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VACCINATION STATUS OF CHILDREN FROM A PUBLIC DAY CARE CENTER IN RECIFE: A CROSS-SECTIONAL STUDY

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Mariana Martins Carvalho da Paixão[1], Ana Carolina Lustosa Nogueira[2], Sandra Trindade Low[3], Carlos Reinaldo Carneiro Marques[4], Maria Eduarda da Silva Bastos[5], Maria Benita Alves da Silva Spinelli[6], Maria Aparecida Beserra[7] and Maria Joana Pereira Neta[8]

ABSTRACT

Objective: To analyze the vaccination status of children enrolled in a public municipal day care center located in the city of Recife, Pernambuco. Method: This is a descriptive, cross-sectional study with a quantitative approach, based on the analysis of the files of children enrolled in a municipal daycare center in Recife, Pernambuco. The population of this study consisted of children aged 0 to 4 years enrolled in the institution. Data collection was carried out through the file of each child, filled out by the daycare center, at the time of enrollment. The data were tabulated in Microsoft Office Excel ® 2016 for record and coded in spreadsheets. Results: During the research, information was obtained from 143 children, which represents 87.1% of the total population, the other 21 children (12.9%) did not participate in the research due to lack of documentation. It was evident that 43.4% of the children were enrolled with the vaccination schedule in arrears. The immunobiologicals with the most delayed doses were: Yellow Fever (35.6%), Triple Bacterial (29.5%), Hepatitis A (28.8%) and Oral Poliomyelitis Vaccine (28.8%). Conclusion: It was noticed that, although

[1] Bachelor of Nursing from the University of Pernambuco
University of Pernambuco
ORCID: orcid.org/0009-0001-3160-7409
[2] Bachelor of Nursing from the University of Pernambuco
University of Pernambuco
ORCID: orcid.org/0009-0007-3422-4474
[3] Dr. in Pathology from São Paulo State University
University of Pernambuco
ORCID: orcid.org/0000-0001-7532-9888
[4] Master in Obstetrics and Gynecology from the University of Pernambuco
University of Pernambuco
ORCID: orcid.org/0009-0000-6829-1551
[5] Bachelor of Nursing from the University of Pernambuco
University of Pernambuco
ORCID: orcid.org/0000-0001-6254-4036
[6] Master in Maternal and Child Health from IMIP
University of Pernambuco
ORCID: orcid.org/0000-0003-4052-7950
[7] Dr. in Science, School of Nursing, USP in Ribeirão Preto
University of Pernambuco
ORCID: orcid.org/0000-0002-5315-5589
[8] Master's degree in Adolescent Adolescence from the Faculty of Dentistry of Pernambuco
University of Pernambuco
ORCID: orcid.org/0000-0001-7545-2966

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necessary, many children have pending vaccination schedule. It is essential that there be a more effective monitoring of the child's card by health professionals, and training to help the effectiveness of this action by the teachers of daycare centers-schools. In this way, contributing with data that evidence the goals presented in the National Immunization Program.

Keywords: Vaccination coverage, Vaccination, Child development, Child health, Day care centers.

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INTRODUCTION

The Sustainable Development Goals, which deal with Health and Well-Being, need, by 2030, to ensure a healthy life and promote well-being for all, at all ages (Brasil, 2021). However, the quality of services provided through Primary Health Care is still one of the great challenges of the Brazilian Unified Health System with regard to the promotion, prevention and recovery of the health of children under 2 years of age. In order to guarantee full access for the specified group, it is necessary to ensure the monitoring of the child's growth and development on a periodic basis, for early detection of possible health problems, in addition to the preservation of child health (Hirano et al., 2023).

Thus, primary care aims to promote actions aimed at improving health indicators and quality of life, resulting in the minimization of perceived inequities in the care provided. In view of this, it works in health promotion, prevention of diseases and injuries, early diagnosis and timely treatment, in addition to offering continued care and providing health education to the population. This contributes significantly to the indicators, and, considering the child's health, cooperates with the reduction of infant morbidity and mortality (Campos et al., 2024).

