



Evidence Request #P0004

WHO guidelines for children in developing countries

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Abstract

Background: The Health for Kids Paediatric Evidence Centre agreed to be part of a project documenting the evidence behind the World Health Organization's Pocketbook / Manual for management of childhood illness in hospitals in developing countries with limited resources. We were asked to identify evidence using PubMed to answer the question: What is the evidence for effectiveness of WHO guidelines for the care of children in hospitals in developing countries?

Clinical Question: In children in hospital in developing countries, does care delivered according to guidelines developed by the World Health Organisation, compared to standard care, improve clinical outcomes or the process of care?

Methods: We searched PubMed on the 23rd of June 2005 for articles published in English.

Our search included terms for world health organisation, children and guidelines. 561 potentially relevant articles were identified. The abstracts and, where necessary, full text of these articles were reviewed to determine whether they met the selection criteria.

Results: 31 potentially relevant articles were retrieved, five articles were included.

Conclusions: There is very limited evidence available to determine whether care delivered according to guidelines developed by the World Health Organisation, compared to standard care, improves clinical outcomes or the process of care for children in hospital in developing countries.

The results of the studies identified suggest that the effect of implementation of WHO guidelines may be positive, however the low quality of the study designs, and paucity of data reported mean this cannot be stated conclusively.

Implications for Practice: More evidence is required to determine whether the implementation of WHO guidelines in hospitals in developing countries improves care or outcomes for children. Funding should be provided to undertake these studies in order to demonstrate the benefit (or otherwise) of guideline implementation.

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Background

The Health for Kids Paediatric Evidence Centre agreed to be part of a project documenting the evidence behind the World Health Organization's Pocketbook / Manual for management of childhood illness in hospitals in developing countries with limited resources. This is a collaboration between WHO Child and Adolescent Health Division in Geneva, and paediatricians from the Centre for International Child Health at the University of Melbourne, the University of Edinburgh, and the Kenyan Medical Research Institute. We were asked to identify evidence using PubMed to answer the question: What is the evidence for effectiveness of WHO guidelines for the care of children in hospitals in developing countries?

Clinical Question

In children in hospital in developing countries, does care delivered according to guidelines developed by the World Health Organisation, compared to standard care, improve clinical outcomes or the process of care?

Methods

Study Selection Criteria

Patient	Children aged less than 18 years in hospitals (or equivalent health care facilities) in developing countries		
Intervention	Guidelines for diagnosis or management of health conditions developed by the World Health Organisation		
Comparison	Standard care		
Outcomes	Clinical outcomes or measures of process change		
Study Type	Any study that included a comparison group (systematic review, randomised controlled trial, cohort study or case-control study)		
Publication Date	Any	Language	English

Search Strategy

Evidence Source	Date of Search
PubMed	23 rd June 2005

Search Terms in PubMed

Patient	infant[MeSH] OR child[MeSH] OR adolescent[MeSH] OR child* OR infant* OR pediatric* OR paediatric*
Intervention	("World Health Organization"[MeSH] OR world health organisation OR world health organization OR world health organi*) AND ("Guideline"[Publication Type] OR "Guidelines"[MeSH] OR "Guideline Adherence"[MeSH] OR "Practice Guideline"[Publication Type] OR guideline* OR protocol*)
Comparison	-
Outcomes	-

Data Collection & Analysis

Studies were selected and appraised by one reviewer in consultation with colleagues, using inclusion, exclusion and appraisal criteria established a priori.

Results

Our initial search retrieved 561 potentially relevant studies. 530 articles were excluded after review of abstract. Full text was retrieved of 31 articles. After application of inclusion and exclusion criteria, five articles were included.

