

Audit of well-baby care in primary health care centers in Buraidah, Saudi Arabia

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ABSTRACT

الأهداف: تقييم جودة استخدام برنامج الزيارات المقررة وتسجيل الإجراءات المطلوبة لرعاية الطفل السليم بمراكز الرعاية الصحية الأولية - بريدة - منطقة القصيم.

الطريقة: تم اختيار مراكز الرعاية الصحية بطريقة عشوائية. ومن إجمالي 7000 مولود مسجلين سنويا. تم اختيار 350 طفل ممن أكملوا عامهم الخامس. وشملت الدراسة المواليد المسجلين في هذين الشهرين. تمت هذه الدراسة بمراكز الرعاية الصحية الأولية - بريدة - القصيم خلال الفترة ما بين مارس 2005م حتى ديسمبر 2005م. تمت مراجعة ملفات الأطفال وسجل التطعيم السنوي وتم جمع المعلومات بواسطة نموذج معد مسبقا معتمدين على دليل الجودة النوعية ودليل رعاية الأمومة والطفولة الصادرين من وزارة الصحة.

النتائج: كان نصف الأطفال ذكورا والغالبية سعوديون. وجدنا أن المعلومات عن الحمل والولادة متوفرة في أكثر من 90%، بينما المعلومات عن حديثي الولادة متوفرة في 74.3%. و المعلومات عن التغذية متوفرة في 96.3%. ولكن مدة الرضاعة الطبيعية مسجلة في 37.8% فقط من الملفات. خلال العام الأول 90% من الأطفال زاروا عيادة الطفل السليم 3 مرات على الأقل و61% زاروا العيادة خمس مرات أو أكثر. أكثر من 75% من منحنيات النمو للأطفال مستكملة وجميع الأطفال مستكملوا التطعيمات الأساسية.

خاتمة: أظهرت الدراسة أن معدل استخدام زيارات عيادة الطفل السليم أقل من المقرر. وهناك حاجة إلى برنامج تثقيفي للوالدين وتعليمي تدريبي مستمر للعاملين على رأس العمل.

Objectives: To evaluate the quality of utilization and documentation of the required process of well-baby care (WBC) visits and immunizations in primary health care centers (PHCCs).

Methods: Ten PHCCs were randomly selected. Of the average annual 7000 registered births, 350 children who had completed their fifth birthday were selected. All registered children who were born during 2 randomly selected months were included. Data were collected in Buraidah city, Kingdom

of Saudi Arabia's PHCCs by the investigators from March to December 2005. Data were extracted from children's files, and well-baby and annual vaccination registers using a pre-designed form based on the Quality Assurance and Maternal and Child Health Care Manual of the Saudi Ministry of Health.

Results: Half of children were males, and most were Saudis. Pregnancy and delivery history were available in >90%, while that of neonatal history was available in 74.3%. Nutritional status was available in 96.3% of the files, but only 37.8% of them had the duration of breast feeding recorded. Number of children's visit to WBC clinics lessens as they grow older, >90% for infants, and less than one third for toddlers. Growth charts were completed in more than 90% of the files. All children completed the first year Expanded Program on Immunization schedule (up to date), and more than 75% of them were age-appropriately-immunized.

Conclusion: The utilization level of WBC visits is lower than recommended. Careful well organized continuous field training of staff and parents' education programs are needed.

