

Cross-sectional study of a child health care programme at one family practice centre in Saudi Arabia

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دراسة مقطعية لبرنامج رعاية صحة الأطفال في أحد مراكز رعاية الأسرة بالمملكة العربية السعودية

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خلاصة: اخترنا بطريقة عشوائية مئة من الأمهات لأطفال تقل أعمارهم عن سنتين ممن يترددن على إحدى عيادات التطعيم، من أجل قياس مدى رضاهن عن برنامج رعاية صحة الأطفال وآثار هذا البرنامج. وتبين أن المدة الوسطى للرضاعة من الثدي كانت 10.7 ± 6.9 شهراً، وأن تغذية 37% من الأطفال كانت مقصورة على الرضاعة من الثدي. وكان 16% من الأطفال يتغذون على المستحضرات الصناعية، بينما كان 47% منهم يتغذون بمزيج من الطريقتين. وكانت درجات المعرفة بالإرضاع من الثدي جيدة أو متوسطة لدى معظم الأمهات. ولم يكن بممارسة تحديد النسل على نحو فعال إلا 26% من الأمهات. وكان 46% من الأمهات يباعدن بين الولادات لمدة اثني عشر شهراً أو أقل. وقد وجدنا أن 78.6% من الأمهات المرضعات كن يتناولن طعاماً متوازناً بدرجة جيدة أو معتدلة. وكانت إجراءات الرعاية تبعث الرضى في 73% من السجلات التي فحصت. كما كان تكوين البرنامج يبعث الرضى أيضاً. وكان 91% من الأمهات راضيات عن البرنامج.

ABSTRACT We randomly selected 100 mothers with children under 2 years attending an immunization clinic to measure satisfaction with and the effects of a child health care programme. Mean duration of breastfeeding was 10.7 ± 6.9 months; 37% of children were exclusively breastfed, 16% artificially fed and 47% mixed fed. Breastfeeding knowledge scores were good or fair for most mothers. Only 26% used effective contraception and 46% had a child-spacing of ≤ 12 months. We found 78.6% of lactating mothers had well or fairly balanced diets. Process of care was satisfactory in 73% of records reviewed, programme structure was satisfactory and 91% of mothers were satisfied with the programme.

Etude transversale d'un programme de soins de santé infantile dans un centre de médecine générale en Arabie saoudite

RESUME Nous avons choisi au hasard 100 mères d'enfants de moins de 2 ans qui consultent dans un dispensaire de vaccination afin de mesurer le degré de satisfaction vis-à-vis du programme de soins de santé infantile et les effets de ce programme. La durée moyenne de l'allaitement maternel était de $10,7 \pm 6,9$ mois; 37% des enfants étaient allaités exclusivement au sein, 16% allaités au biberon et 47% bénéficiaient d'un allaitement mixte. Les connaissances concernant l'allaitement au sein étaient bonnes ou moyennes pour la plupart des mères. Seulement 26% d'entre elles utilisaient un moyen de contraception efficace et pour 47% des femmes l'espacement des naissances était de ≤ 12 mois. Nous avons trouvé que 78,6% des femmes qui allaitaient avaient un régime alimentaire plutôt équilibré. Le processus de soins était satisfaisant dans 73% des dossiers examinés, la structure du programme était satisfaisante et 91% des mères étaient satisfaites du programme.

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Introduction

Children under 5 years of age constitute about 20% of the population in developing countries and the provision of adequate health services for this age group represents a challenge for health planners. Most childhood illnesses are related to the socioeconomic status of the parents.

The continuing and comprehensive nature of care provided by family physicians puts them in a favourable position to properly assess and consider the psychosocial aspects of illness. Family physicians can also provide cost-effective comprehensive child health care services by treating the common health problems of children and by educating mothers about feeding, immunizing, assessing growth and development and getting appropriate screening tests and examinations for the early detection of diseases and congenital abnormalities [1,2]. Furthermore, family physicians could improve the health of both mothers and children by providing antenatal care, family planning and nutrition education services for the whole family [1,2].

