

PRIMARY CARE/FAMILY MEDICINE

Improving Primary Orthopaedic and Trauma Care in Nepal

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ABSTRACT Purpose: To evaluate the efficacy of training programmes for the village health practitioners aimed at improving primary orthopaedic and trauma care in our rural setting.

Materials & Methods: Six year prospective study of training workshops in local health institutions was carried out using locally available manpower and materials.

Results: After 6 years the evaluation of this programme shows a significantly improved ($p < 0.05$) knowledge base and working skills after completion of training workshop.

Summary: To avoid unnecessary complications, effective primary health care provided by an appropriately trained person should be available at the peripheral level. This training programme seems successful in achieving this goal and hence needs adoption for wider use in Nepal.

KEYWORDS Primary orthopaedic and trauma care, training workshop, bonesetters, health assistants (HA), aux. health workers (AHW), rural practitioners (RP).

Introduction

In developing countries the proportion of population without access to health services is extremely high. Whether in isolated rural villages or fast-growing urban slums, the overwhelming need for available, accessible, acceptable and affordable primary care is the same. In such conditions the community health

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workers (CHW) can effect major changes in mortality and other indices of health status, and they can satisfy prominent health care needs which cannot realistically be met by other means (Kahssay *et al.*, 1998). According to the World Health Organization (WHO) consultative committee report on primary health care development (1990), the primary health care programmes that bring life-saving technologies at affordable costs even to individual families in the midst of poverty remain criteria for the ingredients of success.

In Nepal more than 80% of the people live in rural areas, while more than 80% of the qualified doctors work in the urban sectors. Until there is improvement in the doctor patient ratio in the rural area, primary medical care will depend largely upon the locally available, economically affordable and socially acceptable traditional healers and untrained rural practitioners (Shah, 1992). Sadly, our popular rural health practitioners and bonesetters, who are involved the most in the primary orthopaedic care in the villages, usually do not have any formal education or training in this field (Weston, 1978).

Therefore, if the available health workers of the remote districts in Nepal are given even short training in basic orthopaedic and trauma care in their own work setting, the morale of these workers is boosted, people benefit and the incidence of death and disabilities is reduced (Govind, 2002).

A scientifically trained general practitioner can also effectively treat nearly 90% of common orthopaedic and trauma conditions (Tuli, 1985). In some developing countries orthopaedic assistants are carrying out good fracture treatment at the health centre level and possibly this service could even be carried out further into the rural community in co-operation with traditional healers (Weston, 1978; Shah, 1992).

Given this background, a specially designed training programme was launched in 1994 with the main objective of providing basic working knowledge and skills in "Primary Orthopaedic and Trauma Care" to the available village health workers. The course included training for the primary care of common conditions and recognition of common complications arising from simple conditions aimed at prevention of physical disability.

Materials and Methods

Training workshops ($n = 13$) have been organized at Janakpur and Nepalganj in the Eastern and Western Nepal (Figure 1) for the village health workers ($n = 367$) from 1994 until 1999 (Table 1). The candidates for each workshop were selected from the volunteering applicants on the recommendation of the local village chief. All the participants had already been engaged in the medical practice of treating patients in their villages, and so they were socially accepted local physicians. However, their scientific knowledge and skills were variable. Therefore, in order to evaluate the baseline knowledge and skills of the participants and later the efficacy of the training programme, a special set of 10



Figure 1. Map of Nepal.

Table 1. Number of participants in training workshops

Place/Year	1994	1995	1996	1997	1998	1999	Total
Janakpur	30	20	25	35	77	20	207
Nepalganj	35	25	30	25	00	20	135
Gaighat	00	00	00	00	00	25	025
Total	65	45	55	60	77	65	367

($n=10$) multiple choice questions in the local language was framed for both pre-test and post-test by the authors. The course of training included the basic information needed for primary care, recognition of common complications, primary management of common conditions and proper referral of patients for better care. The training materials included AV aids, lectures, demonstrations and actual patient care (Table 2).

