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Safety Audit of Health Care Facilities in Kashmir: A Case Study of SDH Sopore, Baramulla

Saima Akbar, University of Kashmir, India

Abstract

In general healthcare is the most important aspect of society and offer for curative services but at the same time are the most vulnerable and critical infrastructure towards multiple hazards like flood, earthquake, fires etc. Holistic vulnerability analysis of community hospitals will led to more robust disaster mitigation at local level, so we must make hospitals safe for the betterment of overall health during and after emergency

Keywords

Safety audit it, vulnerability, procurement, documentation.

Introduction;

There are multiple reasons for carrying out a safety audit. Most people would (quite correctly) state that it is a legal requirement, however it is arguably equally important to do so for moral and ethical reasons. It ensures that the systems you have in place are working efficiently and are fit for purpose. It also helps to identify areas for improvement and potential weaknesses within the organization. It usually highlights health and safety management failures as being the root of the cause. Overall, an audit demonstrates that the management is committed to the health and welfare, essential feature of successful health and safety management systems. Control systems weaken over time and need to be constantly reviewed, facilitates planned improvements to the safety management system, helps improve skills and identify weaknesses in human resources, demonstrates management commitment to employees, health and safety committee members and other stakeholders of employees, customers and all other stakeholders.

The population growth rate in the state has been consistently high. The population is expected to grow to 12031825 in 2015 and to 13809601 in 2025. Arising population decreases the ability of the state to save, as the dependency ratio is

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high. The rate of growth of the population has important implications for the health services. Increased number of hospital beds will be needed to maintain the same bed/1000population ratio. The demand for medical services depends on the age composition as well as the size of the population.

District and Sub-district hospitals must be strengthened. The infrastructure of the hospitals, buildings, Emergency Medical Services are essential part of healthcare. Functional Emergency Department (Casualty wards) should be set up at all the district hospitals. There is a need to streamline the functioning of the Out Patient Department's. Residential facilities to doctors should be provided at the district hospitals so that they remain available 24x7.The bed strength of the District hospitals has to be increased. Mental Health has been neglected for far too long. It needs our urgent attention. Birthing Centres at strategic locations must be provided to take care of mother and child. Doctors working in far flung areas should be given incentives like rural service allowances. Government must invest reasonably in imparting hands-on training to doctors and paramedics by arranging regular aggressive Continuous Medical Education Programmes both at district and state levels which will help them to enhance their knowledge and skills. Competencies of Health Professionals have to be continuously enhanced. Only proficient staff can provide quality care. Special attention must be given to the training of doctors and nurses in Critical care including Trauma management. All training programs (Symposia, Conferences, Workshops, Seminars) must fetch Credit Points to those who attend it. Earning of credit points should be made essential for professional growth of doctors. District Hospitals should be made a hub of health care activities and designated as teaching centres for doctors and nurses so far Internship and Residency programmes are concerned.

What is Safety Audit?

Safety Audit is an examination of the buildings/structures and relevant documents to ascertain how the buildings are being managed properly. In other words it is aimed to assess the building for compliance with the national building code of India, relevant Indian Standards and the legislations passed by various state governments and local bodies on prevention and life safety measures. Safety audit is a form of risk analysis and evaluation in which a systematic investigation is

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carried out in order to determine the extent to which the conditions are present that provide for the development and implementation of an effective and efficient safety policy. Also a Safety audit is an examination of the premises and relevant documents to ascertain how the premises are being managed with regards to safety. Safety audit is an effective tool for assessing safety standards of an organization or occupancy. Safety inspection helps to ensure that the owners and the occupiers of buildings are meeting their responsibilities under the legislation, that buildings are fitted with correct safety installations required by the safety standard, and that these safety installations are maintained in operational condition. Safety audit means verifying the existence and implementation of elements of safety and health system and for verifying the system's ability to achieved defined safety objectives, we can say safety Audit means verifying the existence and implementation of elements of safety and health system and verifying the system's ability to achieve defined safety objectives. Safety Audit is carried out by experts in the respective fields who examine management system, facilities and activities of the organization on safety aspects.

