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Eight key household practices of Integrated Management of Childhood Illnesses (IMCI) amongst mothers of children aged 6 to 59 months in Gambat, Sindh, Pakistan

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Abstract

Objective: To determine Knowledge, Attitudes and Practices (KAP) regarding eight key integrated management of childhood illness (IMCI) suggested practices and the association of these key practices with stunting as outcome.

Methods: Sampling proportionate to sub-population sizes was employed to ensure representation from all the Union Councils of taluka Gambat-Sindh.

Results: Low female education and mobility show the status of child's first care provider in a typical rural community. Few women knew about giving more food to a child suffering from diarrhoea. Moreover, very few exclusively breastfed their children for first 4-6 months, got their children completely immunized, washed hands before cooking and serving meals and boiled water before utilizing it for drinking purpose. Multiple logistic regression analysis showed that children of mothers, who knew the importance of vaccination, obtained antenatal checkups, exclusively breastfed the last child, washed hands before serving and cooking meals were less likely to be stunted. Similarly, children from households where mothers received husband support in child rearing, and where no child less than five years suffered from diarrhoea in the past one year, were less likely to be stunted.

Conclusions: Without improving education level of females in rural communities, it would be difficult to educate and empower the first care provider of child. However, as an interim strategy, educational messages regarding a limited number of key practices should be disseminated (JPMA 57:288;2007).

Introduction

Every year, an estimated 11 million children die in developing countries before reaching their fifth birthday.^{1,2} Approximately seventy percent of these deaths are due to five childhood diseases occurring singly or in combination: acute respiratory infections, diarrhoea, measles, malaria and malnutrition.³

Although disease-specific vertical programmes have improved child survival in many developing countries⁴, the impact of these programmes has been limited due to the disease-focused approach. In order to address childhood illnesses in a more holistic manner, the World Health Organization (WHO), worked with the United Nation Children's Fund (UNICEF) and other partners to develop a strategy known as Integrated Management of Childhood Illnesses (IMCI).¹

The IMCI has three major components: improvement in the case-management skills of health staff through the provision of locally adapted guidelines on IMCI, improvements in health systems required for effective management of childhood illness, and improvement in household and community practices. After expansion of the

first two components in most countries of the world, including Pakistan, researchers are now focusing on intervention research addressing the third component: household and community practices (HH/C IMCI). The foremost objective of HH/C IMCI is to empower communities to address factors that affect child health, nutrition and development⁵, which may not be achieved unless we understand the existing knowledge, attitude and practices of mothers regarding child health.

Improvement of household practices is even more important for remote areas and rural settings where lack of knowledge and delayed care-seeking have been identified as contributors in up to 70% of childhood deaths.⁶ Literature also suggests that poor children are up to six times more likely to die before reaching their fifth year of life than wealthier children.⁷

IMCI experts recommend sixteen key household and community practices (Box 1). However, the present study is focused on eight of the sixteen key IMCI suggested practices which were most relevant to Pakistan (italicized in Box 1).

Additionally, we also looked for the association between key IMCI practices and malnutrition: an outcome

Box 1. Key household and community practices of IMCI.

Physical growth and mental development

1. *Breastfeed infants exclusively for at least four months and, if possible, up to six months. (Mothers found to be HIV positive require counseling about possible alternatives to breastfeeding.)*
2. *Starting at about six months of age, feed children freshly prepared energy and nutrient-rich complementary foods, while continuing to breastfeed up to two years or longer.*
3. *Ensure that children receive adequate amounts of micronutrients (vitamin A and iron, in particular), either in their diet or through supplementation.*
4. Promote mental and social development by responding to a child's needs for care, through talking, playing, and providing a stimulating environment.

Disease prevention

5. *Take children as scheduled to complete a full course of immunizations (BCG, DPT, OPV, and measles) before their first birthday.*
6. *Dispose off faeces, including children's faeces, safely; and wash hands after defecation, before preparing meals, and before feeding children.*
7. Protect children in malaria-endemic areas, by ensuring that they sleep under insecticide-treated bed nets.
8. Adopt and sustain appropriate behaviour regarding prevention and care for HIV/AIDS affected people, including orphans.

