Integration of basic dermatological care into primary health care services in Mali

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**Objective** To evaluate, in a developing country, the effect of a short training programme for general health care workers on the management of common skin diseases — a neglected component of primary health care in such regions.

**Methods** We provided a one-day training programme on the management of the skin diseases to 400 health care workers who worked in primary health care centres in the Bamako area. We evaluated their knowledge and practice before and after training.

**Findings** Before training, knowledge about skin diseases often was poor and practice inadequate. We found a marked improvement in both parameters after training. We analysed the registers of primary health care centres and found that the proportion of patients who presented with skin diseases who benefited from a clear diagnosis and appropriate treatment increased from 42% before the training to 81% after; this was associated with a 25% reduction in prescription costs. Improved levels of knowledge and practice persisted for up to 18 months after training.

**Conclusions** The training programme markedly improved the basic dermatological abilities of the health care workers targeted. Specific training may be a reasonable solution to a neglected component of primary health care in many developing countries.

**Keywords** Skin diseases/diagnosis/therapy; Dermatology/education; Primary health care; Health personnel/education; Nurses; Physicians; Health knowledge, attitudes, practice; Evaluation studies; Mali (source: MeSH, NLM).

**Mots clés** Dermatoses/diagnostic/thérapeutique; Dermatologie/enseignement; Soins santé primaire; Personnel sanitaire/enseignement; Infirmières et infirmiers; Médecin; Connaissance, attitude, pratique; Etude évaluation; Mali (source: MeSH, INSERM).

**Palabras clave** Dermatopatías/diagnóstico/terapia; Dermatología/educación; Atención primaria de salud; Personal de salud/educación; Enfermeras; Médicos; Conocimientos, actitudes y práctica sanitarias; Estudios de evaluación; Mali (fuente: DeCS, BIREME).

**Introduction**

Recently, awareness that certain common skin diseases are an underestimated health problem in developing countries has grown (1). Prevalence in the general population is high for disorders such as pyoderma, scabies or superficial mycoses, especially in children (2–6). Between 6% and 24% of the total number of visits to primary health care centres in this environment have been reported to be the result of skin disease (7–11), which makes this one of the most common organ-specific reasons for consultation. Expenditure on these disorders may be high (12–13), and this seems to be affected by the low level of skills relevant to the management of such disorders among most general health care workers (13–15). In addition, the desired integration of leprosy services to the level of primary health care also would benefit from an improvement in the dermatological skills of such health care workers (16). The problem of skin diseases has been ignored by most health authorities, however, and specific recommendations for rational control measures are lacking. This seems mainly to be determined by the perception of their generally benign nature, which means that these diseases elicit a lower level of concern compared with more serious disorders prevalent in these areas. Furthermore, adaptation of dermatology to the level of primary health care may seem a daunting challenge, with the eventual need for substantial investment. Finally, implementation of a programme on skin disease at the level of primary care probably is assumed to require disproportionate investment for the
severity of the problem, with the risk of diverting health initiatives from objectives with a higher priority.

Rather than remaining content with these views, a reasonable approach would be to adopt solutions proportionate to the severity of the problem — that is, to design procedures that are easy to implement but capable of producing a significant effect. The aim of this study was to evaluate the effect of a one-day training programme intended for general health care workers in primary health care centres on the basic management of common skin diseases in a sub-Saharan African country.

Methods
Setting
Mali is a Sahelian country with a gross national income per capita of US$ 240 (17) and an adult literacy rate of 27%. At the peripheral level, the health system relies mainly on primary health care centres administered by the state or community (18), whose health care workers consist of mostly nurses who graduate after a course of 3–4 years and possibly doctors (predominantly based in cities) or midwives, or both.

Intervention
Our goal was to train every health care worker who worked at primary health care level in the Bamako area in the basic management of the most common skin diseases that they may encounter. After meetings with local health authorities and a review of available data from Mali (6, 11, 19), it was decided that these health care workers would benefit from training on pyoderma, scabies, tinea capitis, other superficial mycoses and contact dermatitis and on guidance on the referral of suspected cases of early leprosy.

Lessons from the field
We assumed that most health care workers in the area had not previously received specific training in the management of skin diseases (11). We wanted to increase their ability to diagnose and treat these patients, so we did a simple before-and-after study of the impact of training on every health care worker that we could reach. We developed an algorithm for the standardized management of common skin disorders in the area. The idea was that health care workers could improve their diagnostic accuracy by identifying key signs, and make more appropriate prescriptions by using an approved list of drugs available in generic formulations (20). We did a one-day training course that focused on assimilation of the algorithm and included demonstrations of examples of the main disorders through slides and patients. A poster of the algorithm and an illustrated booklet that summarized the main data were prepared for each student. In order to facilitate the supply of drugs, a list of the recommended drugs was transmitted to every pharmacy unit linked to the targeted centres.