Thus, child health is incorporated into primary care through the National Policy for Comprehensive Child Health Care. In view of this policy, the relevance that immunization has in relation to the priority care components is highlighted, since it provides the prevention and protection of child health, resulting in the control and eradication of vaccine-preventable diseases (Silva et al., 2024).

Thus, vaccination is a priority, effective and strategic action of primary care. Currently, Brazil is one of the countries that offer the largest number of vaccines free of charge, thanks to the National Immunization Program. This program brought essential achievements for the improvement of the country's epidemiological and social conditions, including the eradication and intense reduction in the incidence of some diseases, such as poliomyelitis and pneumococcal meningitis, respectively (Marinho et al., 2023).

Although Brazil offers the largest free immunization program, some regions of the country have low vaccination coverage, which may lead to the return of diseases that have been eradicated and/or controlled. Furthermore, the reasons for low coverage are multifactorial, and may be linked to misinformation and/or lack of interest of users, as well as the growing dissemination of *fake news*, (Dell'Antonio, S. et al, 2024) which weakens the confidence of parents and/or caregivers in the vaccination program (Lachtim et al., 2023).

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Based on the current scenario and the various social changes linked to it, including the greater insertion of women in the labor market, there was a need to organize places for the care of babies and children while their parents and/or caregivers worked, which led to the emergence of daycare centers. However, the concentration of children in the same space results in the circulation of pathogens responsible for diseases such as pneumonia and diarrhea (Fonseca Neto et al., 2020).

In view of this, the State of Pernambuco brings Law No. 13,770/2009, which provides for the mandatory presentation of the child's vaccination card for the purposes of registration, enrollment and renewal of students in public or private educational establishments, in addition to granting a period of 06 months for vaccination update (Alepe, 2009). However, it is worth noting that making a critical interpretation of the vaccination schedule often does not contemplate the list of actions of the professionals working in the daycare center. As a result, the identification of possible delays in the immunization schedule is impaired, resulting in an increase in the child's vulnerability, simultaneously with the increase in the risk for the development of vaccine-preventable diseases and their dissemination.

In view of the above, the present study aims to analyze the vaccination status of children enrolled in a public municipal daycare center, located in the city of Recife, Pernambuco.

METHODOLOGY

STUDY DESIGN

This is a descriptive, cross-sectional study with a quantitative approach, developed from the analysis of files of children enrolled in an early childhood education institution.

CONTEXT

This study was developed in a municipal daycare school, located in the municipality of Recife, Pernambuco, which, during the months of April to July 2023, had the enrollment of 164 children who remained in the institution full-time.

STUDY PARTICIPANTS

The population of this study consisted of children aged 0 to 4 years enrolled in the institution. The sample elements were 143 enrollment forms filed at the daycare center,

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which contain the children's documentation. Among the documentation necessary for the confirmation of the children's enrollment, the school daycare centers requested a copy of the child's vaccination card, which contributed to the data collection.

Data collection was carried out from the search of the archived documents of each child, with no direct contact. Based on this, the vaccination status was evaluated, based on the immunobiologicals recommended by the Ministry of Health, correlating the immunization records with the child's age to obtain their vaccination status. All data were filed in an organized way, in the administrative room of the daycare center, which were received at the time of enrollment with delivery of documentation by the families.

STUDY VARIABLES

The data on the vaccination status of the children enrolled in the daycare center were described according to the sociodemographic characteristics of the children and immunobiological data found in the documents. The aggregates of sociodemographic variables were: sex (male, female) and age group (in years: 0-1 year; 1-2 years; 2-3 years; 3-4 years; >4 years). Regarding the aggregate of variables in the immunobiological data, the following variables were: Bacillus of Calmette and Guérin (BCG); Hepatitis B; Inactivated Poliomyelitis Vaccine (IPV) (2, 4 and 6 months); Pentavalent (2, 4 and 6 months); Pneumococcal (2, 4, 6 and 12 months); Rotavirus (2 and 4 months); Meningococcal C conjugate (3, 5 and 12 months); Influenza; Yellow fever (9 months and 4 years); Triple viral (12 and 15 months); Chickenpox (15 months); Tetraviral (12 and 15 months); Hepatitis A (15 months); Infant triple bacterial (15 months and 4 years); Oral Poliomyelitis Vaccine (OPV) (15 months and 4 years); and Covid-19.

