

## The Know-Do Gap in Medical Management of Acute Diarrhea in Gaza City

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### Abstract:

Programs aiming to reduce the burden of diarrhea among children in lower source settings typically raise awareness regarding evidence-based guidelines, however, studies have suggested that provider's knowledge are not necessarily translated into adequate practice. To compare between the medical management knowledge and practices of acute diarrhea regarding the WHO guidelines, a cross-sectional study was conducted in Gaza city (May to August 2016), in order to improve medical adherence to these guidelines. The interview-based questionnaires targeted all physicians working at AL-Nassr and Al-Durra pediatric hospitals (102 physicians) to identify their knowledge regarding the guidelines. The response rate was 93%. Also, a retrieval sheet was used to identify their actual practices, where 301 acute diarrhea cases' records were retrieved. Most of Acute Diarrhea danger signs (3 and 4 compatible signs) was 10.6% in the knowledge v/s 18.9% in the practice. Most of dehydration signs (2 and 3 correct signs) were 71.1% in the knowledge v/s 47.5% in the practice. The percentage of correct classification of dehydration was only 4.2% in the knowledge v/s 27% in the practice. Though the percentage of requesting serum electrolytes was 88.4% in the knowledge, 54.2% of the records contained them. The sharp differences between knowledge and practices were found in the correct indication of IV fluids and the use of zinc during management of acute diarrhea, where the percentages 85.3%, and 86.3% respectively were in knowledge, compared with 16.3%, and 24.3% in the practice. The opposite was found in the use of antiemetics (24.2% VS 65.1%), antimicrobials (18.9% VS 59.1%), and the correct indications of ORS (23.2% VS 65.4%). Regarding the use of antidiarrheal, the difference between knowledge (4.2%) and practice (5.6%) was very small. The pediatricians reported that the largest problem impeding application of the guidelines was workload (48.5%). The relations were highly statistically significant in all of the comparison aspects, except in the number of identified danger signs and in the use of antidiarrheal (P-value were 0.367 and 0.586, respectively). The researcher called for the importance of adoption and application of the WHO diarrheal disease management guidelines as well as the need for audit and regular feedback.

**Keywords:** Acute Diarrhea, Children, Gaza City, Knowledge, Physicians, Practice.

## 1. Introduction:

Diarrhea Disease (DD) is defined by the World Health Organization (WHO) as having three or more loose or liquid stools per day or as having more stools than is normal for that person (WHO, 2015). It may be accompanied by nausea, vomiting, abdominal cramping, clinically significant systemic symptoms, or malnutrition (Ansari et al., 2012).

Globally, DD is the second leading cause of death among children under the age of five. It is called the common illness and the global killer, where it kills 2,195 children every day. In another word, DD kills more than AIDS, malaria, and measles combined (CDC, 2015). DD among children constitutes a large problem in the Palestinian territories, where its average percentage exceeded 11% of the total pediatric diseases (PCBS, 2015). The UNRWA epidemiological bulletin reported that Gaza Strip (GS) showed a constantly increasing trend of the Acute Diarrhea (AD) cases. This was with a fluctuation in the incidence according to the contextual situation. The reported incidence of the DD in 2012 was twofold that one reported in 2005, indicating environmental and sanitary deterioration (UNRWA, 2013). This represents how much DD increases the load on the Palestinian health sector. Generally, the DD's burden related to its high frequency and the large number of hospitalizations, medical consultations, tests and drug prescriptions (Vecchio et al., 2014). For this, multiple actions were proposed by the Palestinian Ministry of Health (MOH) for effective control of DD in GS. These actions included treatment through Oral Rehydration Solution (ORS), exclusive breastfeeding, improvement of water supply, safe water, food safety facilities, improving sanitation and hygiene (PCBS, 2015), besides adding rotavirus vaccine to the Palestinian immunization schedule in 2017 (RVF, 2017). The programs aiming to reduce the burden of DD in lower source settings typically raise awareness regarding evidence-based guidelines, however, studies have suggested that provider's knowledge is not necessarily translated into adequate practice (Lamberti et al., 2015). The knowledge, as well as the actual practical adherence to evidence-based recommendations for DD management in the Palestinian territories, was not adequately studied. The purpose of this study is to compare between the physicians' knowledge and the actual practices regarding the management of AD in Gaza City (GC) according to the WHO guidelines and to identify the major obstacles impeding application of these guidelines.