Several forms of audit have been suggested both nationally [3,4] and internationally [1,5,6] to monitor the work of family physicians in the area of preventive child care. These suggestions include auditing attendance, immunization coverage and surveillance examinations, the frequency of detection of abnormalities and at-risk children, the presence of systems for following up with immunization defaulters and paediatric surveillance.

In Saudi Arabia, considerable progress has been made in the child health care programme [4] as evidenced by the drop in the infant mortality rate from 46/1000 in 1984 to 32/1000 in 1994, the rise in the immunization coverage rate from 77% in 1985 to

92% in 1997 and the decrease in mortality rate due to diarrhoeal diseases in children from 21/100 000 to 1.3/100 000 cases from 1988 to 1996.

There is, however, still considerable room for improvement, particularly in the field of health education regarding mother and child nutrition, child-spacing and paediatric surveillance. Recent reports have found a decrease in breastfeeding and a shorter nursing period [7,8]. The high rate of coverage achieved by the immunization programme for children under 5 years allows for more frequent contact between the primary health care (PHC) team and parents. This could be used to provide opportunistic health promotion activities for both the mother and the child as well as for paediatric surveillance tasks. Family physicians are however faced with the challenge of limited resources, particularly manpower and time, as well as the challenges of widening the spectrum of child health care programmes and developing appropriate methods for continuous monitoring and improvement of their work.

The current work was a cross-sectional study of a child health care programme implemented in one family practice centre in Abha City. The structure of the programme and the process of care were evaluated. Mothers' satisfaction with the programme was evaluated along with their knowledge and practice of breastfeeding, maternal nutrition and child-spacing. The study also investigated determinants that might be related to mothers' knowledge and practice of breastfeeding.

Subjects and methods

The study was conducted at Shamasan Primary Health Care Centre, which is one of

the six urban PIIC centres in Abha City, the capital of Asir Region, Saudi Arabia. This centre has a catchment area of about 15 000 inhabitants. Children under 2 years of age represent approximately 6% of the population (889 children). The centre is staffed by six general practitioners and seven nurses as well as a health inspector, two medical record technicians, a laboratory technician, a radiology technician, a pharmacist, two dentists and an administrator. The centre is affiliated with the College of Medicine and is used for the training and education of medical students in family medicine.

The structure and the process of the child health care programme were assessed with two checklists based on guidelines from the national quality assurance protocol [3] and with the consensus of the practice team. The first checklist was for the rapid assessment of the structure of the child health care programme in the PHC setting (Table 1). It contained 19 items: 8 items assessing the structure of the immunization programme; 5 items monitoring the growth and development of children; 3 health education items; 1 item for the at-risk register; 1 item on the presence of adequate stocks of parent-held child health records; and 1 item on the suitability of the premises for the programme. This checklist was scored on a 3-point scale: 2 for complete fulfillment, 1 for partial fulfillment and 0 for the complete absence of an item. The maximum checklist score was 38. Structure of care was considered satisfactory if the average total score was > 31 points (> 80%).

A second checklist included 15 items which assessed the process of care. Each item in a child's health record scored 1 point if complete and 0 if incomplete. Records of the 100 children were reviewed

for completeness. The score for the process of care was satisfactory if ≥ 10 points and unsatisfactory if ≤ 9 points.

A total of 100 women with children under 2 years attending the well-baby clinic were randomly selected for the study. Complete physical examinations of the 100 children were performed. The growth and nutritional status of the children were assessed by measuring the weight and length of the children using the growth curves of the United States of America National Center for Health Statistics (NCHS) [9]. The developmental status of the child was measured with a simple modified Denver scale adjusted for local use [10]. Both the growth curves of the NCHS and the locally adjusted Denver scale had been used routinely to monitor the growth and developmental status of children in the child health care programme at Shamasan PHC centre.

