

Task Shifting in Primary Eye Care – Literature Review

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Introduction

The problem of blindness and visual impairment

Blindness is estimated to affect around 39 million people in the world and an additional 246 are visually impaired.¹ To give this some perspective, “blindness means visual acuity of less than 3/60, which translates roughly to an inability to count fingers accurately at 3 meters”. Visual impairment encompasses a wide range of visual acuity from blindness up to 6/18, still less vision than is required in industrialized countries to obtain a driving license. In addition, blindness is defined by a very constricted visual field, but this definition is rarely used in developing countries. In terms of prevalence of blindness and visual impairment, among the World Health Organization (WHO) Regions, Africa is one of the highest (0.73%), second only to the eastern Mediterranean (0.85%). Critically, at least 80% of visual disability in Africa could be avoided by

application of recognized preventive and curative measures. Recognizing this, in 1999 a coalition of non-governmental organizations (NGOs) and the WHO launched an initiative named "VISION 2020: The Right to Sight," which aimed to eliminate avoidable blindness by the year 2020. This was considered realistic because of the fact that the technical solutions to eliminate much visual disability already exist and are neither unduly expensive nor complex. However the shortage and poor distribution of human resources for health care were recognized from the beginning as posing a significant challenge.

Task shifting: a solution?

The shortages and mal-distribution of health workers in developing countries are well known. One solution put forth has been to shift tasks from highly specialized-- more scarce and expensive--health workers to less specialized-- more readily available and cheaper-- workers. "Task shifting" is one term for the phenomenon, but it is also known as substitution. It is not new. "Clinical officers" in Africa have been trained and provided the backbone of medical care in many countries for years. These workers generally have a basic secondary education followed by 2 or 3 years of practical medical training, after which they take on tasks that would be performed by doctors in the industrialized countries. They are usually given more responsibilities and prestige than nurses, often working as heads of district hospitals and filling the roles of fully trained medical doctors. They may serve as general practitioners but specialized training has also been designed for them in a number of areas including anesthesia, obstetrics, general surgery, orthopedics, and others.

In the field of ophthalmology there are several examples of task shifting including use of non-physician cataract surgeons and trichiasis surgeons. There is one more example that can be regarded as involving task shifting in the field of eye care; this is not one specific practice, but, a whole group of activities coming under the umbrella of "primary eye care" or PEC. There have been many debates over the role of PEC and at least some of this is probably due to the fact there is no one accepted definition for what constitutes PEC. Historically, the concept of PEC was born as a consequence of the Alma Ata meeting, which highlighted the tenets of primary health care. In particular, it

was suggested that PEC could have an impact on reducing two important causes of blindness in developing countries: (a) vitamin A deficiency related blindness, which could be addressed through measles immunization and vitamin A supplementation, and (b) trachoma, which could be addressed through community based efforts at improved general hygiene (face washing) and environmental improvements, such as construction of latrines and development of safe water sources. In the past few decades, there has been considerable success in controlling both of these conditions; vitamin A related blindness is becoming rare and the global burden of trachoma has dropped.^{2,3}

Early on, the concept of PEC started to expand in terms of scope of work when it was suggested that a minimally trained health worker could probably diagnose a white cataract and could recognize a red eye with minimal or no equipment.⁴ This was expanded to suggest that if such a worker were taught to measure visual acuity, by counting fingers or using an inexpensive visual acuity chart, he or she could identify people with blindness or visual impairment and refer them for curative treatment. In addition, by including tetracycline eye ointment in the standard list of medicines for primary health facilities, some infectious eye conditions might be prevented or treated.

The arguments in favour of embedding eye care within the primary health care system are often taken as obvious by advocates for eye health. “Integrating” eye care into the most basic services is assumed to be the way to ensure that it is maximally accessible to poor rural people who use primary health care services. It is also argued that only when eye care is integrated into the primary health care service will it become sustainable, while more “vertical” service delivery models will always be at the mercy of the donor agencies that support them. On the other hand, arguments against the effectiveness of PEC as a model to ensure the elimination of visual disability include the fact that the most common medical causes of vision loss in Africa (cataract, glaucoma, and increasingly other posterior segment causes such as diabetic retinopathy) cannot be accurately diagnosed, let alone treated at the primary care level. Refractive error, now recognized as an important cause of visual impairment (although not blindness) in Africa, may be more amenable to correction at the primary level than medical causes, although at this point its correction still requires specially trained eye

care workers such as optometrists or refractionists, rather than general primary health care workers.