Participants
Every health care worker in Bamako city and an adjacent rural district (Kangaba district) with a responsibility for issuing prescriptions at primary care level in the public or community health system was targeted. We obtained a complete list of suitable people who worked in the primary health care centres in that area (432 health care workers in 112 centres).

Evaluation
Calendar and general method
Initially, pre-training evaluations were compared with post-training tests performed from just after the training to seven months after the training to determine the optimum learning outcomes. Later, a “long-term evaluation” to assess the retention of skills among health care workers who remained in their posts was scheduled between 16 months and two years after training.

Knowledge
Just before and just after the training course, all health care workers were assessed with a slide presentation of typical cases of pyoderma, scabies, tinea capitis and hypochromic patches. The assessment of answers was standardized. Diagnosis was considered incorrect if the answer was wrong or unclear (for example, use of non-specific terms such as “dermatosis”). Treatment choice was considered correct if the drugs selected were adequate for the condition shown, independent of the suggested diagnosis. Eighteen months after training we assessed retention of skills in 100 health care workers who remained in their posts.

Practice
The evaluation focused on a peripheral district of Bamako city (the sixth district) in addition to the rural area (Kangaba district) — a zone of 340,000 inhabitants. This zone was selected to include comparable proportions of nurses and doctors, as care in Bamako’s more central districts is most often delivered by doctors. In 2000, the zone had 20 primary health care centres, with an activity of 500–13,000 visits per centre. We collected the consultation registers at these centres for four months (April to July) in the period before the training (2001) and in the two years after (2002 and 2003). In 2003, we only collected the registers of the 10 centres at which trained health care workers had remained in their posts.

The following data were recorded: total number of visits; number of visits that were a result of skin disease (we decided to not record cases registered as “abscess”, “chickenpox” or “measles” as “skin diseases”); and, for patients with a skin disease, their age and sex, the grade of health care worker who saw the patient, and the diagnosis, treatment, numbers of drugs used and proportion of generic drugs issued.

Practice indicators were defined as follows:

- Diagnoses: the terminology was divided into “clear diagnoses”, where the term used clearly defined any skin disorder, and “unclear diagnoses”, where non-specific terms (for example, “dermatosis”, “allergy”, “itch” or “eruption”) were used. Different terms used to describe the same entity were grouped together (e.g. “pyoderma” was the term reserved for all cases of superficial bacterial skin infection: “impetigo”, “folliculitis”, and so on).

- Treatments: appropriateness was judged when possible (i.e. when treatment was indicated and when there was a clear diagnosis) in a standardized way by the presumed efficacy of the active drugs prescribed for the diagnosis made (a predefined scheme established from current medical knowledge of the disorders considered was used). The proportion of patients with a clear diagnosis and an appropriate treatment was calculated. We defined “superfluous drugs” as those belonging to categories other than those recommended during training.
Treatment cost was evaluated on the basis of the cost of one delivery unit of each drug. Patients referred were traced.

Between 18 and 24 months after training, all 40 trained health care workers who were still in their posts in the more active centres (i.e. those with at least one dermatological case per day) within the same zone were observed during everyday consultations related to skin diseases by a dermatologist who checked diagnoses and treatments and interviewed the health care worker. All data were captured and analysed with Epi-Info software (version 6.04). χ² Distribution, Fisher’s exact, and Kruskal-Wallis’ H tests were used.

Results

In total, 400 health care workers were trained (397/431, i.e. 92% of those targeted; three more were newly posted to the evaluation area in early 2002). These comprised 87 doctors, 218 nurses and 95 midwives. They were trained during 22 single-day sessions that focused exclusively on the programme described. All midwives were women; other groups comprised 34% men and 66% women. Training costs were calculated at 25 000 Francs CFA per student (about €40).

Knowledge

Table 1 shows data recorded before and after training. Incorrect diagnoses were followed by inadequate treatment more often than correct diagnoses (odds ratio, 5.8; 95% confidence interval, 4.4 to 7.7; \( P < 10^{-7} \)). The frequency of inappropriate treatment did not differ when cases with a patently wrong diagnosis (inappropriate treatment in 255/364 of analysable files) were compared with those with an “unclear” diagnosis (109/169; \( P = 0.2 \)). Although 179/389 (46%) of health care workers would have considered a possible diagnosis of leprosy when shown a suspicious hypochromic patch before training, 284/389 (73%) correctly considered this diagnosis just after training (\( P < 10^{-3} \)) and 77/100 (77%) in 2003.