The training venue remained the local health centres, and the trainers were mostly from the local hospitals. Thus, the local doctors and trained paramedics used local language and local materials for the training. The local trainers prepared the course materials and supervised the training themselves.

However, the main emphasis was placed on providing hands-on training for primary orthopaedic and trauma care of common problems of the villages, i.e. proper first aid (bandaging and splinting).

The evaluation method consisted of a written test assessment (pre and post tests) with the same multiple choice question paper during the training period

Table 2. A sample of the course schedule

Day	Subject Lecture/Discussions (10 am–1 pm)	Break (1–2 pm)	Subject Hands on Workshop (2–4 pm)	Remark
1st Day	(PRE-TEST) Primary care of common injuries		Bandaging techniques	
2nd Day	Primary care of common infections		Primary wound care	
3rd Day	Recognition of common complications		Splinting of common fractures	
4th Day	Primary care of common complications		Simple plaster (POP) techniques	
5th Day	Referring/follow-up patients (post-test)		Closing remarks	

and a different questionnaire by post every 6 months after the training. The test (pre and post) questions were based on the subjects covered by the course, and the questionnaire was based on usual practice in the villages. The efficacy of the course was assessed by the difference in marks obtained by each participant in the pre-test and post-test using the same set of multiple choice questions. The marks obtained by the trainees in pre and post tests were analysed using paired *t*-test. The self-assessment questionnaire was designed to describe the practical behaviour of the health worker in the village as related to the subjects covered during the course. Once a year, the expert team made field visits to randomly selected villages to observe the application of the practical skills by the participants in the actual patient care setting. The health workers and randomly selected local villagers were interviewed by the expert team about the change in general practice approaches following training of the health workers. All courses were assessed using this uniform protocol.

Results

The efficacy of the training workshop was tested by the marks obtained by each participant during the pre-test and post-test sessions. It showed significant ($p < 0.05$) improvement in paired *t*-test, from the mean mark of pretest 6.5 (SD 1.5) to that of posttest 8.7 (SD 0.8) also revealed significant improvement after training (Table 3). The response of the candidates answering the questionnaire was very poor as only 35% of candidates replied. It was observed from the replies that the training workshop had

Table 3. Descriptive statistics and paired samples test

	<i>n</i>	Minimum	Maximum	Mean	SD			
Pretest	367	4.00	10.00	6.4768	1.5868			
Posttest	367	7.00	10.00	8.6703	0.8607			
Valid <i>n</i> (list wise)	367							
	Paired differences (Mean)	SD	SE (Mean)	95% confidence interval of the difference	t	df	Sig. (2-tailed)	
Paired Pretest - Posttest	- 2.1935	1.7220	8.989E -02	Lower - 2.3702 Upper - 2.0167	- 24.403	366	0.000	

helped them to learn basic techniques to solve common problems in their rural set-up. The poor response of the candidates may be due to the poor postal system and frequent transfers of government employees. Our expert team also visited the randomly selected health posts annually where our candidates had been working and the team found that the candidates had been using acquired skills to help local people. One good example was that the trained health worker did not stitch the wounds of open fractures of the leg or forearm straightaway, but rather he/she first washed the wounds with a copious amount of fluid (normal saline). Before training they had been taught to stitch all the wounds without performing this treatment. Another noteworthy example is that the candidates learned to apply plaster splints made from locally available plaster of paris (POP) powder and cotton bandage. This was the first time the trainees were taught this special technique anywhere in Nepal. Apart from providing basic primary care to the patients, the trainees also developed their skills in recognizing common complications seen in orthopaedic and trauma cases such as tight plasters, neuro-vascular complications, life-threatening infections and limb-threatening conditions. Moreover, they were also acquainted with the methods of referral and follow-up of the patients for further care. One more example was also cited, namely, that the uncomplicated fracture of the clavicle bone that used to be referred to central hospitals from villages was approached differently. Following the training programme, the candidates in the villages were able to treat all such fractures with simple triangular slings and figure-of-eight bandages quite successfully. These are only some examples from the site visits as reported by the candidates and also as observed by the expert team. Thus, the training programme has been successful in teaching the village health workers the basic skills to deal with common orthopaedic and trauma conditions in the villages and to refer the suitable cases to the higher centres as needed.