In this review, when we discuss PEC we will be referring explicitly to the provision of eye care services by general health care workers at the basic level. We do not consider paramedical specialist fulltime eye care workers (such as cataract surgeons or ophthalmic nurses) as PEC workers. Also excluded are the community volunteers who have been used in many communities for various eye health related activities.

To summarize, this review will look at shifting “primary eye care” (or “primary prevention or visual disability activities”) from ophthalmic personnel to general health workers. We will examine documentation and evidence (where they exist) of how widespread the shifting of tasks is across Africa, how well it works to ensure acceptable quality eye health for Africans at all levels and the factors that might influence its effectiveness, both in theory and in practice

Methods

We conducted a review of the literature considering the questions stated above. A search of Medline was carried out using Pubmed and the grey literature using Google with combinations of the following key words: primary eye care Africa, task shifting, clinical officers, village health workers, community health workers, nurses, paramedicals. Library technicians at the College of Physicians and Surgeons of British Columbia ran a parallel search using Medline, Google Scholar and CINAHL (a nursing and allied health database). Early in the search one excellent review article by Courtright was identified⁵ which provided a good overview of the topic up to 2010. Subsequently, the search was limited to articles not included in this review. From these remaining articles, abstracts of interest were assessed and most of these were obtained in full text where available. Relevant articles and reports were identified and reviewed in full text. The information obtained is summarized in the following review.

Scope of Task-shifting for PEC

There is very little literature examining formal task-shifting of provision of primary eye care services to general health care workers at the basic level. Despite this, given that it is estimated that only 30% of Africans have access to specialized eye care ⁶ it is likely that front line health workers are practicing eye care by default in most, if not all of the areas not regularly serviced by dedicated eye care professionals, whether or not they have been adequately trained to do so. A review from Rwanda supports this assumption by the observation that general health workers not involved in the official PEC program who had not received the special training were also seeing eye care patients.⁷ In Malawi, a baseline survey done in two districts found that whereas 78% of the health care workers reported providing diagnosis and treatment, 48% of them (mainly patient attendants) had no formal training in primary eye care.⁸

Several countries, particularly Malawi, Tanzania, South Africa and Kenya, have apparently been incorporating PEC into the general PHC worker's role for some years but it is not clear whether this included in official job descriptions or training curricula.

Effectiveness of Task-Shifting for PEC

The recent review by Courtright summarized the relevant literature on this topic to 2010.⁵ In all, only 5 articles providing information on the effectiveness of general primary health care workers practicing primary eye care were identified. The following section briefly summarizes the articles included in his review.

In an early review of PEC from 1987 looking at the results of training front line health care workers in South Africa, Tanzania, Kenya and Malawi in PEC, Steinkuller acknowledged some success among front-line health care workers in promoting general health messages including hygiene and nutrition information useful in trachoma and vitamin A deficiency related eye problems. He was far less positive about PHC workers'

diagnosis and management of eye problems, despite PEC training. He observed that little seemed to have changed in the workers ability (or willingness) to measure visual acuity, remove foreign bodies or accurately differentiate causes of a red eye.⁹

In 2000, De Wet et al reported on primary health workers practicing primary eye care in South Africa. He identified many problems including a cumbersome referral system, lack of availability of appropriate medicines at clinics, insufficient knowledge of primary health care workers regarding eye conditions and poor communication between eye care service providers.¹⁰

A study examining the causes of children being brought late for cataract surgery identified one of the associated factors as the inability of health care workers at primary and secondary health centres to adequately inform families of the diagnosis and need for cataract surgery, which contributed to a delay before surgery. “Among our study population, 15 respondents (13% of all respondents) reported being sent back home with drops or vitamins or nothing at all, and without getting a diagnosis (or were given an incorrect diagnosis). This delayed presentation to the surgical facilities by years in a few cases.”¹¹

Similar issues were found in patients with eye trauma. By the time patients arrived at the eye care centre, significant visual loss had occurred in 95.5% of patients despite presentation by most patients within 24-48 hours to another health facility. Delays were sometimes caused by multiple visits to the primary centre, inappropriate treatment, referral or advice, staff absence or unqualified staff.¹²

Two articles examined a program in Rwanda where PHC workers from health centres were specifically given training in PEC along with village health workers. Researchers found that, although there were some initial increases in eye patients seen at the health centres, the increases were not sustained and after ophthalmic personnel began to make supervisory visits, the community volunteers began to refer patients to the health centres to see the ophthalmic clinical officer directly rather than the PHC workers,

reflecting a lack of confidence in the general health workers' abilities. They also found that patients were being seen for eye complaints by health care workers who had not had the specialized PEC training.^{7,13}

A study looking at Vitamin A distribution among eligible patients in South Africa found that only 34% of the children with risk factors indicating the need for supplementation were appropriately given supplementation.¹⁴ Another study from Malawi, showed that only 12.8 % of children age 5 and under had received Vitamin A supplementation in the past 6 months despite much higher rates of vaccinations and visits to health centres.¹⁵ In both cases it appeared that there were missed opportunities.

