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The knowledge of staff in day nurseries about some basic measures which promote child health

Suzy S. Cavalcante
Federal University of Bahia, Salvador, Brazil
Maria Clotildes Nunes de Melo
Federal University of Bahia, Salvador, Brazil, and
Federal University of São Paulo, São Paulo, Brazil and
Nadya Bustani Carneiro and Luciana Rodrigues Silva
Federal University of Bahia, Salvador, Brazil

Abstract

Purpose – This paper aims to determine the knowledge that staff in day nurseries in Brazil had of basic measures to promote child health which are connected with high child mortality. These measures included breastfeeding, oral rehydration therapy, child growth follow-up, immunization and the identification of signs that indicate that the child must be referred to a health facility.

Design/methodology/approach – A cross-sectional study was performed in day nurseries in the state of Bahia, Brazil, involving 194 care staff from 77 different establishments. Questionnaires, the observation of practical exercises and documentary evidence were used to assess knowledge.

Findings – Seventeen percent of professionals were able to use growth charts correctly, 37.1 percent were able to prepare an oral rehydration solution adequately, 77.8 percent were able to provide appropriate breastfeeding counseling, 65.0 percent were able to identify children who showed respiratory danger signs and refer them to a health facility, and 58.5 percent were able to check the immunization status. This suggests a serious lack of basic knowledge in key areas.

Research limitations/implications – The losses observed in the beginning of the study and the possibility of the existence of memory bias related to the verbal information obtained might have influenced the results.

Practical implications – These findings suggest that there is an urgent need to address the lack of knowledge about basic child health measures shown by these key workers through appropriate educational programs.

Originality/value – This is one of the first studies of levels of knowledge about basic child health measures in professionals who work outside the medical profession, and in particular in day nurseries. It also provides valuable information about health knowledge in a developing country.

Keywords Children (age groups), Child welfare, Health education, Day nurseries

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Introduction

It has become common practice in many communities to leave children in day nurseries while their mothers work. It is reasonable to suggest that professionals who work with

these children should have a minimum knowledge of how to deal with common situations involving child health care.

High child death rates observed in developing countries have been assigned, in more than half of cases, to preventable conditions (Black *et al.*, 2003; United Nations Children's Fund, 2002). Given the low budgets available for health care in developing countries, it is particularly important that strategies aiming at the improvement of health conditions should be effective and have a low cost for low-income populations. This is especially true in those regions where pneumonia and diarrhoea are among the most frequent causes of death among children under five years of age, and where malnutrition is a risk factor which is indicated in a substantial proportion of all children deaths (World Health Organization, 2002).

It would seem desirable that staff who work in day nurseries in developing countries should be able to identify which signs will indicate that a child should be immediately referred to a health facility, so that they can act not only in a preventive way, but also by implementing the most common therapeutic measures. This might include having knowledge of simple measures related to child health care, such as vaccinations, oral rehydration therapy and breastfeeding – all of which have already been shown to be effective in decreasing child death rates (World Health Organization, 1998). Exclusive breastfeeding for at least six months is still one of the simplest and most effective ways of protection against infections (Kramer *et al.*, 2001) and malnutrition, the underlying cause of a substantial proportion of all child deaths worldwide – a number of children end up being weaned early, especially because of lack of maternal knowledge. It is therefore important that carers understand these basic health issues. Carers could also be reasonably expected to have the knowledge and skills to check children's immunization status routinely, to prepare and administer oral rehydration solutions to children with diarrhea, and to provide appropriate nutrition and breastfeeding counseling.

In Brazil, day nursery monitors take care of children while their parents work. In the morning, parents drop their children off at the nursery, inform the carers how their children spent the night and state their needs for the whole day. They pick them up in the evening, and are notified about what has happened throughout the day. The carers play a role as babysitters as well as bathing the children, cooking for and feeding them, and also providing entertainment. They are supervised by coordinators who are able to help them in performing their daily tasks. The children spend the whole day in the care of the nursery staff.

This study aims to assess the knowledge that monitors in day nurseries have of five basic measures that promote child health and which are connected with reduction in child morbidity:

(1) Breastfeeding.

(2) Oral rehydration therapy.

(3) Child growth follow-up.

(4) Immunization.

(5) Identification of signs that indicate the need to refer the child to a health facility.

There are educational health interventions which have been shown to be both cost-effective and feasible (World Health Organization, 2001), and such information

could help to inform health education programs directed at the needs of this specific segment of the population.