Practice

The health care workers in the 20 centres within the zone targeted for practice evaluation consisted of 24 doctors and 45 nurses. One centre was excluded because the registers had not been completed correctly. Overall, 1341 files existed for patients who visited the centres for any skin disease in 2001 and 1351 in 2002; this represented 6.5% of the total visits. Sixty-seven percent of patients were younger than 15 years, and 65% had been seen by doctors and 35% by nurses. In 2003, the registers of the only 10 centres in which the health care workers initially trained had remained in post were collected, accounting for 670 visits.

Table 2 reports a selection of significant indicators of practice before, 4–7 months and 16–19 months after training. The appropriateness of treatment in cases in which a clear diagnosis was made was correct in 473/640 (74%) of analysable cases in 2001, 1038/1127 (92%) in 2002 (\( P < 10^{-3} \)) and 539/596 (90%) in 2003. Each of the following diagnostic categories received more appropriate treatment in 2002 than in 2001: pyoderm (appropriateness in 917/975 cases in 2002 vs \( P < 10^{-3} \)), dermatitis (12/18 vs 3/27; \( P < 10^{-3} \)) and scabies (14/14 vs 2/4; \( P < 0.04 \)). In 2002, 243/511 (78%) of all antiseptics prescribed belonged to the classes recommended during the training compared with 79/209 (38%) in 2001 (\( P < 10^{-3} \)); similar changes were seen for oral antibiotics (868/1113 (78%) vs 540/806 (67%); \( P < 10^{-3} \)) and topical antimycotics (102/143 (71%) vs 39/82 (48%); \( P < 10^{-3} \)).

The results on these items did not alter significantly between 2001 and 2002. The main superfluous drugs prescribed were oral anti-H₁, antihistamines and anti-inflammatories. In 2002, 11 patients suspected of having leprosy were referred to the leprosy service (with a diagnosis of leprosy in five) compared with one in 2001 and none in 2003.

Variations were noticed according to the grade of health care worker (Table 3). Improvements in the proportion of cases with clear diagnosis and appropriate treatment between 2001 and 2002 was greater for nurses than for doctors (\( P = 0.02 \)); the same was true for those with superfluous prescriptions (\( P < 10^{-3} \)). When patients’ ages were stratified, improvement between 2001 and 2002 in the proportion of cases with a clear diagnosis and an appropriate treatment was more important in patients younger than 15 years than in older patients (<15 years, 331/772 in 2001 vs 754/873 in 2002; \( P = 10^{-3} \)), 142/361 vs 284/400; \( P < 10^{-3} \)).

Health care workers’ observations during everyday practice (83 cases seen, i.e. two dermatological cases per health care worker) produced adequate diagnoses and treatments in 88% and 77% of cases, respectively. Most health care workers who were interviewed declared significant improvements in practice and regular use of the algorithm.

Discussion

After a single day of training, a marked improvement was seen in the management of skin diseases in primary health care centres, according to changes in defined indicators evaluated in samples of general health care workers.

Although knowledge was tested for every health care worker, we focused practice evaluation on an area that was not fully randomly selected, so that we could evaluate each main category of health care worker (especially nurses, who are a major resource at national level) with enough power. We did not consider that this was likely to bias the representative nature of that sample in other aspects. In considering the long-term evaluation, we are aware that health care workers...
who remained in their posts — who were the only workers whose study was relevant from the perspective of evaluating retention of learned skills — may have had a different profile of retention compared with those who left their posts.

The lack of data on evaluation of dermatological care at the primary health care level in the literature led us to develop a system on the basis of the recording of a list of standardized indicators, designed for different skill levels, whose evaluation was intended to provide a valid global picture. Evaluation of health care workers’ knowledge — from diagnoses and treatments proposed by workers presented with typical cases — showed a striking improvement after training, even 18 months later. The register-based data provided more indirect information on practice, as diagnostic accuracy was not directly validated here, but the information gathered was still valuable if interpreted carefully. In particular, the following changes were noticeable. Strict conformity in the recorded changes to the training course indicated assimilation and routine use of recommendations whose validity had been established (20). Discernible differences were also seen according to the health care workers’ grade; improvement was comparatively greater for nurses than doctors, probably because they initially had a lower level of knowledge, but perhaps also because of greater adherence to the basic dermatological approach adopted. The importance of nurses in the Malian primary health care system makes this noteworthy.

The improvement seemed better for patients younger than 15 years, probably because of a more clearly defined profile of disorders (18, 21) — a point worth mentioning when the recognized vulnerability of children to skin diseases is considered (2, 5, 22). Discernible differences were also seen according to the health care workers’ grade; improvement was comparatively greater for nurses than doctors, probably because they initially had a lower level of knowledge, but perhaps also because of greater adherence to the basic dermatological approach adopted. The importance of nurses in the Malian primary health care system makes this noteworthy.

