The Internet Journal of Allied Health Sciences and Practice

<http://ijahsp.nova.edu>

A Peer Reviewed Publication of the College of Allied Health & Nursing at Nova Southeastern University

Dedicated to allied health professional practice and education

<http://ijahsp.nova.edu> Vol. 8 No. 1 ISSN 1540-580X

Measuring the Quality of Rural-Based, Government Health Care Workers in Nepal

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CITATION: Knoble, S.J., Pandit, A., Koirala, B., Ghimire, L. Measuring the Quality of Rural-Based, Government Health Care Workers in Nepal. *The Internet Journal of Allied Health Sciences and Practice*. Jan 2010. Volume 8 Number 1.

ABSTRACT

A representative, cross-sectional clinical skills assessment of 163 mid-level, rural-based, government health care workers was conducted in four districts of Nepal in June 2007. All Health Assistants and Auxiliary Healthcare Workers within the target districts were scored using checklists of standardized key skills in clinical encounters with model patients or clinical models. Participant scores were reported as a mean percentage in adult medicine 28(%), pediatric medicine 56(%), maternity medicine 35(%), orthopedic medicine 45(%), clinical procedures 59(%), and management 46(%). This was measured against the government's 60(%) standard on clinical skills. There was little significant difference between categories of health workers by district of posting or years of experience. There was a minor difference in skills by level of facility - workers in higher level facilities scored better across the domains. Reasons for poor performance in clinical skills were attributed to a lack of clinical in-service training programs, training only focusing on prevention and public health, and poor on-sight supervision. Poor pre-service schooling factors included heavy theory concentration in pathophysiology and inadequate clinical exposure opportunities. Recommendations for the improvement of clinical skills and decision-making include the institution of in-service competency-based training with a high emphasis on real patient exposure. Pre-service recommendations include implementation of a national certification program and an expansion of the current government clinical training sites and clinical teacher development programs.

ACKNOWLEDGMENTS

The authors would like to acknowledge Ms. Rubina Prajapati, BN, and Mr. Khem Shreesh who functioned as evaluators in the maternity and management domains.

In Nepal, there is a lack of well trained, quality, mid-level health care workers (MLHCW) in the rural areas. The lack of and poor performance of providers at these health posts results in inadequate preventive and curative health care services to the poor and geographically isolated population of all ethnic groups. The lack of quality providers is a primary reason for a continued high maternal and neonatal mortality rate as well as a general reduction in the quality of life due to the burden of diseases of the rural population.

The shortage of health care workers can be attributed to migration or “brain drain” from the poor countries to the west due to higher salaries and easier living conditions.¹ Because of this crisis in human health resources, there is little hope that we will see further advances in health in the developing world unless this trend is reversed.²

There are some references in the literature to the use of mid-level cadre as a substitute for higher level healthcare workers. They found these workers are very effective in that their outcomes are similar to those of higher level health workers.³

MLHCWs serve as the backbone of the Nepali rural health care system. These cadres are defined as Health Assistants (HA) and Auxiliary Health Workers (AHW). Health Assistants are considered to be on the upper end of the mid-level health provider scale. The HA is the primary provider and administrator of the Primary Healthcare Centers and Health posts that are on the front line of providing health care to the rural population. AHWs primarily man sub-health posts that are located in most villages. MLHCW's scope of practice is prescribed by the government's Department of Health Services. This includes primary curative care, emergency treatment, maternity care, public health, childhood immunizations, TB, HIV and leprosy treatment, and health statistics as well as management of health posts and sub-health posts.⁴

The Council for Technical Education and Vocational Training (CTEVT) is the semi-autonomous government body which approves and oversees the pre-service curriculum of AHWs and HAs. Health Assistant training is 36 months in length. Admission is given to those who have achieved 2nd division pass (>45%) of the Student Leaving Certificate (SLC) which is done after grade 10. The first year consists of general science; the second year covers clinical sciences and community health. The third year consists of clinical specialties and 6 months of practical exposure. The AHW training is similar to HAs but totals 15 to 18 months with 3 months of practical exposure.⁵

Upon completion of studies, students are given a final examination administered by CTEVT. Those that pass are given a provisional certificate and must register with the national paramedical council. Renewal with this council occurs every five years; however, no further continuing medical educational requirements are needed to maintain registration.