## 2. Methodology

### 2.1 Study Design

The design of this study is a cross-sectional one.

### 2.2 Study Setting

This study was conducted at the two general pediatric hospitals in GC; Al-Nasser pediatric hospital and Al-Durra pediatric hospital providing health care for the children with DD in the city.

### 2.3 Sample Size

The study sample included all the physicians working at Al-Nasser pediatric hospital and Al-Durra pediatric hospital during the period of the study, and who satisfied the inclusion criteria (102 physicians; 60 at Al-Nasser pediatric hospital and 42 at Al-Durra pediatric hospital). In addition, 1676 cases was the total number of eligible medical records of AD cases admitted to the two hospitals during the study period the peak period of DD), then as it was calculated by Equation of Steven Thompson (Annex 1), a sample of 301 medical records were reviewed for identifying the actual documented practice.

### 2.4 Eligibility Criteria

The inclusion criteria for physician included the physicians who practice pediatric medicine and were involved in the day-to-day management of pediatric illnesses in GC during the study period; had at least one year experience in working in the pediatric field; work at Al-Nasser pediatric hospital or at Al-Durra pediatric hospital during the study period; and interested in participation in the study.

On the other hand, the inclusion criteria for the medical records included AD cases aged less than 5 years; cases admitted during the study period (1st May to 30th August); cases admitted to one the two GC pediatric hospitals (Al-Nasser pediatric hospital or at Al-Durra pediatric hospital); and cases with no specialized comorbidities (eg: cardiology, urology, oncology, etc.).

### 2.5 Study Period

The study was carried out between May and August of the year 2016 (during the peak of DD season as the MOH reported in the Annual Epidemiological Report- Gaza Strip, 2014).

## **2.6 Study Instruments**

Two types of instruments were used in this study. The first was interview-based questionnaire, while the second type was retrieval sheet. The audit criteria for the two instruments were developed and adopted from the fourth revision of the WHO manual for the treatment of diarrhea "the manual for physicians and other senior health workers, Geneva"(WHO, 2005).

### **2.6.1 Interviewed-Based Questionnaire:**

An interview-based questionnaire was designed and used to be answered by all eligible physicians working in the two GC general pediatric hospitals (Al-Nassr and Al-Durra pediatric hospital) to identify their knowledge about the management of AD according to the WHO guidelines.

The interview-based questionnaire consisted of 5 open-ended questions and 18 multiple choices; all of them were classified into 3 sections. They included the participants' socio-demographic data, any training on the DD management guidelines, case management, and challenges impeding the application of the guidelines. Once the tool design was completed, validity and reliability were examined using the SPSS program. In order to increase face validity, the study tool was organized in categories with logical sequences, while content validity was evaluated by 10 experts in pediatrics to assess the relevancy; the comments were taken in consideration using the Content Validity Index (CVI). Besides, a pilot study was performed on a sample of 30 physicians to test validity, reliability, applicability, and clarity of the questionnaire. At the end of this process, small modifications were made. Since these changes were very small and not significant, the researcher had included the pilot study data in the total data.

### **2.6.2 Retrieval Sheet:**

The researcher designed a retrieval sheet form to review the medical management of AD. The retrieval form included: patient's demographic data, history taking, assessment of dehydration, classification of dehydration, and case management.

## **2.7 Data Collection**

Before starting data collection, each questionnaire and retrieval form was prepared, organized, structured, and numbered with serial to be completed without error. From May to August, the researchers themselves used the interviewed-based questionnaires to be completed by the selected sample of physicians. Also, the total number of the sample size of the retrieval forms was divided equally with each one of the four study months for each hospital, so that actual documented practices were reviewed after randomly selection of the required number of the medical records.

## **2.8 Response rate**

102 physicians in the GC pediatric hospitals met the eligibility criteria. The number of the interviewed-based questionnaire's respondents was 95 physicians with a response rate 93.13%. They were distributed as 57/60 (95%) and 38/42 (90.47%) at Al-Nassr pediatric hospital and Al-Durra pediatric hospital, respectively.

