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Technical Note

Creating a better healing environment in Qatari healthcare sector: Exploring the research agenda for the future

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Abstract

Healing environment and Health Associated Infections (HAI) have been researched for more than 30 years globally. There is definitely a consensus among the researchers and practitioners about its importance. A range of issues such as knowledge management, performance management, design management and process management have been highlighted as major contributors to healing environment and HAI. This paper presents the results of a workshop conducted in Doha, Qatar with the purpose of exploring the problems encountered in the Qatari healthcare sector regarding HAI and healing environment. The major findings from the workshops indicated that there is a need for more research in the areas of knowledge management and performance management in order to better maintain healthcare facilities. The design of healthcare facilities and the implementation of green building guidelines in Qatar also need to incorporate design practices and features that can improve healing and have been researched in other parts of the world. This paper compiles the research agenda for future researchers to pursue and improve the performance and healing environment in Qatar.

Keywords: Healing environment; Health Associated Infections (HAI); Green building guidelines

1. Introduction

Hospital design process has evolved from being just the design of a building to designing a facility that facilitates healing and reduces the possibility of any Health Associated Infections (HAI). This has moved the focus of designers to the post-occupancy phase analysis, while conceiving the building design. There is a lot of research to suggest that issues such as knowledge management and operational occupant performance management also have to be taken into account while designing hospital facilities (May and Pitt, 2012). In addition, there is research to indicate that subtle design decisions such as location of windows and use of wall colour can have an impact on patients' healing (Mourshed and Zhao, 2012).

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The last two decades have also seen the emergence of green building guidelines across the world. The first green building guideline called Building Research Establishment Environmental Assessment Method (BREEAM) was introduced in the UK in 1990 (BRE, 2007). Since then, there has been a rapid growth in the number of green building guidelines in the world (Potbhare et al., 2009). However, one of the issues with these guidelines is too much focus on building performance and, arguably, not enough on occupant performance (Turner and Arif, 2012). One of the countries that have seen similar growth in awareness of green buildings is Qatar. Showing its commitment to green building movement Qatar launched its own sustainability rating system in 2009 that is designed to assess the environmental friendliness and energy efficiency of construction projects (Hassan et al., 2012). Initially it was called Qatar Sustainability Assessment System (QSAS). This name has now changed to Gulf Sustainability Assessment System (GSAS) reflecting the wider outreach of this assessment system.

GSAS was an attempt to address all the three dimensions of sustainability: economic, environmental, and social. Fig. 1 summarises the intent behind the development of GSAS.

GSAS has some generic principles but also has 10 application specific guidelines with one of those applications being in the healthcare sector. These guidelines deal with the project design, construction and performance. However, it is interesting to see what impact these guidelines have on the performance of healthcare facility occupants which include both staff and patients. This paper presents an exploratory study focused on healthcare facilities in Qatar. The purpose of this study is to identify the major gaps in the implementation of green building guidelines and occupant performance in healthcare facilities in Qatar. The gaps identified will help set the research agenda for the future of healthcare facility design in Qatar. The remainder of this paper is divided into five sections. The next section presents a review of the literature; it is followed by a section on methodology. After the methodology section there is a section on the analysis of data from a workshop. This is followed by a section on discussion and finally major conclusions are presented in the last section of this paper.

2. Literature review

The review of the literature section is divided into two sub-sections. The first one discusses the performance related issues of the staff in healthcare facilities. The second one discusses the summary of the literature in the area of patient performance and the effect on their healing through the design of facilities. These two sections will represent two major stakeholder groups in any healthcare facility. The discussions presented could then be taken forward to identify issues that could be incorporated in the green building guidelines such as GSAS and address the issue of occupant performance of these healthcare facilities.

2.1. Staff performance

Healthcare Associated Infection (HAI), according to Horton and Parker (2002), is "infection which was neither present nor incubating at the time of admission but has developed during the course of a stay in hospital or other facility".

One of the most significant challenges that hospital management faces is the prevalence of HAI (Liyanage and Egbu, 2005). Perhaps one of the most famous personalities of the nursing domain; Florence Nightingale who worked in a military hospital during the Crimean was one of the pioneers of infection control. Her works are still regarded as authoritative in the nursing sector. Now it is widely recognised that a high frequency of HAI is evidence of poor quality of health service delivery, and leads to avoidable costs (World Health Organisation, 2002). This cost should be taken into account while reviewing the performance of healthcare facilities.

