

Knowledge and use of Growth Chart among Health-Care Providers in Baghdad

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Abstract

Background: The health-care providers must exhibit consistent and correct utilization of growth charts and be able to correctly interpret and comprehend its data. **Objectives:** The objectives were to assess the knowledge and use of growth chart by health care providers and to investigate factors affecting the knowledge and use, including relation to reproductive Maternal, Newborn, Child, and Adolescent health programs. **Methodology:** A descriptive cross-sectional study was carried out in 20 primary health-care centers in Baghdad: 8 in Al-Rusafa district and 12 in Al-Karkh district, during the period from the first of February to the end of May 2019. **Results:** The total number of study participants was 200, their mean age was 38.3 ± 8.3 years, and 150 (75%) were physicians including 85 (42.5%) family physicians. Most of the respondents (82.5%) had acceptable knowledge, while 9% had good knowledge and 8.5% had poor knowledge. Regarding use, 158 (79%) participants showed an acceptable level of use, 39 (19.5%) a good level of use, and only 3 (1.5%) had a poor level of use. **Conclusions:** Most of the health-care providers had an acceptable level of knowledge and use of growth charts, better knowledge, and use level were related to the number of patients seen per day, while growth chart use was affected by participants' age and being physician.

Keywords: Growth monitoring, health providers, knowledge, use

INTRODUCTION

The assessment of growth by objective anthropometric methods of weight, length/height, and body mass index is crucial in child care to assess the nutritional status and for the identification of growth failure. Reference data are central to growth monitoring, they help doctors, health-care workers, and policymakers to diagnose undernutrition, overweight, obesity, and other growth-related and endocrine conditions.^[1]

The effectiveness of growth charts in the diagnosis of undernutrition is dependent on how well they are plotted and interpreted. Health staff must therefore know how to plot charts accurately and interpret the growth patterns displayed.^[2]

Reproductive Maternal, Newborn Child, and Adolescent Health (RMNCAH) Strategy includes growth charts for infants aged 0–2 months and 2–59 months. Nutrition assessment is integral to the evaluation of sick infants and children and is also central to the care of the well child and promoting their health and development. RMNCAH therefore includes algorithms for use by health workers

based at primary health-care facilities that reflect WHO recommendations on anthropometric assessment and infant and child feeding.^[3] Health workers should focus on child growth and development and the need to understand growth and development to monitor children's progress, to identify delays or abnormalities in development, to counsel caregivers, and to prescribe treatment.^[4]

Objectives of the study

The objectives of the study were to assess the knowledge and use of growth chart by health-care providers in Baghdad primary health-care centers (PHCC) and to investigate factors affecting the knowledge and use, including relation to RMNCAH training programs.

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METHODOLOGY

A descriptive cross-sectional study carried out in 20 PHCC in Baghdad from both sides 8 in Al-Rusafa district and 12 in Al-Karkh district, during the period from the first of February to the end of May 2019. A convenient sampling technique had been used to select the PHCCs. The target population were primary health-care (PHC) providers (physicians [family medicine specialists and general practitioners] and nursing staff) working in the selected PHCCs.

The data were collected using a self-administered questionnaire filled by physicians and by direct interview with health workers the questionnaire was prepared by the researcher reviewed by the supervisor using previously published articles related to the topics of the current study.^[5-7] It included socio-demographic characteristics about participants including age, gender, specialty, degree, grade, years of service, and an average number of patients seen per day and included 15 statements that were answered by the participants, with “correct,” incorrect, or “Don’t know.” Five questions about knowledge included definition, purpose of growth charts, difference between genders, and frequency of weighing the children. Ten questions about the use included availability of growth charts, how to recognize growth falling, flattening and rising, when to discuss with parents, and if they practiced growth monitoring with regular visits.

Analysis of data was carried out using the available statistical package of SPSS-25. Data were presented in simple measures of frequency, percentage, mean, standard deviation (SD), and range. The significance of difference of different percentages was tested using Pearson Chi-square test. A score of 3 was given for each correct answer, (2) for answering, “don’t know,” and (1) for answering wrong answers. The total number of questions concerning the knowledge about growth chart was 5; thus, a poor knowledge level was below 10 (50%), acceptable scores 10–12 (50–74%), and good scores were ≥ 13 ($\geq 75\%$), while questions regarding the use of growth chart were 12; thus, a poor level of use was considered < 18 ($< 50\%$), acceptable scores were 18–23 (50–74%), and good scores were ≥ 24 ($\geq 75\%$).

RESULTS

During the study period, 200 participants were interviewed, their mean age was 38.3 ± 8.3 years, and 75% of them were female. There were 150 (75%) were physicians and the other 50 (25%) participants were health workers.