A questionnaire was designed to collect information about the sociodemographic characteristics of mothers, their satisfaction with the service, the place and type of delivery of the current baby, past and present experiences of child feeding, history of giving the child artificial or bottle-feeding during the immediate postnatal period at the hospital, the use of any contraceptive method and the age of the elder baby. The latter was used to calculate child-spacing (the pregnancy-free period between the birth of the elder baby and the onset of the pregnancy of the current baby).

The questionnaire contained two questions about mothers' nutrition. The first questioned the frequency of intake of each of the four food groups per week and the second questioned the number of cups of milk the mother usually drank per day. Assessment of the quality of nutrition of the mothers was based on the standard re-

Table 1 Checklist for monitoring the structure of the child health care programme**Programme structure***Immunization programme*

- Presence of a well defined and updated target for immunization
- Presence of an adequate registration system for monitoring immunization programme:
 - daily and annual registers
 - monthly calendar appointment system
- Presence of a system for recall of defaulters of immunization
- Presence of a nurse trained to conduct immunization
- Presence of appropriate equipment for conducting immunizations: 2 refrigerators/icebox disposable needles
- Presence of a system for daily monitoring of refrigerator temperature before and after each immunization session
- Presence of a system for monitoring the viability of PHC centre immunization stocks (expiration date)
- Presence of a system for adequate disposal of immunization waste

Monitoring growth and development of children

- Presence of an adequate registration system for monitoring growth of children: daily and annual registers
- Presence of appropriate equipment for monitoring growth
- Presence of a nurse specially trained to monitor growth of children
- Presence of a doctor or nurse particularly interested in and trained in monitoring development of children
- Presence of a protocol for conducting developmental assessment of the child

Health education

- Presence of a plan and a checklist for health education
- Availability of pamphlets, pictures and posters for health education
- Availability of an Arabic-speaking nurse/doctor specially trained to conduct health education for mothers

At-risk register

- Presence of an at-risk register for registering and following up children at risk

Child health records

- Presence of an adequate stock of parent-held child health records

Suitable premises

- Presence of suitable premises for examining the child and conducting health education for the mother

The items were scored using a 3-point scale (0,1,2)

PHC = primary health care

quirements of food intake per day during lactation [11]. Maternal dietary intake was considered good if the mothers reported eating adequate quantities of the four food

groups; fair, if there was some deficiency in one component; and poor, if there was marked deficiency or neglect of one component of the four food groups.

In addition, the questionnaire contained 13 questions to test mothers' knowledge and practices regarding infant feeding. The first two questions were open-ended and asked about the benefits of breastfeeding to the child and to the mother. The subsequent 11 questions were closed-ended questions directed to lactating mothers only and enquired about their knowledge of and current breastfeeding practices. The last three knowledge questions were in the form of three pairs of pictures about the position of the mother, breast and nipple during breastfeeding and the position of the child after breastfeeding. Each pair included one right and one wrong picture. The questions were based on the contents of the health education messages delivered to mothers both in the antenatal and well-baby clinics which were derived from the WHO/UNICEF training manual for breastfeeding [12].

A breastfeeding scoring system was developed for the study. The first open-ended question was scored on a 4-point scale: 0 if the mother did not mention any specific benefit of breastfeeding for the child; 1 if she mentioned 1 benefit; 2 if she mentioned 2 benefits; and 3 if she mentioned ≥ 3 benefits. The second open-ended question about the benefits of breastfeeding to the mother was scored in a similar way but using a 3-point scale. The rest of the 11 questions were closed-ended questions and were scored on a 2-point scale: 1 for the correct answer and 0 for an incorrect answer. The maximum breastfeeding checklist score was 16. Mothers' knowledge and practices of breastfeeding were considered good if ≥ 12 points ($\geq 75\%$), fair if between 8–11 points and poor if < 8 points ($< 50\%$). The family health record was reviewed to determine the number of PHC centre visits by each mother for the health care of the presenting child from the antenatal period onward.