-Assess the prevailing hazards, the level of prevention, protection and emergency management.

-Preparedness and subsequently prepare a recommendation to upgrade safety inputs to avert mishaps and limit consequence

Figure. 1. Elements of Safety

Figure. 2: Audit Process

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How do we scope an audit?

There are three essential elements needed to evidence a successful audit. Firstly, you need to have the correct documentation in place; up-to-date Health and Safety policies, process documents, suitable arrangements for harmful substances etc.
Secondly are the interviews with managers and heads of departments. Auditors need to speak to these people at suitable times. These interviews ask "is it in place?" Finally, there is the evidence. Are the policies and processes being carried out? Here, the auditor will talk to the people on the 'shop floor' and find out the actual processes being carried out. In some cases, staff will actually be using better methods, so it is important to pick up on these, as well as identifying areas where processes are not being carried out. Of course, there are many elements to consider when planning an audit:

1.2 Significance of the study:

Safety audit of healthcare facilities is found to be an effective tool for assessing safety standards of an organization or occupancy. It helps the people to identify the areas for improvement and evolve an action plan. A comprehensive Healthcare safety audit is a structured and systematic examination of an organization or occupancy to identify the hazards from community. In other words, the healthcare safety audit is structured to check current adequacy of components, services and equipment's; make recommendations for the compliance with the existing building rules, regulations, codes and standards, and the requirement of providing a safe place for living or carry out commercial or industrial activities. It is presumed that a comprehensive Healthcare safety audit can cover various aspects which are related to design, operation and maintenance of the facilities. To save lives of occupants and buildings from damage in case of any disaster. To make buildings fire resistant. To make a comprehensive safety audit plan for effective management of healthcare facilities. Review of fire detection measures adopted and to suggest suitable improvement measures. Review of various active (fire hydrants, sprinkler and portable fire extinguisher) and passive fire protection requirements for chemical storage and handling areas and to suggest improvement as necessary.

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Review of fire alarm system. Review of safety awareness and safety training requirements (training identification and efficacy) of employees with respect to hazards present. To ensure that all the facilities have a consistent safety measure in place. It is also done to assess the level of preparedness regarding the incidents .In short, the healthcare sector plays an active part in disaster management, and is an integral part of the national health program and the promotion of public health. When disasters strike, hospitals are among the first units whose efficient and timely services can be crucial and decisive in reducing fatalities and rescuing the injured.

1.3 Objectives of the study:

- To analyze the overall safety of the study area.
- To identify common problems in the study area.
- To provide suitable recommendations regarding the safety of the study area.

1.4 Data Collection:

Keeping in view the objectives of the study, the data has been collected from both primary as well as secondary sources.

a, Primary Data: The primary data has been collected by surveys in different hospitals in order to ensure which healthcare facilities are existing there and what safety measures they possess so far for getting every facility. This remained a key factor while interacting with the officials about safety audit awareness that ensured how much capable they are to prevent buildings from fires.

In fact, a lot of things were observed in the survey from department to department about various fire safety equipments and their installation at proper places. Many of the departments under proper inspection have revealed that they are fire prone and have least fire safety measures that could not handle even a minor fire incident. The data which has been obtained is both qualitative and quantitative by conducting surveys in the selective departments through formal and informal interviews, discussions, observations with the occupants; data has been collected. Here, we understood about the type of characteristic, prior to the collection of data.

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In statistics, most of the analyses are conducted using this data. The tabular and diagrammatic presentation of data is also possible, in the form of charts, graphs, tables, etc. Further, the quantitative data can be classified as discrete or continuous data. The methods used for the collection of data are: Surveys, Experiments, Observation, questionnaire, schedule methods ,filed investigation and interviews etc

b, Secondary Data: This data is being collected from somebody else as it is considered a previous data. This data is usually accessible via past records in many forms. Unfortunately, the data required for the study was not available in the departments. So, data was collected from primary source only by conducting well organized surveys in various departments.