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Routine well-baby care (WBC) programs are important tools to promote children's health through timely recommended vaccinations, detection, and management of diseases, and identification of potential developmental and psychosocial disorders.¹ The quality of life and health status during this important period has a major impact on the future of

an individual, families, and the community as a whole. It is therefore, of prime importance that the quality of child care should be kept at its optimal level in the entire stages of child development.² In Saudi Arabia, children under 5 years of age represent approximately 12% of the Saudi population.³ The preventive health program for children under 5 years of age is adopted by the Saudi Ministry of Health, and implemented at the primary health care centers (PHCCs). It includes a series of well-baby clinic visits, and immunization.² Each primary health care center provides WBC through a designated clinic. As stated in the Quality Assurance Manual, the main objectives of this program are: to promote an optimal status of health and development in order to prepare the child to lead a productive adult life, and to prevent diseases, accidents, and child abuse. Child care at PHCC also helps to recognize and, if possible, to eliminate the potential problems affecting the development, behavior, and education of the children, and to detect any abnormality in order to offer investigation and treatment.² Clinical audit is an integrated part of clinical practice. All clinicians want to provide the best possible care for patients, and clinical audit is an important powerful tool to assess changes, resulting in improved practice and patient outcome.⁴ The objective of this study is to evaluate the quality of utilization of WBC visits and documentation of the required process of WBC and immunization in PHCCs in Buraidah city, Qassim Region, according to the standards of the Quality Assurance Manual (QAM), and Maternal and Child Health Care Manual (MCHCM) provided by the Saudi Ministry of Health (MOH).^{2,5}

Methods. Buraidah city is the capital of Qassim region. The total population of Qassim region is approximately one million, one third of them are in Buraidah city. There are 27 governmental PHCCs providing health services to Buraidah inhabitants and these centers are managed by 2 supervisory offices. Ten PHCCs were randomly selected for this study (5 PHCCs from each supervisory office). We assumed a completeness of 60%, a precision of 5%, a design effect of one, and a 95% confidence interval. Of the average annual 7000 registered births in Buraidah city, we obtained a calculated sample size of 350. The months of February and August 1999 were randomly selected for the study. At these centers, all registered children who were born during these 2 months were included in this study. The child's files, well-baby register, and annual vaccination register were reviewed. Data were collected using a pre-designed form based on the QAM and MCHCM of MOH in Buraidah city's PHCCs by the investigators, during the period from March 2005 to December 2005. This form included the demographic data, date of birth, information on pregnancy, delivery,

and neonatal history. Birth weight, date of first visit to PHCC, number of well-baby visits per year for the first 5 years, and number of other visits to PHCC for other purposes such as, consultation for minor illnesses, for example, acute respiratory infection, or attendance with any of the family members during their visit to the PHCC. According to the QAM guidelines, the number of visits is at least 5 visits in the first year, and 2 visits per year during the next 4 consecutive years. The form also contains information on birth weight, length or height, head circumference, and completeness of growth chart on each visit. Information on milestones progress such as smiling, sitting, and walking were included. A file is considered milestones completed, if all these 3 milestones were documented. More developmental surveillance milestones, based on modified Denver's manual, are included in the WBC program, but these are recorded in the child's health record. These records are kept by the family, making them difficult to retrieve by the investigators, hence, were not included in this study. The data collection form also contains information on the type of feeding, duration of breast feeding, and weaning. Type of risk if any, is also documented. For the immunization program, vaccination type, and date of each dose of a given vaccine were collected. Children were considered up to date (UTD) if they have received all vaccinations at a particular evaluated age. An age appropriately immunized (AAI) child was defined as a child who have received all scheduled vaccinations no later than 30 days of the recommended age for all vaccines except measles, mumps, rubella vaccine (MMR), where the permissible period is up to 90 days. This study was approved by the regional research ethics committee.

The collected data was entered and analyzed using the Epi Info version 6.04d software program. A *p*-value of <0.05 was considered significant.

