

Case Report

The Role of Medical Simulation in Current Paediatrics Training: A Case for Zambia

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Abstract:

There has been a rise in the number of health training facilities offering training in Pediatrics in Zambia in recent years. For nearly four decades, there was only one medical school offering medical training in Zambia, with very low annual enrolment numbers. In the past one decade, the number of students being admitted to medical school have increased dramatically, more so with the introduction of new medical schools both public and private. However, the number of trainers has not increased proportionately, hospital infrastructure has remained relatively static, and the number of trainees per patient has greatly increased. This would thus entail the need to introduce new and additional methods of teaching, such as the simulation based approach as a safe supplementary mode of training to be considered for our setting. This paper will therefore seek to examine the role of simulation based training in medical education in the field of Pediatrics and Child Health.

Keywords: Pediatrics Training, Medical Education, Medical Schools, Simulation

1.0 Introduction

In recent years, Zambia has seen a dramatic increase in the numbers of health related training facilities offering pediatric training. Enrollment numbers to these facilities have also dramatically increased. The University of Zambia has been the only medical school since 1965. For nearly four decades annual enrollment numbers were low ranging from 20 to 30 students in early years, to 50 and rising to 100 in later years.

From 2007 medical school numbers increased in the next decade up to seven and enrollment dramatically increased to 200 or more in each facility per year. The number of trainers (Lecturers) has not increased proportionately, hospital infrastructure has remained relatively static, and the number of trainees per patient has greatly increased.

This scenario poses a challenge to the quality of medical education, a threat to patient safety and pressure on resources and hospital space. This can be very sensitive especially were dealing with the paediatric population as subjects is concerned.

Traditional bedside teaching alone cannot cope with these large numbers of students. There is need to introduce new and additional methods of teaching, hence the need for simulation based approach as a safe adjunct mode of training to be considered for our setting.

2.0 Simulation Defined:

Simulation is a technique used to acquire skills both technical (e.g. History taking or Physical examination) or non-technical (e.g. Communication, leadership or prioritization techniques). Simulation enhances competence and confidence in clinical skills and knowledge [1,2,3]

Simulation can take different forms;

- Simulated scenarios in a Simulation Centre.
- Simulation scenario in a clinic or ward environment, referred to as 'in situ' simulation.
- Simulated patients in the form of manekins or actors. Manekins can be whole body manekins or half body manekins, or a simulated body part, e.g. a limb.

2.1 The Grading Of Simulation:

Fidelity – Fidelity (sometimes described as reality) describes how closely a learning activity is to real practice or real clinical experience. Fidelity is graded as High, Mid or Low, depending on how close the learning activity is to real practice. Manekins, also called Simulators, can be classified as Low, Medium or High Fidelity Simulators [4]. An example of a low-fidelity simulator is the intravenous insertion arm. Moderate fidelity simulators give more resemblance of reality with such features as pulse, heart sounds, and breathing sounds but without the ability to talk and they lack chest or

eye movement. High fidelity simulators combine part or whole body manikins to carry the intervention with computers that drive the manikins to produce physical signs and feed physiological signs to monitors [5].

2.2 The Use of Simulation

Simulation can be used to the benefit of various groups of learners in Paediatrics. Examples are undergraduate students, doctors, post graduates students, nursing students or specialists in various fields of Paediatrics. Simulation can also be used for refresher courses e.g. in Resuscitation, Anaesthesia, accidents or other emergencies. Simulation can be used for examination purposes and for assessing skills and competences.

3.0 Simulation in Paediatrics

As earlier alluded to, simulation can be used to mimic real patients (as in manekins), or as actors, or the environment (as resembling a word environment), to resemble a real situation.

The School of Medicine at the Copperbelt University in Zambia has seen a dramatic increase in enrollment numbers, but little or no increase in the number of trainers so that the trainer to trainee ratio has decreased. The large number of trainees also means the patient is exposed to many trainees, leading patient's bewilderment, stress, fatigue and in some cases harm. This could lead to deterioration of the patient's condition.

In Paediatrics, patients' conditions tend to improve quicker than in adults so that physical signs tend to disappear quicker. This denies the trainee the opportunity for repeated access to the patient. All these factors would seem to build a strong case for simulation.

3.1 Establishment of Simulation in Paediatrics

There are a number of requirements in the establishment of simulation.

(i) Space

Space needs to be found either in one area of an established ward or hospital i.e. 'in situ' simulation centre or a stand-alone facility that should still be fairly close to or within the grounds of the health facility. An 'in situ' or close by centre would provide easy access to the centre. The very tight schedules of students and learners limits their time to access the centre so the closer it is to the work place the better.

(ii) Infrastructure

Construction of the centre would require Architectural designs and technical specifications.

In practice, the centre would require simulation rooms, a ware house, offices, lecture rooms, among others.

(iii) The Inventory

Among other items, the centre requires various manekins, software, communication equipment, furniture and stationery.

(iv) The financial Outlay

Financial resources are the major obstacle to the establishment of a simulation centre. Financial resources are required to procure all items needed. In our case at the

Copper belt University the central government would be the main funder; other cooperating partners are invited to contribute towards the establishment of such a centre.

(v) Training of Trainers

Special training needs arise to train broadly, two categories of staff. Technical staff to service and maintain the equipment, and professional staff who are going to be trainers at the centre.

(vi) Curriculum Development

Curriculum development targets the desired areas of achievement and also targets the population of trainees in whom skills and competences are to be imparted.

4.0 Conclusion

(1) Simulation in Paediatrics will become increasingly important as an adjunct to paediatric training in environments where student numbers are increasing, patient numbers are limited and trainers are few.

(2) Although the initial cost of establishing a simulation centre is high, the returns in investment are equally high. Potential returns include reducing fatalities, improved safety of patients, resulting from better skills and improved competencies in the workforce. Between 10% and 30% of patients are harmed by the care they receive.

With Simulation, it is now possible to accommodate the large trainee population without much stress on patients.

(3) Simulation offers an opportunity for repetitive practice resulting in enhanced learning and improved skill and competence in the trainee.

(4) Rare clinical conditions can be learned on a simulator depicting the conditions.

(5) It is important to transfer simulation skills to the clinical area.

Conflict of Interest: None.

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Author Contributions:

Phiri devised the theme and content of the manuscript. Phiri, Gondwe, Maliko and Nyirenda all contributed to the ultimate write-up of the manuscript.

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