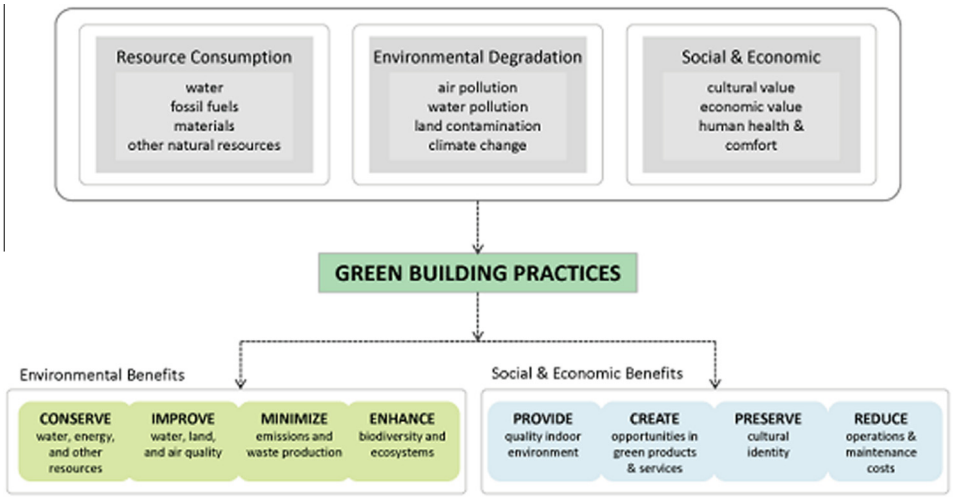

Fig. 1. GSAS vision (GORD, 2013).

Liyanage and Egbu (2005) have identified several organisational and staff performance based issues that lead to HAI. These issues include: lack of measurement systems, management of knowledge, better integration of processes and practices between clinical and non-clinical staff and effective dissemination of knowledge. They contend that Facilities Managers (FM) need to better understand some of the issues around clinical practice in order to develop a better healing environment at healthcare facilities. Liyanage and Egbu (2006) further highlight the fact that short term measures such as outsourcing will not help improve the HAI situation. There is something more fundamental that is needed and that is proper communication between different stakeholders within a hospital. Based on the results of their earlier research, Liyanage and Egbu (2008) developed a performance measurement system that includes key performance indicators such as control of HAI, organisation and policy, service levels, and standards. May and Pitt (2012) have clearly established a relationship between environmental cleaning and infection control in the hospitals. They have highlighted a range of issues from patient perceptions to FM performance that are impacted by appropriate cleaning of the hospitals leading to a perception of a better healing environment.

2.2. Patient performance and healing

There is another thread of the literature that deals with the design of facilities for different specialisations within medicine. This line of research has established different attributes in healthcare facilities design that can facilitate a conducive environment for the patients and healthcare staff as well as faster recovery in some cases. According to Altimier (2004), properly designed built environment of healthcare facilities could lead to shorter length of stay, reduced need for pain medication, and fewer negative comments on nursing notes indicating fewer instances of complications within the recovery process. The emerging design philosophy is to look at how healthcare facilities indicate the physical and social aspects of a patient's recovery process and how they fit into the wider communities where they are located (Gesler et al., 2004).

Gross et al. (1998) have looked at healing environment in Psychiatry. They have indicated some attributes such as single patient rooms, easy to navigate layout, movable seating, good acoustics, natural views from the window, access to gardens, exposure to daylight, and easy access to staff as important drivers for better patient recovery. In a more recent study, Ulrich et al. (2010) have looked at all these factors and have concluded that the factors highlighted by Gross et al. (1998) lead to reduction in aggression in patients.

Whitehouse et al. (2001) have looked at the role that gardens play in children's hospital. They have concluded that these gardens provide a positive environment to the children recovering from illness as well as an important de-stressing environment for parents, which in turn will have an impact on their interactions with the children recovering in the hospital. Similarly, Adams et al. (2010) have looked at the role of Atriums and their impact on healing of children. They have found both positive and negative impacts of an atrium in children's hospital.

Hammond et al. (2013) have looked at midwifery and how it is impacted by the design of the built environment. They have highlighted the need for reducing of clutter, and need for accessibility to wet areas such as showers as critical to their delivery of services to the patient.

