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Knowledge Management in the Control of Healthcare Associated Infections in Facilities Management Services in Hospitals - its Practices and Challenges

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The paper reports on a research project which focuses on the control of Healthcare Associated Infections (HAI) in facilities management (FM) services (specifically domestic services). The main aim of this paper is to provide a detailed discussion on some of the findings of the research, which relates to knowledge management (KM). The findings are based on a case study and a questionnaire survey carried out during the mid-stages of the research. The paper discusses the practices of KM adopted by the domestic services in the control of HAI. It was identified that there are some challenges in domestic services that inhibit practices of KM, and the paper discusses this in detail. Finally, several recommendations are made to improve effective KM practices in the control of HAI; for example, there is a great need to improve Information Technology (IT) facilities in FM services in hospitals. Even if knowledge is captured (e.g. through expert groups) and stored (e.g. in the NHS e-library), getting the staff to utilise this stored knowledge is a challenge due to the lack of IT facilities. With this comes further challenges; for instance, the electronic documents are stagnated because staff are either unaware of or cannot access the involved technology.

Keywords: challenges, domestic services, healthcare associated infections, Information Technology (IT), knowledge management (KM).

INTRODUCTION

The research study on which the paper is based specifically focuses on Healthcare Associated Infection (HAI) in domestic services. HAI by definition means “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 healthcare facility” (Scottish Executive Health Department, 2002). Healthcare Associated Infection (HAI) is a major cause of morbidity and mortality. There is a growing recognition that Facilities Management (FM) services have a dominant role in the control of HAI. Based on the findings of a thorough review of literature and twenty-five informal interviews carried out during the initial stages of the research with key experts in the National Health Service (NHS), a conceptual framework was developed. The conceptual framework highlighted four significant areas to be considered in the control of HAI in FM, one of which being Knowledge Management (KM). Therefore the aim of this paper is to present some findings which relate to KM. The findings are mainly based on a case study approach, and these have been corroborated with the findings of a questionnaire survey. Domestic services were specifically chosen herein for the study out of the FM services. The study primarily focuses on the context of the National Health Service (NHS) in the UK, but particular attention is given to the NHS in Scotland.

THE RESEARCH PROCESS

THE CASE STUDY APPROACH

For the purpose of this study, four categories of domestic service provisions were identified as shown in Figure 1.

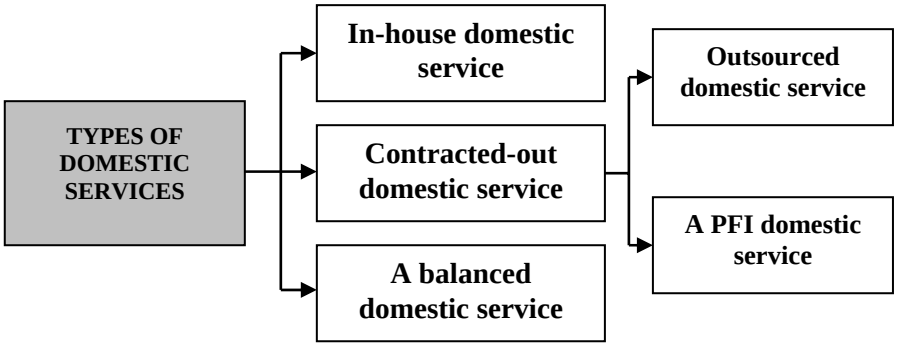

Fig. 1: Types of domestic services (Adapted from NHS Estates, 1998).

Using the above classifications, two different types of domestic services were chosen for the case study. These are the "In-house domestic service" and the "Private Finance Initiative (PFI)" domestic service categories. For ease of reference the two case studies are coded as '*In-house case*' and '*PFI case*' in this study. As the name implies, the *In-house case* is managed by an internal team that is part of the hospital management. The *PFI case* is a domestic service which is managed through a Private Finance Initiative.

Semi-structured interviews were used as the mode of data collection. Respondents were chosen from domestic managers, infection control team members, ward nurses/matrons and staff members. Altogether 26 interviews were conducted across the two cases and the collected data were analysed using content analysis.