About half of physicians (48.5%) had received training regarding the RMNCAH program and 73.2% received only one course. Duration of most of the courses (71, 73.2%) was 5 days, as shown in Table 1.

Table 2 shows that the vast majority of participants recognized the definition and purpose of growth charts, recognized that it is necessary to weigh children in the 1st year of life, and (95.5%) recognized that boys had different growth charts from girls.

Table 1: Distribution of the studied sample according to the participation in training courses (n=200)

	n (%)
Received training regarding the RMNCAH program	
Yes	97 (48.5)
No	103 (51.5)
Number of courses	
1	71 (73.2)
2	12 (12.4)
3	9 (9.3)
4	1 (1.0)
5	2 (2.1)
7	1 (1.0)
10	1 (1.0)
Duration of course in (days/weeks/months)	
3 days	19 (19.6)
5 days	71 (73.2)
1 day	7 (7.2)
When was the last course	
Before 2015	16 (16.4)
2015	13 (13.4)
2016	13 (13.4)
2017	20 (20.6)
2018	31 (32.0)
2019	4 (4.1)

RMNCAH: Reproductive Maternal, Newborn Child and Adolescent Health Strategy

According to their answers, most of the respondents (82.5%) had acceptable knowledge, while 9% had good knowledge and 8.5% had poor knowledge, as demonstrated in Figure 1.

Regarding growth charts use, 75%, 57%, and 76% of participants correctly identified trends of growth falling, flattening, and rising, respectively. As shown in Table 3. Seventy-nine percent of participants showed acceptable use, 39 (19.5%) had good use, and only 3 (1.5%) had poor use, as illustrated in Figure 2.

There was a statistically significant association between the average number of patients seen daily and knowledge scores, while other variables did not show any significant association, as seen in Table 4.

Table 5 shows that there was a statistically significant association between the age of participants and growth charts use scores, as most participants with acceptable and good scores were 30–39 years old. Similarly, physicians had significantly better use compared to health workers. In addition, there was a statistically significant association between use scores and low number of patients/day, other variables showed no significant associations with use scores.

DISCUSSION

In the current study, the vast majority of participants recognized the definition and purpose of the growth chart, recognized that weighing of children monthly is necessary, recognized that

Table 2: Distribution of participants according to their knowledge (n=200)

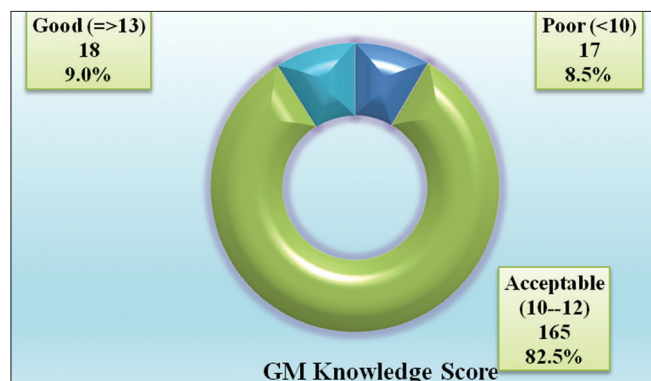
Knowledge	Correct, n (%)	Incorrect, n (%)	Don't know, n (%)
What is growth chart: diagram used by pediatrician and other health care providers to follow a child growth over time and compare it with normal range by age group"	199 (99.5)	1 (0.5)	-
Purpose of growth chart is for monitoring/recording growth/weight of children	192 (96.0)	8 (4.0)	-
Weighing of children monthly is not necessary in the first year of life	19 (9.5)	176 (88.0)	5 (2.5)
Classification of below 2SD for weight for age indicates underweight	173 (86.5)	14 (7.0)	13 (6.5)
Is the growth chart same for boys and girls	6 (3.0)	191 (95.5)	3 (1.5)

SD: Standard deviation

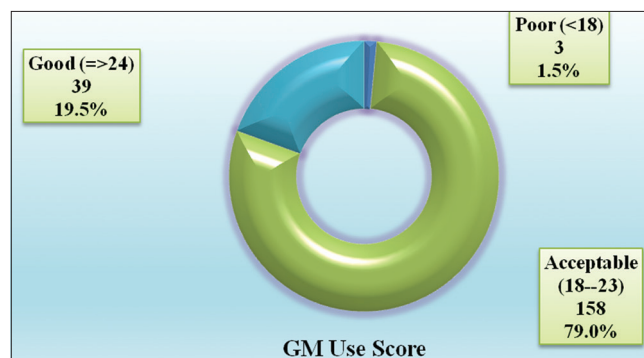
Table 3: Distribution of participants according to their use of growth charts (n=200)

