

Biomedical Equipment Assistant Technician Training (BMEAT) Survey Report: 2023

ENHANCING RURAL HEALTHCARE



RESEARCH TEAM:

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INTRODUCTION

Within Nepal's healthcare system, there were no dedicated posts for staff with the training and responsibilities to maintain and repair biomedical equipment and to perform other general maintenance of the medical devices. As a result, much equipment often breaks down, remains unrepaired and is unable to provide necessary and life-saving procedures for the service users they serve. To address and support these repair and maintenance needs, an assessment was designed and conducted in 2008. The assessment report recommended the following:

- Many items of equipment and utilities in health facilities need repair.
- A large proportion of maintenance needs can be met by the application of low-level skills.
- Hospitals, even when small and remote, have a need for technician level support.

To address these recommendations, Nick Simons Institute (NSI) together with the National Health Training Centre (NHTC) developed a short, and simple equipment maintenance course to suit the needs of lower-level health facilities. Till December 2021, sixteen batches of Biomedical Equipment Assistant Technician (BMEAT) Training with total of 226 participants graduated. Those trainings were jointly conducted by National Health Training Center (NHTC) in collaboration with Nick Simons Institute (NSI). This training was provided to the hospital staff (generally support-staff and other assistant-level cadres) of the government hospital. Since the inception of first training a formal study has not yet been conducted to know the working status of Biomedical Equipment Assistant Technician (BMEAT), and the effectiveness of BMEAT training program.

COURSE GOAL:

The course was designed for eight weeks and focused on extensive hands-on practice under supervision to ensure participants develop sufficient knowledge, skill, and attitudes. Course goal was to enable participants to maintain and repair hospital electrical facilities in a safer mode and to enable participants to maintain and

repair selected items of medical equipment and carry out basic maintenance of more complex in absence of technical manpower (Biomedical Equipment Technician, BMET) in the respective hospitals.

RATIONALE OF THE STUDY

All 77 districts of Nepal have this cadre of support staff who have received the training of BMEAT. This study tries to understand the current working status of BMEAT and collect feedback from respondents which will guide decision makers to take strategic steps for this training package. Effectiveness of BMEAT training can be assessed by evaluating below listed activities performed by this cadre:

- Support staff work as BMEAT full time or in allocated time by hospitals.
- Involvement of BMEAT on regular preventive/repair maintenance of Biomedical Equipment.
- Record keeping in the form of logbook for all the performed activities.

OBJECTIVES OF SURVEY

- To find the working status of BMEAT graduates.
- To find out if they are using the skills learned in the training.
- To find out the reasons to continue/stop this training or should be given to the same/different cadre.

METHODOLOGY

We used a descriptive research design for this study. 20 hospitals were purposely selected where BMEATs were working. A self-administered questionnaire was given to the Medical Superintendent/Department Head of 20 hospitals. In addition, all the BMEATs (n=21) working in selected 20 hospitals were interviewed to understand their working status, facilitating/hindering factors which affect the utilization of their training skill and the perception regarding the BMEAT training as well.

FINDINGS

Characteristics of sampled hospitals	Number of Hospital
Koshi Pradesh	4
Madesh Pradesh	2
Bagmati Pradesh	1
Gandaki Pradesh	2
Lumbini Pradesh	7
Karnali Pradesh	2
Sudur-Pachim Pradesh	2
Total	20

Type of Hospital	Number of Hospital
Provincial Level	7
Secondary A	8
Primary	3
Others [Mission]	2

Availability of BMET Department	Number of Hospital
Yes	11
No	9

Number of Other Equipment Maintenance Staff	Number of Hospital
Biomedical Engineer (BME)	8
Biomedical Equipment Technical (BMET)	11
Electrician	13

CHARACTERISTICS OF BMEAT GRADUATES

A total of 21 BMEAT graduates were involved in this survey from 20 hospitals. BMEAT working in one hospital was absent during the data collection. In an average study participants had 6.85 years of experience after they received BMEAT training with maximum of 10 years and minimum of 3 years.

RESULTS

All BMEATs perceived that BMEAT training was useful. However, they were not able to fully utilize their skills after training due to various reasons such as high workload, ignorance of management, and lack of incentive.

The data from the survey found that most of the hospitals (45%) utilized both in-house and outsourcing mechanisms to repair broken equipment, while 35% used only in-house human resources and only 20% solely depends upon outsource firms/individuals.