THE QUESTIONNAIRE SURVEY

Findings gleaned from the 26 interviews prompted the need to further investigate some of the issues regarding the control of HAI in domestic services. A questionnaire survey was therefore carried out as the next step of the research study. All four different types of domestic services discussed above (refer to Figure 1) were chosen for the questionnaire survey, i.e. in-house, out-sourced, PFI and the balanced approach (a mix of in-house and contracted-out domestic service). The target population of the questionnaire survey was limited to only domestic managers and infection control team members across England and Scotland.

A total of 412 completed questionnaires were received out of the 1304 sent out, giving an overall response rate of 31.60%. The response rate of this survey appears to be fairly satisfactory.

The data collected from the survey were analysed using SPSS (Statistical Package for Social Sciences) version 12.0.1. The types of data gathered from the questionnaire survey were ordinal and nominal. Both descriptive and inferential statistical methods were used to analyse the data.

PRACTICES OF KM - CASE STUDY FINDINGS

At the start of the interviews, most of the interviewees were not familiar with the term 'knowledge management'. After explaining the meaning of 'knowledge management',

the majority of them believed that their organisations adopt at least a few practices of KM. Overall, nine practices of KM were identified from the case study findings.

1. **Training and education programmes**
   The In-house case conducts an array of training and education programmes ranging from management training to staff training, namely: induction training, special control of HAI training, and training and education programmes organised by Higher and Further Education Institutions (e.g. NHS Education Scotland training, Scottish Vocational Qualifications, etc.). All of these training and education programmes are well-planned and organised. Some of them are mandatory for staff, while some of them are for good practices. Staff of the PFI case, on the other hand, undergo only two types of training and education programmes: induction training and on-the-job training. However, it was revealed that none of these cover issues associated with the control of HAI.

2. **Learning from books/ manuals**
   Both cases have reference libraries for staff. In the In-house case, copies of books/manuals are also kept in the assistant domestic manager's office, where all the domestic supervisors and staff have easy access.

3. **Sharing ideas and learning from each other**
   The PFI case participants have contradictory views on knowledge sharing. Some believe that knowledge sharing occurs between them and the other teams, whilst some believe otherwise. For example, the domestic supervisors from the PFI case noted that the domestic team has a good relationship with the nursing team and are therefore continuously learning from each other. On the other hand, two of the staff members from the PFI case claimed that the nurses tend to consider themselves as superior, thus creating barriers for knowledge sharing between them. The situation in the In-house case, however, appears different to this. The nurses and infection control team members seem to be very supportive towards the domestic team.

4. **Mentoring**
   The NHS in Scotland and the NHS Education Scotland have introduced a Cleanliness Champions programme, which was initially instigated through a Ministerial action plan in 2003. Most of the case study participants considered this as an essential change in health services. One of the salient features of this programme is that it selects staff from a range of areas from clinical and FM. These staff members are then given a new role as 'cleanliness champions'. The cleanliness champions are, ultimately, performing as 'knowledge workers' to develop their skills as well as to act as role models to support the other staff members who work in similar areas.

5. **Meetings**
   The domestic team and the infection control team in the In-house case meet every so often to discuss issues relating to the control of HAI. In contrast, it was revealed that the two teams in the PFI case do not have any meetings between them.

6. **Seminars/ conferences**
   Most of the staff get the opportunity to attend the seminars and conferences organised co-jointly by the NHS in Scotland and the Property and Environment Forum Executive (PEFEx), Scotland. These seminars and the conferences not only help the staff to widen their knowledge, but also allow them to meet with other professionals/staff from hospitals across the NHS (both England and Scotland).

7. **Information technology**
   It was revealed during the case studies that the role of IT has not been fully exploited in domestic services. Even though there is a plethora of web-based knowledge available for the control of HAI, at the time of the case study interviews only a few domestic managers had computer facilities and access to the internet. Most of the case study participants believed that the domestic supervisors should at least have computer facilities to access information via the internet. A lack of computer literacy in managers and issues surrounding quality of information over the internet, have also restricted their use of IT.

8. **Expert groups**
   Some of the In-house case participants were members of the HAI Task Force groups formed by the NHS in Scotland. The Task Force groups are multi-disciplinary groups that consist of experts who are specialised in particular areas of concern and are assigned to govern the issue of HAI. The main outcomes of the Task Force groups are documents which discuss the issues surrounding the area of HAI and probable solutions.

