

Evaluation of the Integrated Management of Childhood Illness strategy implementation in Bulawayo City, Zimbabwe, 2006

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Introduction. Bulawayo City reported an age-specific death rate for under-5s of 5.9/1 000 in 2004, and this figure rose to 6.8/1 000 in 2005. Nurses were trained in implementation of the Integrated Management of Childhood Illness (IMCI) strategy in 2005. We evaluated the programme in order to establish the level of implementation and the quality of care given to children aged under 5 years.

Methods. We conducted a cross-sectional study on a population of sick children aged between 2 months and 5 years, health care workers and caregivers. Data were collected using a structured observation checklist of the case management of sick children, exit interviews with caregivers, and a structured inventory checklist for equipment, drugs and supplies at each health facility.

Results. Nine facilities, 17 nurses and 72 children were observed during the study. Seventeen children (24%) were assessed for the three general danger signs (failure to drink or breastfeed, vomiting everything ingested, and convulsions), 31 (43%) were correctly prescribed an oral antibiotic, and 11% received the first dose of treatment at the health facility. Thirty-two per cent of caregivers who received a prescription for an oral medication were able to report correctly how to give the treatment. Drugs were below minimum stock levels in all 9 facilities. Only 19 (20%) of the 94 nurses were trained in IMCI.

Conclusion. IMCI implementation in Bulawayo failed to meet the accepted standard protocol requirements. The main deficiencies noted were the low number of IMCI-trained health workers and the lack of availability of essential drugs at health facilities. However, it was noteworthy that only two case assessment parameters differed statistically between IMCI-trained and non-trained nurses. Larger studies are needed to confirm or refute these findings.

Globally about 11 million children under 5 years of age die annually from common preventable diseases such as acute respiratory infections, diarrhoea, malaria, measles and malnutrition. Many of these deaths occur in countries in sub-Saharan Africa.¹⁻³ The Integrated Management of Childhood Illness (IMCI) strategy was developed by the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) in early 1995 to meet this challenge.¹

Bulawayo reported an age-specific death rate for under-5s of 5.9/1 000 in 2004, and this figure rose to 6.8/1 000 in 2005.⁴ Most of these deaths were due to preventable conditions, mainly acute respiratory infection (ARI) and malnutrition. In 2004 ARI accounted for about 24% of total under-5 mortality, compared with 21% in 2005, and malnutrition accounted for 19% in 2004 compared with 24% in 2005. Both ARI and malnutrition are IMCI conditions, and with introduction of the IMCI strategy in 2005 an improvement in the management of childhood illnesses would have been expected.² Before implementation of the IMCI strategy the city had been running a similar programme called

Control of Diarrhoeal Diseases and Acute Respiratory Infections (CDD and ARI).

We set out to evaluate the IMCI programme in the city with the intention of establishing the level of its implementation and specifically of assessing the current level of quality of care given to sick children at outpatient health facilities by primary health care workers, availability of key health system supports that are required for the effective implementation of IMCI such as drugs and vaccines, equipment and supervision, and quality of counselling given to caregivers and their understanding of home treatment for their sick children as provided for in the IMCI protocol.

Methods

Study type

A cross-sectional study design was conducted.

Study setting

The study was conducted in 9 systematically selected Bulawayo City Council clinics. We selected our first clinic using a random number table, and the subsequent 8 clinics were then selected using a predetermined sampling interval of two.

Selection of study population

Systematic sampling of health facility survey attendees was done. Caregivers attending the clinics with sick children on the day of the survey formed the sampling frame. The total number of women with sick children was divided by 8 in order to obtain the sampling interval. A random number table was then used to determine the first child, and thereafter we used our predetermined sampling interval to find the other 7 children. In some instances convenience sampling was necessary owing due to small numbers reporting at the facility.

Inclusion criteria

Sick children aged 2 months to 5 years, attending for an initial clinic visit and whose caregivers consented to participate in the survey, were enrolled into the study.

Exclusion criteria

Children attending for a baby clinic or well child visit and sick children whose caregivers did not consent to participate were excluded. Children less than 2 months and over 5 years of age were also excluded.

Study delimitation

The study focused on the first two components of IMCI, i.e.:

- case management skills of health staff, and
- the health system component, both of which are health facility based.

Sample size

Assuming an error risk (t) of 1.96, an expected proportion of children who are properly managed (p) of 75% (based on findings of a study in Tanzania which reported a 75% proportion of children correctly managed for pneumonia by IMCI-trained personnel⁵), and absolute precision (d) of 10%, the required sample size was 72. In each of the 9 health facilities, a maximum of 8 (72/9) child/caretaker pairs were interviewed.

Selection of health workers

Seventeen nurses and one clinical officer managing sick children on the day of the survey were observed.

Data collection

Data collection instruments

Three main instruments were used to collect information: a structured observation checklist of the case management of sick children, an exit interview with caregivers of sick children, and a structured inventory of equipment, drugs and supplies in the facility.

