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Evaluate the Implementation of Integrated Management of Childhood Illness regarding Nutritional Care in Egypt

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Abstract: Background: The Integrated Management of Childhood Illnesses (IMCI) is a cost-effective strategy that advocates utilization of evidence-based protocol in the management of common childhood illness. WHO estimated that 56% of childhood deaths worldwide are attributable to the effects of under nutrition. **Aim:** The study aimed to evaluate the implementation of IMCI strategy regarding nutritional care of under five years children in Mansoura district. **Research Design:** The study adopted a descriptive cross-sectional research design. **Subjects and sampling:** The total number of the study subjects was 501 (36 healthcare professionals (HCPs), 456 caregivers and their children under five years and 9 managers of healthcare settings). **Setting:** This study was carried out in nine primary health care settings affiliated to Mansoura District, Dakhalia governorate, Egypt. **Study tools:** three tools were used for data collection. 1-Healthcare professionals' occupational and educational qualifications data assessment sheet. 2-Observation checklist of case management implementation. 3- Managers' feedback self-administrated questionnaire. **Results:** current results showed that (23.8%) of newborn suffered from feeding problems and 64.3% of their caregivers informed when to back immediately to health center. The treatment of feeding and underweight for age problems for children from 7 days to two months constitutes(53.3%). Nearly half (48.2%) of total children were observed by HCPs showed poor level of adherence to case management compared to 18.6% of them showed good level of adherence. All managers reported lack of motivation and insufficient number of trained health care workers among the constraints of IMCI implementation. **Conclusion:** the level of adherence of HCPs regarding children's case management of nutritional status was poor for nearly half of cases compared to less than one fifth showed good level of adherence. **Recommendations:** the study recommended that IMCI in-service training should be adequately addressed the health care providers with knowledge about the importance of nutrition in health.

Keywords: IMCI, under five children, nutrition.

INTRODUCTION

Over the last two decades, the world made considerable progress in decreasing mortality among children and young adolescents. Even so, an estimated 6.3 million children and young adolescents died in 2017, typically from preventable causes. Under five years children accounted for 5.4 million of these deaths, with 2.5 million deaths occurring in the first month of life, despite considerable progress towards Millennium Development Goal IV.[1,2]

However, millions of sick children brought daily to different health care facilities for medical treatment, having a potentially fatal illness, and they are often suffering from more than one condition, making a single diagnosis unfeasible. While, the healthcare providers in such facilities facing a barrier of limited supplies and equipment that hinder to practice complicated clinical procedures.[3, 4]

Though, providing quality care to children in these conditions is a serious challenge. In response to this challenge, the WHO/UNICEF developed IMCI approach, this approach applied evidence-based assessment and treatment of major causes of childhood illness including pneumonia, diarrhea, malaria and malnutrition, and enhancing caregiver knowledge related to home care practices and prevention of childhood illness, concurrent with use of effective and low-cost medicine and simple equipment.[5] In addition, the IMCI guidelines include

methods for checking a child's immunization and nutrition status, teaching parents/caregiver how to give treatments at home, assessing a child's feeding and counseling the caregiver to solve feeding problems, and advising them as regards when to return to a health facility.[6]

What's more, this strategy aimed to improve child survival and reduce death, illness and disability, and to promote growth and development of children under five years. It also comprises of both preventive and curative components that are executed by mutual interaction between families, communities, and health facilities. IMCI could be performed by doctors, nurses and other health care workers who give care to sick children.[4,7]

World Health Organization considered Egypt as a successful model in implementing IMCI at national scale in a country with large population. However, IMCI was adopted as a primary child healthcare program in Egypt since 1997;the main aim was to hasten the reduction in under-five mortality. The government put the priority to improve essential healthcare system elements before the initiation of the IMCI strategy in 1999. The Egyptian national IMCI program was composed of a central IMCI unit coordinated from governorate and district that put the implementation under a general director. This coordination focused to follow-up 95% of trained staff; that help elevate the

coverage of IMCI in primary healthcare facilities from 3% in 2000 to 98% in 2012.[4,8,9]