Methodology

Design and population of the study

This cross-sectional study was conducted in day care centers identified by governmental records in the state of Bahia, Brazil. A total of 126 centers were invited to participate in the study. A total of 77 per cent (97 centers) agreed to participate. Only people working for a at least month in each center – considered to be the minimum amount of time required to learn the details of specific occupations – were included. A total of 277 day care workers were then eligible to participate in the study. Seventy percent of the total agreed: 83 individuals refused to participate, and so 194 took part. Participation in the study was voluntary and confidentiality was guaranteed.

Tools

A combination of theoretical and practical assessments was required to address the knowledge of the participants.

Assessment of theoretical knowledge. Each respondent filled in a comprehensive questionnaire containing information about demographics (age, gender, city of origin) and socio-economic attributes, including education, type of tie with the center (employee or voluntary), and length of service. The questionnaires were also the instruments used for identifying the knowledge that the caretakers have of child health. Concerning diarrhoea, information about its associated factors and preventive measures were recorded; for child growth, information about different ways of monitoring was recorded; with regard to vaccination, information was recorded about the knowledge of the schedule adopted in the country and of the recognition of infectious diseases that can be prevented by vaccination. Knowledge related to child nutrition was identified through examining participants' views about the advantages of exclusive breastfeeding and the causes they considered responsible for early weaning (before four to six months of age). Counseling on child feeding, including early and exclusive breastfeeding for up to six months and appropriate complementary feeding for between six and 24 months, were further subjects of the questions. Respondents were also asked whether they could identify whether participants were able to recognize signs of danger associated with acute respiratory diseases and the need to seek help at a health facility.

Practical assessment of knowledge. Practical exercises attempted to examine three measures considered essential in child health care:

(1) The preparation of oral rehydration solution (ORS).

(2) Checking the "Child's Card" for immunization status.

(3) The evaluation of physical status of an individual using growth standards.

In the first case, participants were asked to prepare the ORS under the observation of two qualified evaluators. The following conducts were considered acceptable:

- washing hands before handling the different materials;
- correct measuring of the water volume to be used in preparing the solution (one liter);

- addition of standard commercial oral rehydration salts; and
- use of a clean, covered container.

The practical assessment of knowledge related to immunization and growth was assessed by examining how the monitors completed the "Child's Card", an official document used in the country to accompany the vaccine schedule and monitor child growth (Ministério da Saúde, 2004). Each participant was asked to check one Child's Card for immunization status, reading and interpreting the information it contained.

Likewise, they were invited to assess the physical status of a child by comparing its weight measurement with the weight-for-age reference data included in the Child's Card (National Center for Health Statistics, 1977). For the reporting of weight-for-age relative to the reference the percentile system was used, indicating the position of the child on the given growth standard distribution. The following conducts were considered acceptable:

- recognition of incomplete items in the vaccination schedule of the child;
- correct transcription of the weight measurement for the Child's Card; and
- identification of deficiency in child weight (defined as an anthropometric value below the 2.3rd percentile relative to the reference mean).

Finally, some questions were included to identify the sources of information used by the monitors and the frequency with which they went on qualification courses related to child health.

Training course

As soon as the assessment stages were concluded, the researchers developed a training course aiming at improving day care workers' knowledge and skills. Facilitators and skilled instructors helped participants to learn about the effective management of children in day care nurseries, emphasizing the prevention of diseases, in a six-hour long course with combined classroom work and hands-on experience.

Data processing

Most questions in the questionnaire and observations about practical activities had coded responses. The coding was done under the supervision of a statistical professional. The data were double entered into a computer and the statistical analysis was done using the EpiInfo software (version 6.04).

Analysis and statistics

Descriptive statistics were used to explore the data. The corrected Yates's chi-square test was used to assess the statistic significance of the difference between proportions. Specific prevalences were calculated as the number of individuals with some knowledge of child health promotion per 100 monitors. The aim was to discover whether there was a correlation between the length of service of the individual in the day nursery and their knowledge of child health, through the calculation of the prevalences reason (PR) and 95 percent confidence intervals (95 percent CI). The statistical significance of the differences between the association measurements was tested using Pearson's chi-square test. p-Values < 0.05 were considered significant.