Characteristics of included studies:

Study	Study Type	N (total)	Setting	Patients	Intervention	Comparison	Outcomes
Ashworth et al 2004	Prospective cohort with historical control	271	2 hospitals in Eastern Cape Province, South Africa	Children admitted to paediatric wards with a diagnosis of severe malnutrition (not explicitly defined)	WHO guidelines for management of severe malnutrition (Post-implementation 2000-1, n=193)	Standard care (Pre-implementation 1997-8, n=78)	Case-fatality rates
Cavalcante et al 1998	Prospective cohort with historical control	60	Nutrition rehabilitation centre in Ceará, Brazil	Children with severe malnutrition (not explicitly defined)	Diet based on WHO treatment guidelines (Post-implementation Nov-Dec 1995, n=20)	Routine diet (Pre-implementation Jan-Feb 1995, n=40)	Rate of weight gain, diet cost, length of stay
Centuori et al 1998	Prospective cohort with historical control	461	Department of Paediatrics, Tirana, Albania	Children aged 1 month to 5 years admitted for acute diarrhoea	WHO guidelines for management of diarrhoea (Post-implementation 1995, n=226)	Standard care (Pre-implementation 1994, n=235)	Case-fatality rate, length of hospital stay
Deen et al 2003	Prospective cohort with historical control	274	2 hospitals, 1 in Northern Province South Africa and 1 in the Volta Region of Ghana	Children with severe malnutrition (not explicitly defined)	WHO guidelines for inpatient management of severe malnutrition in children (Post-implementation 2000-1, n=164)	Standard care (Pre-implementation 1999, n=110)	Process improvements, case-fatality rate, length of hospital stay
Smyth et al 1998	Prospective cohort with historical control	293	District hospital in rural eastern Zambia	Children aged 4 weeks to 7 years old admitted to the children's ward with pneumonia	WHO case management protocol for pneumonia (Post-implementation 1994-5, n=158)	Standard care (Pre-implementation 1993-4, n=135)	Case-fatality rate, process improvements

Quality of included studies:		
Study: Ashworth et al 2004		Comments
Specified inclusion/ exclusion criteria	Partial	Included all children admitted to paediatric wards with a diagnosis of severe malnutrition. No definition of severe malnutrition provided, no exclusion criteria provided. 19 of 97 children (19.6%) in the pre-implementation period were excluded as adequate records were not available.
Groups similar at baseline except for exposure	Partial	Age and weight for age Z score did not significantly differ between pre and post intervention groups. Children at one hospital were more underweight in the post intervention group. Admissions for severe malnutrition and for all causes in both hospitals were much higher post-intervention. Medical access was very limited in both groups and, at one hospital, only new doctors untrained in management of severe malnutrition were available post implementation.
Outcomes assessed blindly with respect to exposure	No	Blinding was not undertaken.
Adequate duration of follow-up	Unclear	Length of follow-up is not stated, however as results were based on medical record review, follow-up is likely to be until discharge from hospital or death.
Minimal proportion lost to follow up	Unclear	No loss to follow up is reported.
Objective & independent assessment of outcomes	Yes	Primary outcome is mortality.
All subjects included in analysis	No	19 of 97 children (19.6%) in the pre-implementation period were excluded as adequate records were not available.
Study: Cavalcante et al 1998		Comments
Specified inclusion/ exclusion criteria	No	No inclusion or exclusion criteria provided. No definition of severe malnutrition provided,
Groups similar at baseline except for exposure	Unclear	No details provided.
Outcomes assessed blindly with respect to exposure	No	Blinding was not undertaken.
Adequate duration of follow-up	Unclear	Length of follow-up is not stated.
Minimal proportion lost to follow up	Unclear	No loss to follow up is reported.
Objective & independent assessment of outcomes	Yes	Primary outcome is rate of weight gain. It is not clear whether assessors were trained, used the same scales for each measurement on all children, or whether there was a protocol in place.
All subjects included in analysis	Unclear	No exclusions reported.

Study: Centuori et al 1998		Comments
Specified inclusion/ exclusion criteria	Yes	All children aged from 1 month to 5 years admitted for acute diarrhoea.
Groups similar at baseline except for exposure	Yes	Mean age, proportion of children <6months, proportion of children with severe malnutrition, hydration status at admission were similar between both groups.
Outcomes assessed blindly with respect to exposure	No	Blinding was not undertaken.
Adequate duration of follow-up	Unclear	Length of follow-up is not stated, however as results were based on medical record review, follow-up is likely to be until discharge from hospital or death, which ever is sooner.
Minimal proportion lost to follow up	Unclear	No loss to follow up is reported.
Objective & independent assessment of outcomes	Yes	Primary outcome is mortality secondary outcome is length of stay.
All subjects included in analysis	Unclear	No exclusions reported.