Data processing and analysis

Data were entered and analysed using Epi-info 3.3.2. Data comprised frequencies and 95% confidence intervals (CIs) of tasks performed for each child, frequencies of health system support IMCI priority indicators, and caretaker reasons for bringing the child to the health facility. Qualitative data were analysed manually.

Permission to carry out study and ethical considerations

Permission to carry out the research was sought from the Health Studies Office and the Director of Health Services, Bulawayo City. Written consent was obtained from all respondents, who were assured of confidentiality of the information given.

Results

Demographics

Seventy-two children, median age 17 months (Q₁=10; Q₃=29) and a median weight 10 kg (Q₁=8; Q₃=13), were enrolled into the study. Of these children 42 (58%) were males and 30 (42%) females. Fifty-seven children were aged 9 months or more. Of these 54 (95%) had completed the primary course of vaccination. There were no defaulters. Forty-four (61%) of the children were managed by non-IMCI-trained health workers and 28 (39%) by IMCI-trained health workers.

Assessment of sick children

Of the 72 children only 17 (24%) were assessed for the three danger signs failure to drink or breastfeed, vomiting everything ingested and convulsions. The best performed indicator was assessment for cough, with 67 children (93%) assessed (Fig. 1). There were only two statistically significant differences in terms of assessment skills between the IMCI-trained and non-IMCI trained nurses: checking for visible wasting, which was performed better by those nurses trained in IMCI ($p=0.007$), and checking weight against a growth chart, which was performed better by non-IMCI-trained nurses ($p=0.03$).

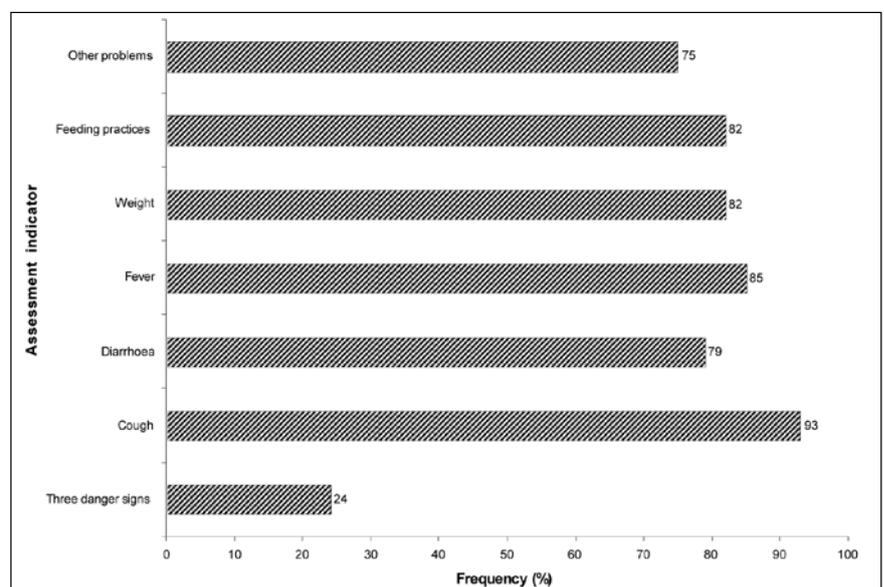


Fig. 1. Assessment of sick children in Bulawayo City Council clinics, 2006.

Treatment

Of the 24 children who were diagnosed with pneumonia, 17 (71%) were correctly treated. Only 8 (15%) of the children prescribed oral treatment received their first dose at the facility. Fourteen children (47%) who did not need antibiotics correctly left the facility without them, while 16 (53%) unnecessarily left with them.

Counselling and communication

Ninety-five per cent of the caretakers were told when to return, whether immediately if signs appeared that suggest the illness was worsening, for the child's next immunisation, or for a follow-up visit. This was equally well done by both the IMCI-trained and untrained categories of health workers. Thirty-two per cent of the caretakers who received a prescription for an oral medication were able to report correctly how to give the treatment.

Health facility support

Drugs were generally in short supply in all the facilities surveyed. At the time of assessment none of the facilities stocked intramuscular quinine, but 6 (67%) and 7 (78%) had benzylpenicillin and kanamycin available, respectively. However, all drugs were critically below minimum stock levels. All 9 facilities had adequate vaccine stocks, with the exception of BCG, which was available in 5 of the facilities (56%). All 9 facilities had essential equipment and materials

as well as mother's nutrition and counselling cards. Although all the facilities reported having received a supervisory visit, in no case had this included observation of case management (Table I). With regard to staffing, of the 94 nurses responsible for management of children in the 9 facilities, only 19 (20%) had been trained in IMCI.

Reasons for bringing the child to the health facility

Reasons for bringing children to the health facility included fever, reported by 40% of the caretakers, pneumonia (39%), ear problems (14%) and diarrhoea and vomiting (15%). Other conditions included failure to feed, chickenpox, sores, rash and scabies.