Appropriate home care

9. *Continue to feed and offer more fluids, including breast milk, to children when they are sick.*
10. Give sick children appropriate home treatment for infections.
11. Take appropriate actions to prevent and manage child injuries and accidents.
12. Prevent child abuse and neglect, and take appropriate action when it has occurred.
13. *Ensure that men actively participate in providing childcare, and are involved in the reproductive health of the family.*

Seeking care

14. Recognize when sick children need treatment outside the home and seek care from appropriate providers.
15. Follow the health worker's advice about treatment, follow-up and referral.
16. *Ensure that every pregnant woman has adequate antenatal care. This includes having at least four antenatal visits with an appropriate health care provider, and receiving the recommended doses of the tetanus toxoid vaccination.*

that is associated with more than 50% of childhood deaths⁸ and explains the overall health and welfare of children. Therefore, we took stunting (height-for-age) as an outcome measure, as it reflects the overall health and welfare of individuals and populations over a period of time.⁹

Subjects and Methods

The study was conducted in Gambat, which is one of the eight talukas of District Khairpur of Sindh province, in Pakistan. It is an agrarian district with cotton, rice, wheat and sugarcane as the main crops.¹⁰

To calculate the necessary sample size to estimate

stunting, we assumed that 50% children would be stunted. With bound of error at 5%, the estimated sample was at least 385. On applying a design effect of 1.5 (as we were cluster sampling), and an adjustment of 10% for non-response, a sample of at least 636 was required. Moreover, we assumed that if associated factors ranged from 15-60% among non-stunted children then the sample calculated for the first objective would be sufficient to fulfill the second objective of our study with an Odds Ratio (OR) of 2 and power of 80%.

Before initiating the field work, we sought and obtained approval from the Ethical Review Committee (ERC) of our institution.

Gambat is divided into nine "Union Councils (UCs)": Gambat I, Gambat II, Kamaldero, Jado, Belharo, Khemtia, Khora, Ripri, and Razidero. We used sampling proportionate to the size of the UCs. To select children age less than five years and interview their mothers, three-stage cluster sampling was employed. At first stage, a village was randomly selected from each UC; however where the sample size was greater than the size of the village, two villages were selected. Then, the important landmarks such as shops, schools and mosques were identified in the selected village and a landmark in each of the village was randomly selected as a focal point for the survey. Finally, at field level a soda bottle was rotated and the first household with at least one child of age less than five was selected. Then the house nearest to the sampled household with an under five child was visited next and this process was repeated until the required number of children for that village was enrolled.

A prestructured questionnaire was used to collect information regarding eight key IMCI practices. Finally, anthropometric measurements (length, height, and weight) for each child were recorded following the WHO recommended procedures.¹¹

Double data entry was performed and validated using EPI-Info 6 to check for completeness and consistency. Statistical analysis was done by the Statistical Package for Social Sciences (SPSS-11.5). To calculate prevalence of malnutrition, WHO reference standard was taken [based on children in the USA¹¹] by utilizing the EPINUT anthropometry program for the following indicators:

Stunting: Proportion of children below -2 standard deviations from median height/length-for-age World Health Organization/National Center for Health Statistics (WHO/NCHS) reference population.

Underweight: Proportion of children below -2 standard deviations from median weight-for-age of the WHO/NCHS reference population.

Wasting: Proportion of children below -2 standard

deviations from the median weight for height of the WHO/NCHS reference population.

Statistical Analysis: Odd Ratios with 95% confidence intervals (CIs) were calculated for univariate analysis. Using Multiple Logistic Regression modeling, variables having p-value of 0.2 or less in univariate analysis and/or having biological significance were included to build a parsimonious yet biologically meaningful model for the stunting as the dependent variable.

Results

We included 647 children of age 6 to 59 months. The mean (\pm SD) age of children, their mothers and fathers were 23.5 ± 13.4 months, 29.6 ± 5.3 years and 33.8 ± 7.4 years, respectively.

Four hundred and eighty seven (75.3%) mothers and 111 (17.2%) fathers had no education. There were only 162 (25.0%) families living in 'pucca' homes (made of brick, plastered wall and roof) and the mean reported monthly income of the household was Rs. 2522 (\pm 2143) [or US\$42 (US\$35.7)]. (Conversion rate Rs. 60 per US\$ is used).

Knowledge and attitude regarding eight key IMCI suggested practices

When asked about best food and best milk for a child in the initial four to six months, 516 (79.8%) and 636 (98.3%) suggested mother's milk as best food and best milk, respectively. Similarly, 570 (88.1%) thought that weaning should be initiated at 4-6 months and 211 (32.6%) thought that the child should be exclusively breastfed for an initial 4-6 months. When asked about effects of additional feed in first 4-6 months of child, 152 (23.5%) thought that it had bad effects on a child's health.