Study: Deen et al 2003		Comments
Specified inclusion/ exclusion criteria	No	No inclusion or exclusion criteria provided. No definition of severe malnutrition provided.
Groups similar at baseline except for exposure	Unclear	No details provided.
Outcomes assessed blindly with respect to exposure	No	Blinding was not undertaken.
Adequate duration of follow-up	Unclear	Length of follow-up is not stated, however as results were based on medical record review, follow-up is likely to be until discharge from hospital or death, which ever is sooner.
Minimal proportion lost to follow up	Unclear	No loss to follow up is reported.
Objective & independent assessment of outcomes	Unclear	Methodology for assessment of process outcomes is not provided. Primary patient outcome is mortality.
All subjects included in analysis	Unclear	No exclusions reported.

Study: Smyth et al 1998		Comments
Specified inclusion/ exclusion criteria	Yes	Children aged 4 weeks to 5 years old admitted to the children's ward included. Children were excluded if wheeze was present on auscultation or if pulmonary tuberculosis was suspected.
Groups similar at baseline except for exposure	Mostly	Similar gender balance, mean and range of age, mean weight for age Z score. More children in the post-implementation group had malaria on blood film (34% vs 21%, P=0.011). The level of severity of dehydration of the 2 groups could not be compared due to poor pre-implementation documentation.
Outcomes assessed blindly with respect to exposure	No	Blinding was not undertaken.
Adequate duration of follow-up	Yes	Length of follow-up was until discharge from hospital or death, which ever is sooner.
Minimal proportion lost to follow up	Unclear	Data was not included if parents removed children from hospital before completion of treatment. The number of children who were removed from hospital before completion of treatment is not provided. No other loss to follow-up is reported
Objective & independent assessment of outcomes	Mostly	Primary outcome is mortality. Methodology for assessment of process outcomes is not clear.
All subjects included in analysis	Unclear	Data was not included if parents removed children from hospital before completion of treatment. The number of children who were removed from hospital before completion of treatment is not provided. No information is provided about any other exclusions from analysis.

Results of included studies:

Ashworth et al 2004	<p>At one hospital case-fatality rates fell from 12 in 26 (46%) to 21% (10/48) after guideline implementation (OR for death=0.31, 95%CI 0.01, 0.98 p=0.023).</p> <p>At the other hospital case-fatality rates initially fell from 25% (18/71) to 18% (18/98), (OR for death=0.66, 95%CI 0.30, 1.49 p=0.27) but then rose to 38% (18/47) when medical staff were replaced with inexperienced doctors.</p>
Cavalcante et al 1998	<p>After implementation, average weight gain rose from 2.4g/kg/day to 10.0g/kg/day, cost of diet fell from R\$2.5 per litre of milk and R\$2.8 per litre of soup to R\$0.5 and R\$0.9 per litre respectively (no standard deviations provided so statistical significance uncertain). Authors also report that average length of stay fell from 4-5 months to less than 1 month. No further details provided.</p>
Centuori et al 1998	<p>Mortality was 1.27% (3 in 235) pre-implementation and 0.44% (1 in 226) post-implementation (OR for death=0.34, 95%CI 0.006, 4.32 p=0.334).</p> <p>Average length of stay was 5.5 days pre implementation and 4.8 days post-implementation (no standard deviations provided so statistical significance uncertain).</p>
Deen et al 2003	<p>Case-fatality was 35% (10/29) pre-implementation and 18% (23/125) post-implementation (OR for death=0.22, 95%CI 0.084, 0.59 p=0.057) at one hospital and 20% (16/81) pre-implementation and 18% (7/39) post-implementation at the other hospital (OR for death=0.89, 95%CI 0.28, 2.57 p=0.814).</p> <p>Pre-implementation average length of stay was 2 weeks at one hospital and 3-4 weeks at the second hospital. Post-implementation average length of stay was 4 weeks at both hospitals.</p> <p>Authors report that malnutrition management practices (including early frequent feeding and management of hypoglycaemia, hypothermia and infection) were strengthened however this is not quantified.</p> <p>Authors also note that some recommended practices were not feasible in the local setting and problems were encountered in implementing others.</p>
Smyth et al 1998	<p>Case-fatality was 25% (34/135) pre-implementation and 15% (23/58) post-implementation (OR for death=0.51, 95%CI 0.27, 0.95 p=0.022).</p> <p>The post implementation group was also more likely to receive oxygen (OR 4.74 , 95%CI(2.68, 8.51) p<0.0000), more likely to receive intravenous antibiotics (OR 9.89, 95%CI 2.94, 51.67 p<0.0000) and more likely to receive intravenous fluids (OR 4.11, 95%CI 1.68, 11.48, p<0.0000).</p> <p>The proportion of patients receiving fluids (intravenous or nasogastric) remained steady as did the proportion of patients receiving parenteral (intravenous or intramuscular) antibiotics.</p>