1.5 Methodology

The study was undertaken to identify safety audit of healthcare facility in Kashmir, and the level of safety awareness among patients and staff members in many departments of the hospitals, identify the firefighting equipment available in the buildings under study, and to identify fire safety management practices which need to be put in place by management to control the outbreak of fire in the buildings. Data for the study was collected through a survey, observations and interviews. This internal health and safety audit methodology provides guidance to auditors and auditees on the internal health and safety audit process. The internal audit methodology ensures that Occupational Health and Safety Management System (OHSMS) audits are conducted to a consistent standard, allowing verification that the OHSMS:

- Complies with planned arrangements;
- Has been properly implemented and maintained; and
- Is effectively implemented throughout the University of Melbourne.

The internal audit methodology includes:

- Auditor selection and competencies
- Audit Frequency

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- Audit schedule
- Audit scope
- Definitions for audit reports
- Audit process requirements
- Audit opening meetings
- Audit closing meetings
- Audit report requirements and template

2.1 Study Area (Sopore) :

Sopore known as suyyapur in antiquity, is a town in the Baramulla district of Jammu and Kashmir, India. It is 45 Km (28 mi) north-west of Srinagar, and 16km (10 mi) south-west from the city of Baramulla. Sopore city has Asia' s second largest fruit mandi (Wholesale market) And Largest Fresh Water Lake Known As Water Lake Known as Wular Lake . it is known as the "APPLE TOWN". Apart from fruit mandi, Sopore is near to one of Asia 's largest freshwater lakes, Wular Lake.

Country	India
State	Jammu and Kashmir
District	Baramulla
Coordinates	34.30°N 74.47°E
Founded	880 CE
Population (2011):	
. Total	118,608
. Rank	6
spoken languages	Kashmiri,urdu
Time Zone	UTC+5:30 (IST)

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Pin code	193201 (Sopore City)

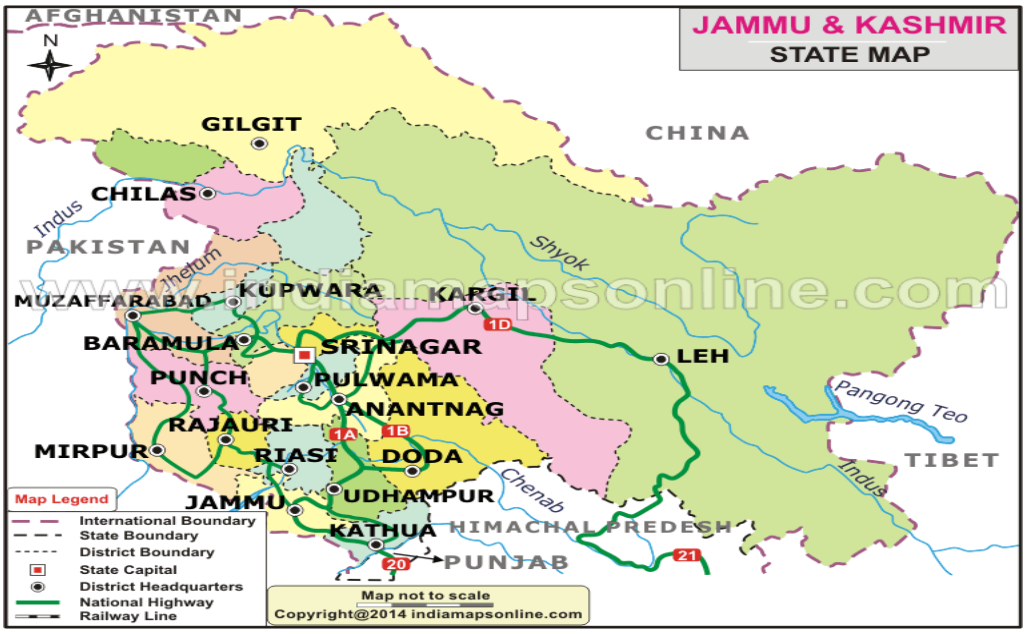

Figure. 3. Map of J&K

Demographics:

As of 2011 census, Sopore had a population of 118,608 and area of 61 square kilometres (24 sq mi).

