds in visibility and awareness produced more communication ii. the higher Spatial communication index the better the quality of care	Relationship between hospital design and the quality of care and communication among healthcare professionals The influence of nursing unit design on the quality of care
2 Cai H, Zimring C.,(2017).	i. Comparative study of Chinese and US nursing unit typologies ii. Comparative analysis of unit designs iii. Unempirical Interpretation of National cultures and relationships with unit designs	i. Impact of national culture on the nursing unit design ii. Developed a methodology combining abstract culture, organisational construct and complex spatial relationships into spatial metrics	i. Relationship between culture and nursing unit design ii. Spatial configuration a product of culture iii. How nursing unit design reflect the different work styles and organisational communication which is driven by culture
3 Real, K., Bardach, S. H., &Bardach, D. R. (2017)	i. Comparative study between centralized and decentralized nursing unit design ii. Focus group discussions iii. Systematic qualitative analysis iv. Quantitative modelling v. Space syntax	i. Highlighted care processes in the frequency of walks and the 2 designs ii. Nursing unit design shapes the communication, processes and outcomes in the nursing wards.	i. The relationship between the spatial layout of hospitals and communication in this case; patient care processes and patient outcomes/quality of care.
4 Gharaveis, A., Hamilton, D. K., &Pati, D. (2018)	i. A systematic review of the literature with a focus on the impact of hospital design on teamwork and communication (19 studies)	i. Spatial layout is a critical factor that promotes the efficiency of teamwork and collaborative communication ii. Layout design, visibility and accessibility are the most cited aspect of design which affect Teamwork and Communication in healthcare facilities.	i. An investigative impact of the hospital design layout on teamwork and communication

Name	Methodology/Techniques	Findings	Approach/Focus
5 Pachilova et al. (2017)	i. An empirical study of 4 hospital wards in 2 UK hospitals. ii. Comparative study iii. Space syntax analysis iv. Social comparative network analysis	1. The distance in the spatial layout influence the frequency and duration of conversation in the wards	i. Relationships between spatial layout and social behaviour especially on patient ward and work processes)
6 Rippin, A. S., Zimring, C., Samuels, O., & Denham, M. E. (2015)	i. Comparative study of Neuro-Critical Ward design ii. Structured observation	i. The unit layout did not contribute to easy interactions in the spatial layout ii. Spatial layout recorded influences in communication patterns	i. Impact of design on caregiver interactions ii. Relationship between spatial design and care (focus on bedside nursing categories)
7 Rashid, M. (2015).	i. Integrative Review of studies form ii. Review based on a framework consisting of a Technical, Psychological and social orientations.	i. 21 Technical oriented Studies ii. 16 psychological oriented Studies iii. 3 Social oriented Studies iv. 13 Technical, Psychological and Social oriented studies.	i. Review of Nursing unit layouts ii. A look at Technical, Psychological and social issues ranging from Behaviour and Perception, Health Outcomes and social and psychological factors. Communication key to quality care How nursing unit layout affect communication patterns and medical and organisational outcomes The focus was on the relationship between spatial layout on communication patterns, nurse satisfaction, distance walked, organisation outcomes, patient safety and satisfaction. Evidence-Based Design research in hospital Focus on how hospital layout can affect communication between categories of people especially in the Outpatient clinics
8 Hua, Becker, Wurmser, Bliss, Haltz and Hedges (2015).	i. A comparative study using Pre/post research design where comparison was between centralised and decentralised units.	i. Patient satisfaction increased substantially ii. Few significant changes in communication patterns iii. No significant changes in nurse satisfaction, patient falls and organisation outcomes	i. quality care ii. How nursing unit layout affect communication patterns and medical and organisational outcomes iii. The focus was on the relationship between spatial layout on communication patterns, nurse satisfaction, distance walked, organisation outcomes, patient safety and satisfaction. Evidence-Based Design research in hospital Focus on how hospital layout can affect communication between categories of people especially in the Outpatient clinics
9 Pachilova&Sailer (2014)	Comparative study of 2 distinctly organised Hospitals, Using Space Syntax methodology for spatial analysis Staff survey highlighting communication networks	Hospital organisation with shared facilities increases the frequency of communication Besides space, the workflow and culture affect interaction patterns between users Spatial separation of user areas	Evidence-Based Design research in hospital Focus on how hospital layout can affect communication between categories of people especially in the Outpatient clinics