Results

Table I shows the demographic breakdown for the group. The sample had an average age of 32 years (ranging from 16 to 65 years), with most falling into the 25-35 years age bracket (40.7 percent). A total of 189 (97.4 percent) were female. Eighteen female teenagers were working at the nurseries included in the study. One third of the population of the survey (31.4 percent) worked as volunteers.

A total of 57 (29.4 percent) participants came from day nurseries in Salvador (the state capital of Bahia). There were few differences in demographic aspects between the workers who came from the city and those who came from the country: there was a greater proportion of males aged 35 or below and volunteers were more frequent among those who came from the capital (Table I) – only differences in education were statistically significant ($p = 0.001$).

Of the 194 participants, 77.8 percent said they provided breastfeeding counseling to mothers attending the nurseries, 65 percent were able to identify children exhibiting respiratory danger signs and claimed they would refer the child to a health facility, and 58.4 percent had some knowledge of the vaccine schedule. In the practical assessment, 37.1 percent of the professionals participating in the study washed their hands, correctly measured the volume of water for preparing the oral rehydration solution (one liter), correctly homogenized the salts and used a clean and covered container. Seventeen percent of the participants were able to assess the physical status of the children, comparing weight measurements with the reference population (Table II).

The prevalence of individuals who were able to prepare the ORS was almost three times greater among monitors who had been working in the centers for more than two

Characteristics	Capital[a] ($n = 57$)	Country[a] ($n = 137$)	p value[b]
Age groups (years)			
≤35	70.2	65.7	0.545
>35	29.8	34.3	
Gender			
Male	3.5	2.2	0.975
Female	96.5	97.8	
Education (years)			
Illiterate or <5	26.3	47.4	0.001
5-8	22.8	29.2	
9-11	43.9	21.9	
>11	7.0	1.5	
Type of tie held with the center			
Employee	59.6	72.2	0.085
Voluntary	40.4	27.8	
Length of service (years)			
≤2	66.7	70.0	0.640
>2	33.3	30.0	

Notes: [a]Figures given are percentages; [b]the corrected Yates' chi-square test was used to compare proportions

Table I.
Descriptive characteristics of 194 participants by place of origin

Measures	P[a]	Length of service >2 years[b] ($n = 60$)	Length of service ≤2 years ($n = 134$)	PR[c]	CI[d]	p value[e]
Provide breastfeeding counseling	77.8	83.3	75.4	1.1	1.0-1.3	0.217
Recognize danger signs and necessity to seek care	65.0	90.0	53.7	1.7	1.4-2.0	<0.001
Check the immunization status	63.4	80.0	56.0	1.4	1.2-1.7	0.001
Prepare oral re-hydration solution adequately	37.1	66.7	23.9	2.8	2.0-4.0	<0.001
Monitor infantile growth	17.0	25.0	13.4	1.9	1.0-3.4	0.047

Notes: [a]Prevalence: number of individuals able to promote child health per 100 caretakers; [b]figures given are percentages; [c]prevalence ratio; [d]95 per cent confidence interval; [e]value equivalent to the result of Pearson's chi-square test

Table II.
Prevalence of knowledge related to appropriate measures for promoting child health

years (PR = 2.8; 95 percent CI 2.0-4.0) than among those who had been recently hired. Greater length of service was also associated with a greater capacity to recognize the signs which indicate the immediate need to refer a child to a health facility (PR = 1.7; CI 1.4-2.0) and of identifying their immunization status (PR = 1.4; CI 1.2-1.7). This group, when compared to the other monitors, also had better awareness of the need to monitor a child's nutritional status, although this difference was not statistically significant.

A total of 81 percent were able to identify factors associated with infectious acute diarrhea. A total of 56 percent identified contaminated water and food, 48.5 percent identified the presence of open sewer near their residence, and 30.9 percent identified a lack sufficient access to water. A total of 95 individuals (49.0 percent) correctly mentioned appropriate measures of prevention, especially those related to hygiene matters (82.1 percent) and adequate cooking of food (33.7 percent).

A total of 28 percent recognized that the frequent measurement of a child's weight and height is a useful way to monitor growth. The difference between the answers of day nursery professionals who worked in the capital and those who worked in the country was not statistically significant ($p = 0.962$). Those who had worked in day nurseries for less than two years were less able to monitor children's nutritional status (13.4 percent) than staff who had worked there for longer than two years (25.0 percent), although again the difference was not significant.