Administration:

Sopore is one of the largest subdivisions of the state with 7 tehsils. And it is also the oldest existing subdivision of the state. Bashir Ahmad Bhat (KAS) who is an

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administrator, has served the sub-division between August 2015 to April 2017 as the Sub-Divisional Magistrate.

Education:

The main public educational institutions in Sopore are Government Boys Higher Secondary School Sopore, Government Girls Higher Secondary School Sopore, Shah Rasool Memorial Welkin Higher Secondary School Sopore, Muslim Education Trust Sopore, Government Degree College Sopore, Government Degree College for Women Sopore, Sopore Law College, Industrial Training Institute Jalalabad and Prime Public School Bomai. The Sher-e-Kashmir University of Agricultural Sciences and Technology is located in Wadoora, Sopore.

About SDH (sub-district hospital) Sopore:

The Foundation of the Sub District Sopore was laid down on 19th MARCH 2008

The hospital consists of 4 WARDS

* Surgical ward & post Surgical ward
* Medical ward & gynae ward
*Pediatric Ward
*Emergency Ward

Sub District hospital sopore accommodates 200 beds. Also, the hospital has the total capacity of 50 rooms. There are 145 staff members working in this hospital among which number of Doctors are 50. Numbers of nurses are 45 & the remaining working staff is 50. Medical facilities are available 24*7. About 10 Ambulances are available in this hospital. Flooring of SDH Sopore hospital Designed with marbles. Solar systems are also installed in this hospital. The hospital provides the following facilities 24x7 round the clock:-

SECTIONS:

- Digital X-Ray
- Medicine
- Operation
- Ophthalmology

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- ENT
- Radio Diagnosis & Imaging
- Radiation Oncology
- Anesthesiology
- Dermatology
- Emergency
- Dental
- Plastic Surgery
- Post surgical Care
- Central Laboratory
- Administration
- Trauma

Figure. 4. Main building of SDH Sopore

Figure.5. Foundation stone of OPD block

3.1 Vulnerabilities OF Hospital: The certain findings determine the vulnerabilities of selected Wards are:

- **Improving Safety of Operation Theatres**

Almost all equipment in the operation theatres of the hospital were found to be on rollers or roller trolleys without any fixity and are therefore highly vulnerable. However, for everyday use this equipment must be flexible and mobile and cannot be permanently fixed. Thus, a special system for anchoring the equipment is necessary; anchoring which can fix the equipment during operations and can be removed afterwards. The system can be a steel frame consisting of vertical and horizontal angles attached to the equipment rack. The system should have a numbers of chains, straps, hooks and guide bars in the rack for fixing and securely placing the equipment in the rack. The frame can then be fastened in a location near to the operation table during the operation. By providing anchor bolts in the ceiling and in the floor of the room the equipment rack can be placed in position near the OT table. Similarly, anchor bolts should be provided in the walls in appropriate locations so that the equipment can be removed and fixed in a safe placed when not used. Problem Identification Solution Provided as an example

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- Power lines around wards increase the vulnerability.
- Wooden Structure like as of ceilings, desks, chairs, paper wastes and empty cartons.
- Curtains hanged on windows, doors, etc.
- Incisions on wiring at certain points.
- Heating equipments like room heaters, Bukharis,
- MCBs were uncovered and wires hanging over them.
- Highly reactive chemicals were at random in laboratories.
- Negligence of concerned authorities.
- Lack of awareness about fire among the occupants.
- Capacity building is at low level.
- Lack of efficient firefighting equipments.

By analyzing the vulnerabilities of selected wards, I inferred that there are maximum chances of fire outbreaks at any time; firstly there is lack of awareness about any disaster and safety management among the occupants, secondly there is dearth of all types of fire control equipments barring few departments. No workshop and mock drills on fire safety management is a major reason of occupant's inability in operating fire equipments. No regular inspection of equipments making buildings more prone to any disaster.

