

# ASSESSMENT OF GOOD STORAGE PRACTICES AND GOOD DISTRIBUTION OF PHARMACEUTICALS IN PUNJAB

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## ABSTRACT

**BACKGROUND:** Medical Logistics (MedLog) & supply chain management (SCM) is one of the WHO's six building blocks and has key an impact on public health interventions. This study highlights the strengths, weaknesses, opportunities and threats of the pharmaceutical storage and distribution practices at public sector teaching hospitals in Punjab. Good storage and distribution practices of pharmaceuticals have been recognized by corporate and humanitarian sectors as a necessary business functions contributing in competitive advantage in healthcare settings.

**METHODS:** This descriptive cross sectional study was conducted on five major public sector teaching hospitals across Punjab in a period of three months, selected through non probability convenient sampling. All Pharmacy directors, deputy directors or their focal persons were considered as study participants. SPSS version 20 was used to analyse collected data.

**RESULTS:** The pharmaceutical good storage practices meet 64% and good distribution practices meet 63% at all selected teaching hospitals.

**CONCLUSION:** The drug storage and distribution is important component of healthcare level which needs management support in the form of organization, financing, information management and adequate human resource.

**KEY WORDS:** Medical logistics, Supply chain management, Warehousing, SWOT.

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## INTRODUCTION

Medical Logistics (MedLog) & supply chain management (SCM) is one of the WHO's six building blocks and has key an impact on public health interventions. Essential medicine can save lives, reduce sufferings and improve health of certain population<sup>1,2</sup>. Provision of drugs and supplies is critical as the project success is associated with proper management of drugs in the form of good storage and distribution practices, which ultimately are covered under the domain of MedLog & SCM<sup>3</sup>. Thus, good storage and distribution practices of pharmaceuticals have been recognized by corporate and humanitarian sectors

as a necessary business functions contributing in competitive advantage in healthcare settings.

National Drug Policy (NDP) was designed for health services and drug management. NDP covers National Essential Drug List (NEDL), drug legislation and other drugs aspects, drugs supply system, distribution for public and private sector, rational drug use, drug utilization, traditional medicine, human resource development (HRD) and hospitals pharmacy setup at provincial and federal level<sup>4</sup>.

Healthcare commission of Punjab (PHC) has set indicators to streamline the service delivery of minimum service delivery standards (MSDS) of

hospitals<sup>5</sup>. The pharmaceuticals cover the major volume of budget expenditure in any healthcare settings. So, the gaps in implementation of appropriate storage and distribution contribute to a major financial loss, disease burden and mortality. The audit quires on improper storage and distribution practices can affect the donor and beneficiary compliance. Health care supplies are covered by government to provide universal health coverage but there are fewer attentions to ensure proper storage and distribution of these pharmaceuticals<sup>6</sup>.

The hospitals in Punjab were constructed a long time ago so the storage sites suggested by planning and development (P&D) do not fit the requirements for proper storage and distribution today. The budget expansion also contributed to workload of inventory management. The underestimated and neglected human resources, either technical or non-technical personnel, result in under performance. Regarding Health policy, the Government of the Punjab does not pay attention to the medical logistics, pharmacy services and regulations<sup>7</sup>.

Drug quantification and procurement procedures exist through which drugs and medical supplies are procured to supply<sup>8</sup>. But still we have to improve pharmaceutical supply storage and distribution, for example, recently in 2015 amount of 3.7 million USD were wasted under EPI program due to interrupted cold chain<sup>9</sup>. Fake drug crisis in 2012 in Punjab Institute of Cardiology Lahore claims a death toll of more than 100 cardiac patients which was due to the distribution of drug prior to drug testing laboratory (DTL) clearance<sup>10</sup>. The case of selling drugs without agreement at public sector hospital in Lahore<sup>11</sup>, the short shelf life/expired drug donations dispensed to beneficiaries in Lahore<sup>12</sup>, the government drugs mismanagement in pharmaceutical waste at Malsi<sup>13</sup> and pilferage of government drugs in Lahore and Peshawar<sup>14,15,16,17,18,19</sup> such incidents were reported in national and international news.

Assessment of good storage and distribution practices of tertiary care public sector hospitals helps to uncover strengths, weaknesses, opportunities and threats. This SWOT analysis then can be helpful in designing TWOS matrix which ultimately provide strategic planning for the medical logistics and supply chain management. It would help in decreasing the financial costs, reduce suffering and ultimately affect public health.

## MATERIAL & METHODS

It was a descriptive Cross sectional study, using mixed methods. This study was conducted to determine good storage and distribution practices of pharmaceuticals at main drug stores in public sector teaching hospitals across Punjab, from five major cities of Bahawalpur, Multan, Faisalabad, Lahore and Rawalpindi over a period from September 2015 to November 2015. Public sector hospitals which fell within the jurisdiction of these cities were included while all non teaching hospitals and teaching hospitals not willing to participate or disclose their information for research purposes due to any reason were excluded. Out of twelve teaching hospitals in these cities, eight hospitals were selected through non probability convenient sampling. The pharmacy directors/ deputy directors deployed at the selected hospitals were engaged for warehouse visits. Some of the directors/ deputy directors nominated hospital pharmacists as focal persons to assist. Interviews were conducted form eight health-care pharmacists.