Based on these studies, Courtright concluded that the results "were generally not encouraging" and reported that "the authors of all three of these articles suggested that such eye care was not meeting the needs or expectations of the target populations," but recognized the limited data available and called for more research on the topic.

Since that time, several other studies have been completed to provide us with some additional information.

In Malawi, task-shifting to promote enhanced diagnosis, treatment and referral at the health centre level through PEC training curricula of nurses and medical assistants is being promoted. A research brief produced by the east African task shifting AHSI research team reports that these workers generally have poor skills, for example, only 56% could accurately identify a white cataract. They see very few patients, only 5 per year on average, which is felt to be inadequate to allow them to maintain their skills. There is also relatively little supervision with only 28% of the staff reporting a supervisory visit in the past year and district eye coordinator visits, although more frequent, focus on the coordinator seeing eye patients without a PHC worker present to observe or learn. Essential equipment for examining eye patients was generally absent with 97% of centres not having eye charts and 90% without torches. Patients bypassing the smaller centres, absenteeism and data reporting systems were also identified as

problems. More research is continuing in these sites to assess the effects of enhanced skills-based supervision for primary health care workers providing PEC services.⁸

The government of Tanzania instituted a formal primary eye care training component within the training of health care personnel (clinical officers, nurses, medical doctors) about 20 years ago. A study of PEC knowledge, skill and productivity of 49 general health workers in one district of Tanzania in 2010 revealed that general knowledge was poor. Testing workers' ability to diagnose and manage four common eye conditions and correctly measure visual acuity revealed an average score of 6.2 out of 12. The health workers' ability to correctly identify cataracts (67.3%) was only slightly higher than traditional health workers' ability in another study from Malawi. Although all workers reported providing eye care, less than half (41%) of them had received training in PEC and only 2 of these remember being taught how to assess visual acuity. Interestingly, having had PEC training did not correspond to higher test scores. Scores were found to be higher for more recent graduates, clinical officers compared to nurses and men compared to women. None of the 36 health centres had vision charts or torches for examination. The poor results were attributed to poor supervision, inadequate equipment (no eye charts), poor training and low volume of patients (average 3 patients per month). Recommendations were made to consider reassessing training needs, skill mix and skills-based supervision. As in Malawi, new research based on these findings is underway to examine the effect of "skills-based supervision" on the delivery of eye-care services.¹⁶

Another study in 2011 from Ethiopia looked at PEC knowledge and skills of Health Extension Workers who are female government health workers who have undergone 1 year of training focused on prevention of common diseases. 48.6% of them had not received any training in eye care while others had received pre-service training, inservice training from an NGO or had learned from colleagues. Their general level of knowledge was poor with only 37% of them being able to identify cataract and trachoma as causes of blindness. The majority suggested referring cataracts but more than half had a misunderstanding of the diagnosis. Although most (89%) correctly mentioned signs and symptoms of trachoma, only 10% could describe its control strategy. The

authors concluded that “HEWs have some level of useful awareness about common blinding eye diseases such as trachoma, cataract, and childhood blindness but not much about refractive error and glaucoma. However, their knowledge of prevention of blindness was limited to hygiene education.” There was recognition among HEWs that blindness was a concern in their communities and they expressed a positive attitude towards participating in blindness prevention. The authors recommended that PEC education be formally integrated into their training.¹⁷

A different type of study was conducted in Zanzibar looking at the results of a pilot project to assess medical officers’ ability to identify need for and distribute ready-made near vision spectacles to patients. This study resulted from a previous assessment that there was a need for presbyopic correction in the community and that patients were willing to pay a small amount for spectacles. Although 89% of people over the age of 40 required correction only one in five had spectacles. Evaluation of visual acuity is one of the skills felt to be appropriate to general health workers. Medical officers (who, in Zanzibar, are primary health care workers with one year of training) from 6 different health centres underwent a one day training course in presbyopic correction and then had follow-up visits at their sites immediately afterwards and at 6 months. Each medical officer was provided with 200 pairs of spectacles to distribute. 574 patients attending the facilities had eye complaints. All of the 173 who had impaired near vision alone were provided with spectacles. Almost all of those (28/29) with distance vision corrected with pinhole were referred for refraction. 74 people were referred for a variety of reasons although it is not clear in some cases the cause for referral and it appears that some patients who should have been referred were not (e.g.-of those with “poor vision of unknown cause” only 2/15 referred). There was no follow-up available from the referral centre to determine if these referrals were appropriate or if the patients actually attended. Also, there was no direct follow-up of the patients who received spectacles to determine if they had been distributed appropriately. There was also no data from eye visits prior to the pilot program for comparison but it is likely that the health care workers were not assessing visual acuities prior to training. After a short training, at least in the short term, medical officers assessed visual acuities of eye