Name	Methodology/Techniques	Findings	Approach/Focus
10 Liu, Mainas and Gertz (2014)	An Explorative study using space syntax methods to analyse spatial layout and observation using movement and behavioural patterns	Highlighted impact on spatial interruption on communication processes Communication difficulty was associated with spatial layout assessed	Hospital design plays a critical role in Health communication processes The research focused on the relationship between hospital design and communication process in acute care hospital settings (Treatment and Diagnostics)
11 Bayramzadeh, S., & Alkazemi, M. F. (2014).	Explorative Study Comparative cross-sectional study, assessing a total of 70 registered nurses in 2 weeks.	No significant difference between centralised and Decentralised nursing unit layout in relation to the frequency of communication and technology used A significant difference in perception the 2 spatial layouts considered	Relationship between nursing unit design and use of communication technologies/methods How the design of nursing unit can impact on the use of communication technology and methods Strength and weakness in nursing unit design with regard to communication technology
12 Pachilova, R., & Sailer, K. (2013)	A comparative study analysing 2 hospitals (with 5 clinics each) which differ in the spatial layout Space syntax analysis of spatial layout. Staff survey and direct observation, communication networks and activities of caregivers	Strong differences between the 2 spatial settings.	Evidence-based design for credible design decisions. Communication important for good health provision The relationship between the spatial layout and the way people interact in Wards.
13 Cai, H., & Zimring, C. (2012)	Comparative study of Neurology intensive care unit A multi-layered approach with spatial analysis, behavioural mapping and co-awareness network analysis	The difference in spatial differentiation between the 2 wings A strong correlation between the spatial metrics and the observed behaviours and co-awareness	Based on the hypothesis that Nursing unit layouts impact the way which nurses interact and maintain co-awareness

Name	Methodology/Techniques	Findings	Approach/Focus
14 Sailer& Penn, 2009	A comparative study, questionnaires, social network analysis	Some influence of spatial layout on organisational behaviour was found to be generic Spatial layout influences organisational behaviour is subject to the context, culture and character. Aspects of social networks and spatial layout combine to provide a good indicator for successful collaboration Spatial layouts with higher integration promoted communication Spatial layout plays a strong supportive role in the formation and maintenance of social relations Spatial layout shapes organisation culture and achievement	The relationship between spatial layout, social interaction and social structure in an organisation
15 Wineman et al., 2009	Explorative study investigating the social dimensions of innovation and its spatial metrics.	Movement in workplaces may be reflected best by a metric distance, Distance is a key indicator of movement patterns in workplaces Spatial configurations are best used to explain movement flows	Relationship between Spatial layout, social networks and innovation.
16 Sailer, 2007	An exploratory study, observations (movement patterns), axial and segment analysis of strong and weak programme aspects of office movement patterns	Spatial layout influences the formation of social structure and organisational behaviour	The spatial layout can explain movement flows with the focus of complex buildings
17 Sailer et al., 2007	An exploratory study with an interpretative and phenomenological approach using correlation and syntax analysis	Spatial layout have consistent effects on movement but inconsistent on visible copresence	How spatial layout influence social interaction and organisation behaviour.
18 Sailer& Penn, 2007	Explorative study with Statistical analyses with observation behavioural data		The effect of spatial layout on face interaction through movement and visible co-

Name	Methodology/Techniques	Findings	Approach/Focus
20 Rashid & Zimring, 2003	A comparative study of 5 office layout	Highlighted generic spatial properties of these constructs using space syntax analysis.	Relationship between spatial layout and organisational constructs like, communication control, territoriality, privacy and status
21 Penn et al., 1999	A comparative assessment of 2 research-led design projects with space syntax techniques survey.	A spatial layout which dictates movement and patterns of space use has a direct impact on the frequency of contact between workers in the office-based organisation Patterns of communication were a direct result of spatial configuration Spatial integration and differentiation of important spatial metrics to support flexible working and a range of different work activity.	How spatial layout can generate new organisation structure and facilitate individual communication Relationship between spatial layout and pattern of communication
22 Serrato & Wineman, 1999	Exploratory study which investigates the relationship between layout and communication patterns Using 2 case studies	The frequencies and location of communication were related to the spatial layout Spatial layout enhanced local networks	Relationship between spatial layout and communication patterns in research facilities
23 Peatross, 1997		Spatial layout influences the spatial patterns of movement and by extension interaction.	Exploring the relationship between spatial layout and control in a restrictive environment Spatial properties of building the effect patterns of space use.
24 Wineman & Serrato, 1997	A comparative study with observations (face to face interaction) spatial analyses.	Integrated spatial layout correlated the significantly higher number of face to face communication	Examining interrelationship between spatial layout with face to face communication outcomes

As highlighted previously, this paper focused on spatial configuration and communication-related research. A summary of the systematic review is seen in Table 2. This study critically reviewed past research based on the focus of these studies, the methodological approach and techniques used and the variables and findings of these studies. Thus, this study discusses the findings from the systematic review as follows.

Focus of the Study.