Statistical analysis of data was performed using *SPSS*. Appropriate tests of significance were carried out. The total breastfeeding score and the practice of exclusive breastfeeding as dependent variables were compared with socioeconomic characteristics of the parents of the child, mother's satisfaction with care and other independent variables using linear and logistic regression analyses.

Results

The activities of the child health care programme at Shamasan PHC centre include immunization, assessment of growth and development, conducting of clinical examination for the early detection of congenital abnormalities and health education. The programme is administered by two doctors, one for sick children and the other for healthy children, and by two nurses, one Arabic-speaking nurse trained for immunizations and an Indian nurse trained to take anthropometric measurements and conduct health education. Two child health records are used for each child in the programme. The first is kept at the PHC centre in the family health records and the second is kept by the parent.

The structure of the child health care programme was satisfactory and scored 35 points of a possible 38 (92.1%). Most of the resources needed to conduct the immunization programme and to monitor growth and development of the children were available. A register for recording and following up at-risk children was available. Deficient items were: the lack of an Arabic-speaking nurse to conduct health education for mothers and a shortage in the availability of health education materials and parent held child health records.

Table 2 Process of care items within the child health care programme

| Care component at each visit of the child for immunization | Percentage of children (n = 100) |
|---|-------------------------------------|
| Demographic data recorded in the CHR | 90 |
| Immunization date and signature of nurse in CHR | 100 |
| Nurse measures and records in CHR: | |
| Weight | 100 |
| Length | 100 |
| Head circumference | 100 |
| Nurse records and plots on growth charts: | |
| Weight | 97 |
| Length | 96 |
| Head circumference | 92 |
| Nurse or doctor assesses and records in CHR: | |
| Gross motor development | 60 |
| Fine motor development | 10 |
| Social development | 5 |
| Hearing and language development | 5 |
| Nurse or doctor registers type of infant feeding in CHR | 90 |
| Doctor performs complete physical examination to detect congenital abnormalities and records in CHR | 7 |
| Doctor or nurse records health education topics discussed with mother | 73 |

CHR = child health record

Evaluations of the process of care are given in Table 2. We found 90% of the children's files contained the complete demographic data of the child and 100% contained dates and signatures of the nurse for immunizations given to the child as well as records of the weight, height and head circumference. There were, however, some errors in the recording and plotting of measurements on growth curves of the child. Type of infant feeding and health education topics given to mothers were recorded in 90% and 73% of the files respectively. A total of 60% of the children had gross motor development assessed, whereas only 5%–10% of the children had the other three aspects of development as-

sessed. Routine complete physical examination at each immunization visit was performed for 7% of children. The overall process of care was satisfactory in 73% of the children's health files.

Characteristics of the mothers attending the well-baby clinic at Shamasan PHC centre are given in Table 3. The majority of mothers were housewives (79%), of young mean age (28.3 ± 5.6 years), in a nuclear family (82%) and with an illiteracy rate of 19%. Characteristics of the children are given in Table 4. Most of the children were born in hospital (99%), with normal delivery (85%), had immunization for age completed (90%) and had normal nutritional status (98%). We found 96%, 94%, 90%

Table 3 Profile of mothers (n = 100) attending the well-baby clinic at Shamasan primary health care centre

| Characteristic | Value |
|-------------------------------|----------------|
| Age of mothers (years) | |
| Mean \pm s | 28.3 \pm 5.6 |
| Range | 18-40 |
| Education status (%) | |
| Illiterate | 19 |
| Primary | 30 |
| Intermediate | 13 |
| Secondary | 19 |
| University | 19 |
| Employment status (%) | |
| Employed | 21 |
| Unemployed | 79 |
| Family type (%) | |
| Nuclear | 82 |
| Extended | 18 |

s = standard deviation

and 88% achieved normal standards for age for gross motor, fine motor, social development and language development respectively and 8% of the children had some sort of congenital abnormality.

