

Assessment of Implementation of Integrated Management of Childhood Illnesses in Primary Health Care Centers/ Baghdad 2021

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Abstract

Background: Every year some 12 million children in developing countries die before they reach their fifth birthday. Seven in ten of these deaths are due to acute respiratory infections (mostly pneumonia), diarrhea, measles, malaria, or malnutrition. The IMCI was developed in response to many global under-five deaths in low- and middle-income countries in the 1990s. This study aimed to assess the compliance of health workers to the guiding booklet of IMCI in the management of cases.

Methods: A cross-sectional study was conducted in the four primary healthcare centers (PHCCs) in Baghdad for 5 months. A total of 223 children aged between 2 months to 5 years who attended the selected four PHCCs in their initial visit were recruited. A structured questionnaire was designed for this study, including information about the recruited children and assessment criteria of the IMCI guiding booklet for case management.

Results: The assessment of the 6 domains of IMCI guidelines were as follows: high/perfect scores were detected in 86.6% for cough/difficulty breathing, 100% for diarrhea, 37.6% for fever, 100% for ear problems, 78.5% for throat problems, while weak score was detected in 71.8% for anemia and malnutrition. Out of the 223 children, 182 (81.6%) received treatment, antibiotics were prescribed for 99 (44.4%) of them, and (88.9%) of these cases received antibiotics according to the IMCI guidelines. In most of the cases (94.5%) treatment administration was explained to the patient's relative and 59.9% were asked if they understood how to administer it.

Conclusions: Adherence of physicians to IMCI guidelines regarding cough/difficulty breathing, diarrhea, ear problems, and throat problems was high, while it was low in terms of fever and anemia/malnutrition. We recommend the installation of an internal audit system with clear criteria to allow evaluation of PHCCs and their employees' performance at regular intervals.

Keywords: IMCI, Baghdad, PHCCs, Under-five deaths.

Introduction

Every year some 12 million children in developing countries die before they reach their fifth birthday. Seven in ten of these deaths are due to acute respiratory infections (mostly pneumonia), diarrhea, measles, malaria, or malnutrition⁽¹⁾. The Integrated Management of Childhood Illness (IMCI) initiative was created by the World Health Organization to aid health workers in the classification and management of common childhood illnesses in regions with low resources⁽²⁾. The main objectives of the strategy are to lower the death rate, as well as the incidence, severity, and duration of disease and disability, and to support better growth and development. One important tactic for lowering child mortality is still the IMCI. There are three main components to the strategy: enhancing the family and community to improve child health, fortifying the health system, and enhancing the case management abilities of unwell children at first-level medical institutions⁽¹⁾.

The high incidence of under-five fatalities worldwide in low- and middle-income nations in the 1990s prompted the development of the IMCI. Through the use of a standardized algorithmic approach, IMCI offers evidence-based recommendations for the management of unwell children in primary health care settings, guiding IMCI practitioners through consultation steps by step⁽³⁾. IMCI has been implemented in more than 75 countries globally, and studies have shown that IMCI implementation can improve morbidity and mortality among under-five children⁽⁴⁾. Nonetheless, concerns have been raised over maintaining the quality of IMCI, and several studies have demonstrated inadequate and dispersed IMCI implementation, with medical professionals neglecting important recommendations and skipping chances to offer complete treatment or not using IMCI at all⁽⁵⁾. Numerous and intricate factors contribute to the poor execution and disregard for IMCI recommendations, such as frequent staff turnover, insufficient staffing, deficient health systems, and low morale among medical professionals. The successful deployment of IMCI requires ongoing assistance and oversight, but they have seldom been provided enough at-scale⁽⁶⁾. In health facilities, the precise identification of illnesses affecting children in outpatient settings has been promoted by IMCI strategy to ensure appropriate combined treatment of all major illnesses, build up the counseling of caretakers, and accelerate the referral to the hospital of severely sick attendant children. When the setting was home, suitable care inquiry behaviors, enhanced nutrition and preventative care, and the accurate achievement of prescribed care, were the targets of IMCI⁽⁷⁾. IMCI case management training provides the health workers with skills to deal with and manage children presented with a combination of illnesses, identify those requiring urgent referral, administer appropriate treatments (especially the antibiotics mainly amoxicillin, co-trimoxazole, erythromycin or intramuscular penicillin or ceftriaxone vials), and provide relevant information to childcare providers. IMCI implementation has revealed the advancement in the quality of management of sick children⁽⁷⁾.