9. **Hiring external consultants**
   As the name implies, the In-house case is managed and operated by an in-house service provision. Therefore the In-house case managers consider the hiring of external consultants as a vital practice of KM. The idea here is to acquire new knowledge in order to improve their service further.

CHALLENGES OF KM

It was identified in the previous section that the two case studies conducted for this research are adopting some of the practices of KM; although these practices are implicit and not necessarily known as KM. Most of the practices are related to knowledge sharing and dissemination. It was apparent that the role of KM in domestic services is limited and as yet has not been fully exploited.

The following section introduces some challenges identified from the case studies. These were then corroborated with the findings of the questionnaire survey.

CASE STUDY FINDINGS

The following can be considered as the challenges that impede the practices of KM in the control of HAI in domestic services:

- **Organisational structure**
  The organisational structures of the In-house case and the PFI case are hierarchical and complex respectively. It was understood from the findings that in both the In-house and PFI cases, organisational structures have not forged any relationship between essential units of the respective hospitals in order to create links with each other.

- **Poor working relationships and communication between the domestic and clinical teams**
  It was evident from that there is a clear rift between the domestic and clinical teams (especially with the infection control team) in the PFI case.

- **High workload**
  The staff members and domestic supervisors, in both cases, have to cover a large workload due to high sickness absence and a high turnover rate of staff. This has obstructed organisational learning and development.

- **Lack of IT facilities**
  The domestic managers are using the know-how of staff/managers for effective sharing of knowledge. However, they have not begun to focus their interest in KM in a more systematic and a formal manner. The main reason for this is the issue of technology – mainly the unavailability and the level of use of Information Technology (IT).

- **Lack of guidance from infection control team members**
  Two domestic managers and two domestic supervisors affirmed that, at present, there is a lack of guidance from the infection control team members on issues to do with the control of HAI in their domestic service.

- **Lack of motivation of staff members**
  It is a known fact that staff should be encouraged and motivated to acquire extra experience and learn new things in order to widen their knowledge and improve their performance. Some staff members in the PFI case, however, averred that the PFI contractor does not have any motivation schemes for staff members. This has resulted in staff stagnating in the same role and earning the same wage over a long period of time.

- **Cost of training and education**
  Budget limitations are one of the major challenges faced by the In-house case; therefore most of the essential training and education programmes are being provided only for a limited number of staff on a need basis.

- **Employee retention**
  Poorer retention of staff members due to an array of issues such as job security, low salaries and wages, and so forth has also become a challenge for the domestic services.

- **Lack of understanding of control of HAI goals**
  One of the infection control team members from the PFI case suggested that the PFI consortium and PFI contractor's lack of understanding of control of HAI goals has resulted in ineffective practices of control of HAI in the PFI case.

- **Absence of a learning culture**
  Both the In-house and PFI cases have reference libraries in their hospitals where staff members have direct access to books and manuals. However, it was revealed that members of staff do not use the reference libraries. As one of the infection control team members of the PFI case noted:

"During their (staff) 4 or 6 hours of work, the staff members have to cover many areas of cleaning… even if they have time I don't think they will go to the reference library to read books. It's a learning culture, the staff should be trained to do that or the managers should encourage them to do it."

QUESTIONNAIRE SURVEY FINDINGS

Boocock (2004), in his presentation on "Opportunities, challenges and winning ways" during a conference on HAI control and prevention in 2004, highlighted budget constraints, work pressures and human factors as elements which hamper the effective management of knowledge. Besides which, findings of an Infection Control IT Implementation and Evaluation Project, carried out by the Department of Health, have recognised the lack of availability of computers as a major limitation to implementing an 'infection control software' in the NHS Trusts (Department of Health, 2004c).
Setting up training and education programmes seem to be very significant in developing the knowledge and skills of staff and in supporting support their career progression (Government of Ontario – Canada, 2003; Department of Health 2004a, 2004b). However, budget limitations applied to the whole of FM services appear to be limiting the number of training and education programmes implemented (Newton, 2003). A report by Ann Noble Architects (2003) highlights some further challenges of managing knowledge in the control of HAI. These include inconsistency of interaction between the FM and infection control team, and human resource issues such as poorly trained staff.