The mean duration of breastfeeding \pm standard deviation was 10.7 \pm 6.9 months. Supplementary feedings were introduced to 2 of 43 of the children (4.7%) at \leq 3 months, 19 of 20 of the children (95%) at 4-6 months and to 33 of 37 children (89.2%) at \geq 6 months. A total of 37% of mothers were breastfeeding, 16% artificially feeding and 47% mixed feeding (Table 5) and 91% were satisfied with the services provided by the programme. In all, 36% and 51% of mothers could not state any single specific benefit of breastfeeding to the child or to the mother. Approximately one-third mentioned one benefit for both the child and the mother and 13% mentioned three or more

Table 4 Profile of children (n = 100) attending the well-baby clinic at Shamasan primary health care centre

| Characteristic | Percentage |
|--------------------------------------|------------|
| Age (months) | |
| 0-3 | 40 |
| 4-12 | 47 |
| >12 | 13 |
| Place of delivery | |
| Hospital | 99 |
| Home | 1 |
| Type of delivery | |
| Normal | 85 |
| Caesarean | 15 |
| Immunization status (for age) | |
| Complete | 90 |
| Incomplete | 10 |
| Nutritional status | |
| Normal | 90 |
| Underweight | 10 |
| Gross motor development | |
| Normal | 96 |
| Delayed | 4 |
| Fine motor development | |
| Normal | 94 |
| Delayed | 6 |
| Social development | |
| Normal | 90 |
| Delayed | 10 |
| Language development | |
| Normal | 88 |
| Delayed | 12 |
| Congenital abnormalities | |
| Congenital dislocation of hip | 3 |
| Tallipes equino valgus | 2 |
| Undescended testicle | 1 |
| Squint | 1 |
| Syndactyly | 1 |

benefits of breastfeeding to the child and two or more benefits for the mother.

Table 5 Mothers' satisfaction with the child health care programme and their knowledge and practice of breastfeeding

| Effect | Percentage of mothers (n = 100) | Effect | Percentage of mothers (n = 100) |
|--|---------------------------------|---|---------------------------------|
| <i>Mother's satisfaction with the service</i> | | Does the breastfed baby need any fluids or water during the first 4 months? | |
| Satisfied | 91 | | 36.9 |
| Unsatisfied | 9 | If your baby wakes at night, do you breastfeed or give fluids? | 81.0 |
| Mother's knowledge and practices | | Do you usually clean your hands before breastfeeding? | 34.5 |
| <i>Patterns of infant feeding</i> | | Do you usually clean your nipple before breastfeeding? | 34.5 |
| Breastfeeding | 37 | What do you usually use to clean your nipple? | 77.4 |
| Artificial feeding | 16 | Do you use one or two breasts each time you feed your baby? | 61.9 |
| Mixed | 47 | What do you do to make your child open his mouth while he is being fed from one breast to transfer him to the other breast? | 4.8 |
| <i>What are the benefits of breastfeeding to the child?</i> | | Which of these two pictures shows the correct position of the mother during breastfeeding? | 63.1 |
| Did not know | 36 | Which of these two pictures shows the correct position of the breast during breastfeeding? | 56.0 |
| Mentioned one benefit only | 32 | Which of these two pictures shows the correct position of the child after breastfeeding? | 63.1 |
| Mentioned two benefits | 19 | | |
| Mentioned three or more benefits | 13 | | |
| <i>What are the benefits of breastfeeding to the mother?</i> | | | |
| Did not know | 51 | | |
| Mentioned one benefit | 36 | | |
| Mentioned two or more benefits | 13 | | |
| (Questions given to lactating mothers only, n = 84) | | | |
| When should supplementary food be introduced to the baby? | Correct answers | | |
| | 89.3 | | |

Mothers' correct answers to closed-ended questions about breastfeeding ranged from 4.8% to 89.3% (Table 5). Approximately two-thirds of lactating mothers believed incorrectly that the child in the first 4 months needed fluids or water in addition to breast milk. Approximately one-third of mothers reported practising good hygiene of the breast and nipple be-

fore breastfeeding. About 50% of mothers identified the correct position of the mother and the breast during lactation and the correct position of the child after breastfeeding from the pictures presented to them. Approximately 50% of mothers reported using one breast only each time they breastfed their child and 4% reported transferring the child from one breast to the oth-