Discussion

The CHW and traditional health workers can be trained to enable them to play a role in some formal primary health care programmes. This may be a positive way to improve health care delivery programmes, especially in rural areas (Twumasi, 1994). The two principal reasons for the misery in poor developing countries like Nepal are a preoccupation with advanced technology and the associated inability to adapt principles to the prevailing circumstances (Loefer, 1992). If we aim at providing maximum relief to the largest number, we will have to develop and adapt techniques to suit our requirements. The present generation of orthopaedic surgeons must be perceptive to the limitations and resources of our society (Alms *et al.*, 1987; Shah & Sharma, 1991). To avoid unnecessary complications, effective primary care should be available at the

peripheral level by an appropriately trained person (Mock *et al.*, 1993). Therefore, it is essential to develop a strategy based on the available resources within the existing limitations, on improvisation, and on adaptation of the modern art and science of orthopaedic surgery to the prevailing circumstances (Alms *et al.*, 1987). The study of traditional birth attendants (Lynch & Derveeuw, 1994) also indicated that appropriate training and supervision of village health workers play a vital role in the effective performance and utilization of locally available manpower. The evaluation of dhamsi *jhankri* (traditional healers) training programme in Nepal found conclusive evidence that faith healers can play a culturally appropriate and cost-effective role in health programmes, and there was increased attendance at rural clinics after the trained traditional healers began working in local communities (Kahssay *et al.*, 1998). It has been advised by Siddiqi *et al.*, 2001 that public awareness and training of available health workers are essential for proper referral system to work.

Our results also support the fact that training of the local health workers of the villages in a developing country like Nepal can be one of the effective means of helping the local people obtain access to appropriate primary care in time. Where there is no doctor for the remote villages, these local health workers become most effective vehicles for the health care delivery system and, therefore, they deserve the opportunity for proper training and retraining in the fields of public health needs. This programme seems to be effective (Table 3) in providing suitable training in the fields of orthopaedic and trauma care, as it should be practiced in our villages. It is a common observation in Nepal that about 70% of common injuries can be safely managed by simple methods including effective primary care (Shah & Sharma, 1991), and more than 50% of preventable physical disability results from common injury or infection of locomotor organs (Shah, 1999). Therefore, this programme has objectively promoted effective primary care with a view to prevent physical deformity in our rural locations. Our study showed significant improvement ($p < 0.05$) in the knowledge base and working skills of local health care workers after the completion of the training workshop.

We acknowledge the limitations of a written test and a once-a-year visit for the assessment of behaviour of randomly selected persons and places, which were not standardized in order to minimize the biases.

Although the design of this study is based on available resources of a varied nature that are difficult to measure, the preliminary outcome has been relatively encouraging. However, a broad-based study in a defined area with a fixed population for a definite period has to be planned on a prospective basis for the evaluation and objective analysis of the outcome of this training programme. Any programme largely depends for success on appropriate technology, sustainability, environmental compatibility and available resources (Frederick, 2002), and this innovative programme has all these characteristics.

Summary

An innovative programme was launched in 1994 to train local health professionals in the villages of Nepal with support from WOC-UK, and it has been running ever since. The course contents were designed according to the prevailing needs of the rural population. The methodology of training was a simple hands-on workshop in a small local setting. The local trainers used local language, materials, manpower and methods for the training. The evaluation of this programme after 6 years shows that the participants gained a significantly ($p < 0.05$) improved knowledge base and working skills after the completion of the training workshop. Therefore, the expansion of this programme is recommended for the wider acceptance of the primary care of common orthopaedic and trauma patients and thus for the prevention of physical disability in the rural settings.

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