Discussion

In this study we observed sick children consulting health workers in 9 randomly selected health facilities. Owing to the Hawthorne effect it is possible that the way health workers manage children when they are observed may differ from their usual practices.^{5,6}

The fact that only 24% of the children were checked for three general danger signs is a cause for concern, since recognition of these signs can be critical. An outpatient study in rural Kenya showed that the mortality risk associated with having at least one danger sign was six times higher than that for children

TABLE I. HEALTH SYSTEMS SUPPORT INDICATORS IN 9 BULAWAYO CITY CLINICS, 2006

Indicator	Yes	No
Availability of drugs		
Health facility (HF) has 100% essential oral treatment available	0	0
Co-trimoxazole	8	1
Amoxicillin	2	7
Nalidixic acid	6	3
Chloroquine	9	0
Sulphadoxine pyrimethamine	7	2
Vitamin A	9	0
Iron	9	0
Paracetamol tablet	3	7
Tetracycline eye ointment	9	0
GV	8	1
HF has injectable drugs for pre-referral treatment available		
Quinine IM	0	9
Benzylpenicillin	6	3
Kanamycin	7	2
Availability of vaccines		
HF has equipment and supplies to support full vaccination services		
Functioning fridge	9	0
BCG	5	4
All other vaccines	9	0
Availability of supplies		
HF has essential equipment and materials, e.g. chart booklet, scales, watches, etc.	9	0
HF has IMCI chart booklet and mother's nutrition and counselling cards		
Supervision		
Health facility received at least one supervisory visit that included observation of case management during the previous 6 months (excluding follow-up after training)	0	9
HF received at least one supervisory visit during the previous 6 months (excluding follow-up after training)	9	0

without any signs. Numerous studies in developing countries have also established the presence of co-morbidity in many sick children and the benefits of an integrated approach to assessment.⁷

A study in northeastern Brazil by Amaral *et al.*⁸ found that although the majority of indicators show that quality of care improved significantly with training in IMCI, levels of performance for some indicators, such as checking for at least three danger signs and evaluation of feeding practices, were still low even after IMCI training, leaving room for further improvement. These findings are worrying because delay in the identification of serious illness may affect a child's chances of survival.⁸

The guidelines on IMCI require that a number of key assessment tasks should be performed in any sick child, irrespective of the specific complaint. This helps in identifying conditions that are not reported by the caretaker.⁹ Data from a descriptive hospital-based study conducted in South Africa found that at least 83% of deaths were associated with avoidable factors relating to administration or management at primary health care level.⁶

The insignificant differences between trained and untrained health workers in almost all categories of assessment except for checking visible wasting ($p=0.007$) and checking weight against a growth chart ($p=0.030$) may be attributable to the small sample size or the fact that the intervention had been implemented fairly recently, i.e. just over a year ago.¹⁰

The unnecessary prescription of antibiotics in 53% of study patients is also a cause for concern, as this can lead to drug resistance.¹¹ Our data show that counselling skills are sub-optimal. The lack of improvement in counselling may be because nurses were focusing more on the assessment, examination, and treatment of the sick child, or the counselling component of the training itself may have had limited impact on nurses' practice.⁷

The baseline survey in the Western Cape province of South Africa found that only 25% of health workers counselled caregivers on the use of medication prescribed.⁶ Counselling about home treatment of illness is a key step in the management of sick children, as appropriate home treatment can prevent severe morbidity and mortality.⁶

Drug availability was varied and pre-referral injectable drugs, in particular benzylpenicillin and kanamycin, were below minimum stock levels. Absence of such medication in primary health centres can mean that seriously ill children are transferred without receiving the necessary first dose of medication, which worsens outcome.⁸

Supervision is commonly considered to be a key part of any health system, and essential to improving the quality of care.⁵ A controlled field trial in the Philippines found that systematic supervision of midwives based on observation of health worker performance with immediate feedback was associated with improved performance.⁵ Strengthening of supervisory support, with an emphasis on structured observations of clinical encounters and use of IMCI-specific supervisory guidelines, could improve practice further.

There is no doubt that IMCI is an intervention that can contribute towards reducing under-5 mortality. There is also no doubt that training of health workers in IMCI produces positive effects if the training includes clinical practice, sufficient facilitators and use of materials relevant to local culture and language. However, our survey shows that despite training of health workers, gaps and deficiencies exist in assessing and managing sick children.

IMCI implementation in Bulawayo is not up to standard, as it failed to meet the minimum requirements of the IMCI protocol. Of note is that in all 9 facilities sampled only 20% of health workers were trained in IMCI implementation, as opposed to at least 60% as recommended by the protocol.

Although many studies have reported IMCI case management training to be associated with significant improvements in the quality of care received by children, training alone is not sufficient to attain and sustain adequate levels of service quality.¹² Multiple factors must operate together in order to strengthen health worker performance and sustain improvements achieved. These include adequate training quality, effective reinforcement of skills, and policies that are supportive, consistent across and communicated to all levels of the health system.¹²

In terms of health system support, an integrated supervisory system together with appropriate resource allocation for supervision is needed. The supervision should pay particular attention to observation of case management of under-5s. The Director of Health Services should also ensure that second-line and pre-referral treatment drugs are available in all facilities.

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