Popular anecdotes, along with some unpublished studies, have questioned the quality of the performance and skill level of these MLHCWs. At this point, there is no assessment which has examined the clinical skills of practicing MLHCWs in Nepal using the standard of government approved competencies or the national “Essential Health Care Services List.”⁶

There are a few references to the poor quality and performance of MLHCW in general within the international literature addressing other medical and health sector deficiencies in the developing world. A review article in *The Lancet* found that there was a general lack of quality in HCW performance, and that single interventions were not effective. They recommended the further study of other factors affecting performance and the devising of new strategies that address these factors.⁷

The traditional didactic method of in-service training for medical assistants was studied in Ghana as it related to the specific treatment of malaria. The findings showed that although theoretical understanding was improved, the actual practice of the HCW did not change.⁸ The quality of nurses in regard to barriers for referral was studied, and it was found that the system broke down at the village level because of a lack of understanding about the need for referral as well as the nurses' concern about preserving their reputations.⁹ These studies support the assertion of poor quality or a lack of training in these MLHCWs.

The inadequate and poor performance of providers has led to inadequate preventive and curative health care services to the poor and geographically isolated populations of all ethnic groups. This public health need is evidenced by the fact that last year only 19% of births were attended by a skilled attendant and only 43% of children who had pneumonia were taken to a health provider.¹⁰ The lack of quality providers is a significant reason for a continued high maternal and neonatal mortality rate as well as a general reduction in the quality of life due to the burden of diseases of the rural population. A study was needed to measure the clinical skills of practicing MLHCWs and identify the factors that contributed to the quality or lack thereof of their clinical practice.

METHODS

A representative, cross-sectional study design was chosen to measure clinical skills of rural-based government MLHCWs. This allowed for a snap-shot view of the current clinical skills of practicing MLHCWs. It did not measure any intervention that had occurred in order to improve their skills.

Permission to implement this study was obtained from the Ministry of Health and Population and the Nepal Health Research Council (NHRC). Participants were asked to sign the informed consents and fill out demographic questionnaires. The assessors

were blinded from any of the demographic data of the participants. An interview was conducted with each participant in regard to his or her clinical experience in his or her pre-service training as well as in his or her current practice.

The clinical skills assessment (CSA) was divided into six different domains: general medicine, pediatric medicine, maternity care, orthopedics, procedures, and management. Pilot testing and a review by various experts in the specific domains were done for each CSA check list to ensure accuracy and appropriateness for MLHCWs in a rural environment. The assessors consisted of three doctors, a nurse, and a manager. Two AHWs were used as live model patients. One model patient was used in adult medicine domain and the other was used in the pediatric and orthopedic medicine domains. These model patients gave a consistent history when asked in order to ensure a standardized patient for each participant. The participants also did their physical examination, treatment, and patient education with these model patients. In the pediatric domain, the model patient functioned as the child's parent to give a standardized history. Due to ethical reasons, an actual child was not used in the assessment. A clinical pelvic birthing model was used to assess the maternity medicine domain and a clinical arm model was used to assess procedures.

Each domain had a standardized set of key skills that the participants were asked to perform. (See appendix 1) A similar design was used by Carlough for an assessment of auxiliary nurse midwives.¹¹ Each domain was scored and reported as a mean percentage of the total possible points. Each domain was measured against the government's minimum score of 60% for practical clinical skills.⁵ The performance gap is defined as the difference between the mean percentage and the standard score of 60(%). At the end of the CSA, the evaluation team conducted a focused discussion group through guided interview techniques.

PARTICIPANTS

The study selected a sample of rural based government MLHCWs. To do this, five different districts were selected - one from each of the five development regions. Among the five, each of the three ecological zones: two hilly, two flat, and one mountain district were chosen. Districts were chosen based on some logistical and time constraints, meaning that there was road access to the districts, a condition which eliminated some of the more remote districts. All MLHCWs currently practicing in the district were tested. The participants were categorized by mid-level designation, experience, district, and level of health facility.

A total of 163 participants were tested. These included 23 HAs, 31 Senior AHWs and 109 AHWs. The district of Saptari was cancelled due to continuing political unrest and the participants' inability to travel to testing areas. The percent of participants tested vs. the actual MLHCWs posted in the districts was 97.6(%). Two participants in Rasuwa district and two in Dadeldhura district were not tested. All participants posted in Gorkha and Bardia districts were tested.

The average age of the participants tested was 36.1 years with 12.8 years of experience. MLHCWs more often received government schooling 59 (%) than private schooling 41(%). Postings in sub-health posts, health posts, primary health centers, and district hospitals were 45.7(%), 31.5(%), 13(%) and 9.9(%) respectively.