Conclusively, vaccines are a cost-effective interference in the health system. Despite the low costs of vaccines, they provide enormous benefits for the health of populations. According to WHO records, the annual death among children below the age of 5 years reaches 10.6 million; while an estimated 1.4 million of those are due to diseases that might be prevented by vaccines⁽⁸⁾. In IMCI, vaccination status is checked for every attending child. Any missed vaccines are given to children who do not have severe classifications. Moreover, IMCI-trained health workers communicate better with the parents⁽⁵⁾. Because being unaware of the need for immunization, uninformed about the need to return for subsequent second or third dose, unknown place and/or time of immunization, the probable side effect, the incorrect thoughts about contraindications, lack of reliance on immunization, inconvenient time of vaccination, absence of well-trained health worker and vaccine, and long waiting time at the health facility were reasons for not fully immunizing the children⁽⁹⁾.

Historically, the IMCI program in Iraq was officially launched in 1998. A noticeable increase in the number of governorates that adopted the program, the number of IMCI units opened in the primary healthcare centers, the number of IMCI training courses, and the number of trainers. However, stumbling in implementation was a prominent feature⁽¹⁰⁾. Evaluation of the adoption of

these guidelines in different countries, the potential strength of the impact of the adoption of these guidelines, and factors contributing to its effectiveness and the main factors limiting its effectiveness are essential for an understanding of how the implementation of these guidelines can progress⁽²⁾. A few local studies have paid attention to evaluating the program during the past two decades compared to the strategic importance of its implementation. Therefore, this study aimed to assess the compliance of health workers to the guiding booklet of IMCI in the management of cases, throw light on the major difficulties in the implementation of the program and measure the extent of patients' relative to provided health care services.

Patients and Methods

Study Design and Setting: A cross-sectional study was conducted in the two primary healthcare centers (PHCCs) belonging to the Al-Rusafa Health Directorate, and two PHCCs belonging to the Al-Karkh Health Directorate for 5 months, from the 1st of January to the 30th of May 2021. A total of 223 children aged between 2 months to 5 years who attended the selected four PHCCs in their initial visit were recruited randomly in this study, while those who came for follow-up visits were excluded.

Data Collection Methods: During the study period, data was collected for two days per week in the selected PHCCs by direct interview with the person who accompanied the child (usually the mother) after obtaining permission. A structured questionnaire was designed for this study, including information about the child's age, sex, weight, complaint, and measuring temperature, the assessment of the child for danger signs, cough, diarrheal disease, fever, ear problems, throat problems, anemia, and malnutrition. Further, asking about the immunization schedule and feeding of the child and the treatment given to the child depends on the assessment criteria of the IMCI guiding booklet for case management.

Scoring System of Complaint Evaluation: The assessment of each of the 6 complaint domains was performed by following an inventory checklist. The checklist contained general questions (applicable in all the 6 domains) like classification and treatment. In addition, there were also items specific to each complaint domain. Each item in the specific domain inventory was given a score of 1 when it was performed according to IMCI guidelines. The total score for items was summed in each domain and then divided by the total possible score and multiplied by 100 so that the resulting total score can be interpreted as part of a maximum score of 100 units. A total score of 0 means none of the items in the inventory were checked (complete failure of adherence to IMCI guidelines in that domain), while a score of 100 means perfect score. Two other categories were used: a weak score category for those with less than 50 units score and a high score category for those with ≥ 50 score units attained in the specific complaint domain.

The patient's relatives were asked about their knowledge regarding the treatment given, how to be given, the major signs that should bring the child back to the health centers, and their satisfaction with the IMCI services and quality of care provided. Information was also obtained regarding the availability of drugs and equipment for case management in these health centers. In addition, doctors were asked about the major difficulties they are facing in the implementation of the program. A pilot study was performed to evaluate the questionnaire's validity. It was carried out on a sample of 20 child clients. This sample was excluded from the total sample. Then the necessary modifications to the questionnaire were made according to the results of the pilot study

Statistical Analysis: The data was analyzed using Statistical Package for Social Sciences (SPSS) version 25. The data is presented as mean, standard deviation, and ranges. Categorical data is presented by frequencies and percentages.