Although IMCI guidelines also incorporate nutrition components, including identification of acute malnutrition, immediate referral of severe cases, and guidance on the continued feeding of any sick child treated at home. Whereas, early identification of severe acute malnutrition being important for initiating treatment and minimizing the risk of complications.[10,11,12]

Certainly, good nutrition is essential for survival, physical growth, mental development, performance, productivity, health and well-being across the entire life-span. Though, we are still far from a world without malnutrition, WHO estimated that 56% of childhood deaths worldwide are attributable to the effects of under nutrition, with 83% of these arising from the mild-to-moderate form rather than the severe form.[13,14]

Childhood under nutrition can have long-term physical and cognitive impact. However, both fetal and childhood period with under nutrition have a marked impact on child immune response and changes in adult anthropometric outcomes.[15,16] Results of Egyptian Demographic Health Survey, 2014 (EDHS) showed that among children under 5 years, overall nearly 27% of children suffered from variable degree of anemia. Also, 21%, 8.4% and 5.5% of children had stunting, wasting and underweight respectively. It showed that under nutrition was higher in urban Upper Egypt where prevalence of stunting was about 30%, wasting was 9% and underweight was 8.1%.[17]

Despite availability of data on the effectiveness of IMCI in child health and health system, current global coverage of IMCI is far from expected. In view of the fact that IMCI program was implemented as a component of child health services in Egyptian Ministry of Health, it has a well evident impact on decline of childhood mortality. However, the details of IMCI implementation process have not been examined.[18]Likewise, there have been very few previous published researches on the evaluation of implementation of IMCI in Egypt despite its valuable impact. Therefore, this study aimed to evaluate the implementation of IMCI strategy regarding nutritional care of children under five years.

Aim of the study:

The study aimed to evaluate the implementation of IMCI strategy regarding nutritional care of children under five years in Mansoura district.

The study examined the following research questions:

1. Do the healthcare professionals adhere to case management guideline of IMCI strategy regarding nutritional care of children under five years?
2. What is the healthcare managers' feedback regarding the implementation of IMCI strategy in the primary healthcare settings?

Method:

Study Design:

The study adopted a descriptive cross-sectional research design.

Setting:

This study was carried out in nine primary healthcare settings affiliated to Mansoura District, Dakhalia governorate, Egypt.

The following criteria were used for the selection of primary healthcare settings:

- The setting is geographically located in the district of Mansoura city.
- The setting is equipped with at least one health care professional trained in IMCI.
- IMCI strategy has been implemented in the PHC for at least a year.
- Adequate attendance rate of under five years children.

Subjects and Sampling Technique:

The total number of the study subjects was 501 (36 healthcare professionals, 456 caregivers and their children under five years and 9 managers of healthcare settings).

Recruitment of the study subjects was accomplished as the following:

A convenience sampling technique was used to recruit the healthcare professionals (physicians and nurses) from different primary healthcare settings. To involve the healthcare professionals in this study, they should had a previous in-service training about IMCI. Therefore, only thirty six of the primary healthcare professionals were eligible and agreed to participate in the study. The eligible study participants involved 22 nurses, and 14 physicians.

A convenience sampling technique was used to recruit the caregivers and their children (n=456). It was based on their presence in primary healthcare settings at the time of data collection.

- Caregivers and their newborn aged from zero to seven days (n=168).
- Caregivers and their infant aged from one week to two months (n=150).
- Caregivers and their children aged 2 months to less than 5 years (n=138).

A purposive sampling technique was used to recruit the managers of healthcare settings (n=9) to elicit their feedback regarding the implementation of IMCI strategy.

Study Tools:

Tool 1: Healthcare professionals' occupational and educational qualifications data assessment sheet:

This questionnaire was used to assess the healthcare professionals' occupational and educational qualifications data as (occupation, educational level, years of experience, no of attendance of training courses about IMCI).

Tool 2: Observation checklist of healthcare professionals during application of case management of children regarding nutritional status:

This observation checklist was used by the researchers to observe the actual performance of healthcare professionals in applying case management guideline regarding nutritional care of under five children.[19]The observation checklist was composed of four sections; assessment, classification, treatment and communication.