The case study findings discussed in the previous section also revealed some of the challenges of KM. Altogether seven challenges were identified for inclusion in the questionnaire survey:

1. Lack of IT facilities.
2. Poor integration between clinical (especially the infection control team) and domestic teams.
3. Human resource issues (e.g. high workload, lack of motivation, lack of empowerment, employee retention).
4. A hierarchical organisational structure.
5. Lack of understanding of control of HAI goals.
6. High cost of training and education programmes.
7. Absence of a learning culture.

The overall mean score of the responses was then taken to identify the main challenges out of the above. These mean scores were ranked (refer to table 1), with 1, being of the greatest challenge.

Table 1: Challenges of KM – descriptive statistics.

	Overall mean score	***Rank***
Poor integration between teams	2.01	***1***
HR issues	2.76	***2***
High cost of training and education programmes	2.81	***3***
Lack of IT facilities	3.23	***4***
Absence of a learning culture	3.45	***5***
Lack of understanding of HAI goals	3.47	***6***
Hierarchical org. structure	3.87	***7***
Valid N (listwise)		

Scale of scoring: **1** (Very High Level), **2** (High Level), **3** (Low level), **4** (Very Low Level), **5** (Not Applicable)

Comparisons were then made between the groups to identify any variations in the questionnaire findings. The groups were categorised according to the region (i.e.

England and Scotland), job title of the respondents (i.e. domestic managers and infection control team members) and type of domestic service provision (i.e. In-house, balanced approach, totally outsourced and PFI).

The ranks of the aforementioned comparisons appear to be, moreover, similar to the findings displayed in Table 1, with only few exceptions. Taking all these into consideration, the following were identified as the main challenges which could negatively impact on KM:

1. Poor integration between domestic and clinical teams.
2. HR issues.
3. High cost of training and education programmes.

Apart from these three, all the other challenges obtained mean scores of greater than 3 (i.e. a low level of challenge presented to KM) or, at times, even greater than 4 (i.e. a very low level of challenge presented to KM). Hierarchical organisational structure, without a doubt, was the least of the challenges.

DISCUSSIONS, IMPLICATIONS AND INFERENCES

According to the case study findings, most of the participants believe that they adopt at least few KM practices, most of which are related to knowledge sharing and dissemination. Training and education seem to be the most common practice of KM in the two cases. Informal interviews carried out during the first stage of the research study also revealed similar findings. Training programmes conducted by the two cases included formal (e.g. induction training) and informal training (e.g. on-the-job training). The high cost of formal training programmes, however, seems to be one of the main three challenges of KM. Budget limitations applied to the domestic services and high staff turnover further hamper this. The latter, together with other HR issues, appear to be a challenge of KM in the control of HAI. HR issues also need to be given due consideration if training and education issues are to be resolved, as one could impact on the other (N.B. even though the two were taken as separate issues for the purpose of this study, in general, training and education is part of human resource management - HRM). For example, in the national training and education framework developed for staff members by the Property and Environment Forum (2005), the Forum supposes that the nature of the domestic role and workforce issues such as rapid staff turnover, variable shifts, staff working outside normal day shift hours and so forth, provide unique challenges to training and education programmes. The House of Lords Science and Technology Committee (1998) further asserts this issue, highlighting in particular the case of contracted-out domestic services. As the committee observed, it is extremely difficult to ensure training of contract cleaners (i.e. staff members in contracted-out domestic services). They are also of the view that although training requirements may be written into the contract, this is often cut due to cost/ profit margins (House of Lords, 1998). No matter what, domestic practices will always form part of the hospital-wide control of HAI programmes. Therefore it is imperative that staff members gain knowledge on the control of HAI and apply this in their day-to-day cleaning practices. If resource constraints such as budget limitations restrict this, the domestic managers could promote informal training as an established practice of KM. This would encourage the development of new knowledge or skills in workers. In addition, it would allow the transfer of work experiences between new and experienced workers (Baird, Deacon and Holland, 2000). While some of these practices, such as on-the-job training, have been used for several years, their continued use emphasises the importance of transferring and sharing knowledge in the workplace (Earl, 2002).

From the case study findings, the infection control team members from the PFI case claimed that there is no knowledge sharing between them and the domestic team. As

the questionnaire survey findings revealed, the lack of effective integration between the domestic team and the infection control team is undoubtedly the biggest challenge of KM. One of the questionnaire survey respondents noted that:

"No matter what, NHS is a common place where you always get breakdown of human communication".