Results: This study included 223 children between two months and five years who attended the PHCCs implementing IMCI. Out of the 223 children, 107 (48%) were male and 116 (52%) females, the highest percent (30%) were in their second year, and the high percent of the children were accompanied by their mother 166 (74.4%) while 45 (20%) were accompanied by both parents. Most children who attended the selected PHCCs were checked for weight (96%), while 39.5% were

checked for temperature by trained health workers; weight and temperature were registered on the checklist of each child.

Table (1): Sociodemographic and related characteristics of the studied patients

Variable	No. (N= 223)	%
Gender		
Male	107	48.0
Female	116	52.0
Age Group (Years)		
First-Year	40	17.9
Second Year	67	30.0
Third Year	51	22.9
4+ Years	65	29.1
Health Care Center		
Zayona	55	24.7
Al-Mustansiriya	53	23.8
Al-Mansor	60	26.9
Darussalam	55	24.7
Accompanying Adult		
Mother	166	74.4
Father	12	5.3
Both Parents	45	20.2
Checked Important Signs		
Child Weighed	214	96.0
Body Temperature Measured	88	39.5
Danger Signs Checked For (N= 228)		
Can't Drink Or Breastfeed	91	40.8
Vomits Everything	109	48.9
Asked About Convulsion	28	12.6

The complaints of the patients were variable with a high percentage (50.7%) presenting with cough/difficulty breathing; other complaints were: diarrhea 11.7%, fever 26.5%, ear problems 11.2%, throat problems 17.9%, anemia and malnutrition 2.2% and other problems 24.7% (Figure1).

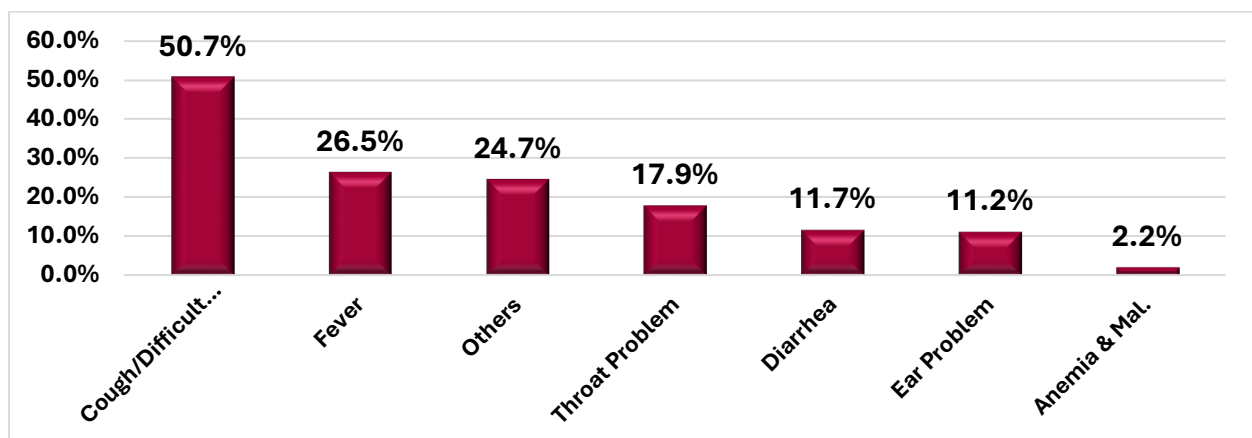


Figure (1): Main complaint among the studied children

* Some children had more than one complaint, therefore the percentage exceeded 100%.

Checking for danger signs is a task applied in the IMCI checklist, the picture was 40.8% were asked about can't drink or breastfeed, 48.9% about vomiting everything, and 12.6% were asked about convulsions. The percentage of children who were not checked for danger signs was 48.9%. The rate of subjects with high/perfect scores was 39%.

Regarding cough/difficulty breathing, 119 children had positive cough/difficulty breathing after formal questioning by the examiner. The rate of subjects with high/perfect scores was 86.6% which reflects a high performance on following IMCI guidelines in the domain of cough/difficulty breathing.

The total number of children positive for diarrhea after formal questioning was 31, all of them were asked about the duration, 87.1% asked about blood in stool, and pinching abdominal skin was done in 71%. The rate of subjects with high scores was 100% which reflects a high performance in following IMCI guidelines in the domain of diarrhea. Children presented with fever as the main complaint, or after being asked for by the examiner were 101. The rate of subjects with high scores was 37.6% which reflects low performance in following IMCI guidelines in the domain of fever.