Each checklist was included four sections:

1. **Assessment of child nutritional status:** Look for severe visible wasting; look for edema of both feet, determine child's weight, check the child's weight on a growth chart.
2. **Classification of nutritional status based on the IMCI guidelines:** Classify nutritional status into normal, low weight and severe malnutrition.
3. **Treatment given or identified.** Treatment as prescribing or give injections, oral medicine, ORS, and refer the child who need referral.
4. **Caregivers' counseling.** Caregivers advised to give extra fluids to the child, frequency of feeding or breast feeding and how to use oral drugs correctly.

For each observation item; score zero was awarded for not applicable or done incorrectly, and score (1) was awarded for done correctly. Then, total mean score for each part in the observation checklist was calculated to determine the mean adherence of healthcare professionals with each part in the IMCI guidelines. *The adherence level was categorized into three levels as follows:-*

- Poor = Scores <50% of total scores.
- Fair = Scores 50% to < 75% of total scores.
- Good = Scores \geq 75% of total scores.

Tool 3: Mangers' feedback self-administrated questionnaire:

Self-administrated feedback questionnaire was used to obtain the mangers' feedback about the implementation of IMCI strategy in the primary healthcare settings. It included three parts covering the changes observed in the healthcare organization due to IMCI implementation, problems or constraints related to the implementation of IMCI, and suggestions concerning the improvement of healthcare given to the children.

Process of Study Implementation

Ethical considerations:

An institutional ethical approval was sought and gained from the administrative authorities in the chosen settings after clarifying the aim of study for obtaining permission and support during data collection. Informed verbal consents were taken from each subject before administering the data collection. Information was handled confidentially and anonymously in the study.

Literature review:

A review of local and international literature was carried out on the diverse aspects of IMCI regarding nutritional care of under five years children using scientific published articles, internet search, and textbooks.

Study tools:

Tools were adopted from (WHO. Health facility survey,2003).[19]

Pilot study:

Pilot study was carried out before starting data collection on:

- ✚ 17 of cases less than 7 days,
- ✚ 15 of cases from 7 days to 2 months,
- ✚ 14 cases 2 month to less than five years
- ✚ One manger from other health care center rather than the included HC.

All of 46 cases and their caregivers were excluded from the study. The pilot study aimed to test the clarity applicability and reliability of the research tools and to estimate the approximate time required for data collection. Accordingly the necessary modification was done.

Data collection:

In order to collect the necessary information from the healthcare professionals, caregivers and managers; the researchers accompanied the child and caregiver throughout the case-management process, to record what happened without interfering with routine services. Three observation checklists (one for each age group) were utilized by the researchers to observe the actual practices of healthcare professionals in applying case management guideline regarding nutritional care of under five children. Eighteen to twenty children (depending on the frequency of the consultations) were observed during 2 working days/week.

The feedback of health care centers' managers was obtained during slack periods to get their feedback about the implementation of IMCI strategy in the primary healthcare settings. At the end of each day, the researchers reviewed all sheets for consistency and completeness. The total time spent on data collection was six months starting from August 2018 to the end of February 2019.

Data Analysis:

After data were collected, they were coded, organized, categorized and transferred into especially design formats to be suitable computer feeding. Statistical analyses were performed using the statistical software SPSS (Stands for Statistical Product and Service Solutions) v21. Categorical variables were described using the number and percent. Continuous variables were presented as mean \pm SD (standard deviation).

RESULTS

Table (1) portrays distribution of the healthcare professionals (HCPs) according to their occupational and educational qualifications. It was observed that, (61.1%) of them are nurses. In relation to their educational qualifications, (50%) of them have bachelor's degree of nursing. Regarding years of experience, (52.8%) working more than 20 years. Furthermore, (63.8%) had more than twice previous training in IMCI strategy.