Table 1. Participant Demographic Data

Description	Gorkha District	Bardia District	Dadeldhura District	Rasuwa District	Average
Average age (in years)	36.6	37.1	32.2	36.3	36.1
Average years of experience	12	15	9.2	12.1	12.8
Private Schooling (%)	54.1	26.3	39.1	47.4	41.3
Government Schooling (%)	45.9	73.7	60.9	52.6	58.8
Sub-health Post (%)	60.7	37.9	43.5	25	45.7
Health Post (%)	19.7	34.5	47.8	40	31.5
Primary Health Center (%)	8.2	17.2	4.3	25	13
District Hospital (%)	11.5	10.3	4.3	10	9.9

RESULTS

Clinical Skills Assessment

In the Adult Medicine domain, the participants were asked to take a history, complete a physical exam, diagnose, and treat a model patient with pneumonia and anemia. They scored 29(%) in patient history, 13(%) in patient exam, 64(%) in diagnosis and

42(%) in treatment. The total mean adult medicine score was 28(%) with a 32(%) performance gap identified.

Participants in the Pediatric Medicine domain were asked to take a pediatric history from a model parent. They were also asked to assess for malnutrition and orally quizzed on proper immunizations and schedules for the child. They scored 45(%) in history and treatment, 65(%) in malnutrition recognition and treatment and 97% in immunizations. The total mean pediatric medicine score was 56(%) with a performance gap of 4(%) identified.

In the Maternity Medicine domain, participants were asked to conduct a normal vaginal delivery with no complications on a clinical birthing model. All needed equipment was supplied. Their mean score was 44(%) in normal vaginal delivery and 25% in management of postpartum hemorrhage. The total mean maternity medicine score was 35% with a performance gap of 25(%). The MLHCWs were questioned about their maternity training and whether they conducted deliveries at their posting. Seventy three percent (73%) CI(65.5 to 79.7) reported that they did do normal delivery cases, yet only 42(%) CI(20.3 to 34.5) reported any formal training in normal deliveries. Sixty seven percent (67%) CI(59.1 to 74.0) reported having to treat delivery complications, yet only 15(%) CI(9.7 to 21.1) reported any formal training in delivery complications.

Participants in Orthopedic Medicine were asked to assess a model patient with a supracondylar fracture. They were assessed on their exam and treatment including the application of a splint. The mean score was 45(%) with a 15(%) performance gap in orthopedic medicine.

Participants were assessed on starting an IV infusion. Proper steps, techniques, sterile procedure, and drip calculations were assessed. A mean of 59(%) was scored in the Procedures domain.

In the Management domain, two case studies were presented and various questions were asked of the participants. Answers were scored based on whether the answers covered the basic management concepts of work, information, resource utilization, and performance evaluation. Participants had a mean score of 46(%).

Table 2. Clinical Skills Assessment (by %)

Domain	Mean %	Performance Gap
Adult Medicine	28.3	31.7
Pediatric Medicine	56.1	3.9
Maternity Medicine	34.8	25.2
Orthopedic Medicine	45.3	14.7
Clinical Procedures	58.7	1.3
Management	45.7	14.3

The participants were compared against each other in all domains by designation, district, years of experience, and posting location. The scores showed that there was only a slight difference in the performance of the HAs as compared to the other two designations in the areas of adult and orthopedic medicine. (see *table 3*) The data showed that there is no statistical difference in any domain based on years of experience (see *table 4*) or district of posting. Comparison by level of facility did show some statistical differences in clinical skills based on posting. (see *table 5*) The comparative data show no practical clinical differences among categories of MLHCWs, as well as no difference based on years of experience and districts. Therefore, the data for the clinical skills assessment all three categories of MLHCWs were combined and reporting the mean results as a total.