Table 6 Multiple regression analysis of breastfeeding knowledge and practice scores of lactating women attending the well-baby clinic on selected independent variables

| Independent variable | Partial regression coefficient, β | Computed t for β | P -value |
|--|---|--------------------------|------------|
| Mother's age | -0.12 | -0.24 | 0.2218 |
| Mother's education | 0.94 | 2.23 | 0.0312* |
| Father's education | -0.04 | -0.09 | 0.9248 |
| Mother's employment | -0.15 | -0.11 | 0.9117 |
| Mother's satisfaction | 1.24 | 0.79 | 0.4324 |
| Family size | 0.49 | 1.72 | 0.0936 |
| Family type (nuclear/extended) | 1.00 | 0.82 | 0.4198 |
| Number of visits | 1.23 | 1.38 | 0.1741 |
| Breastfeeding of current child | 0.23 | 1.47 | 0.1465 |
| Breastfeeding practice of the previous child | 1.25 | 0.28 | 0.7784 |
| Constant | 1.29 | 0.366 | 0.7164 |

*Statistically significant

Multiple $r = 0.4852$; $r^2 = 0.2355$; adjusted $r^2 = 0.05$; $SE = 2.63$; $F = 1.29$; $P \geq 0.05$

er to avoid inflammation or laceration to the nipple, particularly with children who had developed teeth. The scores of lactating mothers ($n = 84$) on breastfeeding knowledge and practices were 17 good (20.2%), 47 fair (56.0%) and 20 poor (23.8%).

Mother's education was the only significant predictive variable of higher breastfeeding knowledge and practice score ($P < 0.05$) (Table 6). Of the socioeconomic variables studied, previous and current experience of breastfeeding and the number of health education sessions attended by the mother accounted for 5% (adjusted r^2) of the variance in knowledge score ($F = 1.29$, $P > 0.05$).

Increasing age of mother and previous experience with exclusive breastfeeding were the only predictive variables for exclusive breastfeeding of the current child ($P < 0.05$) (Table 7). Mother's knowledge

of the benefits of breastfeeding, number of health education sessions, mother's education, employment status and satisfaction with the programme and extended family type did not predict exclusive breastfeeding. The present study found that 12/37 children (32.4%) who were exclusively breastfed and 36/63 children (57.1%) who were on artificial milk formula only or on mixed feeding were given artificial milk formula at the hospital before the mother began breastfeeding. Although there was significant association between giving the child artificial milk formula at the hospital before breastfeeding (prelacteal) and the subsequent continuous giving of artificial milk formula to the child by the mother ($\chi^2 = 5.70$, $P = 0.017$), this factor in multivariate analysis did not significantly predict the type of infant feeding later ($P > 0.05$).

Table 7 Logistic regression analysis of the practice of exclusive breastfeeding on selected independent variables

| Independent variable | Partial regression coefficient, β | P-value | Adjusted odds ratio |
|---|---|---------|---------------------|
| Mother's age | -0.21 | 0.0182 | 0.81* |
| Mother's education | 0.19 | 0.6048 | 1.21 |
| Father's education | -0.36 | 0.3682 | 0.70 |
| Mother's employment | 0.67 | 0.5534 | 1.96 |
| Mother's satisfaction | 0.44 | 0.7483 | 1.55 |
| Family size | 0.30 | 0.2089 | 1.35 |
| Family type (nuclear/extended) | 0.43 | 0.7007 | 1.54 |
| Number of visits | -0.35 | 0.6543 | 0.70 |
| Previous experience of exclusive breastfeeding | 1.77 | 0.0116 | 5.85* |
| History of giving the child artificial milk before onset of breastfeeding in the hospital | 1.16 | 0.0927 | 3.18 |
| Maternal knowledge of benefits of breastfeeding to the child | 0.46 | 0.1922 | 1.59 |
| Maternal knowledge of benefits of breastfeeding to the mother | 0.38 | 0.4869 | 0.68 |

*Significant at the 5% level

The effect of the programme on maternal nutrition and child-spacing is given in Table 8. Approximately 80% of lactating mothers had well balanced or fairly balanced diets and were drinking one or more cups of milk per day. Child-spacing was ≤ 12 months for 47% of mothers and 26% were using contraceptive methods.