It was emphasizing that the assessment of the newborn reveals that (92.9%) of them were weighed, (67.9%) of child's caregiver were asked about feeding problems, and (50%) evaluated breastfeeding process. The classification of newborn by HCPs revealed that (71.4%) of them had normal

weight and (23.8%) suffered from feeding problems. Also, treatment of children by HCPs showed that only (28.6%) of child's caregiver was received prescription in pre-transfer treatment and care of feeding problem. Regarding communication with the caregiver, (67.9%) of caregiver

gaining advice about continuing breast feeding at home, (57.1%) of caregiver was advised on birth spacing, and (32.1%) caregiver gained consultation by using IMCI chart booklet as portrayed in (Table 2).

Table (1): Distribution of the healthcare professionals according to their occupational and educational qualifications

Items	N = (36)	(%)
Occupation		
Physician	14	38.9
Nurse	22	61.1
Educational level		
Bachelor's degree of medicine	8	22.2
Technical education	4	11.1
Bachelor's degree of nursing	18	50
Doctor	6	16.7
Years of experience		
≥ 20 years	17	47.2
≤ 20 years	19	52.8
Previous training on IMCI strategy		
Once	5	13.9
Twice	8	22.3
More than twice	23	63.8

Table (2): Distribution of case management of children aged from (zero to seven days) regarding nutritional care

Items	(N=168)	(%)
Child sex:		
Male	90	53.6
Female	78	46.4
Assessment:(4 marks) $\bar{x} \pm SD 2.78 \pm 1.29$		
The HCP asked if the infant is unable to breast feed	114	67.9
The HCP weighed the new born	156	92.9
The HCP asked for feeding problems	114	67.9
The HCPs evaluated breastfeeding	84	50
Classification of nutritional cases:(2 marks) $\bar{x} \pm SD 1.78 \pm 0.49$		
According to weight		
Very low weight	12	7.1
Low weight	24	14.3
Normal weight	120	71.4
Not classified	12	7.1
According to feeding problem		
Serious disease or serious bacterial infection	8	4.8
Feeding problems	40	23.8
No feeding problems	96	57.1
Not classified	24	14.3
Treatment:(2 marks) $\bar{x} \pm SD 0.89 \pm 0.72$		
Newborn was referred and got the pre-transfer treatment at health center (HC)	48	28.6
The HCPs prescribed the pre-transfer treatment and took care of feeding problem	48	28.6
Communication:(7 marks) $\bar{x} \pm SD 4.1 \pm 1.84$		
The HCPs explained how to administer oral treatment/ medication	102	60.7
The HCPs asked the mother or accompanying adult to give the first dose at the HC	84	50
The HCPs wrote or tell the accompanying adult date for next follow up visit	114	67.9
The HCPs explained the importance of continuing breast feeding at home	114	67.9
The HCPs explained when to bring back sick child immediately at HC	108	64.3
The HCPs advised caregivers on birth spacing	96	57.1
The HCPs used booklet of tables all along the consultation	54	32.1
Total score of case management (15 marks) $\bar{x} \pm SD$	9.57 \pm 3.22	

Observation of HCPs during assessment of nutritional status of children aged from one week to two months reveals that, (56%) of the caregivers were asked for feeding problem, and (72%) evaluated breast feeding. While, (8%) of children did not classified. With respect to treatment of children, (53.3%) of them were treated for feeding problems and underweight

for age problems. Communication with the caregivers showed that, (60%) of them were received appropriate advice on feeding the child according to his/her age, (48%) advised on birth spacing and only (16%) of caregiver gained consultation by using IMCI chart booklet as illustrated in (Table 3).

Table (3): Distribution of case management of children aged from (one week to two months) regarding nutritional care