Considering the focus, this study found that all the researches reviewed were based on the relationship and influence of space on many socially related concepts, in this case, communication-related. Table 2 summarises the many communication-related concepts that were associated with the spatial configuration in hospitals. A look at these concepts gave a range of interpretations to the multifaceted concept of communication, especially in Hospitals.

Table 2: Main Communication-Related concepts in Hospital Settings

Space		Communication-related Concepts
Spatial Configuration Spatial layout Nursing Unit Design, Ward design	Relationship	Caregiver Interactions, Communication (Outpatient Clinics) of different categories of People Communication (Teamwork), Communication patterns, Communication Processes (in Treatment and Diagnostics Areas) Culture, Different Work Styles, Face to Face Interaction Interaction and Coawareness Interaction in Wards
	Influence on	Medical and Organisational Outcomes Movement Flows Nurse Satisfaction Observed behaviours and Environmental Perception Organisation communication, Communication (Patient Care processes, Organisational Behaviours Organisational Constructs (Communication, Control, Privacy, Status, Territoriality) Patient Outcome/Quality of Care) Patient Safety and Satisfaction Productivity (Healthcare Outcome) Quality of Care, Social Interaction and Social Structure Social behaviour (Work processes), Social Network and Innovation Technical, Psychological and Social orientation

Source: Author, 2020.

It is important to note the various interpretations of space itemised in the studies under review. Space was interpreted as the designed layout of the hospital. Thus, in the reviewed literature space was defined as spatial layout, spatial configuration and in specific cases, nursing unit design and other specialised spaces in the hospital setting as the case implied. Also, the research reviewed in this paper focused on two major concepts and the focus was on the relationship or influence as the case was presented. In other words, the studies reviewed focused on the relationship between spatial configuration and communication, the influence of spatial

configuration on communication and the influence of communication on the spatial layout in the Hospital settings. More importantly, each study reviewed conceptualised communication in a unique way that set the pace for this systematic review. From Table 2, the concept of communication can be divided into 3 categories namely Communication defined by Culture and social interactions (Social), communication defined by category of users (Psychological) and Communication-related to work processes and healthcare outcomes (Technical). Contents of these communication definitions are seen in Table 3.

Table 3: Conceptualising Communication in Spatial and communication - Related Studies

Communication categories		
1	Communication: Culture and Social Interaction	Interactions, Patterns, Face -to-face Interaction, Coawareness, Movement Flows, Behaviour, social structure
2	Communication: User Groups	Nurse Satisfaction, Perception, patient Outcome, Safety and Satisfaction
3	Communication: Work processes and Healthcare Outcomes	Teamwork, work processes, Different Work Styles, Medical organisational Outcomes, organisational communication, Organisational Constructs; Control, Privacy, Status, Territoriality

Source: Author, 2020.

From Table 3 it is clear that the concept of communication with spatial configuration studies covers a wide range of concepts as seen above. However, most of the studies reviewed in this paper mostly fell in the Technical category. This category accounted for 60% (about 19 of the studies reviewed). The Social and Psychological category accounted for 30% and 10% of the studies reviewed respectively. It should be noted that the studies reviewed was a cross-section of spatial configuration and communication-related studies from over four decades. It is safe to conclude that a majority of the studies in spatial configuration and communication especially in Hospital settings were focused on the technical aspects of communication as related to the Social and psychological interpretations of communication as opined by Rashid (2015).

A closer look at the technically oriented category of communication, this research found out that communication was conceptualised as focusing on areas that had to do with work processes and health care outcomes. In this category, communication was seen to influence the work processes that contribute to healthcare delivery or outcomes (Pachilova & Sailaer, 2020, Cai & Zimring, 2017, Real et al., 2017, Gharaveis & Hamilton, 2018, Pachilova et al., 2017, Hua *et al.*, 2015, Liu et al., 2014, Bayramzadeh, 2014, Peponis et al, 2007, Hanson & Zako, 2005, Rashid and Zimring, 2003). Terms like teamwork, work styles, organisational communication and constructs like control, privacy, status, and territoriality were all concepts that were focused on in this category. In other words, the concepts of communication as seen in the Technical category of this review

focused on healthcare outcomes. Put differently, the relationships investigated in these studies pointed to how communication contributed to efficient healthcare delivery in Hospital Settings. Thus, the concept of communication was used as a variable to understand work processes, teamwork, Control and many other constructs in research. Also, the concept of communication was seen to be an integral part of healthcare delivery.

When considering the social and psychological category of research under review, communication as a concept is seen as a construct on its own. For the Social category of research, communication was interpreted by the organisational culture and the interactions within the spaces. The focus of this category was on the social interactions in the spaces in the hospital environment. Keywords in this category were social interactions, patterns, culture, face to face interactions coawareness, movement flows, behaviours and social structure. In line with these, this study found that this category focused on the behaviour and movement patterns of the users of the spaces being studied. Here, the research pointed to the relationship between the spatial layout and the behaviour and movement patterns of the users of the spaces being investigated. For the Psychological category, the studies focused on specific User-groups and how the spatial configuration in hospital affect these groups, their movement, behaviour, job satisfaction, commitment, and their perception.