Therefore this has not only has created poor working relationships but also has inhibited good practices of KM. Disseminating good specialist knowledge and involving infection control team members in domestic services reduces the risk of HAI (Health Building Note 30 - NHS Estates, 2001). The infection control team can provide the necessary support and expertise for the domestic teams on the control of HAI. In fact, this is a two way process where infection control team members could also gain knowledge on FM.

Knowledge has long been recognised as 'power' and pundits are persuaded that this 'power' intensifies when it is shared (Stehr, 2001). As mentioned in the previous paragraphs, the poor level of integration is a major issue in the control of HAI in domestic services. Obviously, this has also resulted in less knowledge being shared. Many experts argue that even though initiatives exist for promoting KM in the NHS, knowledge sharing need to become more ingrained amongst healthcare professionals (Parliamentary Office of Science and Technology, 2005), and even amongst staff (i.e. staff members and nurses). Neo (2002; Earl, 2002), in a study of knowledge sharing practices in a Singapore news company, found that cultural factors have a significant impact on an individual's decision to share or hoard knowledge. His study revealed that lack of motivation, management support, trust and teamwork spirit were considered as major barriers to knowledge sharing. It was also observed that the 'knowledge is power' mentality was hindering the promotion of a knowledge sharing culture in the company. Thus it is apparent that changing the behaviour of domestic teams and clinical teams, and establishing a 'culture of friendliness/togetherness' amongst them will improve the situation. Policies in the control of HAI may, therefore, need to focus on ensuring the implementation of KM initiatives and innovative education and training programmes. Incentives and reward mechanisms can also be considered as favourable components of organisational culture for creating knowledge friendly environments (Neo, 2002; as cited by Earl, 2002).

Likewise, if many of the challenges of KM were resolved then significant benefits could emerge for domestic services in the control of HAI. Robust KM practices lead to the development of service intensity, better quality of work and culture, uniformity of processes across an organisation, shortening of product life cycles and the removal of redundant processes. This in turn leads to faster services, better employee retention, valuable knowledge asset creation, innovation and idea generation, reduced costs and the effective delivery of organisational goals to employees (Sonalina, 2004).

CONCLUSIONS AND RECOMMENDATIONS

Today more than ever, knowledge matters (Baird, Deacon and Holland, 2000). New terms related to knowledge are creeping into everyday vocabulary. There is the idea of a knowledge-based economy and knowledge-based industries (Organisation for Economic Corporation and Development, 1999). We have knowledge workers; academics study knowledge-based enterprises; firms and organisations are concerned about knowledge loss (Cross and Baird, 2000). Understanding how and whether domestic services are actively applying knowledge management in the control of HAI, in the present context, was one of the objectives of this research study. This was mainly conducted using a case study approach. From the case study findings it was initially understood that many of the participants were unaware of the term 'knowledge

management', even though they were managing some aspects of knowledge in their day-to-day practices. Overall, the participants identified nine practices of KM. Further investigations revealed some of the challenges that negatively impact on the role of KM in the control of HAI.

Most of the practices of KM adopted by the case study participants are related to knowledge sharing and dissemination. It was also revealed that the role of KM is not fully exploited in the domestic services in the control of HAI. One of the main reasons for this is the limited use of Information Technology (IT).

Finally, it is imperative for healthcare managers to take the necessary steps to overcome the aforementioned challenges. For example, make an attempt to provide education and training which is flexible, readily accessible, consistent, quality assured and that fits the needs of this workforce.

Considering the discussions above, the following recommendations can be made:

- Every attempt should be made to ensure that collective effort is taken by the domestic teams and clinical teams in the control of HAI. They should maintain good relationships and communication with each other.

- A national training and education framework for domestic teams should be developed in order to enable them to carry out their work to the highest standard. Herein, particular emphasis should be given to training staff members. This will enable the domestic managers to recognise the staff members' existing skills and identify where more training is needed.

- The aforementioned training framework should provide measures so as to address issues relating to budget limitations and issues relating to the workforce (high staff turnover, etc.).

- The NHS Trusts/healthcare managers should ensure that sufficient IT facilities are provided, at least for all the domestic managers and domestic supervisors. They should also be given appropriate IT training.

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