Discussion

No high quality studies were identified. The little evidence which is available is limited by a lack of methodological rigour, particularly in that the control and intervention groups may differ markedly in aspects other than receipt of the intervention. The amount of data reported in the identified trials is also minimal.

The results of the studies identified suggest that the effect of implementation of WHO guidelines may be positive, however the low quality of the study designs, and paucity of data reported mean this cannot be stated conclusively.

This review has a number of limitations. Importantly, the scope of the search was restricted to evidence published in English and indexed in PubMed. Searching only PubMed, which is freely available, ensures that the search is able to be repeated in contexts with only limited access to evidence. This restriction also means that the body of potentially relevant research only available in other databases such as Embase or CINAHL (to which access is not freely available) was not identified.

Restricting the search to studies published in English is another substantial limitation, particularly with a topic of this nature where it is likely that research has been published in other languages. The restriction was made as a result of resource limitations.

Another difficulty of this search was accurately classifying documents as World Health Organisation (WHO) guidelines. Many guidelines are produced with some funding from WHO, or in partnership with WHO, however these documents are not necessarily WHO endorsed, or implemented. For the purposes of this review we only included those guidelines explicitly identified within the study as being developed by WHO.

Searching for WHO guidelines was also challenging as many publications do not use the phrase "World Health Organisation" but only the acronym WHO, which databases cannot distinguish from "who". Searching with the term "WHO" resulted in retrieval of an overwhelming number of irrelevant citations. In light of this and in consultation with the steering group, we restricted our search to articles retrieved using the search term "world health organi*" and appropriate category headings, realising this means we are likely to have missed some relevant articles.

It is possible that the results of this review are open to publication bias. Small, methodologically weak studies which show no impact, or a negative impact of WHO guidelines may be unlikely to be published as the results might be dismissed as the outcome of poor research design. However small, methodologically weak studies demonstrating a positive effect may well be published in spite of the poor research design. This effect would be likely to exaggerate the perceived benefit of WHO guidelines.

Conclusions

There is very limited evidence available to determine whether care delivered according to guidelines developed by the World Health Organisation, compared to standard care, improves clinical outcomes or the process of care for children in hospital in developing countries.

The results of the studies identified suggest that the effect of implementation of WHO guidelines may be positive, however the low quality of the study designs, and paucity of data reported mean this cannot be stated conclusively.

Implications for Practice

More evidence is required to determine whether the implementation of WHO guidelines in hospitals in developing countries improves care or outcomes for children. The resource-poor settings in which these guidelines are implemented often means that the impact of the implementation is not evaluated.

Small, well conducted cohort studies could provide useful evidence where resources are not available to fund randomised controlled trials. Funding should be provided to undertake these studies in order to demonstrate the benefit (or otherwise) of the extensive and potentially expensive implementation process.

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