STATISTICAL ANALYSIS

The data were transferred to an instrument of the researchers' own elaboration, then the information present in the data collection instrument was coded and stored in *Microsoft Excel* 2010 spreadsheets, then tabulated for descriptive statistical analysis.

ETHICAL ASPECTS

The research sought to meet the recommendations of Resolution 466/12 of the National Health Council/Ministry of Health, which deals with research carried out with human beings, in order to guarantee their anonymity, privacy, confidentiality, the right to

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withdraw at any time without any penalty, as well as to ensure the absence of burdens related to their participation. Data collection occurred only after approval by the Human Research Ethics Committee of the Amaury de Medeiros Integral University Health Center of the Hospital Complex of the University of Pernambuco; with the Certificate of Presentation of Ethical Appreciation: 67666923.4.0000.5191 and Opinion Number: 5.990.316.

RESULTS

The data were organized in graphs and tables, which were described with the distribution of the sociodemographic characteristics of the children and immunobiological data found in the documents. Of the total of 164 children enrolled, 21 had pending vaccination records and were excluded from the survey, resulting in a population of 143 students.

Regarding the sociodemographic data of the population studied, Table 1 shows that of the total of 143 children who had their documents evaluated, 69 were female, which represents 48.3% of the total, and 74 were male, which is 51.7%. Regarding age, the age group with the highest number was 3 to 4 years old, with a total of 40 students, followed by the age group from 2 to 3 years old, with 37 and those over 4 years old with 27 children, characterizing a profile where more than 70% of children have already reached 2 years of age.

Table 1. Distribution of sex, age, and vaccination status of children (n=143) enrolled in a public daycare center in the municipality of Recife, Pernambuco, Brazil, 2023.

Variables	N	%
Biological sex		
Female	69	48,3%
Male	74	51,7%
Age		
0 - 1 year	16	11,2%
1 - 2 years	23	16,1%
2 - 3 years	37	25,9%
3 - 4 years	40	28,0%
> 4 years	27	18,9%
Vaccination status		
Up-to-date	81	56,6%
Outdated	62	43,4%

Source: Authors, 2023.

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Also according to Table 1, on the date of enrollment, when delivering the necessary documents to the educational institution, 62 children were counted in vaccination arrears (43.4%), while 81 (56.6%) had their immunobiologicals up to date. Of these 62 children in vaccination delay, there was parity between the biological sexes.

Regarding the vaccines presented on the child's card at the time of enrollment, Table 2 stands out, which presents the distribution of immunobiologicals present in the documentation of the enrolled children.

Table 2. Distribution of Immunobiologicals present in the card of the child enrolled in a public daycare center in the municipality of Recife, Pernambuco, Brazil, 2023.

Variables	on	%
BCGb (at birth)	142	99,3%
Hepatitis B (at birth)	142	99,3%
VIP c (2 months)	139	97,2%
Pentavalent (2 months)	138	96,5%
Pneumococcal (2 months)	138	96,5%
Rotavirus (2 months)	135	94,4%
Meningococcal (3 months)	133	93,0%
VIP cv (4 months)	123	86,0%
Pentavalent (4 months)	121	84,6%
Pneumococcal (4 months)	122	85,3%
Rotavirus (4 months)	118	82,5%
Meningococcal (5 months)	117	81,8%
VIP c (6 months)	114	79,7%
Pentavalent (6 months)	112	78,3%
Influenza (+6 meses)	97	67,8%
Yellow Fever (9 months)	83	58,0%
Pneumococcal (12 months)	95	66,4%
Meningococcal (12 months)	98	68,5%
MMR (12 months)	100	69,9%
MMR (15 months)	90	62,9%
Chickenpox (15 months)	90	62,9%
Tetra viral (15 meses)	66	46,2%
Hepatitis A (15 months)	87	60,8%
Bacterial Triprice (15 months)	86	60,1%
VOPd (15 months)	87	60,8%
Yellow fever (4 years)	13	9,1%
VOPd (4 years)	15	10,5%
Triple bacterial (4 years)	15	10,5%
Covid-19	0	0%