Table 3. Scores by Designation (by %)

Domain	AHW	SAHW	HA	p- value
Adult Medicine	27.6	27.3	32.4	0.02
Pediatric Medicine	55.1	58.2	58	0.18
Maternity Medicine	33.8	35.6	38.4	0.17
Orthopedic Medicine	44.5	44.9	49.4	0.03
Clinical Procedures	58.3	62.6	55.6	0.42
Management	45.2	47	46.2	0.71

Table 4. Comparison of Clinical Skills Scores by Years of Experience (by %)

Domain	< 5 yrs	5-10 yrs	> 10 yrs	<i>p-value</i>
Adult Medicine	28.2	30.3	27	0.06
Pediatric Medicine	52.6	57.5	56.2	0.17
Maternity Medicine	34.5	36.8	33.7	0.27
Orthopedic Medicine	43.1	46.4	45.1	0.30
Clinical Procedures	67.7	58.1	57.2	0.10
Management	45.7	45.9	45.4	0.97

Table 5. Comparison of Clinical Skills Scores by Posting (by %)

Domain	Sub-health post	Health post	Primary Health Center	District Hospital	<i>p-value</i>
Adult Medicine	26.2	28.6	28.6	35.5	<0.001
Pediatric Medicine	55.5	56.1	59.4	55.1	0.42
Maternity Medicine	31.8	36.4	36.8	40.9	0.006
Orthopedic Medicine	45	43.8	45.3	50.3	0.052
Clinical Procedures	55.2	58	65	68.6	0.04
Management	45.3	45.6	46.1	47.6	0.89

Focus Group

A focus group discussion involving all participants followed the clinical skills assessment portion. The majority of participants felt their in-service training in preventive and public health was adequate and that they were confident in their skills in this area. They complained, however, that the public's expectations of them were for curative treatment of common diseases and not in the areas of prevention and public health. They felt that more emphasis should be put on improving their clinical skills in order to meet the work expectations.

When questioned about their exposure to clinical skills in their pre-service training, a few felt that they had had adequate exposure to practical skills while in training, but upon posting in a rural health post, they quickly forgot all that they had learned due to lack of practice. Most others, however, felt that their training was very weak in practical skills. As students, they had been sent to a health post or district hospital for their practical training and due to the large number of students and / or lack of patients, they did not get adequate exposure. They also complained that there was no real supervision when they were doing their practical training. Many felt they would have had better clinical skills if the pre-service institutions were required to provide adequate clinical exposure during their practical training.

DISCUSSION

The authors believe that this study gives a good representation of the current condition of clinical skills of government MLHCWs. The fact that the four districts had very similar CSA scores suggests that other districts in Nepal would also compare similarly to the districts tested. Therefore, we believe the findings of this study can be considered representative of mid-level government HCWs working in Nepal's rural areas.

This study shows that there is essentially no statistical or clinically significant difference in clinical skills among MLHCWs when analyzed by designation, district, or years of experience. Any small difference noted among MLHCWs was not to the extent that the difference could be considered clinically significant. The only significant comparative finding was by facility level. Those who worked in primary health centers and district hospitals scored better than those at sub-health posts or health posts. The belief is that exposure to more patients and doing more clinical skills with better supervision improves overall performance.

The data also supports the anecdotal evidence that the MLHCWs have poor clinical skills as related to curative medicine. The study shows that in the areas of adult, maternity, orthopedic, and management domains, the MLHCWs had a significant performance gap of 14% to 32%.

There are multiple reasons for the general weakness in government MLHCW's clinical skills. First and foremost is the lack of quality practical skills training and exposure in the pre-service training of these HCWs. There are many schools which continue to graduate a large number of students who have had adequate theory but minimal clinical exposure. The few clinical sites

available are flooded with students of all levels or the students are sent to health facilities where there are few patients, little supervision, and little opportunity for practical exposure.¹²

Another reason for general weakness in clinical skills is the lack of in-service training. The Integrated Management of Childhood Illness (IMCI) training which has a curative component was shown to make a difference in the pediatric assessment with a performance gap of only 4%. Other than IMCI, there has been little attention paid to this aspect of their job responsibilities even though they are called to do clinical medicine the vast majority of the time.

Finally, in the focus group discussion, the participants stated that their clinical skills declined after arriving at their posting. Some are assigned to an SHP where there is little support infrastructure and no orientation to their job responsibilities. Due to lack of confidence, the local villagers do not seek help at the health post. The provider has no opportunity to use or improve his/her skills and over time, the clinical skills deteriorate. In summary, the clinical skills of the MLHCWs are weak due to lack of proper training in pre-service training, lack of clinically related in-service training, and lack of exposure and supervision in their current practice.

There are approximately 6,500 mid-level health care workers practicing in the government health care system. There are 15 Health Assistant schools and 65 AHW/CMA schools under government supervision producing thousands of new graduate MLHCWs each year.¹² Any intervention regarding the quality of government MLHCWs must take into account the currently practicing workers as well as the new graduates who will be joining the health care workforce. A comprehensive strategy must include ensuring a quality pre-service education as well as in-service training in the clinical skills of curative medicine.