Mourshed and Zhao (2012) have presented the perceptions of hospital staff about the environment of healthcare facilities and have categorised factors into three categories that have an impact on the overall staff performance which eventually leads to better healing of the patients. The categories are spatial, environmental, and maintenance. The spatial category includes factors such as landscaping, furniture layout, exterior view from the workspace, presence of coordinated art objects, pleasant colour scheme, architectural design of the space, and location and orientation of the space. The environmental category includes: adequate illumination, availability of daylight, thermal comfort, noise level, and air quality and freshness. The third category is maintenance and it includes factors such as: provision of hand hygiene, proximity to wards, cleanliness and ease of maintenance, and spaciousness.

As highlighted in the last two sections there is significant research to suggest that there is an impact of management issues such as knowledge management and performance management as well as design issues such as colour, layout and furniture on the overall healing being experienced by the patient. Green building guidelines all over the world have developed focused guidance for healthcare facilities but they primarily concentrate on the environmental and economic performance related to energy savings. What they often ignore is the social side of sustainability that looks at occupant performance (Turner and Arif, 2012). GSAS; a guideline designed specifically for Qatar is a newer guideline, and has a healthcare specific green building standard. This research explores whether factors such as the ones discussed in the literature review are incorporated into these guidelines. If not, then what should be done for the future in order to modify these? The following section presents the methodology adopted for this exploratory study.

3. Methodology

In order to conduct this exploratory study a workshop was organised in Doha, Qatar on June 14, 2014. There were 35 delegates in the workshop. All these attendees were familiar with GSAS guidelines on healthcare sector and had more than 10 years of experience in facilities management. All the participants were given two presentations summarising the issues documented in the two sub-section of the literature review. Each of these presentations was of 25 min duration and summarised key points from these

presentations. Participants were also provided with an opportunity to ask questions and seek clarifications. There were 5 major questions that were posed to the participants. For each of these questions there was specific guideline that was provided so that they can focus on key issues within that question. However, they were free to explore any other relevant issues they felt necessary to consider for Qatar. These questions were:

1. How do we effectively improve awareness and understanding of multi-disciplinary and cross professional working and practices needed in reducing Healthcare Associated Infections (HAIs)? For this question participants were asked to concentrate on opportunities for collaborative working amongst different professionals to address HAI issues, role(s) of professional bodies, training and education opportunities, and policy, regulation and legislation.
2. How do we effectively (i) develop and (ii) improve our multi-disciplinary and cross-disciplinary knowledge on HAI for improved reduction of Healthcare Associated Infections (HAIs) for the benefit of all? For this question participants were asked to concentrate on building capacity and capability around multi-disciplinary and cross-disciplinary knowledge on HAI, learn from practices and procedures that have gone well and those that have not gone so well, ascertaining what knowledge was associated with HAI, key barriers and enablers, and building an appropriate knowledge repository; communities of practice for HAI.
3. How do we effectively put in place performance management regime(s), involving key stakeholders, to monitor improvements or otherwise on Healthcare Associated Infections (HAIs)? For this question candidates were asked to consider types of performance management processes, tools and techniques, key barriers and key opportunities and enablers, critical success factors (CSF) to the implementation and embedding of performance management regime(s) around HAIs, and performance management enforcement.
4. Are any of the functional/process related requirements incorporated in design and construction of hospitals in Qatar? And how? For this question candidates were asked to consider types of parameters considered during design, how this kind of information is collected, and to take into consideration, if possible, the requirements by individual departments and specialities.
5. How can guidelines such as GSAS incorporate these in hospital accreditation? For this question candidates were asked to consider incorporation of social sustainability, and healing environment and improvement of patient wellbeing.

The delegates were divided into three groups. Each group was given three questions to consider over a duration of 90 min. Each group had a leader and this leader was asked to either report back the discussions of the group himself or nominate someone who would do that. Group 1 was assigned questions 1, 2 and 4. Group 2 was assigned questions 1, 3 and 4. Group 3 was assigned questions 1, 4, and 5. After 90 min of discussions the delegates were brought back to present the findings of the three groups. The findings from the discussions are as follows.

4. Analysis of results

The first question was "How do we effectively improve awareness and understanding of multi-disciplinary and cross professional working and practices needed in reducing HAIs?"

This question was addressed by all the three groups. The groups felt that there was a need for improved awareness of the issues that face different disciplines/stakeholders in the process. There needs to be a more concurrent engineering based approach in designing and managing healthcare facilities in Qatar. This concurrent approach needs to be taken into account right at the very beginning and at the point of compiling the contract. However, everyone felt that indeed sharing of knowledge between different disciplines and stakeholders is a challenge that we all face. Blending all of this knowledge together is the need of the hour at the moment.