Discussion

Most mothers in the study (91%) expressed their satisfaction with the programme. This could indicate appropriateness and acceptability of the methods and tools used for health education in the programme. Methods were based on the guidelines of the WHO/UNICEF training

programme for breastfeeding [12]. Counselling approach skills including listening to mothers, identifying their health needs and those of their children, supporting them and educating them using simple health education messages and pictures were the core methods and tools of the programme.

Most of the resources for providing the child health care programme in accordance with the quality assurance protocol [3] were available with the exception of two distinct shortcomings. The lack of Arabic-speaking nurses was a cultural and linguistic barrier to providing health education to mothers. This problem will remain an ongoing national concern as most of the nurses in Saudi Arabia are expatriates who are

Table 8 Effect of child health programme on maternal nutrition and child-spacing

| Variable | No. | % |
|---|-----|------|
| <i>Dietary regimen of lactating mothers (n = 84)</i> | | |
| Well balanced | 23 | 27.4 |
| Fairly balanced | 43 | 51.2 |
| Poorly balanced | 18 | 21.4 |
| <i>Daily amount of milk intake of lactating mothers (cups) (n = 84)</i> | | |
| 0 | 15 | 17.9 |
| 1 | 42 | 50.0 |
| ≥ 2 | 27 | 32.1 |
| <i>Child-spacing period (months) (n = 100)*</i> | | |
| ≤ 12 | 46 | 46.0 |
| 13-24 | 24 | 24.0 |
| ≥ 25 | 30 | 30.0 |
| <i>Mothers using contraception (n = 100)</i> | | |
| Yes | 26 | 26.0 |
| No | 74 | 74.0 |

*Child-spacing period = number of months pregnancy-free between the birth of the previous child and start of pregnancy of the current child

recruited primarily from India or the Philippines.

The second shortcoming was the frequent unavailability of stocks of the parent-held child health records. These records were designed to empower parents by giving them more detailed information about the growth and development of their children as well as some health education advice. They contained structured items for recording detailed information about the developmental assessment and the physical examination of the child at various ages which were not included in the child health record kept in the PHC centre. This led to the frequent omission by PHC physicians of developmental assessments of the chil-

dren and of complete physical examinations of children to detect congenital abnormalities. Anthropometric measurements of the children however had usually been performed and recorded in the PHC centre child health records because these records included those items.

The immunization status of the children was comparable to national figures [4] and their developmental assessment showed patterns similar to other studies in which speech and language disorders were the most common developmental disorders among children [10].

The profile of mothers attending the well-baby clinic with their children was typical. They were primarily young mothers with low illiteracy rates (19%) living in nuclear families in an urban community at the centre of Abha City and making excellent use of the available health care facilities as demonstrated by the high rate of hospital deliveries (99%). A community-based national survey study of breastfeeding in Saudi Arabia [8] reported an average illiteracy rate among a representative sample of urban and rural mothers to be 50%, while an illiteracy rate of 78.9% was reported by another study in rural areas of the southwestern region of Saudi Arabia [13]. This variation in illiteracy rate reflects the varying speed of socioeconomic transition in different Saudi communities.