The total number of those positive for ear problems after formal questioning was 37 children. One hundred percent of children had high/perfect scores reflecting very high performance and following IMCI guidelines in this domain. All children brought to the selected PHCCs were checked for throat problems; Only 33.2% were asked about the difficulty in swallowing while 55.2% were examined for enlarged, tender lymph nodes in front of the neck, and 175 children (78.5%) had high to perfect score.

Regarding the assessment of anemia and malnutrition, visible severe wasting and edema of both feet were poorly performed by healthcare providers (3.6%, 3.1%) while measuring the weight of the child and application of his weight on the chart to consider malnutrition status was done in a high percentage (90.1%). The rate of subjects with non-checked and weak scores (< 50%) was 71.8 which means a low performance in following IMCI guidelines. As illustrated in (Table 2).

Table (2): Results of the assessment of the IMCI case management items

IMCI Items	No. (N= 223)	%
The Score Of Assessed Danger Signs		
None Checked	109	48.9
Weak Score (<50%)	27	12.1
High Score (50%+)	60	26.9
Perfect Score (100%)	27	12.1
Total	223	100.0
Score Of Positive Criteria Of Cough And Difficulty Breathing		
None Checked	0	0.0
Weak Score (<50%)	16	13.4
High Score (50%+)	86	72.3
Perfect Score (100%)	17	14.3
Total	119	100.0
Score Of Positive Criteria Of Diarrhea		
None Checked	0	17.9
Weak Score (<50%)	0	30.0
High Score (50%+)	31	22.9
Perfect Score (100%)	0	29.1
Total	31	100.0
Score Of Positive Criteria Of Fever		
None Checked	0	0.0
Weak Score (<50%)	63	62.4
High Score (50%+)	38	37.6
Perfect Score (100%)	0	0.0
Total	101	100.0
Score Of Positive Criteria Of Ear Pain		
None Checked	0	0.0
Weak Score (<50%)	0	0.0
High Score (50%+)	26	70.3
Perfect Score (100%)	11	29.7
Total	37	100.0
Score Of Positive Criteria Of Throat Problem		
None Checked	48	21.5
Weak Score (<50%)	0	0.0
High Score (50%+)	105	47.1
Perfect Score (100%)	70	31.4
Total	223	100.0
Score Of Positive Criteria Of Anemia And Malnutrition		
None Checked	20	9.0
Weak Score (<50%)	140	62.8
High Score (50%+)	56	25.1
Perfect Score (100%)	7	3.1
Total	223	100.0

Regarding child feeding, 98 (88.3%) of children under 2 years of age had positive feeding. On the other hand, 79% were evaluated for other health problems either asked for by the examiner or as a complaint of the patient. Out of the 223 children, 182 (81.6%) received treatment, antibiotics were prescribed for 99 (44.4%) of them, and (88.9%) of these cases received antibiotics according to the IMCI guidelines. In most of the cases (94.5%) treatment administration was explained to the patient's relative and 59.9% were asked if they understood how to administer it.

After the use of health services, children accompanying adults have a good understanding of information on how to administer the oral antibiotic (88.9%) and how to prepare and give ORS (90.3%) (Table 3).

Table (3): Results of the assessment of child feeding, and ORS and antibiotics administrations

	N	%
Child's Feeding		
Negative	13	11.7
Positive	98	88.3
Total	111	100.0
Other Problem		
Not Checked	47	21.1
Self-Reported	55	24.7
Asked By Examiner	121	54.3
Total	223	100.0
ORS Assessment (N = 31)		
ORS Prescribed For A Child With Diarrhea	31	100.0
ORS Prescribed In The Correct Guidelines	28	90.3
Consultation For Treatment (N= 182)		
Explain The Administration Method	172	94.5
Ask Questions To Know The Understanding	109	59.9
Antibiotic Prescribed		
Negative	53	23.8
Positive	99	44.4
Don't Know The Treatment	30	13.5
No Treatment Prescribed	41	18.4
Total	223	100.0
Recall Of Antibiotic Administration Instruction		
Negative	11	11.1
Positive	88	88.9

Knowledge of parents about the signs that necessitate bringing the child back to the healthcare center showed that a high percentage of parents (80.6%) knew that poor drinking is a dangerous sign, while 64.5% recognized bloody stool as a sign (Table 4).