One of the important and interesting issues that was raised during the discussions was that there is some precedence of inter-disciplinary collaboration in healthcare sector. Most of the healthcare facilities in Qatar have facilities management safety committees which are multi-disciplinary committees. There is no reason why similar committees for infection control could not be established and made a core part of the facilities planning policies and procedures. There need to be more awareness raising activities which should include training programmes and certifications. Bodies such as the Gulf Organization for Research and Development (GORD) can play a key role in establishing industry standards and compiling competencies for certification programmes. At the moment none of these healthcare facilities have a lessons learnt database. There appears not to be any formalised mechanism to populate this lessons learnt database. At the moment there appears not to be any robust plan and strategy to tackle HAIs in Qatari healthcare facilities. The formulation of such plans and strategy could lead to the development of a more comprehensive approach towards HAIs, which will then lead to addressing issues such as knowledge management and performance management.

The delegates felt that the knowledge base in the area of HAI is completely missing at the moment. They also felt that there is a need for some sort of professional body in the area of HAI, which could be established through a joint effort of various existing professional bodies such as International Facilities Management Association (IFMA), and Project Management Institute (PMI). There was also consensus among the delegates that there is a need for government funding to initiate this effort. The delegates

also contend that there is a need for a dynamic approach to knowledge sharing, and bringing all these professional bodies will just make it easier and any encouragement or facilitation from the government will help such an initiative. Bringing these professional bodies together will help different indicators where everyone is coming from and would facilitate the coming up of more comprehensive and well informed strategies to tackle HAIs. There is also a need for clinical and non-clinical staff to come together. Most facilities managers indicated that they can learn a lot from clinicians about HAIs. This is a challenge that could only be addressed by professionals from clinical and non-clinical disciplines coming together and formulating an inclusive strategy.

The second question was "*How do we effectively (i) develop and (ii) improve our multi-disciplinary and cross-disciplinary knowledge*"

The delegates, while discussing this question were of the opinion that it is important to involve end users very early in facilities planning and the design process itself. There is an absence of any knowledge base in this area. Involvement of people from a range of disciplines will help in developing this knowledge base further. Qatar can learn from the experiences of other countries in this area. There is definitely a need to develop a new discipline of medical planning. The knowledge base developed will help compile the competencies needed by these medical planning professionals. We also need to develop a mechanism for continuous development of this knowledge base. This could be done through more training and professional development programmes and collaboration with professionals from other countries where this knowledge base is developed. Qatar can become the hub of development for this kind of initiative in the Gulf region and can spearhead the movement to tackle HAI.

The third question was "*How do we effectively put in place performance management regime(s), involving key stakeholders, to monitor improvements or otherwise on Healthcare Associated Infections (HAIs)?*"

The group discussing this question first asked a question and that was, what exactly are we trying to measure? How do we measure performance of HAIs avoidance practices? The group felt that there is a need to develop metrics to measure performance along the control of HAIs in healthcare facilities in Qatar. Development of these metrics will also lead to the development of benchmarks. These metrics and benchmarks can then be embedded in the processes of facilities management in these healthcare facilities in Qatar. Once these metrics and benchmarks are embedded in the processes then it will become part of normal practices and day to day operations in the healthcare sector in Qatar. Any mandates or decrees from the government will be helpful to improve the uptake of these practices.

The fourth question was "*Are any of the functional/process related requirements incorporated in design and construction of hospitals in Qatar? And how?*"

This question was posed to all the three groups. The responses highlighted a range of issues. The delegates felt that the master plan of medical city for 2020 and 2030 does not take into account the research that exists globally on healing environment and HAIs. There are some British and American standards but there are no local standards that touch upon these issues but given that the climatic and operating conditions in Qatar are significantly different there need to be some local standards. There is a need for different government bodies to come together and agree on a unified standard for HAIs and healing environments. There should be a steering committee that should be setup which should include these departments, facilities managers, clinicians, and international experts. This committee can look at developing standards that could be incorporated in hospital designs in Qatar. Given the scale of this undertaking, significant funding and support from the government will be beneficial. A wider level of dissemination and raising of awareness is also needed to make a case for incorporation of this new body of knowledge in hospital designs. Universities locally can play a key role in it by incorporating some of this knowledge into their curriculum.