Results. A total of 350 health records of children who had completed their fifth birthday were reviewed. Half (177 [50.6%]) of them were males, and most (346 [98.9%]) were Saudis. Pregnancy and delivery history were available in more than 90% of files, while that of neonatal history was available in 74.3%. Milestones were recorded in 79.4% files, (Table 1). Nutritional status was available in 337 (96.3%) files, of these 42.4% were recorded as breast fed, 13.6% were recorded as exclusively bottle fed, and the rest (43.9%) had mixed feeding. The duration of breast feeding was recorded in 37.8% files. Of these, 34 (31%) children were exclusively breast fed for at least 4 months. The age of weaning was recorded in 44.6% files. None of these children were weaned before 4 months, while 14% were weaned at age of 6 months (Table 1). The risk status of children was recorded in almost all files, of which 51(14.6%)

were considered at risk by the PHCC staff according to the reference in the MOH manuals. Table 2 shows the frequency of visits of children to well-baby clinics at PHCC. All infants were seen in well-baby clinics at least once, and >90% of them were seen at least 3 times. For the second year, 75.4% of children were seen 2 times or more, and >95% were seen at least once. The third, fourth, and fifth year visits scored <30% in having 2 or more visits, and >40% have not shown up in well-baby clinics in any given year. This deterioration in number of visits was directly related to child's age, ($p=0.0000$). Table 3 shows children visits to PHCC for other purposes other than WBC. Seventy-six percent of children below 2 years visited the PHCC at least once a year. Similarly, the following 3 years of age children were seen at least once a year; third year (65%), fourth year (56%), and fifth year (48%). Weight, length/height, and head circumference were plotted in growth charts of below one year children's visit in 96.2%, and in 93.2% of above one year. All children completed the first year Expanded Program on Immunization (EPI) immunization schedule (UTD), and more than 75% of them were AAI immunized (Table 4).

Discussion. Most of our study sample were Saudis, and half were males. This is the typical MOH PHCC population in the Kingdom of Saudi Arabia. The utilization level of recommended WBC visits is lower than recommended by the MOH QAM. Internationally, the number of recommended visits for WBC is variable.⁶⁻⁸ Generally, the recommendation is 5-6 visits during the first 2 years of age.⁶ The variability of number of visits is large in consecutive years as some programs have only 2 visits throughout these 4 years.⁷ In our study, only 61% of infants received ≥ 5 visits during the first year of age. However, more than 93% had ≥ 3 visits. During the second year of age, 75% visited the clinic 2 or more times. The well-baby visit rate sharply dropped during the next 3 years (Table 2). This decrease in WBC visit is associated with age, and is explained by the fact that families usually bring their children primarily for immunization activities. Once the second year is over, hence compulsory immunization is completed, families

Table 1 - Routine well-baby care of children under 5 years in Buraidah, frequency of data documentation (N=350 files).

Variable	n	(%)	95% CI
Pregnancy history	317	(90.6)	87 - 93
Delivery history	323	(92.3)	89 - 95
Neonatal history	260	(74.3)	70 - 79
Milestones	278	(79.4)	75 - 83
Nutritional data	337	(96.3)	94 - 98
<i>Type of feeding (n=337)</i>			
Breast	143	(42.4)	37 - 47
Bottle	46	(13.6)	10 - 18
Mixed (Breast + bottle)	148	(43.9)	39 - 43
<i>Duration of BF (n=291)</i>			
Duration of BF	110	(37.8)	32 - 43
Weaning data	296	(84.8)	81 - 88
Weaning age (n=296)	132	(44.6)	39 - 50

CI - confidence interval, BF - breast-feeding

Table 2 - Routine well-baby care of children under 5 years in Buraidah, frequency of well-baby visits, (N=350 files).

Number of well baby visits	n	(%)	95% CI
<i>First year</i>			
≤ 2 visits	19	5.4	3 - 8
3-4 visits	118	33.7	29 - 39
≥ 5 visits	213	60.8	56 - 66
<i>Second year</i>			
Zero	13	3.7	2 - 6
One visit	73	20.9	17 - 25
≥ 2 visits	264	75.4	71 - 80
<i>Third year</i>			
Zero	149	42.6	38 - 48
One visit	99	28.3	24 - 33
≥ 2 visits	102	29.1	25 - 34
<i>Fourth year</i>			
Zero	185	52.9	48 - 58
One visit	96	27.4	23 - 32
≥ 2 visits	69	19.7	16 - 24
<i>Fifth year</i>			
Zero	224	64.0	59 - 69
One visit	72	20.6	17 - 25
≥ 2 visits	54	15.4	12 - 20

CI - confidence interval

Table 3 - Routine well-baby care of children under 5 years in Buraidah, and frequency of visits to primary health care centers for other purposes (N=350 files).