Table (4): Results of the parents' responses to Knowledge questions

Knowledge Questions	No.	%
Knowledge About Diarrhea-Related Danger Signs		
Hardly Drinks	25	80.6
Has Blood In Stool	20	64.5
Knowledge About Respiratory Signs		
Breathing Is Fast	21	17.6
Difficult Breathing	23	19.3
Knowledge About General Signs		
Unable To Drink Or Breastfeed	27	12.1
Becomes Sicker	83	37.2
Has Fever	42	18.8

More than three-quarters of parents were satisfied with the health care provided to their children 177 (79.4%), while the remaining 46 (20.6%) were dissatisfied. The main causes of dissatisfaction were the way of examination and treatment given in 47.8% and 45.7%, respectively. Fifteen trained doctors on the IMCI were inquired about major difficulties in implementing the IMCI program. All of them raised the issue that the workload is too heavy, implementing the IMCI program takes too long, and filling the forms is time-consuming, while 13.33% note that the parents are uncooperative, and 20% suffer from no support or help from other staff (Table 5).

Table (5): Satisfactions of parents and difficulties in implementing the IMCI program

Satisfaction Of Parents With Healthcare Services		
Satisfied	177	79.4
Not Satisfied	46	20.6
Total	223	100.0
Dissatisfaction Reasons (N= 46)		
Time Dedicated To The Child	3	6.5
The Way That The Child Was Examined	22	47.8
Received Treatment	21	45.7
Difficulties In Implementing The IMCI (N= 15)		
Workload Too Heavy	15	100.0
Uncooperative Parents	2	13.33
The Examination Takes Too Long	15	100.0
No Support Or Help From Other Staff	3	20.0
Filling The Forms Is Time-Consuming	15	100.0

Discussion

This study is one of the few studies in Iraq to be executed in the expansion phase. It was mainly concerned with the extent and quality of implementation of IMCI and the context of implementation. In Iraq, the IMCI strategy was formally endorsed by the Ministry of Health in October 1998 and hence the national IMCI task force was established. Iraqi adapted version of training materials for physicians was developed and used for the first time in May 2005⁽¹¹⁾.

Out of 223 medical encounters assessed in the present study for conformity with IMCI guidelines, 40.8% and 48.9% of the child's guardian asked for two danger signs (can't drink or breastfed and vomits everything) respectively by PHC physicians, while 12.6 % were asked about convulsion. Three specific danger signs need to be asked for in the IMCI program. In the present study, 51.1% were asked for danger signs. The evaluation of danger signs by PHC physicians was stressed in this study. Nicholas D Walter et al, 2009 evaluated the adherence of PHC physicians to IMCI guidelines in Tanzania⁽¹²⁾. The results were 11%, 41%, and 25% of the child's guardians were asked about (can't drink or breastfeed, vomiting everything, and convulsion) respectively. His study concluded that "PHC physicians had the perception that referring to severely ill children is often unnecessary". In such a way, there is a high possibility of missing a referral opportunity to the secondary health center, which is sometimes a life-saving measure. While in the Republic of Rwanda, 85% of children were checked for general danger signs⁽¹³⁾.

Adherence to IMCI guidelines was high, as shown by the percentage with a high score of assessment (<50%) in the following domains: cough/difficulty breathing, diarrhea, ear problem, and throat problem. In the assessment of fever, no PHC physician asked, "if the child came from a malarial area" The reason behind this may be that physicians no longer consider malaria as an important in their area of practice. An Iraqi study in 2009 reported that 79.8% of child guardians were asked if the child came from a malarial area. Examination of neck stiffness is rarely done (17.8%) because it can be inferred by observing a child's activity. While 98.1% of children were checked for stiff neck in Tawfiq WA study⁽¹⁴⁾.

Iron deficiency anemia is certainly the most frequent cause of anemia in childhood. Only 29.1% of PHC physicians looked for palmar and mucous membrane pallor, while in Tawfiq W A reported 99.1% of children were assessed for pallor which is a sign of anemia⁽¹⁴⁾.