Quantitative information was conducted using a structured close ended questionnaire while qualitative information was based on face to face interviews. The information obtained was further substantiated through in depth interviews with key informants. SPSS version 20 was used to analyze the data.

A comprehensive checklist was designed in accordance with the Pharmacy Act 1967, Drug Act 1976, National Drug Policy (NDP) Pakistan, international standard material on Medical Logistics & Supply chain documents belonging to Fritz institute

USA/ Chartered institute of Logistics and transport (CILT) UK, World Health Organization, UNICEF, Save the Children International, Merlin, MSF, USAID Deliver Project and Sphere standards. Minimum standards meeting good storage and distribution practices were considered in the whole study.

## RESULTS

**TABLE 1: GOOD STORAGE AND DISTRIBUTION TRENDS OF PHARMACEUTICALS IN PUNJAB**

Name of Hospital	Good Storage Practices (%age)	Good Distribution Practices (%age)
Bahawal Victoria Hospital, Bahawalpur	73.3	78.3
Nishtar Hospital, Multan	35.6	52.2
Jinnah hospital, Lahore	68.9	65.2
Allied hospital, Faisalabad	75.6	56.5
DHQ hospital, Faisalabad	53.3	60.9
DHQ Hospital, Rawalpindi	86.7	60.8
Holy Family Hospital, Rawalpindi	62.2	69.6
Benazir Bhutto Hospital, Rawalpindi	57.8	60.9
Average of all hospitals	64	63

**TABLE 2: TOWS MATRIX OF GSP & GDP EXPLAINING THE STRATEGIC PLANNING**

TOWS Matrix	Strengths	Weakness
Opportunities	<p>SO 1: Utilizing the experienced staff on IT software and gadgets would improve overall efficiency of supply chain.</p> <p>SO2: The provision of up to date supply chain tools like pallet racking, fork lifter, mapping etc can provide additional storage space, save time, recourses and energy.</p>	<p>WO1: Keeping in view the limited space we can build pallet and floor racking with adjustable/ moveable racks.</p> <p>WO2: Donor funded purpose built main drug stores can be built.</p> <p>Hiring of technical and non-technical staff.</p> <p>WO3: The experienced staff can be offered supply chain diplomas, certifications or degree which can produce champions.</p>
Threats	<p>ST1: Suppliers assessment and focus on procurement of quality drugs. Identify competent suppliers.</p> <p>ST2: The pharmaceutical marketing and physician's evening practice should be discouraged.</p>	<p>WT1: The pharmaceutical waste pilferage reported in some hospitals can be covered by 3rd party contracting with competent organization</p> <p>WT2: Stock insurance should be initiated.</p>

Results are based on qualitative and quantitative data. The trends of good distribution and storage practices are plotted for each hospital.

The pharmaceutical good storage practices meet 64% and good distribution practices meet 63% at all selected teaching hospitals.

### SWOT Analysis:

#### Strengths

The internal capacities to capitalize the teaching hospitals are as follows:

S1: The supply chain documentations are followed for storage and distributions at every teaching hospital. Some hospitals are vigilant in finalizing management of medicine (MOM) of their own. Healthcare commission of Punjab had included this parameter in minimum service delivery drug management standards (MSDS).

S2: Experienced human resource is dealing with multiple areas of medical logistics and supply chain such as pre-qualification, procurement, storage, distribution, transportation, disposal of pharmaceuticals. They have been dealing with constraints and are flexible enough to bear the work pressure.

S3: The capacity to manage drug supplies efficiently. First expiry first out (FEFO) rule to manage shelf life data, expiry alerts return policy. The labelling requirements of "Govt. property, Not for Sale" The pharmacists are familiar with WHO storage and distribution guidelines.

S4: The emergency preparedness contingency stock available at each station to cope any humanitarian crisis.

S5: The available warehouse infrastructure with logistics representative (Pharmacist).

S-6 Drug regulatory policy and drug laws regulating the pharmaceuticals need to be updated with time. The positive changes needed.

S-7: The surveillance data on ADR reporting, Pharmacovigilance.

### Weaknesses

W1: Limited storage space is allocated for drug storage. None of the warehouse is purpose built drug central pharmacy/ main drug store/ warehouse sufficient to store annual turnover of drugs round a year. Some stocks are stored out of sight in different wards and galleries.

W2: The limited human resource both professional and non-professional and overburden supplies have decreased their capacity. Pharmacists are not enough to ensure rational drug use. In addition, none of the pharmacist has supply chain diploma/certificate.