RECOMMENDATIONS

To address the in-service training gap, a curriculum needs to be developed to focus on basic clinical skills that these MLHCWs come into contact with on a daily basis as they work in their health posts. Clinical decision-making skills also must be an essential part of the training. This should not be at the expense of preventive or public in-service training. However, concentration of training in an area where only a minority of time is spent by the health care worker is not effective.

Secondly, a concerning performance gap is in the area of maternity care. Until these front-line health care workers are given the skills to deliver and intervene if delivery complications arise, there will not be a substantial improvement in the state of safe motherhood and maternity care in the rural areas.

To address the lack of pre-service quality clinical skills training, it is recommended that the introduction of a national certification for all MLHCWs be implemented. This certification examination process, including theory and practical skills, would set the bar for quality of MLHCWs. Those pre-service institutions would need to ensure that a high percentage of their students pass this certification or they would lose students who would look for institutions that offer a better quality education.

In order for there to be an improved learning process in clinical skills, there must be three components: (1) students willing and able to learn, (2) opportunities for clinical exposure, and (3) clinical teachers who are able to effectively teach these skills to the students who are learning. Although this study does not specifically seek to evaluate or determine the quality of clinical teaching, one may deduce from the focus group discussions that the teaching capacity in both pre-service and in-service clinical skills training is weak. The recommendation is that the majority of the clinical teaching must be done in a practical setting rather than a classroom. Clinical decision making can be best learned in a clinical setting, thus, the teachers should be practicing clinicians rather than lecturers.

To teach clinical skills, the use of step-by-step learning guides are essential. Learning guides are step-by step instructions that not only tell what to do, but also how to do it. Learning guides can be used by the instructors to teach, the student to learn, and also as a standard for evaluation of the student during testing. History-based clinical algorithms are also a tool that can be used to teach clinical decision making. Algorithms can be used to teach a decision making process, but also can be used by the student at the point of contact with the patient to assist in the process of diagnosis.

We recognize that the delivery of quality health care does not depend only on competent clinical skills. A supportive working environment, good logistical support and proper supervision are among some of the other factors that must be included in developing a strategy for improving the health care service delivery system. This study does not seek to evaluate those aspects of the health care system and acknowledges that those issues must also be addressed for a comprehensive change in quality to take place. However, any strategy to improve MLHCWs performance must include both the pre-service and in-service barriers to quality clinical skills. As Nepal seeks to continue to improve its health care services in the rural areas, competent and qualified MHLHWs must be seen as an integral part of any overall strategy in building the capacity of the government health sector.

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Appendix 1
Example of a CSA Checklist for Assessment of Clinical Skills

Procedure Evaluation Criteria

Participant Number: _____

District: _____

Time for Evaluation: 10 minutes

Supplies: All supplies needed for starting an IV are provided: catheter, tubing, IV solution, alcohol, cotton balls, tourniquet, scissors, tape, gloves, sharps container, hand washing facilities

Scoring Criteria:

0	Task / Skill omitted
1	Task / Skill performed incorrectly
2	Task / Skill performed correctly but hesitantly
3	Task / Skill performed correctly with confidence

No.	Skill / Standard	0	1	2	3	Total
1	Prepare the patient and items needed for procedure.					
2	Q: What is the procedure for joining the IV fluid to the IV line? 1. Spike into the bottle (1 pt.) 2. Needle into the bottle for air (1 pt.) 3. Run fluid through without air bubbles					
3	Washes hands or uses clean exam gloves					
4	Place tourniquet (about 20cm above insertion point)					
5	Palpate for vein					
6	Clean area with alcohol before catheter insertion, maintain sterile technique					
7	Position needle bevel up, use traction on the skin prior to sticking. (30-40 deg. angle					
8	Insert needle until blood in flash chamber					
9	Hold needle while advancing the catheter up to the hub					
10	Release the tourniquet on the upper arm					
11	Connect IV tube to catheter					
12	Secure catheter to skin with tape and dress using sterile technique					
13	Dispose of needle in sharps container and other contaminated waste					
14	Set up IV hydration. Calculate at 300 cc/hr (answer 80 drops/minute)					
15	List possible complications of an IV: 1. Infiltration (Swelling) (1 pt.) 2. Infection (1 pt.) 3. Broken catheter, embolism (1 pt.)					
Score:						
Total:						45
%						

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