A total of 54 percent were unaware of the proper age for employing the triple vaccine (diphtheria-pertussis-tetanus, or DPT) and 52.0 percent were unaware of the Oral Polio Vaccine (OPV) administration schedule. Almost half (49.4 percent) of the participants were able to check immunization status with regard to Bacillus Calmet-Guerion (BCG) and measles (45.4 percent), respectively, while 63.4 percent recognized infectious diseases that can be prevented by vaccination.

A total of 42 percent could correctly identify the advantages of exclusive breastfeeding for four to six months. The advantages were thought to be the nutritional value of breast milk (78.8 percent), the protection offered by breastfeeding against infections (23.2 percent) and the positive influence on the mother-child relationship (9.1 percent).

Medical personnel were the most frequent source of knowledge about breastfeeding (mentioned by 48.2 percent) and oral rehydration preparation training (mentioned by

49.0 percent). Such information appeared mainly to have been delivered in occasional events organized by individuals – only 12 (9.8 percent) said they had participated in training courses. No participants reported having been trained to identify the signs which indicate the need of urgent referral of the child to a health facility.

When comparing the ability to prepare oral rehydration solutions, recognize severe respiratory disease and identify childhood illnesses against which immunization is available, statistically significant differences were apparent between those who had worked at the day care center for two years or less and the group who had a greater length of service ($p < 0.001$).

Discussion

The results suggest that the knowledge of the five observed measures to promote child health was poor among these professionals.

In the introduction to this paper we outlined the reasons why staff who work in nurseries need basic health knowledge. There are further specific reasons why it is particularly important for staff in day nurseries to have sound knowledge about some of these issues, as some of risks involved are higher in day nurseries.

In the case of acute diarrhea infection, the risk of occurrence among children in day care centers is 2-3.5 times higher than that of children cared for at home (Barros and Lunet, 2003; Barros, 1999; de Castro *et al.*, 1994; Boerma *et al.*, 1991). Diarrhea can be prevented by good hygiene and sanitary practices, but when a child with diarrhoea becomes dehydrated, rapid and appropriate treatment is necessary.

Studies are also consistent in attributing a higher risk of lower respiratory tract infections or pneumonia to children attending day care centers (Koopman *et al.*, 2001; Hernández et al., 1999; Marbury *et al.*, 1997; Fonseca *et al.*, 1996; Victora *et al.*, 1994). Acute respiratory infection, chiefly pneumonia, is one of the most important causes of death in children younger than five years old, killing over two million children annually. Carers need to know how to recognize respiratory disease, referring the child to a health facility rapidly as soon as pneumonia is suspected.

The participation of day nurseries in the monitoring of the nutritional status of children could do much to promote child health. It was observed, however, that even individuals who had been working in day care centers for more than two years had some difficulty in reading growth charts. The lack of knowledge related to its use reflects not only the absence of specific training but also the non-inclusion of this simple measure in the routine of day nurseries. Furthermore, it is notable that in the day nurseries studied, there was a great rotation of monitors – 69.1 percent had been working for a period of time of two years or less. For child growth follow-up, the Child's Card does not include height standard curves. The absence of the curves for the graphical record of height in this instrument is possibly associated with the infrequent use of this anthropometric measurement for monitoring child growth in day nurseries, or at least in those that participated in this study.

Although not all the associations achieved statistic significance, it was observed that individuals working in the area for more than two years had better knowledge of child health promotion measures than those who had worked in the field for a shorter time. The short length of service of the individuals in the institution makes continued educational programs the most appropriate. There is considerable turnover of staff in

nurseries – 69.1 percent of respondents had been working for a period of time of two years or less.

Therefore, the study concludes that the knowledge that monitors have of the basic measures for the promotion of child health is precarious. It would appear that there is an urgent need for educational programs to improve the basic health knowledge of these frontline health workers.

Scope and limitations of the study

To our knowledge, this is the first piece of published research to examine knowledge of preventive actions to decrease child morbidity and death rate among staff in day care nurseries, and makes an important contribution to existing knowledge in this area.

The study has some limitations. All studies that use verbal information must deal with the limitations represented by memory bias. However, staff were asked about routine behaviours, which did not demand great effort in terms of memory.

Although there was some loss of respondents, the distribution according to gender, educational background and type of tie held with the institution was similar to the ones in the group studied. Information about the eligible individuals who did not participate in the study revealed that 98.2 percent of them were female, 42.3 percent presented an incomplete school degree and 31.7 percent maintained a voluntary tie with the institution. These characteristics were similar to those of the group studied ($p > 0.001$).

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