Number of visits	First year		Second year		Third year		Fourth year		Fifth year			
	n	(%)	95% CI	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI	
Zero	85	(24.3)	20-29	84	(24.0)	20-29	122	(34.9)	30-40	153	(43.7)	30-49
One visit	52	(14.9)	11-19	77	(22.0)	18-27	90	(25.7)	21-30	69	(19.7)	16-24
≥ 2 visits	213	(60.8)	56-66	189	(54.0)	49-59	138	(39.4)	34-45	128	(36.6)	32-42

CI - confidence interval

Table 4 - Routine well-baby care of children under 5 years in Buraidah, and coverage with essential immunizations (N=350 files).

Schedule of vaccine	First BCG HB	Second DPT, first HB	Second DPT	Third DPT	Measles, third HB	First MMR	First DPT booster	Second DPT booster, second MMR
% (95% confidence interval)								
UTD	100 (99-100)	100 (99-100)	100 (99-100)	100 (99-100)	100 (99-100)	100 (99-100)	99.7 (98-100)	98.0 (96-99)
AAI	97.1 (95-99)	79.2 (75-83)	77.1 (73-81)	85.7 (82-89)	76.6 (72-81)	93.3 (90-96)	67.1 (62-72)	65.5 (60-70)

UTD - up to date, AAI - age appropriate immunization, BCG - Bacillus Calmette-Guérin, HB - hepatitis B, DPT - diphtheria, pertussis, and tetanus, MMR - measles, mumps, and rubella

and staff fail to comply with the recommended WBC schedule. Studies have shown that it is difficult to achieve the recommended number of WBC visits.⁹ Only 34% of infants received ≥ 5 visits during the first year of age in Connecticut's Medicaid managed care program.¹⁰ Similarly, in a study conducted in Taiwan, only 24% of infants completed the recommended 4 visits, while 36% had no WBC visits.⁷ Toddler visits were also shown to be low in different studies. Al Shihry and Al Sekait¹¹ reported high first year WBC visits rate (90%) in Al-Khobar, but for the following years performance was very low, and the fifth year rate was only 28%. Similarly, the Taiwan study⁷ showed that 58% of children had failed to have the fifth (1-3) years, and 82% had failed to have the sixth (3-4) years visits.⁷ As children under 5 years of age frequently visit the PHCCs for other purposes, these visits can be used as backup for the routine visits such as, to perform the required tasks of delayed WBC visits. Parents could also be reminded that they had missed the routine appointment for WBC and given a new appointment.

In our sample, 48-76% under 5 years children have visited the PHCC at least once a year for other purposes. The actual number of these visits are believed to be more than recorded. Failure to document visits to PHCC may happen, when files could not be retrieved due to misfiling, when patients come earlier than clerical staff, or arrive at end of sessions, or there is an improper chronological order of visit documentation. In Qassim region, all doctors and most nurses are expatriates, a reason for high turn-over of staff, leading to a swinging awareness and compliance with national guidelines. If these visits were utilized for WBC activities, the performance could have been much better. Furthermore, the high recommended number of visits partially explains the low compliance. The number of WBC visits could be reduced without affecting the quality of care.¹² Many childhood diseases and developmental disorders may ensue or become evident during toddlerhood and preschool age. Nutritional diseases, developmental and psychosocial disorders, and communication difficulties could pass unrecognized, unless strict adherence of the staff and parents to the WBC program is observed.

