International Journal of Surgery Open 4 (2016) 18–22

Contents lists available at ScienceDirect

International Journal of Surgery Open

journal homepage: www.elsevier.com/locate/ijso

Research Paper

# Evaluating a surgeon led training program: Targeting kidney disease in Vietnam

Douglas P. Slakey *, Robert Reily, Ingemar Davidson, James R. Korndorffer, Jr.

*Department of Surgery, Tulane University School of Medicine, New Orleans, Louisiana, USA*

ARTICLE INFO

*Article history:*
Received 21 February 2016
Accepted 1 June 2016
Available online 6 June 2016

*Keywords:*
Outcomes effectiveness
Crew resource management
Kidney disease
Simulation
Global health

ABSTRACT

**Background:** An educational program consisted of lectures and simulation training designed to provide knowledge and skills to improve the delivery of care to patients with kidney disease was delivered in Hue, Vietnam. A follow-up study to validate the efficacy and durability of the education and training was done one year later.

**Methods:** The course was validated using Kirkpatrick's four levels of evaluation: (i) pre- and post-course interviews reflecting initial reaction; (ii) training quality assessment on simulated scenarios; and (iii) follow-up questionnaires, interviews, and on-site observation of clinical care delivery.

**Results:** Reaction to the course was uniformly positive. Multidisciplinary design and emphasis was rated highly. The combination of evidence-based didactics and simulation training provided an assessment of application of learned material. Structured debriefing demonstrated a high degree of understanding. Predicted language and cultural barriers were reduced using simulation. Follow-up identified that course material had been put into practice, including communication, crew resource management, and a systems approach to the management of complications. Observation of clinical care identified systems changes that improved ability to deliver care in a cost-effective manner.

**Conclusions:** The curriculum improved multidisciplinary team performance in the short and long term. Course design provided a structured training framework, and enhanced the learning. The methods used to deliver the educational material and simulation training overcame potential language and cultural barriers. Follow-up demonstrated a sustained acceptance and application of the training in the care of complex kidney disease patients. The Kirkpatrick evaluation method assisted in determining the effectiveness of this training methodology. Using this platform for education and training can foster improvements in patient outcomes effectiveness.



## 1. Introduction

There is an increasing awareness that surgical care is an important component of global health. Over the last several decades, the worldwide burden of disease has been shifting away from communicable illness toward chronic disease, injuries, and cancer [1,2]. However, attention and funding for global health has traditionally been primarily directed to combat infectious diseases, such as AIDS, malaria, and smallpox [3]. The role of surgeons is often overlooked on the global stage, which Dr. Paul Farmer has dubbed it the "neglected stepchild of global health." [3] Today, only 3.5% of surgical procedures are performed for the poorest one third of the world's populace, and otherwise minor surgical conditions will often progress to incapacitating illness and death [4]. Most often, global surgical efforts have been provided by teams from developed countries performing procedures over a specific time period. While this episodic care has helped many people, it is not usually sustainable by the local healthcare community. To be durable and sustainable, strategies to improve the capacity of the local healthcare infrastructure need to be developed and implemented. Furthermore, complex, chronic disease care, especially that involving surgery, requires extensive collaboration and participation with the local population and responsible government agencies in order to be effective components of a global health strategy [5,6].

One example of a chronic condition that is increasing in many areas of the world is end stage renal disease (ESRD). Treating patients with ESRD imposes significant financial burdens and logistic challenges on healthcare infrastructure. The complexity and cost of providing ESRD care are increased by the need for procedural services. Treatment of patients with kidney disease is inherently complex, and requires significant training, infrastructure, and coordination between many different members of the healthcare team.

* Corresponding author. Department of Surgery, Tulane University, 1430 Tulane Avenue, SL22, New Orleans, LA 70115, USA. Tel.: +1 504 988 2317, fax: +1 504 988 1874.
*E-mail address:* dslakey@tulane.edu (D.P. Slakey).

http://dx.doi.org/10.1016/j.ijso.2016.06.001

A strategy to improve the availability of complex, surgical healthcare is to provide education and training designed to enhance outcomes effectiveness. High reliability industries such as airline transportation and petroleum have witnessed success in applying safety – outcomes focused education and training as a routine worldwide. In 2012, a scholarship was awarded to one of the authors (DPS) from the Vietnam Education Foundation (VEF) to develop and provide an education and training course designed to improve the care and outcomes of patients with kidney disease, from diagnosis to treatment including surgical management. We previously published a report highlighting the details of the program [7]. In brief, the program involved education and simulation training of healthcare teams treating patients with kidney disease in Vietnam. The course material included evidence based information and technical training, provided within a structure that emphasized human factors and crew resource management (CRM) concepts. The goal was to provide the information and training necessary to improve the system of care, thereby creating lasting improvements in patient outcomes.