## **2.9 Statistical Analysis**

To achieve the goal of the study, the researcher used Statistical Package for Social Science (SPSS 20) program for data entry and analysis.

## **2.10 Ethical Considerations**

\* An official letter of approval to conduct the study from Helsinki committee was obtained.

Another administrative approval was obtained from the Human resources development directorate general in the MOH to facilitate study conducting.

\* To guarantee participants rights, a verbal consent to participate in the study was obtained from each participant after explanation of the study and the voluntary nature of participation. They were informed that refusal to participate in the study would not affect their status and their daily management of children in their departments.

\* Confidentiality was maintained. Medical records that were eligible for the study were given a unique study identification to ensure patients' names or files' numbers were not utilized during analysis. Personal details such as names of the study participants were not recorded.

### 2.11 Study limitation:

The main limitation faced the data collectors was the patients' medical files. They contained incomplete data, unclear hand writing and data fragmentation. Moreover, using questionnaires to assess compliance or adherence is considered reductionist. Adding observation methods or qualitative tools can enrich the results.

## 3. Findings

### 1. Comparison between physicians' knowledge and actual practices (Interviews' answers V/S Records' documented practices):

Table 1 summarizes the data derived from both of the two study tools; the interview-based questionnaire, and the retrieval sheet. It illustrates the physicians' knowledge and practices regarding the medical management of AD cases in GC pediatric hospitals. As the knowledge and the practices were identified, it was crucial to compare between them. The comparison focused on various aspects which were: the number of the AD danger signs; as identified by the guidelines (changing in conscious level/ irritability, vomiting everything, inability to drink /breastfed, and convulsions), the number of the dehydration signs; as identified by the guidelines (sunken eyes, irritability, and skin pinch), the correct classification of dehydration, measuring serum electrolytes, correct indications of ORS, correct indications of Intravenous Fluid (IVF), the use of zinc, the use of antiemetic, the use of antimicrobials, use of antidiarrheal, and supporting of continuous feeding. To identify the relations between the different variables of the knowledge and the practices, Chi-square test was used. For the number of the identified AD danger signs, the differences between knowledge and practices were very small except in identifying three from the four signs (3/4) specified by the guidelines, where the practice's percentage was doubled what were

**Table 1 Knowledge V/S Practices**

Comparison Aspect		Physicians' Knowledge	n	Physicians' Practices	n	df	P-value
No. of Identified AD Danger Signs	0 of 4 signs	27.4%	26	25.6%	77	4	0.367
	1 of 4 signs	27.4%	26	27.2%	82		
	2 of 4 signs	34.7%	33	28.2%	85		
	3 of 4 signs	7.4%	7	14.6%	44		
	4 of 4 signs	3.2%	3	4.3%	13		
	Total	100.0%	95	100.0%	301		
No. of Identified Dehydration Signs	0 of 3 signs	3.2%	3	17.3%	52	3	0.00
	1 of 4 signs	25.3%	24	35.2%	106		
	2 of 4 signs	58.9%	56	35.9%	108		
	3 of 4 signs	12.6%	12	11.6%	35		
	Total	100.0%	95	100.0%	301		
Correct Classification of Dehydration	Yes	4.2%	4	27.2%	82	2	0.00