We also found that 174 (26.9%) had heard about pneumonia, 297 (45.9%) about tetanus and 525 (81.1%) about vaccination. The most reported vaccine-preventable diseases by mothers (impromptu answers) were polio 444 (66.8%) and tuberculosis (49.8%). Moreover, 422 (65.2%) reported that vaccination has a role in improving child health by preventing diseases.

When asked about the amount of food required for a child suffering from pneumonia and diarrhoea, 542 (83.3%) replied less than usual amount of food in pneumonia and 284 (43.9%) thought that less than usual amount in case of diarrhoea. On the other hand, only 76 (11.7%) mothers suggested that a child suffering from diarrhoea should be given less than the usual amount of fluid.

Furthermore, 554 (85.6%) mothers thought that washing hands before serving meals and cooking meals for a child has positive effects on child's health. In addition to

that, 566 (87.5%) indicated that male partner should support them in child rearing.

Practices regarding eight key IMCI suggested practices

Our analysis showed that 638 (98.6%) mothers breastfed their last child and the mean age until they were breastfed was 14.5 months (\pm 7.9). Furthermore, 134 (20.7%) exclusively breastfed their last child and 532 (82.2%) initiated weaning after four months. Among mothers who did not breastfeed exclusively, 292 (45.1%) gave water, 216 (33.4%) gave butter and 141 (21.8%) gave 'ghutti' as additional feed during first 4-6 months. On further inquiry about how the additional feed was given, 334 (51.6%) gave an additional feed every day in comparison to 15 (2.3%) who gave it just once after birth.

We also found that 35.5% of children were completely vaccinated. Moreover, 403 (62.3%) children received polio vaccine during National Immunization Days (NIDs).

Hand-washing before serving and cooking meals was reported by 37 (5.7%), and boiling water before drinking by only 3 (0.5%) mothers. Male partner support in child rearing was reported by 165 (25.5%) mothers and 133 (20.6%) could go to a health facility alone. Furthermore, 429 (66.3%) had their last delivery at home and 402 (62.1%) of those deliveries were conducted by Traditional Birth Attendants (TBAs). Similarly, 335 (51.8%) reported that they received antenatal checkups during their last pregnancy and 152 (23.5%) received 3 or more antenatal checkups.

Morbidity and mortality indicators

We found that 112 (17.3%) mothers reported the death of one or more child of age less than 5 years at some time in their life. Furthermore, 188 (29.1%) mothers reported that one or more children of age less than 5 years in the family suffered from diarrhoea during the past year. However, only 19 (2.9%) revealed that one or more child <5 years had pneumonia in the past year. Furthermore, 37 (5.7%) mothers reported that one or more children ever had tetanus.

Anthropometric indicators

We found that 352 (54.4%) children were stunted (Height for age \leq -2 Standard Deviation (S.D.)), 244 (37.7%) were undernourished (Weight for age \leq -2 S.D.) and 100 (15.5%) were wasted (Weight for height \leq -2 S.D.). The mean weight of mothers was 50.6 kg (\pm 10.5) and mean height was 153.7 c.m. (\pm 6.9). Furthermore, 275 (42.5%) mothers revealed a low Body Mass Index (BMI) (BMI < 20).

Table 1 shows independent variables that were

Table 1. Univariate analysis of factors associated with stunting among children of age 0-59 months in Gambat, Sindh.