patients and thereby identified not only those requiring spectacles but also, importantly, at least some of those requiring referral. It is possible that the availability of spectacles at the centres was an incentive that motivated more eye patients to present to the centres. All medical officers, village leaders and participants recommended continuing with the scheme.^{18,19}

A recent study compared the effectiveness of health workers to “key informants” (prominent non-medical community members) for identifying children with blindness or severe visual impairment in Tanzania. Researchers found that, after a one day training, the key informants were far more effective than health workers at identifying children and the cost of training them was lower. The cost for each child found (and receiving a service) by a KI was US\$32 while for a HW it was US\$291. It appeared that attempting to add yet another task onto the already overburdened health workers was not successful.²⁰

A team in Malawi sought to improve referral of glaucoma patients (and glaucoma suspects) by providing training to general nurses at health centres in vision testing (including providing vision charts) and referral of anyone age 40+ with a vision less than 6/18. Over a one year period in the two pilot districts only 294 patients were screened and 147 patients were referred by the 87 trained nurses; among the referrals, 38% presented to a dedicated OCO. In the end, only 2 were seen by the ophthalmologist and diagnosed with glaucoma or glaucoma suspect. During the same period, 64 patients self-presented with glaucoma to the ophthalmologist, by-passing the referral system. The authors concluded that training and supplying nurses for visual acuity testing would not lead to improved utilization of services to prevent blindness from glaucoma.²¹

Discussion

Challenges

Several challenges to the widespread adoption of primary eye care are evident from the literature, beginning with the absence of a clear definition of the term. Related to this is the lack of clarity about who should best be tasked with primary eye care (full-time eye care workers, front line generalists or community volunteers?) and which tasks each level should be expected to do.

This review provides some useful information about how effective primary healthcare workers are in diagnosing and managing eye problems in their primary care settings. There are still only a few studies available reflecting the situation in a small number of countries. It is impossible to know what is happening in other countries where research has not been carried out or published. Overall, the new research is no more encouraging than that performed earlier. With the exception of the Zanzibar study, the PHC workers faced considerable challenges and did not appear to be providing a high quality eye care service.

The difficulties encountered were many: Insufficient knowledge and skills were found in most cases either due to lack of, or inadequacy of training or retention and application of information learned; in many locations the basic equipment required to provide primary eye care was absent; the volume of eye patients seen in many settings was very low; primary care workers were bypassed so patients could see dedicated ophthalmic personnel directly.

There are several possible explanations for the disappointing results of the studies. The most obvious is that the front line health workers are overburdened with an ever-growing number of tasks. The widespread belief that programs need to be integrated into primary health care in order to be sustainable has led to these workers being assigned many of the tasks that were previously handled by others. Continually adding more new skills to job descriptions of workers who have a finite number of hours in their day appears equally unsustainable. If they do more eye care, they will necessarily have to do less of something else.

Additionally, although the reported failings of the health workers reflect poor provision of primary eye care service, the situation is not unique to eye care. Front line generalists with limited training are often expected to perform a large number of sometimes demanding and complex tasks beyond their skill level simply because there is no one else to do it. In this sense they are being set up to fail within an often already failing system; many of the workers are dedicated and working to the best of their abilities.

Since eye problems are not immediately life or limb threatening, eye care is often not given high priority by governments, NGOs, supervisors and the workers themselves. PEC needs to compete with a host of other topics which may have more support or funding like malaria, HIV, maternal/child health and many others. Well-funded programs are more likely able to compensate workers for extra activities like training, monitoring and field visits making it more likely that PHC staff will make time for funded rather than unfunded activities.

Improvements in the technology of preventing and treating vision loss globally and increasing demands of people with vision related problems in the past 20 years have been substantial. As a consequence, the necessary skills and knowledge regarding eye care have expanded. It is likely that some PEC training programmes (whether embedded in general training or provided separately) is insufficient in content or length to meet the primary eye care needs of populations.