Use	Correct, n (%)	Incorrect, n (%)	Don't know, n (%)
Ability to recognize growth-falling trend and relate to poor growth/eating/sickness when curve on growth chart is flattening	150 (75.0)	42 (21.0)	8 (4.0)
Ability to recognize flattening growth trend and relate to poor growth/eating/sickness when curve on the growth chart is falling	64 (32.0)	114 (57.0)	22 (11.0)
Able to identify rising growth and relate to good growth/eating/health when curve on the growth chart is flattening	152 (76.0)	32 (16.0)	16 (8.0)
Is the growth chart available in PHCC (Y)*	200 (100)	-	-
Do you use growth chart (Y)	200 (100)	-	-
Is the weight and height scales available in the PHCC (Y)	200 (100)	-	-
Sometimes, the respondents use growth charts to pediatric patient's growth during annual/regular check-ups	103 (51.5)	62 (31.0)	35 (17.5)
The respondent always discusses pediatric patient's weight status with his/her caregiver during annual/regular check-ups	152 (76.0)	24 (12.0)	24 (12.0)
The respondent discusses pediatric patient's weight status with his/her caregiver when the child was underweight only	170 (85.0)	21 (10.5)	9 (4.5)
If the growth charts show any abnormality, what is your job - advice (Y)	126 (63.0)	74 (37.0)	-
If the growth charts show any abnormality, what is your job - treatment (Y)*	76 (38.0)	124 (62.0)	-
If the growth charts show any abnormality, what is your job - refer (Y)*	118 (59.0)	82 (41.0)	-

PHCC: Primary health-care center

**Figure 1:** Distribution of the participants according to the knowledge levels

below 2 SD for weight for age indicates underweight, and recognized that there were different growth charts for boys and girls. These results were comparable to the results of Melkamu *et al.*, in Ethiopia who studied 500 health workers from public health centers and reported that 99.8% recognized the purpose of growth charts and 92.8% recognized the frequency of growth monitoring.^[8] Our results were slightly better than the results of Sulley *et al.*, in Ghana who studied 58 health workers in health facilities concerned with children welfare and reported that 81% of them recognized that below 2 SD for weight for

**Figure 2:** Distribution of the participants according to the use levels

age indicated underweight 82.8% recognized that charts are color-coded blue and pink for boys and girls, respectively.^[9] Our results showed that performance of participants regarding essential knowledge about growth charts was not optimal, which might lead to misdiagnosis and malmanagement. In the current study, 97 (48.5%) received Integrated Maternal, Newborn, and Child Health (IMNCH) training; 71 (73.2%) received only one course which lasted for 5 days. Our results showed a lower frequency of IMNCH training compared to Abdullah and Bahir in Iraq, who studied awareness of IMNCH

Table 4: Distribution of selected variables according to knowledge levels

	Knowledge score			P
	Poor (<10), n (%)	Acceptable (10-12), n (%)	Good (≥13), n (%)	
Age (years)				
<30	1 (5.9)	12 (7.3)	1 (5.6)	0.361
30-39	7 (41.2)	105 (63.6)	8 (44.4)	
40-49	5 (29.4)	27 (16.4)	5 (27.8)	
≥50	4 (23.5)	21 (12.7)	4 (22.2)	
Gender				
Male	4 (23.5)	43 (26.1)	3 (16.7)	0.675
Female	13 (76.5)	122 (73.9)	15 (83.3)	
Type				
Physician	11 (64.7)	125 (75.8)	14 (77.8)	0.581
Health worker	6 (35.3)	40 (24.2)	4 (22.2)	
Health worker type				
Nurse	3 (50.0)	8 (20.0)	-	0.138
Not nurse	3 (50.0)	32 (80.0)	4 (100.0)	
Years of service				
1-9	6 (35.3)	60 (36.4)	5 (27.8)	0.380
10-19	6 (35.3)	75 (45.5)	6 (33.3)	
20-29	4 (23.5)	21 (12.7)	6 (33.3)	
≥30	1 (5.9)	9 (5.5)	1 (5.6)	
Average number of patients seen per day				
≤25	59 (29.4)	40 (24.2)	10 (55.6)	0.017*
26-39	11 (64.7)	79 (47.9)	6 (33.3)	
≥40	1 (5.9)	46 (27.9)	2 (11.1)	
Received IMNCH training program				
Yes	7 (41.2)	81 (49.1)	9 (50.0)	0.817
No	10 (58.8)	84 (50.9)	9 (50.0)	
Number of courses				
1	6 (85.7)	57 (70.4)	8 (88.9)	0.565
2	-	11 (13.6)	1 (11.1)	
≥3	1 (14.3)	13 (16.0)	-	
Duration of course in (days/weeks/months)				
3 days	-	19 (23.5)	-	0.092
5 days	7 (100.0)	57 (70.4)	7 (77.8)	
10 days	-	5 (6.2)	2 (22.2)	