W3: Ongoing training and capacity building is deficient in the system

regarding hospital SOPs, protocols & formulary development, pharmacy and therapeutics management, HR, security, first aid, fire fighting etc.

W4: There is staff disappointment with the benefits provided. The negligence of policy makers and stewardship. The allowances of pharmacists are not improved as that of physicians and nurses working within hospital setup.

W5: The floor and pallets racking needed at each premises (industrial level) based on the supply chain volume. The manual supply loading/unloading is associated with risks and challenges.

W6: The underutilization of pharmacy services. Some services could not be initiated such as clinical pharmacy, unit dose dispensing, extemporaneous preparations, Total parenteral nutrition (TPN), pharmacoeconomics or pharmaceutical care etc.

W7: The emergency tray medicines are not quoted in the supplier bidding and are purchased at high rates.

W8: The pharmacy management tools are deficient such as rodent control, availability of updated books and reference material, first aid kit.

W9: Weak internal controls and performance evaluation indicators.

W10: Research and publications are rare in pharmaceutical supply chain to draw attention of leaders and policy makers.

### Opportunities

O1: Strong written need of capacity building training workshop on pharmaceutical/public health logistics and supply chain management. The stakeholders (DRAP, PHC, WHO) should conduct trainings on pre-qualification, procurement, storage, distribution, transport and safe disposal.

O2: To equip with technical gadgets, inventory management software and trainings meeting international standards. (Environmental impact).

O3: To train with international supply chain tools, handling equipments and support.

### Threats

T1: None of the Pharmacy stocks is insured and hazard of fire, electric shock or pilferage. The firefighting equipment and supplies are

optimum. No fire alarms, no water sprinkles installed at any drug store in Punjab.

T2: Patients and qualified professionals or staff is not happy with the quality of drugs procured for hospital. Community compliance needs to be studied.

T3: Pharmaceutical marketing and biased prescriber tendency to achieve sale targets at hospitals and evening practice. Patients are prescribed to buy drugs from market without feasibility of affordability.

T4: The challenges in import of active pharmaceutical ingredient and monopoly in artificial shortage.

T5: Independent monitoring and evaluation (M&E) is weak to spot shortcomings and end corruption from drug procurement to utilization.

### TOWS Matrix for strategic planning

The tool is further expanded on a matrix which explains the combinations of SWOT into a matrix. This detailed information is suggestions for strategic planning to cope with the gaps in good storage and distribution practices in teaching hospitals of Punjab. These outcomes can be used as agenda settings of possible improvements in supply chain.

## DISCUSSION

The teaching hospital got professional trainings environment. Physicians, dentists, nurses, pharmacists as well as para-medical students have practical trainings, internships, and orientation. The study on good storage and distribution practices of teaching hospitals reflect limited resources, partial human recourse, with no trainings/workshops for pharmacy services have depressed pharmacists. They are aware of the good practices but are forced to manage medical commodities unethically. The technology is still out of reach in 2015 in Pakistan. In the institutions evaluated, very few computers can be seen that too only at the draft office for correspondence purposes. The regional and global advanced interventions are still not incorporated.

The pharmacist to patient ratio was agreed as 1:50 by the politicians in Punjab but it is still pending. Inad-

equate pharmacists are not able to accomplish all activities efficiently. Regional health system observatory EMRO, Health System Profile Pakistan states "The pharmacists lying in category A (Whole selling) and B (whole-sale + retail) providing consultancy and dispensing are non-qualified person"<sup>22</sup> Whereas WHO integrated model has rated pharmacist 8 star professional for the professional skills which are care giver, communicator, decision maker, leader, lifelong learner, manager entrepreneur, teacher and team player. Need to establish independent medical logistics pharmacy services department in Pakistan who can ensure quality assurance, rational drug procurement, drug management, storage, distribution, monitoring & evaluation (M&E) and proper pharmaceutical waste disposal. The department should be independent and work in close collaboration with stake holders. Such examples exist in the Asian countries like Philippines who got National Centre for Pharmaceutical access and management (NCPAM) which is working with close collaboration with Philippines-FDA<sup>23</sup>.

## CONCLUSION

The drug storage and distribution is important component of health-care level which needs management support in the form of organization, financing, information management and adequate human resource. The quality storage and right distribution practices are essential components of pharmaceutical supply chain management. The limited technical and support staff in stock management is ultimately implementation, performance and output of quality healthcare delivery at hospitals. One pharmacist per fifty beds ratio is the demand of pharmacists in hospital settings of Punjab which is still under process. Drug regulatory authority of Pakistan (DRAP), Pharmacy Council of Pakistan, World Health Organization

(WHO) Pakistan, and related stakeholders and Health Services academy, Islamabad should make a committee to regulate drug storage and distribution.

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### CONFLICT OF INTEREST

Authors declared no conflict of interest

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NIL

**Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.**