

## ABSTRACT

“Equipment Availability” is an increasingly important performance indicator in both fields of clinical engineering and material management. It is considered as one of the determinants of overall equipment effectiveness. It describes the percentage of readiness of equipment for use. This study attempted to find the degree of equipment availability of different categories of medical equipment in selected departments of Base Hospitals of the Western Province in Sri Lanka and factors affecting it.

There are different classifications of “Equipment Availability”; hence, it was operationalized in terms of “Operational Availability” which is supposed to be determined by all sources of downtime; due to administrative, logistic and maintenance shutdowns. It was intended to find out the degree of maintenance support, logistic support and operator personnel support with the operational availability. These support considerations are viewed as elements of integrated logistic support and constituted the theoretical framework of the study. The study variables were; preventive maintenance support, corrective maintenance support, supply support, facilities, staff availability and training and skill support.

Seven equipment categories were selected from five departments of four Base Hospitals for the purpose of study. Usable and serviceable quantity of equipment belonged to these categories made the study sample. Data was collected using a closed type questionnaire, observation checklist and focus group discussions with the operator staff. Observations were carried out at the level of operation for period of sixty days starting from 3<sup>rd</sup> July 2007 to 31<sup>st</sup> of August 2007, in order to capture downtime of each equipment. Collected data was analyzed using SPSS computer package.

Operational availability of equipment was revealed as 57%. This figure seemed to be above that of the developing countries. There was no significant difference of operational availability among each hospital of the province; however, different equipment categories showed wide variation of operational availability. Twenty five out of eighty five pieces of equipment were not ready for use at all, through out the period of study. Operational availability figures were seen clustered at both ends of a continuum. Technical faults

accounted for most of the downtime (77%). Lack of facilities and Lack of consumables accounted for 7% of downtime each.

Planned shutdowns had not been observed during the period of study except for cleaning which had resulted in 3% of total downtime. With reference to preventive maintenance support, it was found that practice of periodic inspections, service agreement support and maintenance planning was low. Equipment which had higher preventive maintenance support showed higher operational availability and such association was statistically significant. ( $P=0.04$ )

With reference to corrective maintenance support, speedy fault reporting was observed but fault inspections were relatively late. Higher coordination of repair process and accuracy of repair was noticed. The time taken for repair was acceptable to 48% of the respondents. Assessment of “mean time taken for repair” and “mean time between failures” was not possible due to the limited period available for the study. A statistically significant association ( $p=0.00$ ) was noticed with overall corrective maintenance support and operational availability.

Availability of consumables and management support for supply process were estimated as satisfactory by majority of the respondents. Provision of space and infrastructure, power supply has been estimated as adequate for 76.5% of the equipment. There were no statistically proven associations found between supply support and facility support with the operational availability of equipment.

87.1% of the respondents had estimated that provision of staff as adequate. Substitute staffs were available for most of the equipment (74.2%). Majority of the respondents (69.5%) had perceived training was adequate. 78.8% of the staff had perceived skill was adequate to perform the required operation of equipment. However, there were no statistically significant associations found between staff availability or training and skill support with operational availability of equipment.