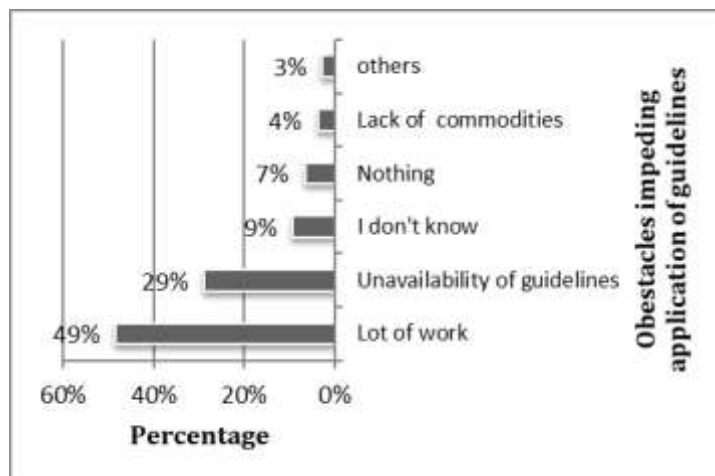
	No	95.8%	91	14.3%	43		
	NA	0%	0	58.5%	176		
	Total	100.0%	95	100.0%	301		
<b>Measuring of Serum Electrolytes</b>		88.4%	84	54.2%	163	1	0.00
<b>Correct Indications of ORS</b>		23.2%	22	65.4%	197	1	0.00
<b>Correct Indications of IVF</b>		85.3%	81	16.3%	49	1	0.00
<b>Use of Zinc</b>		86.3%	82	24.3%	73	1	0.00
<b>Use of Antiemetic</b>		24.2%	23	65.1%	196	1	0.00
<b>Use of Antimicrobials</b>		18.9%	18	59.1%	178	1	0.00
<b>Use of Antidiarrheal</b>		4.2%	4	5.6%	17	1	0.586
<b>Supporting of Continuous Feeding</b>		97.9%	93	-	-	-	-

mentioned during the interview. For the dehydration signs, 3.2% of the physicians couldn't mention any signs of dehydration (sunken eyes, irritability, and skin pinch), while 17.3% of records didn't mention any one of them. A quarter of physicians could identify one sign of dehydration, while 35.2% was the practice percentage. Despite 58.9% of the physicians could mention two of the three signs of dehydration, 35.9% was the percentage of documenting the same signs number in the practice. Lastly, little difference in percentages was observed between knowledge and practices in the identifying of all signs mentioned by the guidelines (12.6% and 11.6%, respectively.). For the correct classification of dehydration, only 4.2% of the physicians classified dehydration correctly, while 27% of the classification practices were correct. While the highest percentage (88.4%) measured serum electrolytes, 54.2% of records contained serum electrolytes results. The sharp differences between knowledge and practices were in the correct indication of IVF, and use of zinc during management of AD, where the percentages 85.3%, and 86.3% respectively were in knowledge, compared with 16.3%, and 24.3% in the practice. The opposite was in the use of antiemetic, antimicrobials, and correct indications of ORS where the sharp high percentages were in the practice.

The difference in percentages between knowledge and practice in the use of antidiarrheal was very small (1.4%). Most of the physicians (97.9%) in GC reported that they support continuous feeding (as it is appropriate for child's age) during management of AD cases, On the other hand, no document regarding feeding was observed during the accurate audit of the medical files. The relations between knowledge and practices were highly statistically significant (P- value = 0.00) in all of the comparison aspects except in the number of the identified AD danger signs and in the use of antidiarrheal, where there was not any statistically relation (P-value were 0.367 and 0.586, respectively).

## 2. Challenges facing application of DD guidelines

The most difficult problems that face GC pediatrics physicians in the application of the WHO guidelines for the management of DD are summarized in Figure (1). Workload and unavailability of guidelines represented the highest rank; 48.5% and 28.9% respectively. The lowest rank (2.8%) was shared by other obstacles included child refusing of ORS and lack of health education among patient's family.