	Normal n=295 (%)		Stunted n=352 (%)		OR** (95% C.I) †	
Socio-economic and demographic						
Mother's occupation						
Teacher/government employee	11	(3.7)	4	(1.1)	1.0	-
Housewife/labor/work in field	284	(96.3)	348	(98.9)	3.4	(1.1-10.7)*
Mother's literacy						
Formal schooling	65	(22.0)	48	(13.6)	1.0	-
Illiterate/religious education only	230	(78.0)	304	(86.4)	1.8	(1.2-2.7)*
Father's occupation						
Teacher/Government employee	86	(29.2)	79	(22.4)	1.0	-
Landlord/Businessman	52	(17.6)	55	(15.6)	1.2	(0.7-1.9)
Unemployed/labor/fisherman/farmer	157	(53.2)	218	(62.0)	1.5	(1.1-2.2)*
Family system						
Extended	63	(21.4)	50	(14.2)	1.0	-
Nuclear	232	(78.6)	302	(85.8)	1.6	(1.1-2.5)*
Construction of house						
Pucca	87	(29.5)	75	(21.3)	1.0	-
Semi pucca	91	(30.8)	123	(34.9)	1.57	(1.1-2.4)*
Katcha	117	(39.7)	154	(43.9)	1.53	(1.1-2.3)*
Monthly Income (PKR)						
>6500	16	(5.4)	7	(2.0)	1.0	-
4500-6500	28	(9.5)	28	(8.0)	2.3	(0.8-6.4)
2500-4500	105	(35.6)	107	(30.4)	2.3	(0.9-5.9)
<2500	90	(30.5)	106	(30.1)	2.7	(1.1-6.8)*
Don't know	56	(19.0)	104	(29.5)	4.2	(1.6-10.9)*
Practices						
Exclusive breastfeeding						
Yes	73	(24.7)	53	(15.1)	1.0	-
No	222	(75.3)	299	(84.9)	1.8	(1.2-2.6)*
Place of last delivery						
Hospital	113	(38.3)	105	(29.8)	1.0	-
Home	182	(61.7)	247	(70.2)	1.46	(1.1-2.0)*
Antenatal visits during last pregnancy						
Yes	197	(66.8)	138	(39.2)	1.0	-
No	98	(33.2)	214	(60.8)	3.1	(2.3-4.3)*
Yes	86	(29.2)	130	(36.9)	1.4	(1.1-1.9)
Additional feed given at:						
Not given	48	(16.3)	35	(9.9)	1.0	-
Once after birth	7	(2.4)	2	(0.6)	0.4	(0.8-2.0)
Rarely in 4-6 month	36	(12.2)	25	(7.1)	0.5	(0.5-1.9)
Often in 4-6 months	51	(17.3)	68	(19.3)	1.8	(1.0-3.2)*
Everyday in 4-6 months	153	(51.9)	222	(63.1)	2.0	(1.2-3.2)*
Child had diarrhoea in last year						
Yes	105	(35.6)	83	(23.6)	1.0	-
No	190	(64.4)	269	(76.4)	1.8	(1.3-2.5)*
Wash hands before serving and preparing meals						
Yes	26	(8.8)	11	(3.1)	1.0	-
No	269	(91.2)	341	(96.9)	3.0	(1.5-6.2)*
Did husband support in child rearing						
Yes	92	(31.2)	67	(19.0)	1.0	-
No	203	(68.8)	285	(81.0)	1.9	(1.3-2.8)*
When additional feed was given						
4-6 months	251	(85.1)	281	(79.8)	1.0	-
>6	20	(6.8)	26	(7.4)	1.2	(0.6-2.1)
<4	24	(8.1)	45	(12.8)	1.7	(1.0-2.8)*

** Odds Ratio

† 95% Confidence intervals

* Statistically significant

Table 2. Multiple logistic regression analysis of factors associated with stunting among children of age 0-59 months in Gambat, Sindh.

	AOR*	(95% CI) †
Exclusive Breastfeeding		
Yes	1.0	-
No	1.7	(1.1-2.7)
Water given during first 4-6 months		
No	1.0	-
Yes	1.7	(1.2-2.4)
Role of vaccine in child's health		
Known	1.0	-
Not known	2.2	(1.5-3.2)
Episode of diarrhoea to < 5 child in last year		
No	1.0	-
Yes	2.0	(1.3-2.8)
Washes hand before cooking and serving meals		
Yes	1.0	-
No	3.2	(1.4-7.0)
Husband supports in child rearing		
Yes	1.0	-
No	1.8	(1.2-2.7)
Antenatal checkups		
Done	1.0	-
Not done	2.7	(1.9-3.8)

* Adjusted Odds Ratios

† 95% Confidence intervals

significantly associated with stunting among children. Other variables that showed significant association at univariate analysis are presented below.

Children of mothers who had heard about pneumonia (OR: 1.5; 95% CI; 1.1-2.2) and tetanus (OR: 1.5; 95% CI; 1.1-2.2) and knew the role of vaccination in the child's health (OR: 2.7; 95% CI; 1.9-3.8) were less likely to be stunted. Similarly, children who received ghutti, an herbal paste, (OR: 1.5; 95% CI; 1.1-2.3) and butter (OR: 1.4; 95% CI; 1.1-1.9) at the age of less than six months were more likely to be stunted compared to those who were not given these items. In contrast, the odds of stunting were low among children who received BCG (OR: 2.3; 95% CI; 1.6-3.3), OPV0 (OR: 1.5; 95% CI; 1.1-2.1) and DPT-1 (OR: 1.5; 95% CI; 1.5-2.1).