*Significant association using Pearson Chi-square test at 0.05 level. IMNCH: Integrated Maternal, Newborn, and Child Health

in 150 health workers of PHCCs in Baquba city and reported that 78.4% of their study sample had previously been trained on IMNCH.^[10] In another study also done in Iraq, Yasin *et al.* studied knowledge of IMNCH of 84 health workers from 24 different PHCCs in Salahuddin province and they reported that 50% of them had previous training and that 31% of them were doctors and 69% were other PHC providers.^[11]

Regarding the use of growth chart in the current study, 150 (75%) identified growth falling, 114 (57%) identified growth flattening, and 152 (76%) identified normal growth. Better results were shown by Gyampoh in Ghana who studied health workers and caregivers' awareness and use of growth monitoring and reported that 94.1% of health workers were able to recognize falling, flattening, and normal growth.^[12] Growth charts were designed in such a way that guide further management and decisions, by doing that, it

rules out the subjective opinions to a more organized pattern of management.

In this study, 165 (82.5%) and 18 (9%) participants had acceptable and good knowledge, respectively, about growth charts, 158 (79%) and 39 (19.5%) had acceptable and good uses, respectively, and the majority (93.5%) had acceptable total scores. Better results were reported in a recent study, done by Majeed *et al.*, in Iraq/Baghdad, who studied 127 health workers, they reported that 63.8% of participants had good knowledge and 64.6% had good use.^[13] Although workload is a generalized problem in Iraq, some PHCCs suffer more from it because of maldistribution of doctors,^[14] which negatively affects management. In the present study, concerning factors associated with better uses included older age, physicians, and lower number of patients examined per day. In another study done by Tesfay in Ethiopia, who studied 268 health workers

Table 5: Associations between some variables and use levels

	Use score			P
	Poor (<18), n (%)	Acceptable (18-23), n (%)	Good (≥24), n (%)	
Age (years)				
<30	-	13 (8.2)	1 (2.6)	0.035*
30-39	1 (33.3)	97 (61.4)	22 (56.4)	
40-49	1 (33.3)	31 (19.6)	5 (12.8)	
≥50	1 (33.3)	17 (10.8)	11 (28.2)	
Gender				
Male	-	41 (25.9)	9 (23.1)	0.757
Female	3 (100.0)	117 (74.1)	30 (76.9)	
Type				
Physician	1 (33.3)	113 (71.5)	36 (92.3)	0.005*
Health worker	2 (66.7)	45 (28.5)	3 (7.7)	
Health worker type				
Nurse	1 (50.0)	10 (22.2)	-	0.343
Not nurse	1 (50.0)	35 (77.8)	3 (100.0)	
Years of service				
1-9	-	57 (36.1)	14 (35.9)	0.109
10-19	1 (33.3)	73 (46.2)	13 (33.3)	
20-29	2 (66.7)	22 (13.9)	7 (17.9)	
≥30	-	6 (3.8)	5 (12.8)	
Average number of patients seen per day				
≤25	-	51 (32.3)	4 (10.3)	0.005*
26-39	1 (33.3)	76 (48.1)	19 (48.7)	
≥40	2 (66.7)	31 (19.6)	16 (41.0)	
Received IMNCH training program				
Yes	2 (66.7)	74 (46.8)	21 (53.8)	0.457
No	1 (33.3)	84 (53.2)	18 (46.2)	
Number of courses				
1	-	55 (74.3)	16 (76.2)	0.255
2	1 (50.0)	7 (9.5)	4 (19.0)	
≥3	1 (50.0)	12 (16.2)	1 (4.8)	
Duration of course in (days/weeks/months)				
3 days	1 (50.0)	14 (18.9)	4 (19.0)	0.365
5 days	1 (50.0)	56 (75.7)	14 (66.7)	
10 days	-	4 (5.4)	3 (14.3)	

*Significant association using Pearson Chi-square test at 0.05 level. IMNCH: Integrated Maternal, Newborn and Child Health

and reported that growth charts use was not significantly affected by age, degree, or availability of equipment.^[15]

CONCLUSIONS

Most of the health-care providers had an acceptable level of knowledge and use of growth charts and knowledge and use levels were related to a number of patients seen per day, while growth chart use was affected by participants' age and being a physician.

Recommendations

Recommendations health providers should undergo more training programs principally concerned with growth monitoring and promotion, and all health workers should be aware of the tools used for assessing it.

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Conflicts of interest

There are no conflicts of interest.

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