In summary, the approach and focus of spatial configuration and communication-related studies provided clear distinctions concerning the interpretation of the concept of communication and providing an insight into the various aspects in the hospital settings that communication can be related to. In short, communication can be socially interpreted focusing on the social interactions and patterns within the spatial layout. It can also be psychologically interpreted with a focus on the User groups in the Hospital especially the relationships between the spatial layout and the perceptions of these groups.

Review of Methodologies

As part of this review, this paper also studied the methodology and techniques used to investigate the relationships and influence between spatial layout and communication in the hospital setting. Three distinct methodologies were identified in the review. First, a majority of the research reviewed were comparative studies while a few others were Explorative and Interpretative in their methodological approach. The comparative studies focused on comparing distinct spatial layouts based on established typologies. For example, Pachilova and Sailer's study in 2013, compared the spatial layout of five clinics each in two hospitals other studies focused on comparing the spatial layout across varying cultures as exemplified in Cai and Zimring's (2017) study.

For the exploratory studies, most of the research reviewed focused on case studies which provided a platform for in-depth investigation of the relationships between the spatial layout in hospitals and specific ways the spatial configuration influenced communication. Methods employed in these studies were tailored towards the spatial layout and communication. The space syntax theory and methodology was used for assessing the spatial layout in all the studies reviewed. First, the theory of Space Syntax provides an interpretation of spatial layout that highlights its social milieu (Hillier and Hanson, 1984). This interpretation provided these studies with the opportunity of highlighting specific properties in the spatial layout that were socially related. Second, the space syntax methodology helped to quantify the spatial properties of the layout related to socially related concepts, in this case, Communication.

This study recorded quite a number of methods to assess communication in the Hospital settings investigated. This paper identified some methods that were used to gather data on communication (Technical, Psychological and Social). For the communication defined by social interaction and culture methods included, non-participant observation of social and communication network within the spaces being investigated, direct observation of

activities in the spaces, and questionnaire survey. The Communication interpreted as Psychological had its data mostly gathered by surveys (Questionnaires) and focused group discussions because of the focus on the perception of unique categories of people. The data gathered for the technically defined communication category were done using both observations (social and communication networks) and survey techniques to accurately assess work processes and organisational outcomes in hospital settings.

Most of the studies (90%) reviewed, used statistical analysis to conclude on the relationship between the spatial layout and communication in Hospitals. A good number using correlation to investigate whether a relationship exists between space and communication while a few used regression models to predict significant influences of variables between space and communication in Hospital environments. It should be noted that the Space Syntax methodology provides a platform for these studies to harmonise the data collected by quantifying space. Other studies in this review used interpretative phenomenology to link the concepts of spatial layout and communication. (Peatross and Peponis, 1995, Allen, 1977)

CONCLUSION This study set out to review systematically studies that focused on spatial configuration and communication-related studies for the past four decades. Using content analysis, this study first highlighted relevant studies in this category from key online databases as stated above. Using the approach/focus of research, methodology and findings of the studies, this study proceeded to perform a systematic analysis using the above as content criteria for the assessment. Following the findings, the conclusion of this study are as follows;

i. Studies that have focused on spatial configuration and communication in hospitals can interpret Communication into three categories namely; communication as social interaction and culture, communication as it refers to a specific user

group (Psychological), and communication referring to work processes and organisational outcomes (Technical category)

ii. Studies that focused on communication as social interaction and culture are better positioned to develop a theory on behaviour, movement and space usage patterns in the Hospital environment.

iii. Studies that pointed to communication as it refers to specific user groups target the relationship of spatial configuration and perception of these user groups which border on a range of psychological concepts.

iv. Studies that focused on the organisational Outcomes address the processes that lead to the efficient delivery of healthcare.

v. Most of the methodologies in the review are Comparative studies that research on existing typologies with a limitation to building theory in spatial layout and communication-related studies.

vi. Exploratory and Phenomenological Studies provide a solid platform for developing theory in spatial configuration and communication-related studies

vii. Statistical analysis remains a highly patronized method for harmonizing data and investigating the relationship between spatial configuration and communication-related studies

viii. Considering the many theoretical assumptions in spatial configuration and communication-related studies and the bias in comparative studies in healthcare environments, there is a need to focus on in-depth study to better understand the relationship between the two (2) concepts (spatial configuration and communication-related studies)

The study recommends that further studies in this area should be focused on the in-depth study (case studies) to better understand and shed light on new relationships between the concepts under review.

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