Multiple Logistic Regression analysis (Table 2) showed that children of mothers who did not know about the role of vaccination in a child's health were more likely to be stunted than the children of those who knew about it. Similarly, history of non-exclusive breastfeeding was more likely among stunted children than non-stunted children (AOR 1.7, 95% CI; 1.1-2.7). Moreover, odds of giving water to a stunted child in the first four to six months was 1.7 times (95% CI; 1.2-2.4) that of a non stunted child.

We also found that children belonging to households in which at least one child of age less than five years suffered with diarrhoea in the past one year were more likely to be stunted compared to children belonging to households with no history of diarrhoea (AOR: 2.0; 95% CI; 1.3-2.8). Children of mothers who reported not having husbands' support in child rearing were more likely to be stunted (AOR: 1.8; 95% CI; 1.2-2.7). Similarly, mothers who reported not having antenatal checkups during their last delivery were more likely to have stunted children as compared to those who reported antenatal checkups (AOR: 2.7; 95% CI; 1.2-2.7).

Discussion

The household and community component of IMCI is one of the most important strategies to improve child survival, especially when research suggests that educating parents, who are first care providers to the child, is essential to reduce child mortality.¹² This component therefore emphasizes the importance of getting closer to the underlying social, political, environmental and economic conditions where children pass their lives with their caretakers.¹³

Studies have shown that support for the education of women and girls is critically important for their own and their children's well-being. However, our results showed that taluka Gambat has a much wider gap between male and female education than found in the whole of the district Khairpur.¹⁴ This gap perhaps reiterates the traditional prejudice of influential landlords against education, as mentioned by the census report of district Khairpur.¹⁵ As suggested by Mahmood et al. for rural areas of Sind¹⁶, our study also showed low female mobility. The reported low levels of literacy, mobility and husband support in child rearing, reveal the low status of and support for sick children among first care providers in these rural communities of Sindh.

Evidence has shown that care-givers show less resistance to giving more fluid than to giving more food to sick child suffering with diarrhoea.¹⁷ Our study also revealed that more mothers knew of the importance of giving more than more food for a child suffering from diarrhoea. This is perhaps because of the emphasis of media campaigns is more on fluids than more food for sick child.

Although, more fluid to a child suffering from diarrhoea is a key to reduce childhood mortality, however, increase food intake of a child, during diarrhoea and in convalescence from it, is also an important strategy to reduce malnutrition and long term effects of diarrhoea. We suggest that the health education message should emphasize both on increase fluid and food the children suffering from diarrhoea.

As suggested by Kulsoom and Saeed¹⁸, we found that a high proportion of children were breastfed after birth, however, very few were exclusively breastfed for first four to six months. Further, corroboratively¹⁹ our study also reveals the low proportion of women receiving three or more antenatal checkups. These areas need further research to determine whether mothers know about the importance of these practices and the nature of the gap between knowledge and practices.

Our study, in contrast with past reports²⁰ from other areas of Pakistan, showed a lower rate of completely immunized children. However, a much higher proportion of children received polio vaccine through the mass polio campaign. The outreach services and media coverage for mass polio campaign may be reasons for this difference, although this may also be a reflection of felt need in the community, who would utilize vaccination services if and when more actively offered or made available.

Evidence has shown that washing hands, especially with soap, before cooking and serving meals to children²¹⁻²³ and boiling water^{24,25} before drinking reduces the risk of diarrhoea. It was alarming that few mothers reported washing hands before serving and cooking meals for children, and that even fewer reported boiling water before using it for drinking purposes. These possibly are two of the main factors underlying the high frequency of diarrhoea among children in the community. Although energy sources to boil water are meager, the local Government should develop a mechanism to help communities obtain safe water.

We suggest that with such low literacy levels and limited mobility of women, it would be very difficult to raise their knowledge and practices in rural communities like Gambat. Increasing education in the community therefore, to ultimately improve childcare practices of rural women is critically important. Moreover, health education messages should address the importance of general hygiene, exclusive breastfeeding and vaccination of children.

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