In our study, most (90%) of the files have pregnancy history available, as most pregnant ladies have their pregnancy care at PHCC, while neonatal history was less documented as it depends on hospital feed back reports. Although the documentation rate of milestones was good (80%), the documented milestones are very limited. Detailed milestones are recorded in the child health record that is kept with the family and may be difficult to retrieve. As this record is with the family, bringing these to the clinic at each visit depends on the mother's interest. A detailed milestones form such as, the modified Denver form, has to be included in the child's file. This will make developmental follow up easier, and audit possible.

Breast feeding is the most ancient, beneficial, and reliable form of infant feeding.¹³ The rate of feeding type documentation was excellent. It is however, unfortunate that the duration of breast feeding documentation was available in only one third of the files. This possibly reflects lack of awareness of the staff, regarding this important item.

It is shown by previous studies conducted in Saudi Arabia that breast feeding duration and exclusive breast feeding in early infancy, in particular is low.¹³⁻¹⁵ The results of our study are also similar to their findings. In our study, weaning age was recorded only in 37.8% of files, none of those children started weaning after the age of 6 months. This result was in accordance with the result reported in previous studies.^{13,15} The risk status of children was recorded in almost all files; 14.6% of children were considered high risk, and had at least one risk factor. Although we did not evaluate this rate in terms of reliability, we feel that the true rate is higher as the items listed in the MCHCM provide a long list that include 3 groups:⁵ Group A - include normal children who live under unsuitable conditions such as working mothers, and large family size of more than 7 members, which is common in our community, Group B - include children with any abnormality of one or more of the growth and development indicators, Group C - include children who have any congenital, chronic disease, or disability. Unless precisely and reliably identified, the risky child will be denied the proper care.

Growth and development are important indicators of good health and nutrition. Anthropometry is the best single most universally applicable, inexpensive, and non-invasive method available in PHCC to assess child growth.¹⁶ The cornerstone of WBC is that every child has to have his/her growth indices measured, plotted, interpreted, and discussed with his parents. Failure to do so is a serious sign of poor performance by the staff. The growth charts plotting was completed in most well-baby visits. Weight, length/height, and head circumference were plotted in the growth charts of 96.2% of under one year children visits, and 93.2% of above one year children visits. Although this figure is high, we believe that it should be more than this. Our study shows that all children completed their first year immunizations. However, only 75% of them were AAI. At the end of the second year, 99.7% were UTD, and 67% of them were AAI. This was higher than the result reported from Al-Khobar¹¹ where 69.8% were UTD by the end of first year of age, and only 19% were AAI, and at end of the second year 58.6% of children's were UTD, and only 10.3% of them was AAI. The immunization coverage survey conducted in 8 regions of Saudi Arabia in 1990¹⁷ reported that 84.8% of infants completed their immunization schedule by the end of the first year of age, and 91.9% by the end of second year. A Saudi family health survey conducted in 1996¹⁵ found that 98% of children aged 12-23 months were fully immunized (UTD).

At school entry, the targeted rate for EPI vaccines in the Kingdom is to exceed 95% coverage. Our study showed that immunization coverage among children entering school were 98% UTD, 64% of them were AAI. Similarly, in the United States, vaccination coverage (UTD) among children entering school was >95%, which was also the targeted rate.^{18,19} This achievement in coverage is great. Although we lack a standard for AAI rate, we are not satisfied with what we feel as a low rate of AAI, as delaying vaccination behind its due date is risky for the child and the community.

This study have many limitations. Of these, the inherent weaknesses of surveillance and retrospective studies are the main limitation factors, and it is responsible for most of other human and system factors.

In conclusion, WBC performance in Buraidah PHCCs is relatively good compared to the result of other studies. However, the utilization level of recommended WBC visits is lower than recommended, and there is a lack of documentation of some important data, such as, data on feeding and weaning. As per immunization schedule, children had good UTD rates with relatively lower AAI rate. Careful, well organized continuous field training of staff and parents' education programs are needed to improve compliance with WBC visits' program.

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