Items	N=150	(%)
Child sex		
Male	69	46
Female	81	54
Assessment (4 marks) □± SD:3±0.85		
The HCPs asked if the infant is unable to breast feeding	126	84
The HCPs wrote the weight of child on growth graph	132	88
The HCPs asked about feeding problem	84	56
The HCPs evaluated breast feeding	108	72
Classification (1 marks) □± SD: 0.92±0.27		
Unable to feed by him/herself and possibility of a serious bacterial infection	138	92
Not classified	12	8
Treatment (3 marks)* □± SD:2.04±0.77		
Child was referred	48	32
The child got a pre-transfer treatment at health center	72	48
The HCPs treated the feeding problems and underweight for age problems	80	53.3
Communication (9 marks) □± SD:4.2±1.90		
The HCPs explained how to administer oral treatment	90	60
The HCPs showed how to administer oral treatment	30	20
The HCPs gave or asked the mother to give the first dose at MCH	18	12
The HCPs wrote or told the accompanying adult date for next follow up visit of the child	90	60
The HCPs explained the importance of continuing breast feeding at home	126	84
The HCPs provided appropriate advice on feeding the child according to his/her age	90	60
The HCPs explained when to bring back the sick child immediately at health center	90	60
The HCPs advised caregivers on birth spacing	72	48
The HCPs used booklet of tables all along the consultation	24	16
Total score of case management (17 marks) □± SD:10.1±2.78		

* More than one answers

Table (4) presents observation of HCPs during case management of children aged from two months to five years regarding nutritional status. A slightly more than one third of the children (34.8%) were checked the visible severe wasting, (82.6%) were checked for their weight against a growth chart, and (34.8%) of caregiver were asked if the child has ever been given vitamin A capsules. Furthermore,

more than one quarter of child's caregiver (28.3%) were received recommendation for immediate referral for their child, (78.3%) gain explanation when to return for follow up and to bring child back immediately if danger signs are noticed. While, only (19.6%) caregiver gained consultation by using IMCI chart booklet during the consultation.

Table (4): Distribution of case management of children aged from (two months to five years) regarding nutritional care

Items	N =138	(%)
Child sex:		
Male	66	47.8
Female	72	52.2
Assessment (11 marks) □± SD:6.31±2.59		
The HCP weighed /recorded the weight of child today	114	82.6
The HCP asked whether the child is able to drink or breastfeed	84	60.9
The HCP asked whether the child vomits everything	39	28.3
The HCP checked the visible severe wasting	48	34.8
The HCP looked for palmer pallor	69	50
The HCP looked for edema of both feet	69	50
The HCP checked the child's weight against a growth chart	114	82.6
The HCP asked about breastfeeding	84	60.9
The HCP asked whether the child takes any other foods/fluids	99	71.7
The HCP asked whether feeding changed during the illness	104	75.4
The HCP asked the caregiver if the child has ever been given vitamin A capsules	48	34.8
Classification (2 marks) □± SD:0.93±0.32		
The HCP made classification of the condition	75	54.3
The HCP told the caregiver the child classifications directly	54	39.1
Treatment (4 marks) □± SD: 3±1.12		
The HCP administered/prescribed and recorded the medications	120	87
The HCP recommended immediate referral for the child	39	28.3
The oral treatment given or prescribed by the HCP included an antibiotic	87	63
If oral treatment given or prescribed included an antibiotic, recording the name, dose, form of the drug (tablet, capsule), number of times a day and total number of days	78	56.5
Communication (9 marks) □± SD:2.86±1.48		
The HCP explained how to administer the oral treatment	108	78.3
The HCP demonstrated how to administer the oral treatment	27	19.6
He HCP asked an open-ended question to verify the caregiver's comprehension of how to administer the oral treatment	6	4.3

The HCP gave or asked the mother to give the first dose of the oral drug at the facility	3	2.2
The HCP explained when to return for follow up and to bring child back immediately if danger signs are noticed	108	78.3
The HCP explained the need to give more liquid, feeding or breast milk at home	60	43.5
The HCP gave advice on the need and frequency of feeding or breastfeeding	48	34.8
The HCP asked at least one question about the mother's health	9	6.5
The HCP used the IMCI chart booklet during the consultation	27	19.6
Total score of case management (26 marks) □ ± SD:13.3±5.08		

Table 5; illustrate the adherence of healthcare professionals to case management of under five years children regarding nutritional care. Nearly half (48.2%) of total children were observed by health care professional showed poor level of

adherence to case management. While 33.1% of case management revealed fair level of adherence. On the other hand, 18.6% of case management showed good level of adherence.