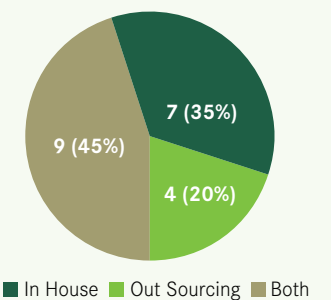


Fig: Equipment Repair Mechanism

As shown in this graph, it is found that despite all 20 hospitals having at least 1 BMEAT, only in 9 hospitals BMEATs were involved in medical equipment maintenance. The remaining were occupied with their regular task for various reasons.

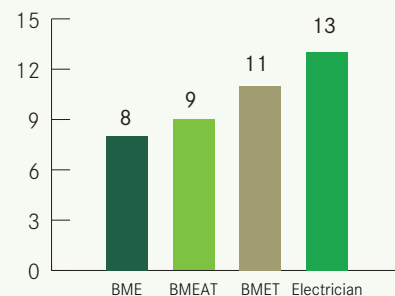
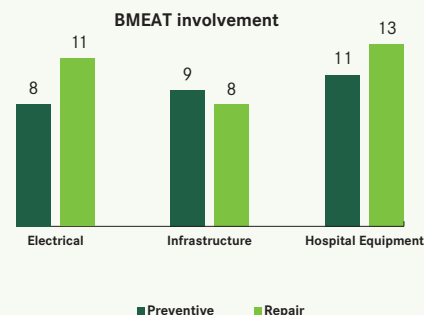


Fig: Equipment Maintenance Staffs

BMEATs are involved in multiple tasks of preventive maintenance and repairing. Data revealed that they are involved in more repairs (Electrical and Hospital equipment) than preventive maintenance.



The survey data shows that out of 20, only 25% of hospitals have assigned BMEAT graduates as a full time BMEAT.

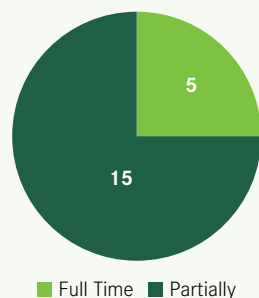
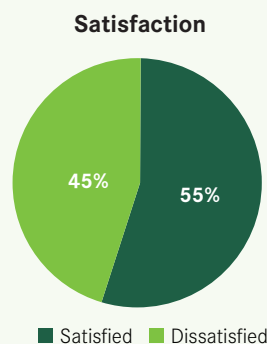


Fig: Working as a BMET

It was found that only 40% of BMEATs are maintaining Logbook with the help of BMETs which is of high importance in biomedical work for the history of the equipment.

With the survey, 40% of the Medical Superintendent said, training should be given to different cadre other than support like electrician, 40% of them said we need BMET or BME and 20% said refresher training should be provided to BMEATs.



When asked the Medical Superintendent/ Department head if they were satisfied with the work of BMEAT, more than 50% of Medical Superintendent/ Department heads said they were satisfied with the work of BMEATs.

Almost 50% of Medical Superintendent/Department heads perceived that high workload prevent BMEAT to involve in preventive and repair works of medical equipment.

Hindering Factors	Frequency
Due to high workload	10
Lack of self-motivation	8
Lack of job description	8

CONCLUSION

In conclusion, this study has presented a glimpse of BMEATs working status, utilization of their biomedical knowledge and skills and the working environment at the hospital level to utilize these skills. The findings suggest that it's time to revisit the approach, contents, and participants selection for this training, as not all the trained human resources could utilize their skills in their work setting. Also, not all of the trained staff had the skill set to carry out their roles independently and confidently.

- Nine hospitals BMEAT along with support of electricians are maintaining and repairing medical equipment.
- Only 25% are working in biomedical department rest are still working as support staff, cleaning, and washing at the hospital, which is not appropriately utilization of training related skills.
- 55% of medical superintendent/ department head are satisfied with the work of BMEATs, but data shows that most of the BMEATs are not involved in the work which they learned from the training i.e., of repairing and maintenance, instead they are found to be cleaning and washing at the hospital.

RECOMMENDATIONS

This study suggests that BMEATs have been a helping hand for the hospital at a time when there were no dedicated human resources at the hospital to repair biomedical equipment. While these groups of cadres were being helpful however, the hospital team also realized that the level of skills they were given as BMEAT were not sufficient and at the same time they were overloaded with this added responsibility on top of their regular JD. This study recommends the following to consider before making decisions regarding BMEATs:

- The level of knowledge and skills given to support staff through eight weeks' extensive BMEAT training was not adequate to meet the complete needs of the hospital. Also, the majority of the trained support staff were overloaded with this additional responsibility. So, it would be better if this training could be given to cadre other than support staff of the hospital.
- Since there are other set of cadre BMEs and BMETs who have wider knowledge and skills about hospital biomedical equipment repair and maintenance, strengthening these cadre would be more reasonable than providing training to support staff.
- The current government system doesn't allow to create a post of BMEAT for the currently trained support staff they do not meet the minimum requirement. The training can be upgraded to a level which can meet the requirement to create a post as well as meet the skill set to prevent and maintain biomedical equipment in hospitals.