The fifth question was "*How can guidelines such as GSAS incorporate these in hospital accreditation?*"

All the delegates at the workshop were familiar with the GSAS guidelines. They felt that GSAS does a very good job of incorporating issues related to building design, construction and post occupancy performance. One thing that is overlooked is the occupant performance. There is nothing in GSAS that looks at occupant performance, in case of healthcare sector GSAS there is nothing that addresses the performance of staff or the patients in healthcare facilities. This indeed is a major issue, given all the new knowledge that exists in the areas of healing environments and HAIs, it would be appropriate to have these issues incorporated into GSAS. The current GSAS addresses the environmental and the related economic aspects of sustainability quite well, what it needs to incorporate are the social aspects of sustainability into these guidelines and make them more comprehensive. This will ensure that getting a GSAS certification does not remain a building design focused initiative but it becomes a wider initiative that involves occupant performance. This should also be something that is monitored and modified during the life of the building.

5. Discussion

The workshop was able to shed light on some very important issues that need to be considered while compiling the research agenda for the future. The first issue was the lack of effective knowledge sharing between clinical and non-clinical staff in the healthcare facilities. This impacts negatively on the fight to reduce HAIs in the UK (Liyanage and Egbu, 2008). It seems this issue is relevant

to Qatar as well. There needs to be a concurrent engineering based approach towards addressing this. Multi-disciplinary teams need to come together right from the conception stage of these facilities. They need to be actively involved in contract and should contribute to terms and conditions put forward in these contracts.

There is a clear need to have a concerted effort in trying to spearhead knowledge sharing and knowledge management in this area. Agencies such as GORD could play a vital role in compiling and disseminating industry best practices. They could also use these best practices to develop accreditation standards that could benefit not only Qatar but the whole region. This would be one of the first such accreditation standards if developed and could make Qatar a world leader in the area of knowledge management for improved healing environment in the healthcare sector. There is a strong role that existing professional bodies can play. The role of the Qatari government could be invaluable in funding and overseeing such an initiative. This initiative will lead to probably a new area of research and practice which could be classified as medical planning.

There is a complete lack of performance standards in this area. Development of performance standards and associated metrics can bring more tangibility to this process. This will be a good way to change the processes and systems as measuring the impact of collaboration between clinical and non-clinical staff will become possible. There is a view that anything that can be measured is easy to monitor and improve. This is similar to the findings of the research by Liyanage and Egbu (2008) for the UK. It seems this issue is quite global in nature and independent of country; there is generally a lack of such performance metrics in the healthcare sector.

The existing green building guidelines such as GSAS only seemingly address building design, construction and performance issues. What they miss is the occupant performance based issues. There is a need to change the focus of building design, and green building guidelines on occupants as well. This issue has been highlighted by Turner and Arif (2012) as well, and there is a significant gap in the existing green building guidelines globally.

There is quite a sizeable body of knowledge that looks at different issues in relation to the healing environment. The choice of colour of walls, carpets, curtains, acoustics, layout, furniture, landscaping, signage and other interior features can have a significant impact on patient healing. A range of articles in this area have been published and some of them are presented in the literature review of this paper. However, the authors of the current paper argue for the need to incorporate these features into the green building guidelines such as GSAS. The current green building guidelines primarily focus on the environmental and economic aspects of sustainability. One dimension that often gets ignored is the social dimension. Performance and well being of the occupants of the buildings could be classified under the social dimension of sustainability. In order to improve occupants' performance we also need to develop performance standards and metrics to measure the occupants' performance. To truly represent sustainability agenda green building guidelines, such as GSAS, need to incorporate the social dimension of sustainability in them.

Fig. 2 summarises the research agenda for Qatar in the area of healthcare facilities design. The whole agenda could be classified under the heading of healing environment. There will be the first strand which could address important issues pertaining to HAIs such as knowledge management, performance management, concurrent engineering, and communication leading to a new discipline of medical planning. The second area of research is the GSAS green building guidelines. These guidelines can incorporate interior facilities layout and design issues creating a better healing environment for the patients. The third area needs to look at occupants' performance and productivity. This area could consider building design features that lead to better productivity of staff and faster recovery of patients. There is a link between this performance management and that of performance management of facilities management activities in the first strand of research. More needs to be

Fig. 2. Research agenda for Qatar.

done to explore the synergies between these strands of performance management.

6. Conclusions

The purpose of this paper was to compile the research agenda for the Qatari healthcare sector to create a better healing environment by incorporating additional post-occupancy considerations in building design. The authors of this paper conducted a workshop in Doha, Qatar and used the feedback from experienced professionals to compile these areas of research. The three major areas that were identified were HAIs, GSAS green building guidelines, and occupants' performance. These areas need to be explored further. Each of these areas has sub-areas that have been identified. The findings of this paper will help guide researchers in the future and will lead to an improved healing environment in Qatari healthcare facilities.

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