3.2 Availability of Firefighting Equipment in the Hospital

Firefighting equipment are provided in buildings to provide means of controlling fires at the initial stages even before personnel from the fire departments are called unto the scene of the incident. Such equipment provides first-aid means to extinguish flames before the situation is aggravated. A list of commonly used first aid firefighting equipment was listed in the questionnaire for the respondents to indicate whether such equipment are available in their respective wards.

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Figure.6. Internal Fire Fighting Equipment

Figure.7. Fire Extinguishers

Table. 1: Availability of fire fighting equipments:-

S.No.	Equipments	Ground Floor	First Floor	Second Floor
1.	Fire Extinguisher	07	08	10
2.	Emergency safety shower	0	0	0
3.	Sand Buckets	15	0	0
4.	Fire Alarms	02	02	03
5.	Fire fighting installations	08	12	15

Source: Field survey

Table. 2. Availability of drugs(Medicines) at SDH Sopore

S.No.	Name	S.No.	Name

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1.	CatGut 1 4242	25.	Inj. Metsiontiazol
2.	CatGut 2	26.	Inj. Atricussium
3.	CatGut 3	27.	Inj. Termin
4.	ECG Electrodes	28.	Inj. Adernalene
5.	AD. Plaster 7.5 cm	29.	Inj. Envas
6.	Oint. Soframycine	30.	Inj. Dizepam
7.	Dental X-Ray Film	31.	Inj. Paracetamol
8.	Urobag	32.	Inj. Fursimide
9.	Silk 0/1/2/3	33.	Inj. Auti D 300mg
10.	Follyes Catheter	34.	Inj. Prostadine
11.	POP	35.	Piodine/iodine 10%
12.	Sodium Hydrochloride	36.	Piodine/Iodine 5%?
13.	Tab. Cotrinss	37.	Bandage cloth
14.	Tab. Transtate	38.	Dispo face Mask
15.	Tab. BicloSodium	39.	B/P Knife Blades
16.	Vicaryl No 1	40.	Sanitary Pads
17.	Fixzation I/V	41.	Scalp Vein Sets
18.	Protolysis Anemia	42.	Royles tubes
19.	Inj. Atropine Sulphate	43.	Zinc Phosphate Concet
20.	Inj. Ethophyline	44.	Inj. Oxytocin
21.	Inj. Medazolam	45.	Inj. ARV

Source; Field survey

Table. 3. RVS (Rapid Visual Survey) of SDH (Sopore)

Building Name	Community Health Centre (Sopore)
Coordinates	34.30°N 74.47°E
Construction Year	2008
Nearby Rivers	Yes, Jhelum River
Number Of Storeys	3
Material of Load Resisting System	Reinforced concrete
Floor Material	RC Slab
Roof Structural System	RC Slab

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Roof Covering	Metal Sheeting
Roof Pitch	Multi-Pitch
Roof Condition	Good
Roof Connection	Good
Lateral Load Resisting System	Load Bearing Walls
Structural Condition	Good
Connection Quality	Good
Retrofitting	No
Foundation type	Stone
Vulnerability Factors	Short Column
Masonry type	Masonry brick/Masonry block
Mortar type	Cement
Use of beams and columns	Yes
Wall Thickness	0.25 m

Source: Field survey

3.3 Common Problems Identified:

- Too many entrances /exits that are not secured
- Poor indoor and outdoor lighting
- Broken or damaged doors and/or windows
- Emergency lighting not properly functional
- Emergency generator not properly maintained
- Lack of proper emergency communication system
- Lack of post Doctrates
- Lack of modular OT(operation theatre)
- Lack of Oxygen plant
- Lack of awareness/concern
- Traffic congestion within the site
- Patients are facing number of significant problems during the OPD related to appointment, registration, searching OPD location and waiting for doctor checkup

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3.4 Main features of lifeline systems

The main features of the lifeline systems were obtained from visual observations and interviews with relevant hospital staff .The results are as follows;

Electricity: The hospital is connected to 100 KV feeder line, which is not always reliable. In the main building, electricity is provided in low voltage and its transformer does not work well.