ANNEX: 1

Name of the hospital where the survey was conducted:

- Syangja Hospital, Syangja
- Parbat Hospital, Parbat
- Lumbini Provincial Hospital, Butwal
- Prithvi Chandra Hospital, Nawalparasi
- Pyuthan Hospital, Pyuthan
- Provincial Hospital, Kalaiya
- Illam Hospital, Illam
- AMDA Hospital, Jhapa
- Seti Provincial Hospital, Dhangadi
- Provincial Hospital, Surkhet
- Mehelkuna Hospital, Surkhet
- Mahakali Provincial Hospital, Kanchanpur
- Bheri Hospital, Nepalgunj
- Gulmi Hospital, Tamghas
- Tansen Mission Hospital, Palpa
- Bardia Hospital, Bardia
- Mechi zonal Hospital, Bhadrapur
- Provincial Hospital Janakpur, Janakpur
- Panchthar Hospital, Panchthar
- Dhading Hospital, Dhading

ANNEX: 2

Biomedical Equipment Assistant Technician Training (BMEAT) assessment survey, 2022

DATE:

NAME OF THE RESPONDENT:

POSITION:

NAME OF THE FACILITY:

PROVINCE:

CONTEXT

Introduction:

Sixteen batches of Biomedical Equipment Assistant Technician (BMEAT) Training has been conducted by National Health Training Center (NHTC) in collaboration with Nick Simons Institute (NSI). This training was given to the staff (generally support-staff and other assistant-level cadres) of the hospital. Till date, almost all districts of Nepal have this cadre, but the question is are they working as Biomedical Equipment Assistant Technician (BMEAT), using the skills learned in the training.

Course goal was to:

- support in maintenance of biomedical equipment.
- maintain and repair hospital electrical facilities.
- provide participants with the skills to work with the whole staff team and be aware of their own responsibilities.

Impact of BMEAT training can be assessed by evaluating below listed activities performed by this cadre:

- Cadre works as BMEAT in allocated time by hospitals.
- Regular Preventive maintenance of Biomedical Equipment.
- Repair maintenance of Biomedical Equipment when required.
- Record keeping in the form of a logbook for all the performed activities.

Medical Superintendent/Hospital Manager/Facility in charge are requested to fill this survey questions. The objective of this survey is to assess the BMEAT training.

PLEASE ANSWER THE FOLLOWING QUESTIONS, THANKS!

1. How is the medical equipment maintenance conducted in the hospital ?

- In house
- Outsourcing

2. If medical equipment maintenance is conducted inhouse, who is involved in it ?

- Biomedical Engineers
- BMET
- BMEAT
- Electricians/plumber

3. If the staff with BMEAT training are involved in maintenance work, does he/she ?

- Works as Full time BMEAT
- Works few days a week (allocated time)
- Works as support staff and helps in maintenance occasionally

3.1. What types of maintenance work does BMEAT do ?

- Preventive maintenance
- Electrical
- Infrastructure (Generator/ Water supply)
- Hospital Equipment
- Repair
- Electrical
- Infrastructure (Generator/ Water supply)
- Hospital Equipment

3.2. Is there any logbook or record of the work done by BMEAT ?

- Yes (Note: please check the logbook)
- No

4. Are you satisfied with the work of BMEAT ?

- Yes
- No

4.1. If no, is there any solution to make it better ?

Please specify.....

5. What are factors that restricted him/her to work as BMEAT ?

- Self-motivation
- Occupied with work as Support staff
- Lack of proper job description as BMEAT
- Others (please explain)

6. What kind of technical cadre is most suitable for medical equipment maintenance in your hospital ?

- Biomedical Engineer
- Biomedical Equipment Technician
- Biomedical Equipment Assistant Technician
- Others (Please Specify)

Thank you for your time and information.

TO THE BIOMEDICAL EQUIPMENT ASSISTANT TECHNICIAN

Name: _____

Working Years: _____

Year of Training: _____

Working as BMEAT: Yes No

Does the department in charge know about the training he/she has taken: Yes No

Does the Medical Superintendent know about the training he/she has taken: Yes No

Present Position:

Was the training useful for him/her: _____

Learning experience from the training in today's context:

Thank you for your time

For more information, please contact:

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