Table (5):Distribution of the healthcare professionals' adherence to case management of under five years children regarding nutritional care

Adherence level	Zero to seven days (n=168)		One week to two months (n=150)		Two months to five years (n=138)		Total (n=456)	
	No	%	No	%	No	%	No	%
Poor	114	67.9	43	28.7	63	45.7	220	48.2
Fair	0	0	79	52.7	72	52.2	151	33.1
Good	54	32.1	28	18.7	3	2.2	85	18.6

In relation to the healthcare manager' feedback regarding the implementation of IMCI strategy, the majority of them reported that improvement of child health assessment, classification, treatment and health outcomes were among the changes observed in the health care organization due to IMCI implementation. In addition, improvements in quality of care, healthcare professionals' performance, proper use of resource and consumer satisfaction were observed.

lack of motivation and insufficient number of trained health care workers, shortage of supplies, and lack of mentoring and supportive supervision were reported.

Concerning problems or constraints related to the implementation of IMCI, the majority of them stated that

With respect to their suggestions concerning the improvement of health care given to the children, the majority of them mentioned developing positive attitude among HCPs, continued professional development and training, adequate supply of updated IMCI chart booklets, guidelines and essential drugs and supplies, and consistent and supportive supervision as clarified in (Table 6).

Table (6) Distribution of the healthcare manager' feedback regarding the implementation of IMCI strategy in the primary healthcare centers

Items	N=(9)	(%)
Changes observed in the health care organization due to IMCI implementation		
Improvement of child health assessment	8	88.9
Improvement of disease classification	5	55.6
Improvement of disease treatment	8	88.9
Improvement of child health outcomes	7	77.8
Improvement of quality of care	9	100
Improvement of health professionals' performance	7	77.8
Promotion of prevention as well as cure	9	100
Reduction of childhood morbidity and mortality	8	88.9
Proper use of resource	6	66.7
Consumer satisfaction	7	77.8
Problems or constraints related to the implementation of IMCI		
Insufficient number of trained health care workers	9	100
Lack of motivation of health care workers	9	100
Shortage of supplies	8	88.9
Lack of mentoring and supportive supervision	7	77.8
Suggestions concerning the improvement of health care given to the children		
Developing positive attitude among HCPs	9	100
Continued professional development and training	9	100
Adequate supply of updated IMCI chart booklets and guidelines	7	77.8
Adequate supply of essential drugs and supplies	7	77.8
Consistent and supportive supervision	8	88.9

DISCUSSION

The IMCI strategy is effective in the reduction of under-five's morbidity and mortality if properly and efficiently implemented and supervised. Nevertheless, the implementation of the IMCI strategy is not optimal due to various factors that can otherwise be overcome by local and institutional interventions.[20]

well-trained personnel. As families have the major responsibility for caring their children, success requires a partnership between health providers and families, with support from their communities.[4]In this regard, outpatient care is predominantly significant, as it often constitutes the first point of contact between the sick child and the healthcare system.[21,22,23] Some 10–30% of these children may require hospital admission throughout the course of their illness, hence good service provision is essential in the outpatient setting.[22,23,24]

However, success in reducing childhood mortality requires more than the availability of adequate health services with

The early years of a child's life are particularly critical and inadequate nutrition, suboptimal management for feeding problems and/or malnutrition, and poor feeding practices during this time period increase a child's risk of falling ill or dying. Despite the growing focus on nutrition, there is significant concern about the level of integration of interventions focusing on nutrition and the treatment of childhood illness.[25]

The performance of healthcare providers was assessed using the quality of care indicators designed by WHO, which include assessment tasks, correct classification, correct treatment and correct counseling of caregivers.[19,26] In the current study, the assessment and classification of under five children regarding nutritional status by using IMCI standard revealed that more than half of the children were assessed for feeding problem and evaluated for breast feeding process. As well, the majority of children was weighed and put their weight on growth chart.