The very low volume of eye patients seen by health workers in some of the studies also likely contributes to the lack of emphasis on eye care. Seeing, in some cases, only 5 patients per month with eye complaints make it difficult to maintain interest and skills and gain experience.

In some of the studies, a proportion of the healthcare workers had not received any training in eye care whatsoever while others had received training from a variety of sources. The quality of this training may have had an effect on the low level of knowledge and abilities of the workers.

High levels of absenteeism and attrition also contribute to the problems of training these front line workers as in one study by Helen Keller International which found that of 400 workers trained in PEC, (in the Philippines) only 50 remained in practice 5 years later.²²

Variable levels and quality of supervision were reported and may have contributed to the poor results.

Finally, the small number of studies may not be representative of PEC programs in other areas of Sub-Saharan Africa where research has not been done (or published).

Recommendations

It is tempting to suggest that simply supplying equipment, training or supervision would address the problems and result in improved delivery of PEC services, particularly in the cases where some of the personnel had never received any training in PEC. It has long been assumed that, with adequate training, reinforcement and supervision, PHC workers could certainly learn to perform relatively simple tasks such as measuring visual acuity and identifying white cataracts. Unfortunately, some of the studies showed that PEC training did not necessarily correlate with improved knowledge and skills to provide quality eye care services. It is also widely recognized that correcting a knowledge deficit alone is generally insufficient to cause a behaviour change on the ground. But the nature of the training, which was not clearly described in these articles, could also be examined and maybe enhanced. With a different type of training (more focused, practical, hands-on, limited competencies) the results of training may be improved.

Perhaps the expectations for PHC workers should be re-evaluated or returned to the earlier model (which was somewhat successful) where workers were trained mostly to deal with preventive, community-based eye health topics and for all other eye problems they might need only to know who, how and where to refer, leaving the more complex

diagnosis and management to their more specialized eye mid-level eye care personnel. To try to incorporate more eye care into front line government workers' workload may not be in line with country priorities. Even if it is the NGOs typically providing much of the funding for eye care programs, the appropriateness of training government PHC staff in PEC needs to be reassessed, particularly in light of the research revealing the questionable efficacy of such training, recognizing that even the time spent away from their post to attend training (which they will willingly attend given appropriate allowances) has a cost to patients, (the ones not being seen in their absence). This is particularly relevant in the cases of HCWs who might see very few eye patients in their sites. In these cases, the time and cost of intensive training and supervision of PHC workers might be of questionable value. There needs to be clarification of the best way to direct limited eye care resources while also considering the needs of PHC staff with limited time. With further research, it may become clear that training is better aimed at mid-level eye care workers or even community volunteers rather than PHC staff. Although the role of volunteers was not specifically addressed in this review there is some literature on the topic. The bypassing of PHC staff in some of the studies reflects the patients' "vote with their feet" and suggests that they are demanding higher quality care than they perceive is available from PHC staff.

Addressing the lack of adequate supervision might also improve performance. Skills-based supervisory visits such as that currently being researched in Malawi, Tanzania, and Kenya might address both educational and supervisory problems.

The low priority given to PEC by governments is another, perhaps more difficult problem. Once more research helps to clarify how PEC training resources should best be utilized, advocacy to promote these recommendations at higher levels of government would be required.

The study from Zanzibar looking at provision of presbyopic spectacles, which suggested a positive outcome of training PHC workers in one aspect of PEC, deserves further attention. Although it is not clear from the study that prescriptions or referrals were

appropriate, the pilot did show that front line workers were able and willing to check visual acuities on a considerable number of patients. One could speculate that the key difference here might be that the availability of spectacles created a demand from the patient side, which provided the health care providers with adequate volume to maintain and use their skills and ensure that their eye chart was not lost or forgotten. The evident patient satisfaction might also have provided a positive incentive for the health care workers to continue checking eyes to identify patients who would benefit. Further, longer term and more detailed evaluation is warranted to determine whether this type of program is one that would be worth attempting to replicate or expand.

Conclusion

Unless there is more demand for and higher priority given to eye care services, it will be difficult for PEC activities to compete with all of the other demands on a PHC worker's time. Efforts aimed at enhanced training and supervision and more research may help improve this situation and better define the most effective ways to implement PEC to reach the population while still providing timely, high quality care. There are many possible models for delivery of PEC and each area needs to determine the appropriate roles for different workers in their communities. Given the evidence presented here, task-shifting PEC to the PHC worker might need to be reassessed with more emphasis given to other cadres of workers, whether they are village level volunteers, dedicated ophthalmic personnel or, most likely, some combination of all three.

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