**Figure 1** Challenges impeding application of guidelines

## Discussion

The researchers see that the presence of differences between the percentages of knowledge and practice indicates that there was a disparage in this knowledge; the thing that requires the importance of combining the training and the raising of awareness with regular assertive audit and feedback. It is noted in the comparison between knowledge and practice in the number of the danger signs of AD, identified by the respondents, that there was a shortage in the both; theory and practice. The WHO recommended low osmolarity ORS for all cases of AD, while IVFs are prescribed for the cases with severe dehydration (WHO, 2005). This study revealed that 85% of the physicians know that IVFs are indicated only for severely dehydrated cases. Outstandingly, though ORS is the spine of management during an episode of DD, only 23.2% of the physicians reported that ORS recommended for all AD cases. These findings reflect how much GC pediatricians need training about the guidelines. This agrees with the result found by Shaha's study in India (2012), where knowledge regarding ORS was very low (Shah et al., 2012). In similar studies, Alameddine et al. (2010) in Lebanon, found that ORS was known to be prescribed by 49% of pediatricians (Alameddine et al., 2010), while the percentages were great and semi-identical in Georgia and in Bahrain where they were 89.3% and 90%, respectively (Kherkheulidze et al., 2011; Ismaeel et al., 2007). The discrepancy in findings found in GC study (knowledge 23.2% V/S practice 65.4%) is much and much wider what was found in 2012 in a study done in Utter Pradesh (India) (knowledge 68.1% V/S practice 77.3%) regarding the use of ORS (Walker et al., 2016). This also was found in regard to the use of antimicrobials (knowledge 18.9% V/S 59.1% practice in GC, while knowledge 65.9% V/S practice 61.9% in Uttar Pradesh) (Walker et al., 2016). The researchers interpreted these discrepancies by probability of slipping and escaping of some information during the interview, whereas the physicians practice them during the cases' actual treatment. Zinc sulfate was the only drug recommended for all cases of AD (WHO, 2005). In spite of a wide discrepancy found between knowledge and practice in the two studies (GC and Utter Pradesh) in the use of zinc, this was worthy for India, where the practice was doubled what was said (knowledge 14, 3% V/S practice %29.9 in Utter Pradesh) (Walker et al., 2016).

The WHO guidelines prevent the use of antidiarrheal drugs for the treatment of AD. In this topic, the practitioners recommended antidiarrheal less than what they reported in Utter Pradesh (knowledge 21.6% V/S practice 17.5%)(Walker et al., 2016). The finding in GC study is much better (lower percentages and lower discrepancy).

The knowledge v/s practices were 88.4%, and 54.2%, respectively in the unhelpful routinely measuring of serum electrolytes for AD cases. This wrong idea distracts the focus of the physician to correct them, while using of ORS alone sponsor to correct them(WHO, 2005). In a study conducted in Lebanon, serum electrolytes were requested by 24.6% of pediatricians (Alameddine et al., 2010).



During our study, searching all physicians' documentation in AD cases' records, the researcher didn't find any physician's documenting or hint regarding feeding which was highlighted on by the guidelines. In a study, Assathiany et al. (2013) found that nearly all the pediatricians in France recommended early nutrition after administration of ORS, while another study revealed that most respondents in Georgia advised continuation of breastfeeding (Kherkheulidze et al., 2011). In Italy, diet changes were recommended by 27.6% of physicians (Vecchio et al., 2014). Another study represented that the condition is better than ours in Lebanon, where 96% of pediatricians resumed early feeding as recommended by the guidelines, 67% of the teaching hospital practitioners follow early feeding as recommended by the guidelines, while the practitioners who worked in rural areas tended to allow early feeding at 73.8% (Alameddine et al., 2010).

As 7% of the physicians reported that there was nothing impedes the application of the guidelines, and 9% didn't know what the obstacles were; this means that audit and administrative enforcement or instruction may play a vital role in improving the degree of compliance with the guidelines. Moreover, 29% of them justified the low application of the guidelines as there were no available guidelines, so provision a copy of the guidelines will also be more helpful. According to their experience, the researchers support those who reported workload as the main obstacle. This was obvious after the closer of Kamal Odwan hospital in the North of Gaza, when a high workload was added to the two the GC pediatric hospitals. Generally, filling of the gap in the medical management of AD in Gaza City pediatric hospitals requires to apply the followings: adoption and application of universal guidelines such as the WHO in the management of the DD; provision of copies of WHO AD treatment manual to the health practitioners; improving knowledge and practices among GC physicians regarding the WHO AD management guidelines; regular on-the job training in addition to audit and regular feedback should be given; improving documentation which reflects the actual practices of the health practitioners; appropriate use of IVF; avoiding inappropriate use of antidiarrheal, antiemetic and antibiotics which are inconsistent with the WHO guidelines; comprehensive use of ORS and zinc sulfate which are recommended for all cases of AD by the WHO guidelines; eliminating of the obstacles impeding application of the guidelines; and provision of the commodities necessary for applying of the guidelines.

## Conclusion

This study suggested that a minority of pediatricians in GC know and comply with the WHO guidelines for optimal management of Acute Diarrhea, in addition to the presence of a high discrepancy between knowledge and practice. Consequently, significant burdens may ensue. Adoption and application of these guidelines besides audit and regular feedback are our priority in Gaza City.

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