The Emergency block has a new transformer but the electricity had not been plugged into the department.

- **Water:** Water is supplied from the town network, which is enough to supply the hospital's daily demand.
- **Sewage:** Hospital sewage is also connected to the town network. The hospital also has a sewage septic tank. Normally, there are no problems with water drainage.
- **Medical gas:** There is no Central Oxygen Room at the hospital. Oxygen is provided to all facilities in 30-40 oxygen cylinders. Air and suction are provided by electrical pump units.
- **Roads:** There are two access roads to the hospital from the Baramulla and Kupwara. There are other roads also connecting the hospital. The accessibility to the hospital is considered as very good for local standards.
- **Internal Transportation:** The main building has one internal staircase and two doors for external access. There is no lift, but it might not be necessary since most of the critical facilities are located on the ground floor. Internal transportation is not a problem, the building is not large and can be evacuated easily.
- **Waste Disposal:** There is proper disposal of waste in the hospital regularly.

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- **Heating system:** There are proper and well-maintained heating systems in the hospital.

Fig.8. picture Showing drinking water facility image showing heating system

Solar Panels: Solar panels have also been installed in the hospital for additional power supply or during emergency times to supply the uninterrupted electricity to the hospital 24*7.

Figure.10. Solar Panel

Recommendations and Suggestions

1. Regular check and proper installation of safety equipments should be carried out.

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2. Faulty electrical equipments should be fixed.
3. Electrical sockets in hospitals should not be overloaded.
4. In labs, it is necessary to install highly standard safety equipments and also there should be proper maintenance of very highly reactive chemicals.
5. Installation of triage system/process/concept .
6. More attention towards the safety of building and occupants.
7. There should be proper medical preparedness plan in action and guidelines to deal with disaster in future if any.
8. There should be proper fire gaps in place between different buildings/blocks.
9. There should be proper installation of sign boards for entrances/exits and towards different sections/departments (labs, operation sections, emergency section, etc).
10. Extra care towards hygiene and cleanliness of wards should be kept under consideration.
11. New and advanced machines should be installed in the hospital.
12. Disaster/safety awareness programs and mock drills should be conducted atleast once or twice a year.
13. All the Stakeholders should know how to use the fire and safety equipments.
14. All the entrances/exits should be made functional.
15. There should be addition of buildings/blocks to the hospital.
16. Also, there should be increment in the number of wards and staff members including doctors, nurses, managers, technicians and other specialists.
17. Extra care should be given towards the emergency/critical patients.
18. There should be upgradation of the hospital with time.
19. There should be proper installation of emergency communication systems.
20. Provide proper lighting systems in hospital
21. Inspection of the safety equipments should be done on regular basis
22. Identification of old wirings and their replacement with an advanced ones

CONCLUSION:

From the above study it has been observed that SDH Sopore lacks in many aspects like lack of awareness regarding any disaster, lack of education of how to manage

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during an emergency situation, lack of faculty members including all doctors, nurses, etc, lack of facilities like oxygen plant and other machines necessary for the treatment of patients. The doctors are not regular and punctual due to which patients have to suffer a lot. Also, the entrances/exits are not enough wide, even some are not functional. Also, the hospital is in need of retrofitting, modification and upgradation. Also, there should be increment in number of staff, buildings, doctors, ambulances, machines and other facilities.

It can be conclude that hospital management has a prime responsibility towards safety of patients especially during an emergency situation. Emergency situation can be controlled with proper and ideal safety management in the hospital. Every single employee of the hospital shall follow his/her responsibility during emergencies and try to save as many potential victims as possible without waiting for instructions and that is possible only when the hospital staff is aware about these situations, which clearly indicates that there is high need of conducting awareness programs in the hospital.

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