Note: multiple choices; bBacillus of Calmette and Guérin, vaccine administered at birth; cInactivated Poliomyelitis Vaccine; dOral Poliomyelitis Vaccine.

Source: Authors, 2023.

Table 2 highlights that, with regard to the vaccines with greater adherence, the presence of vaccines referring to the first 3 months of the child's life is significantly noted, which are BCG, Hepatitis B, 1st dose of Pentavalent, 1st dose of IPV, 1st dose of Pneumococcal, 1st dose of Rotavirus and the 1st dose of Meningococcal C, which had adherence above 90%.

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In the case of Table 3, the distribution of immunobiologicals in vaccination arrears after the evaluation of the child's card is shown compared to the vaccination schedule recommended for the age group in question.

Table 3. Distribution of Immunobiologicals in vaccination arrears in relation to the child's vaccination schedule. Recife, Pernambuco, Brazil, 2023.

Variables	on	%
BCGb (at birth)	1	0,8%
Hepatitis B (at birth)	1	0,8%
VIP c (2 months)	2	1,5%
Pentavalent (2 months)	2	1,5%
Pneumococcal (2 months)	3	2,3%
Rotavirus (2 months)	6	4,5%
Meningococcal (3 months)	7	5,3%
VIP cv (4 months)	14	10,6%
Pentavalent (4 months)	16	12,1%
Pneumococcal (4 months)	15	11,4%
Rotavirus (4 months)	19	14,4%
Meningococcal (5 months)	20	15,2%
VIP c (6 months)	21	15,9%
Pentavalent (6 months)	23	17,4%
Influenza (+6 meses)	37	28,0%
Yellow Fever (9 months)	47	35,6%
Pneumococcal (12 months)	32	24,2%
Meningococcal (12 months)	30	22,7%
MMR (12 months)	28	21,2%
MMR (15 months)	35	26,5%
Chickenpox (15 months)	36	27,3%
Tetra viral (15 meses)	33	25,0%
Hepatitis A (15 months)	38	28,8%
Bacterial Triprice (15 months)	39	29,5%
VOPd (15 months)	38	28,8%
Yellow fever (4 years)	13	9,8%
VOPd (4 years)	12	9,1%
Triple bacterial (4 years)	13	9,8%
Covid-19	113	85,6%

Note: multiple choices; bBacillus of Calmette and Guérin, vaccine administered at birth; cInactivated Poliomyelitis Vaccine; dOral Poliomyelitis Vaccine.

Source: Authors, 2023.

Thus, Table 3 shows that the most neglected immunobiologicals in the basic calendar were: Yellow Fever (35.6%), MMR (29.5%), Hepatitis A (28.8%), OPV (28.8%) and Varicella (27.3%). In addition, 85.6% of the children did not present any document or card record regarding vaccination against COVID-19.

DISCUSSION

According to the data obtained, it was found that of the total of 143 children who had their documents evaluated, 43.4% were late in vaccination at the time of enrollment in the institution, which can be considered worrying if compared to the goals of the National

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Immunization Program. These provide 90% for BCG, Rotavirus, Human Papillomavirus, Covid-19 and Influenza vaccines; and 95% for the other vaccines indicated in the routine of the national vaccination calendar (SES-DF, 2023).

In view of this, it is noted that the expansion of vaccination coverage is one of the contemporary challenges for ensuring the health of the population. Thus, it can be seen that the lack of information and awareness of parents and/or caregivers is one of the main factors that contribute to low vaccination coverage, which leads to the incompleteness of the child's card (Araújo et al., 2024). In this way, children become more susceptible to serious diseases, which could be prevented with adequate immunization coverage.

