APPLICATION OF INFORMATION TECHNOLOGY
by Blood Banking and Transfusion Facilities
in Ghana

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ABSTRACT

INTRODUCTION

Information technology (IT) is fast developing and used by health facilities to improve efficiency and quality of health care. It is well known that IT can play a major role in the achievement of health sector objectives and the Millennium Development Goals. Despite the use of IT by public service providers in Ghana and its numerous advantage, there is a paucity of information on the level of application of IT by health facilities that provide blood banking services, not only in Ghana but across Africa.

OBJECTIVES

This study was designed to explore the level of application of IT by facilities that provide blood banking services in the Greater Accra Region of Ghana and to identify the challenges that come with its usage.

STUDY DESIGN AND METHODS

An observational study of 13 health facilities involved in the collection, processing and/or storage and usage of blood and blood products was carried out in the Greater Accra Region of Ghana. A semi-structured questionnaire was designed to capture information about the current usage of IT in these facilities. Data was collected between June and August 2012 through the administration of questionnaire. Data was entered into EpiData 3.1 and analyzed with Stata 12.

RESULTS

Out of the 13 facilities surveyed, 77% and 92% did not use computers and computer applications respectively, in their activities even though 75% of their staff had basic IT knowledge. Only 22% of computers used by these facilities were dedicated to blood banking activities. Majority (85%) of the facilities indicated lack of computers, blood banking applications and IT training as their major challenges with the use of IT.

DISCUSSION AND CONCLUSIONS

There is minimal use of IT for blood banking in the Greater Accra Region of Ghana. Major challenges with the use of IT for blood banking are lack of computers, computer programs and IT training. User knowledge and interest will not be a limiting factor in an effort to improve the use of IT for the provision of blood transfusion services in the Greater Accra Region.

INTRODUCTION / BACKGROUND

Information technology (IT) can be described as a 'combination of hardware, software, office, and telecommunications equipment that transform raw data into useful information for speedy retrieval'.[1] It is applied in various forms by organizations to facilitate work and plays an important role in effective management.[2] In medicine, IT is used by health facilities to improve efficiency and assist in the documentation and communication of their processes and findings.[3,4] It improves productivity as well as quality of health care.[5] Blood banking and transfusion service involves the collection, processing, storage, distribution and transfusion of blood and blood products to improve health or save lives[6–8].

Even though blood is a life saver, there are life-threatening risks related to blood transfusion[9–11] and as such the use of blood and blood products has to be controlled and properly monitored. In the same vein, the accompanying documents of all the processes from collection to transfusion must be kept appropriately.[12] Information technology is employed in blood banking facilities to simplify these activities, which includes documentation. IT can play a major role in the achievement of health sector goals. It can also help improve the range of activities of health professionals to minimize the effect of their low numbers[13] and improve the quality and efficiency of health care delivery by supporting the management of emergencies as well as blood banking.[14]

Despite the use of IT by public service providers in Ghana[15] and its numerous advantages,[16,17] the level of application of IT by health facilities that provide blood banking services in Ghana is unknown. This study was designed to explore the application of IT by facilities providing blood banking services in the Greater Accra region of Ghana and to identify challenges that come with its usage.

MATERIALS AND METHODS

Study Design
This was an observational study carried out in the Greater Accra Region one of the ten regions in Ghana as well as the capital. Accra is the capital town of this region. The study included only hospital blood banks (HBBs) involved in the collection, storage, processing and usage of blood and blood products within the region. Ethical clearance was sought from the Committee on Human Research, Publications and Ethics; Komfo Anokye Teaching Hospital (KATH). The study design ensured that data collected remained confidential, neither the names of the respondents nor that of their facilities were recorded.

Data collection
Between June 2012 and August 2012; a semi-structured questionnaire was administered to facilities that met the inclusion criteria to collect data on their current usage of information technology after the necessary permissions and consents were given.
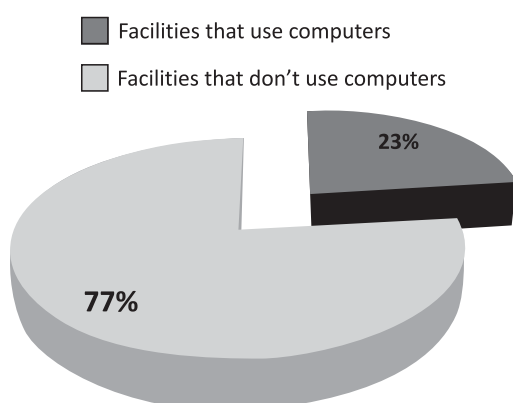
Statistical analysis
After collection, data was entered into a database on EpiData 3.1. The stored data was checked for inconsistencies and errors were cleaned when identified. The data was then imported into Stata 12 for analysis. Tables, Graphs and Charts were created with Microsoft Excel 2010.
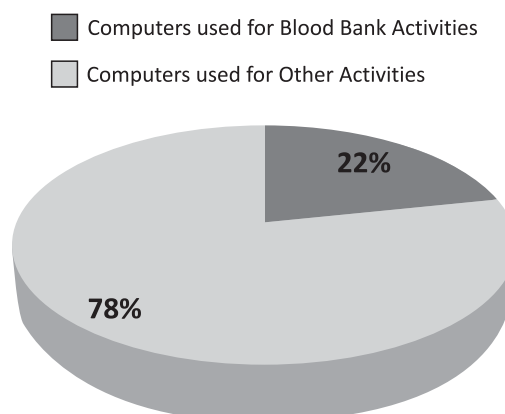
RESULTS

Questionnaires were distributed to the fifteen (15) facilities within the Greater Accra region that met the inclusion criteria; thirteen (13) were completed and returned, giving a response rate of 86.67%. The use of IT for blood banking activities by the facilities ranged from no use to minimal use. Ten (77%) facilities indicated that they do not use computers in their blood banking activities as against three (23%), that use computers in their blood banking activities, depicted in Figure 1.