Declining rates of breastfeeding, particularly in urban communities undergoing rapid socioeconomic transition, have been documented in several reports [7,17,18]. The mean duration of breastfeeding in the present study of 10.6 ± 6.9 months was lower than the 14.2 ± 2.5 months reported for all rural areas of Saudi Arabia but higher than the 9.5 months reported for all urban areas of Saudi Arabia [8], the 10 months reported in Tunisia [14] and much higher than the 5.1 months reported in the

USA [15]. The rate of exclusive breastfeeding at any age of the child (37%) found in the present study was lower than the rate reported by another study conducted in rural areas (50.7%) [16] but higher than rates reported by other community-based studies in urban Saudi Arabia (21.5%, 31.3%) [7,16], Kuwait (26.1%) [17] and Libyan Arab Jamahiriya where exclusive breastfeeding after the age of 3 months was continued for less than 30% of children [18].

We found that many mothers had incorrect beliefs and practices regarding breastfeeding which might affect the proper flow of breast milk and might lead to insufficient breast milk production. The latter is the most common reason reported by mothers for introducing artificial milk formula to their children [8]. Of the socioeconomic variables studied, previous and current experience of breastfeeding and the number of health education sessions attended accounted for 5% of the variance in breastfeeding knowledge score, which indicates that other unstudied variables might play roles in this aspect. Mother's education was the only independent variable which predicted a higher breastfeeding knowledge score; however, this variable did not have a significant predictive effect on the behaviour of the mother regarding the practice of exclusive breastfeeding of the child. This is in contrast to studies which found that education of the mother had a negative effect on the practice of breastfeeding, i.e. the higher the education level of the mother, the less likely she was to breastfeed her child and the more likely she was to breastfeed for a shorter period [7,8,17].

This difference might be attributed to three possible causes. Health education programmes implemented in our practice may be changing negative attitudes and practices of educated mothers towards breastfeeding. Adjustments for variables

that affect the practice of breastfeeding might be lacking in some of the studies in which only univariate analyses were conducted. Finally the larger sample size and frame of these studies may also account for this difference [7,8,17].

The only independent factors that predicted the practice of exclusive breastfeeding at any age of the child were mother's increasing age and previous experience with breastfeeding. Mother's knowledge of the benefits of breastfeeding, mother's education, employment, type of family (nuclear or extended) and history of giving the child artificial milk formula in the hospital before starting breastfeeding (prelacteal) were not found to predict exclusive breastfeeding of the child. This might reflect that the attitude and beliefs of the mother towards breastfeeding was the main contributing factor towards abandoning artificial milk formula by the mothers. These findings agree with compliance studies that indicated that socioeconomic factors and knowledge played minor roles in the adherence of the subjects to advice given by the health care team [19].

The impact of the programme on child-spacing was less satisfactory. Only 26% of the mothers with children under age 2 were using effective contraceptive methods (including pills and intrauterine devices and excluding traditional methods such as menstruation, withdrawal and breastfeeding) and approximately half had a child-spacing period of ≤ 12 months between the birth of the previous child and the onset of pregnancy of the current child. Other community-based studies in Saudi Arabia have found the use of effective contraceptive methods among married women to be 21% in the Riyadh region [20] and 70% in the Eastern Region [21]. The difference in the use of effective contraceptive methods in the present study in comparison with that

in the cited studies may be attributed to differences in the socioeconomic characteristics of the women studied and cultural differences in the habits, traditions and beliefs in the various Saudi communities, as well as to differences in the type and the impact of the health programmes implemented in these regions.

The effect of the programme on maternal nutrition was satisfactory. More than 75% of the lactating mothers had well or fairly balanced diets and they were drinking at least one cup of milk daily.

Conclusions

The child health care programme implemented at Shamasan PHC centre was

found to have satisfactory structure and process of care. Mothers were satisfied with the care and maternal nutrition during the lactation period was positively affected. The impact of the programme was less satisfactory on the rate of exclusive breastfeeding and child-spacing. Mothers' knowledge and practice of breastfeeding showed several shortcomings. Increasing age of the mother and previous experience with exclusive breastfeeding were the only predictive variables for exclusive breastfeeding of the current child. Further studies are needed to investigate the impact of alternative strategies and programmes to promote breastfeeding and child-spacing practices for women attending PHC centres.

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