These results were in accordance with a study done in Ismailia, Egypt by (Abdo HA. *et al.*, 2016), [27] who stated that feeding practices were evaluated in 83.6% of the children. Additionally, a study done in Langata, Nairobi country by (Ontiro DM., 2015), [28] revealed that proportion of children who have been weighed and checked their weight for age was 65.2% plus 36% were assessed on whether they were able to drink or breast feed. Furthermore, a study done in Alex, Egypt by (El-Ayady A *et al.*, 2016), [29] reported that weight for age was properly determined and plotted in only 69% of the children. In contradiction, the study of (Arifeen SE. *et al.*, 2005), [30] in Bangladesh which reported that none of the children had their weight checked against a growth chart.

Overall, IMCI-trained workers were more likely to correctly classify illnesses with 95% according to Nguyen *et al.*, (2013). [31] The finding of the present study displayed that more than two thirds of children were classified in relation to nutritional status by health care provider. This is may be due to many primary health care providers fail to recognize malnutrition—including stunting, wasting, micronutrient deficiencies, and overweight/obesity—in children while diagnosing and treating illness. In contrast, finding of (Arifeen SE. *et al.*, 2005), [30] stated that the health care providers classified the child's illness correctly for only one in five children and almost none of the children whose weights were very low that correctly classified.

The IMCI basic guidelines in relation to treatment were prescribe the treatment and provision caregivers with practical treatment instructions e.g. how to give oral drugs at home. As shown in our study, the majority of children were received treatment for nutritional cases. The same was approved with the study of (Sallamet *al.*, 2016), [32] who reported that sixty percent of children treated according to IMCI approach were improved clinically, while 16% had worse outcomes after treatment. In addition to, study done in Assiut City by (Osman D M. *et al.*, 2019), [33] stated that the physician prescribed treatment for 93.4% of children.

Family physicians and nurses are the main providers of care at the primary health care facilities. They are well oriented

by all family members, their social, health and environmental backgrounds and have a good chance for proper communication and education for all family members. Meanwhile, the right management, communication and advice given to the caregiver are important to ensure continuity of care at home. [28,29] In addition, a basic component of IMCI management process is counseling the caregivers how to feed and give fluids during illness. [34]

Furthermore, health care workers have a vital role in to promote good nutrition in the first 1,000 days. Capitalizing on health care providers to provide correct and adequate nutrition advice/counseling to caregivers is one of the best strategies to improve children's nutritional status. [35,36]

Provision of accurate and timely information about nutrition helps to decrease burden of children under nutrition. [37] In the current study, about two thirds of child's caregiver received appropriate advice on feeding the child according to his/her age, importance of continuing breast feeding at home, as well as when to bring back the sick child immediately at health center. These results were supported with the finding of (Karamagi CAS., 2004), [38] in Uganda who used direct observation revealed that 76% of health providers gave feeding advices. In the same line, (Ontiro DM. 2015), [28] found that a half of the caregivers received advice on general feeding. However, it contradicts with (Osman D M. *et al.*, 2019), [33] study who found that physician and nurse did not inform about two thirds of children caregivers about the type of child feeding and nutrition at home. Also, (Awadallah., 2016), [39] & (Abdel Kader SM A., 2013), [40] mentioned that the most common suboptimal practice was in the steps of counseling and assessment of cases.

However, the implementation of IMCI strategy is showed suboptimal as some health care workers are more depending on their experience and capacities rather than to follow IMCI guidelines rigorously. Beside lack of motivation regarding implementation process several years later. [41]

Regarding IMCI training, many studies already reported its importance showing that those trained performed better than those who were not. [42,43,44] So, building skills is crucial in IMCI strategy, both in terms of initial and continuing trainings. [44] The present study showed that less than two thirds of HCP received more than twice previous training in IMCI strategy. This implies that more efforts have to be directed towards providing continuous in-service IMCI training to improve their adherence. This finding was agreed with (El-Ayady A *et al.*, 2016), [29] study who reported that all physicians have attended training workshop on IMCI guidelines. On the contrary, (Titaley C R *et al.*, 2014), [43] study revealed that at most health care facilities the on-job training for IMCI was not conducted.