We believe this is the first time that the positive impact of a public health strategy that focuses on skin diseases in a developing country has been established. The training of general health care workers in the care of skin disease has been identified as a key to tackling the problem (1, 23); however, the few previous attempts to do so were not evaluated in a systematic manner (23, 24) or proved disappointing. In Kenya, repeated training of itinerant community health care workers did not
informal talks with health care workers and the high attendance at sessions suggested a high demand for training in skin diseases added to rapid and visible improvements in practice after training.

Several limitations of this programme should be noted. The benefits were modest or transient for certain items, such as the reduction in superfluous prescriptions — a lack of awareness of the extent of this issue when the programme was developed meant that this was considered only superficially during training. Although the programme’s contribution to the integrated detection of leprosy cases was probable, it seemed transient. It might be interesting to include certain borderline disorders that were not considered here, such as chickenpox, in the training course. These points may be amenable to more in-depth training or repeated sessions, but this should be weighed against the risk of making the programme more cumbersome and difficult to implement.

Indeed, we suggest that one major feature of this programme was its brevity. That the observed changes were obtained after such a short training course is remarkable. Moreover, it is noticeable that the programme was tested under conditions that should be considered to be close to those expected in the field in many developing countries: no supervision or organized revision was performed after the initial, single training session, yet evaluations performed 18 months after training did not show deterioration of most skill indicators. The profiles of skin diseases and of the health system encountered in Mali, which may be considered representative of that in many developing countries, suggest that the observed effects would be reproducible, particularly when nurses play an important role in primary health care. Some of the defined evaluation indicators might be useful in routine supervision.

Conclusion
We believe that this study represents a significant contribution to improving the problem of common skin diseases in developing countries, as it establishes for the first time the impact, as well as the practicability, of a specific programme proportionate to the priority profile of the diseases targeted. It may represent a reasonable solution to a neglected component of primary health care in many developing countries, which, although not a top priority, would benefit from a more rational management than so far has been adopted.

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Competing interests: none declared.
Résumé

Intégration des soins dermatologiques de base dans les prestations assurées par les services de soins de santé primaires maliens

Objectif Évaluer l’effet, dans un pays en développement, d’un programme de formation de courte durée destiné au personnel soignant non spécialisé et concernant la prise en charge des affections cutanées courantes, composante souvent négligée des soins de santé primaires dans ces régions.

Méthodes Les organisateurs ont dispensé un programme de formation d’une journée sur la prise en charge des affections cutanées à 400 soignants, travaillant dans des centres de soins de santé primaires de la région de Bamako. Les connaissances et les pratiques de ces soignants ont été évaluées avant et après la formation.

Résultats Avant de recevoir cette formation, les soignants présentaient des connaissances insuffisantes sur les affections cutanées et des pratiques inadaptées. A l’issue du programme, une amélioration marquée de ces deux paramètres a été constatée.

Conclusion Le programme de formation a notoirement amélioré les capacités de base en dermatologie du personnel soignant visé. Une formation spécifique de ce type peut donc constituer une solution raisonnable pour répondre aux insuffisances de cette composante des soins de santé primaires dans de nombreux pays en développement.

Resumen

Integración de la atención dermatológica básica en los servicios de atención primaria en Mali

Objetivo Evaluar en un país en desarrollo el efecto de un breve programa de capacitación dirigido a los agentes de atención de salud general acerca del tratamiento de enfermedades cutáneas comunes, aspecto éste descuidado en la atención primaria en esas regiones.

Métodos Impartimos un programa de formación de un día sobre el tratamiento de las enfermedades cutáneas a 400 agentes de salud que trabajaban en centros de atención primaria de la zona de Bamako, y evaluamos sus conocimientos teóricos y prácticos antes y después del adiestramiento.

Resultados Antes de la capacitación, los conocimientos sobre las enfermedades cutáneas eran a menudo deficientes, y las prácticas inadecuadas, pero después de la capacitación detectamos una mejora marcada de esas dos variables. Analizamos los registros de los centros de atención primaria y hallamos que la proporción de pacientes que acudieron con enfermedades cutáneas y obtuvieron un diagnóstico y un tratamiento acertados aumentó de un 42% antes de la capacitación a un 81% después de la misma; ello se asoció a una reducción del 25% de los costos de prescripción. La mejora de los conocimientos y prácticas persistió durante 18 meses después de la capacitación.

Conclusión El programa de formación mejoró notablemente los conocimientos básicos de dermatología de los agentes de salud destinatarios. La capacitación ad hoc puede constituir una solución razonable para este componente descuidado de la atención primaria en muchos países en desarrollo.
Lessons from the Field

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Dermatological training for primary health care workers in Mali

References