To assess malnutrition, the body weight of 90.1% of children was checked. Looking for visible and severe signs of thinning and edema of feet which indicate severe malnutrition, however rarely checked (3.6%, 3.1%) respectively. It seems that these signs are rarely observed in the PHC area where the current study was performed. Tawfiq WA et al. 2009 results showed 97.9% of children were checked for visible severe wasting and 98.6% of children were checked for edema of feet⁽¹⁴⁾. Although adherence to IMCI guidelines in different complaint domains was less than perfect, the current study showed that the practical aspect of patient management reflected by classification and treatment showed a very high level of adherence (<90% in general). This may reflect the success of the IMCI program despite some observed deficiencies.

The under 2 years of age are a special vulnerable group. Assessment of feeding is a cornerstone in health care provided to this age group. In the current study, PHC physicians were keen to evaluate a child's feeding by IMCI guidelines in a high proportion (88.3%) of under 2 years of age medical encounters. Rwanda study⁽¹³⁾ shows similar results, feeding assessed for infants less than two years of age (81%). Vaccination activities were assessed well by IMCI-trained healthcare providers. A high proportion (90.1%) of physicians routinely check vaccination status in children by reviewing the immunization card carried by the client. The previous Iraqi study done in the implementation phase also reported an equally high level of interest in checking the immunization status of children (100%). While in the Republic of Rwanda, 90% of children were checked for immunization⁽¹³⁾.

The healthcare providers explain effectively how to administer medication. For those who obtained oral antibiotics, clear instructions need to be provided for the child's guardian. The majority (88.9%) of them recalled instructions on dosage and treatment duration that perfectly matched the instructions of health care providers or IMCI guidelines. This high level of adherence to IMCI guidelines regarding explicit treatment instructions was similarly reported by an Iraqi study

(88.1%)⁽¹⁴⁾. A total of 31 children had diarrhea in the current study; all of them were prescribed ORS (100%). The prescriptions were by IMCI guidelines in 90.3% of cases. Counseling services are of high quality in the domain of diarrhea⁽¹⁵⁾.

Less than 50% of the sample showed knowledge about one or more of these signs (unable to drink or breastfeed, becoming sicker, having a fever). Regarding cough and difficulty breathing, less than 20% knew the two respiratory signs necessitating bringing the child under medical attention. On the other hand, child guardians had adequate knowledge about the two dangerous signs related to diarrhea, and more than 50% reported knowledge about these two signs. Tawfiq WA et al reported that 99.3% of children's caregivers were advised when to return immediately to the H.C. The high level of knowledge does not agree with the modest level of knowledge shown in the current study⁽¹⁴⁾. The difference may be explained by the fact that the Tawfiq WA et al study was done under a strict, standardized application of IMCI in the implementation phase, while the current study stresses the deficiencies and difficulties observed in the expansion phase in the same country (Iraq). A total of 15 physicians were asked about major difficulties in their medical practice. All of them (100%) raised the issue of being overloaded by an exceptionally high number of patients, which interfered with compliance with standard guidelines, assessing, classifying, treating, filling enquired information, and lastly counseling and education of caretakers. The opposite attitude is seen in private clinics, sometimes even by the same providers. This controversy may reflect the failure of payment systems in public services to initiate provider satisfaction and job security⁽¹⁴⁾. Although it's obvious in the current study that clients expressed a high level of satisfaction with the provided quality of health care services and the role played by physicians and the health workers (79.4%); there is still an alternative (paradoxical) explanation, Iraqi clients may be reluctant to express dissatisfaction via interview with public services. In addition, they may be embarrassed to criticize their providers.

Conclusion

It was concluded that:

1. Adherence of physicians to IMCI guidelines regarding cough/difficulty breathing, diarrhea, ear problems, and throat problems was high, while it was low regarding fever and anemia/malnutrition.
2. The percentage of physicians following ICMI guidelines in classification and treatment was very high, almost perfect sometimes.
3. A high level of adherence to IMCI guidelines regarding explicit treatment instructions was detected.
4. A high level of satisfaction with the quality of healthcare services was expressed by the clients.
5. The current study reflected some shortage in the transfer of knowledge about danger signs (except for diarrhea) from physicians to the child's guardian.
6. The workload was the major difficulty that faced physicians in their medical practice.

We recommend the installation of an internal audit system with clear criteria to allow evaluation of PHCCs and their employees' performance at regular intervals. Channels allowing feedback should be available also, using tools to improve the quality of PHC institutional performance. Further, there is a pressing need to adopt a continuous professional development system to upgrade physicians and improve their performance. Training is an important tool in this respect. Nevertheless, supervision, incentives, and accreditation are other important tools.

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