The global IMCI generic chart booklet includes a section on feeding counseling and provides recommendations related to feeding for all children during sickness and health. It is a detailed version of the wall chart but smaller and portable. [25,28] It worse mentioning in this study that less than one third of health care providers were used it in

caregivers' counseling. This finding came in agreement with (Ontiro DM., 2015),[28] who reported that at times the chart booklet is not placed on top of the desk and rarely is it used. This may be attributed to that the health care provider not perceived nutrition as a health issue plus focus is on the clinical condition rather than nutrition itself.

Regarding health care professional adherence to case management, the current study reported nearly half of total consultations done by HCPs to attended children about nutritional status showed poor adherence to IMCI guideline. While, only less than one fifth of these consultations were showed good adherence. From the researcher point of view, many factors may be alleviated to poor adherence such as nutrition is often afforded a much lower priority than treatment of illness, HCPs fail to provide appropriate nutritional care to children and counseling to their caregivers, overburdening health care workers and often the problem of staff turnover. Moreover, time is a constraint in the sick-child encounter, with the provider aiming to address the needs of a large number of children in an environment with "outcry children and parents' upset."

This finding was in agreement with (El-Ayady A et al.,A 2016),[29] study who stated IMCI guidelines still show certain areas of poor adherence, and (Ontiro DM., 2015),[28] mentioned that health care workers' compliance to the IMCI guidelines was poor.

Implementation of IMCI has been found to be associated with multiple benefits to the health care delivery system, health care staff, and community such as reduction in the under-five mortality, augmenting children' nutritional status, improving caregivers' knowledge and satisfaction, enhancing healthcare providers' skill/performance, improving quality of care, reducing financial burden on the health system, and discouraging the practice of misuse of antibiotics and other drugs which supports the findings of this current study.[8,45,46,47]

In spite of availability of data on the effectiveness of IMCI in child health and health system, existing global coverage of IMCI is far from expected. Numerous bottlenecks such as imperfect supervision and monitoring mechanism, resistance among healthcare workers, and insufficient funding support have been recognized to arrest the reach of IMCI in the community.[46,47,48]

Our study highlighted that lack of motivation and insufficient number of trained healthcare workers, and lack of mentoring and supportive supervision were among the problems or constraints related to the implementation of IMCI which were reported by the healthcare managers. This is compounded by the fact that many healthcare settings were located in rural/remote area with limited resources. The same results were also identified by a qualitative study in Benin (2010),[49] which revealed that routine supervision, in terms of both frequency and content, appeared largely inadequate to support health care workers practicing IMCI in facilities. Also, poor coordination; lack of motivation; health care workers' resistance and less priority given to IMCI supervision are a barrier to improve IMCI supervision.

The same finding was supported by (Awadallah.,2016),[39] who illustrated lack of follow-up training, untrained supervisor on IMCI strategy and absence of supervision were the most important challenges as perceived by physicians about disadvantages and challenges facing IMCI application. Furthermore, the greatest percentages of those physicians recommended increasing training coverage through in-service and pre-service training.

CONCLUSION

Our study concluded that lack of motivation and insufficient number of trained healthcare workers, and lack of mentoring and supportive supervision were among the problems or constraints related to the implementation of IMCI. Moreover, the level of adherence of HCPs regarding children's case management of nutritional status was poor for nearly half of cases compared to less than one fifth showed good level of adherence.

RECOMMENDATIONS

- 1- Activate the routine supervision that occurs four to six weeks after the training and support supervision from the high level authorities which done regular whenever it took place there was follow up of action points.
- 2- IMCI in service training should be adequately addressed the health care providers with knowledge about the importance of nutrition and the role it plays in health, and expressed the desire at the country level to strengthen national training materials.
- 3- Enhancing the level of integration of interventions focusing on nutrition and the treatment of childhood illness.
- 4- Optimization of opportunities to strengthen the counseling and follow-up of high-risk newborns and infants to promote breast milk and appropriate feeding through training.

LIMITATION

Direct observations could introduce bias as healthcare professionals knowing that they are observed, would be prone to change their usual habits and try to perform better (Hawthorne effect).

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