In this paper, we discuss the ability of this collaborative education and team-training project to provide a sustainable positive impact on patient outcomes and on the effectiveness of surgical healthcare.

## 2. Methods

Beginning in 2012, education and simulation training was provided to teams (physicians, surgeons, and nurses) caring for patients with chronic kidney disease in Vietnam. The curriculum of the course included lectures (given both on site at the Hue University of Medicine and Pharmacy and by live interactive internet sessions) and on-site simulation-based team training [7]. A list of lecture topics is given in Table 1A and B. The course material focused on improving patient safety, efficiency and outcomes of care. Special attention was given to incorporating human factors and CRM into the patient care delivery system. The curriculum was designed with sensitivity to the clinical realities of providing patient care in Vietnam and to the social and cultural norms existing in the healthcare delivery system there. The total course duration was six months.

**Table 1**
(A) On-site lectures. (B) Real-time Internet lectures.

| (A) |
|---|
| ESRD treatment time line |
| Why a multidisciplinary team? |
| Simulation for medical education |
| Dialysis for newly diagnosed ESRD patients: Patient considerations, timing, measuring outcomes, cost, and effectiveness |
| Using human factors to improve outcome |
| Checklists and patient data registries- ensuring optimal patient care |
| Managing the complex ESRD patient- special techniques for surgery and medicine |
| Simulation education- a way to improve team function and patient safety |
| Ultrasound evaluation for central venous catheters and dialysis access |
| Best practice for placement of central venous catheters and dialysis access |
| The OR cockpit: Standardization checklists, and communication skills |
| Improving communication when caring for patients |
| Surgery techniques: Best practices for using expanded PTFE grafts for dialysis |
| Complex decisions in vascular access: Interesting cases |
| Safety and outcomes- the OR cockpit and communication |
| Checklists and data- the next steps in measuring outcomes |
| Simulation sessions- what to expect |
| (B) |
| Central access and ultrasound |
| Peritoneal dialysis: How it works, patient evaluation, surgical consideration |
| Hemodialysis (HD): How it works, HD outcomes, catheter, fistula, or graft |
| Surgery for dialysis access |
| AV fistula surgery: Anatomy, techniques, optimizing outcomes |
| Managing complications of dialysis access |
| Kidney transplantation: History, outcomes, creating a transplant team, deceased donor evaluation |
| Kidney transplantation: Evaluating the patient, evaluating a living donor |
| Donor operation: Deceased, living |
| Kidney transplant operation |
| Immunosuppression |
| Team training: Communication, leadership, including the team |

Course evaluation was done continuously beginning with an initial needs assessment, pre- and post-tests, and self-assessment by learners. The course lasted 6 months. In depth follow-up was done 10 months after the course ended to evaluate the impact and effectiveness of the education and training. The final course evaluation was done by direct observation, semi-structured interviews, and questionnaires. The Kirkpatrick four-level model (Reaction, Learning, Behavior, and Results) was used to quantify the effectiveness of the education and training [8–10].

In brief, the four Kirkpatrick model levels can be described as follows: *Level one, reaction*, is defined as what the participants thought of the particular program, including materials, instructors, facilities, methodology and content. *Level two, learning*, measures the learners' acquisition of knowledge principles, facts, techniques and skills presented during the course. *Level three, behavior*, can be thought of as the impact of training on students' performance on the job. *Level four, results*, is the ultimate outcome measure, and assesses the impact of changes in the operational performance and organizational behavior attributable to the educational program.

## 3. Results

The participants enrolled in the course were selected by the administration of Hue University School of Medicine and Pharmacy. The needs assessment was performed onsite, and involved both semi-structured interviews with stakeholders providing patient care as well as direct observation of daily patient care activities. The needs assessment was essential to the development of a curriculum that was relevant and met the needs and expectations of the participants. Additionally, the on-site needs assessment ensured that the realities of the existing patient care system were integrated into the educational program. The course and written materials were delivered in English. Teaching assistants with fluency in English were identified during the needs assessment phase and helped to insure all learners understood the course material.

*Level one, reaction:* The student reaction to the educational program was uniformly positive. In fact, the number of learners increased spontaneously over time based on word of mouth and professional networking. Designing the live Internet sessions to be available to anyone having the URL facilitated increased participation. The lectures were recorded and made available on the web for improved access and for subsequent review.

The results of a questionnaire designed to evaluate the learner reaction to the course are shown in Table 2. The mean student response indicated a high degree of satisfaction with course design and content.

*Level 2, learning* was measured in two ways. A final written examination was given to the 35 students who participated in the entire course via email that consisted of patient case examples, and emphasized team-based systems of patient care delivery. The students were asked to write patient care management plans (in