FIGURE 1: Percentage of facilities that use computers in their blood banking activities

Facilities that use computers
Facilities that don't use computers

Out of the thirteen sites studied, information technology was used for blood banking by three (23.1%) and only one (7.7%) facility used a blood banking computer software for managing information on its activities. There were a total of forty-six computers being used at the study sites, out of which only ten (22%) were dedicated to blood banking activities.

FIGURE 2: Percentage of computers used in blood banking and other activities by blood banking facilities

Computers used for Blood Bank Activities
Computers used for Other Activities

Out of the total number of 157 workers involved in blood banking at these sites, 75.2% had prior basic knowledge of information technology before employment while 3% of them were undergoing some form of IT training. The number of workers with basic IT knowledge i.e. able to operate a computer is indicated in Table 1 below.

TABLE 1: Number of workers involved in blood banking in the Greater Accra Region, those with basic knowledge in information technology and those undergoing IT training.

Category	Number	Percentage (%)
Number of workers	157	100%
Number of workers with basic IT knowledge	118	75.2%
Number of workers ubdergoing IT training	5	3.2%

Lack of IT resources was the main challenge faced by 84.6% of facilities involved in the study, followed by 'lack of IT trained personnel' indicated by 38.5% of the facilities. It was also noticed that lack of interest in IT both by workers and management of the facilities were at minimal levels at 7.7% and 15.4% respectively.

TABLE 2: Challenges with the use of IT by blood banking facilities in the Greater Accra Region

Challenges	Number	Percentage (%)
Lack of IT resources (computer and computer programs)	11	84.6%
Lack of IT trained personnel	5	38.5%
Workers low interest in IT	1	7.7%
Management's low interest in IT	2	15.4%

TABLE 3: IT needs of blood banking facilities in the Greater Accra Region

IT Needs	Number	Percentage (%)
IT resources (computers)	11	84.6
IT resources (blood banking software)	11	84.6
IT training for workers	11	84.6

Eleven of the facilities indicated that they need computers and blood banking software to facilitate their usage of information technology. Training in IT for their workers was reported by 84.6% of the facilities as their need to successfully use IT in their activities.

DISCUSSION

From the study, 23% of the facilities used IT in their blood banking activities and procedures. This is less than the figure reported from a survey in Brunei, where 51% of organizations used information technology in the running of their businesses either most of the time or occasionally.[18,19]

Only 22% of IT resources such as computers used by the facilities in this study were for blood banking activities compared to 78% used for other activities within the same facility. The percentage of computers used for supporting blood banking activities in these facilities is about half the level found in a study on computer usage in the Ghanaian public sector, which indicated that 43% of both government ministries and public sector organizations have computer systems for their activities.[20]

As far as the IT knowledge level of the workers were concerned, though literature suggests that computer literacy has a significant effect on the use of information technology.[21–24] This study shows that majority (75.2%) of workers these facilities had prior basic knowledge in using a computer, however, this number of computer literate workers had no effect on the rate of IT use. This supports the findings of a study by Seyal et al (2000) which indicated that computer experience does not contribute towards the use of information technology.[18]

One of the major factors that contribute positively to the use of IT is computer training. This is evident in the findings of previous studies which concluded that computer training was very significant in the use of information technology by business organizations.[18,25] Even though the study did not address how the workers with prior IT knowledge acquired their knowledge and the various forms of IT training given to the workers, it identified that only five (3.2%) of them were undergoing some form of IT training. This number is not encouraging considering the outcomes of prior studies which concluded that the attitude people show towards the use of information technology can be influenced by training to give a better insight into IT and its importance.[22,26]

Eleven (84.6%) of the facilities involved in the study stated that their major challenge with the use of IT in their work was lack of resources. The same percentage of the facilities indicated that they need computers, software and IT training for personnel to boost the use of IT in the provision of service. This supports statements made by a number of stakeholders in the health industry on lack of investments and resources hindering the application of information technology in providing and impacting positively on health delivery in Ghana.[14,27] Availability of IT resources is an important issue that needs to be given a greater level of attention in Ghana.

One (7.7%) and two (15.4%) of the facilities indicated workers' and management's interest respectively as their challenge in the use of information technology. Twelve (92.3%) and eleven (84.6%) of the facilities indicated that their workers and management respectively are interested in using IT to support their services. This is quite significant and similar to a finding of a study by Sayal et al which indicated that the more involvement of top management leads to more successful use of IT in businesses.[18]

CONCLUSION

This study ascertained the amount of information technology used by facilities that provide blood banking services in the Greater Accra region of Ghana. One of the major findings is that most of the facilities do not use IT to support their blood banking activities including the management of records.

Majority of the workers in the facilities had knowledge in operating computers which should facilitate the use of information technology by the facilities. However the minimal use of IT may be attributed to the unavailability of IT resources for blood banking and in-house IT training for the workers.

The study also identified challenges associated with the use of information technology by facilities that provide blood banking services in the Greater Accra Region. These included lack of IT resources and training. The study also concluded that user knowledge and interest will not be a limiting factor in an effort to improve the use of IT for the provision of blood transfusion services in the Greater Accra Region.

We recommend that managers of blood banking facilities should explore ways to adopt IT in the provision of services by providing adequate computers and computer programs (blood banking softwares) to help them manage the heavy load of paper work associated with blood banking as well as simplify their record keeping procedures. In addition, in-service trainings in information technology should be instituted for workers involved in blood banking to equip them with the appropriate skills for them to harness the numerous benefits if IT in running their respective blood banking facilities.

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