In the present study, it was observed that among the most neglected immunobiologicals were Yellow Fever (35.6%), MMR (29.5%), Hepatitis A (28.8%), and OPV (28.8%), while the immunobiological that obtained the highest adherence rate was to the BCG and Hepatitis B vaccines. In their studies, Oliveira and Silva (2023) found that the BCG vaccine usually remains within the goals stipulated by the immunization program, however, vaccines such as Yellow Fever have low vaccination coverage, which may justify the data presented in this study.

Based on studies evidenced in the literature, low adherence to vaccination in the country was already considered a problem before Covid-19 (Melo, 2023). However, during the pandemic this action was enhanced, especially due to *fake news*. In addition, the lack of knowledge of parents and/or guardians on the subject is highlighted, who, many times, when resorting to the information vehicles, were afraid to allow the immunization of their children.

In view of this, it is essential that health professionals, especially those linked to primary care, try to understand the reasons that led to non-compliance with the vaccination update, in order to develop strategies that facilitate the coverage process. In this way, health education becomes a great ally, especially when carried out by the media, not only during endemic diseases and epidemics, but as a form of constant awareness (Zeber et al., 2024).

Also, according to the literature, it is possible to see that the greater the number of doses in the vaccination schedule, the greater the chances of delays or incompleteness. It is assumed that parents and/or caregivers judge these subsequent doses to be less important and, therefore, dispensable, since single-dose vaccines are unlikely to fail to be administered (Costa et al., 2022). An example of this, observed in the present study,

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concerns the IPV, in its first dose, performed at 2 months of age, had 97.2% adherence, decreasing to 86% in its second dose and ending with 79.7% in the third dose.

In addition, one of the data that drew the most attention was the significant lack of adherence to immunization against Yellow Fever. Regarding the first dose of the immunobiological, performed at 9 months of age, non-adherence was 36.5%, referring to 47 children in the total sample, while in the second dose of the vaccine, the value was 9.8%, reinforcing attention to the negligence in relation to the booster dose of the immunobiological.

Yellow Fever is an endemic or enzootic disease in the tropical forests of Africa and Central and South America, with periodic outbreaks, whose magnitude is variable. In all, 47 countries, 13 of which are in Central and South America, are endemic or have endemic regions. It does not have a specific antiviral treatment, but immunization is the greatest ally in terms of control and prevention. Thus, based on satisfactory vaccination coverage, it is possible to minimize negative outcomes, blocking transmission by the vector (Lopes et al., 2023).

Another alarming point evidenced by the study was the lack of proof of vaccination against Covid-19, as 113 of the 143 children, referring to 85.6% of the total sample, did not have any document presented or recorded on the child's card. It is noteworthy that Covid-19 has led to a serious crisis in the various sectors of Brazilian society, especially in health, with an exacerbation in the scenario of vaccine abandonment. Thus, it was possible to observe a reduction in vaccination coverage and the fear, on the part of immunization programs, of the possible reappearance of vaccine-preventable diseases (Garcia; Pear tree; Sato, 2021).

According to the study by Garcia, Pereira and Sato (2021), some structuring elements may have determined this process, namely: the fear of parents and/or caregivers in relation to the transmission of the virus; the restrictions due to the *lockdown*; the changes in priorities to curb the transmission of Covid-19; the shortage of vaccines due to logistical issues in delivery; in addition to the suspension of some mass immunization actions.

In view of this, the indispensability of the Family Health Strategy is highlighted, which is linked to primary care, aiming to increase vaccination coverage, in addition to reducing infant morbidity and mortality. Thus, it is essential that parents and/or caregivers feel welcomed to strengthen the bond with health professionals, so it will be possible to capture their attention to promote health education, highlighting the importance of keeping the

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vaccination status updated on the child's card, in addition to emphasizing that vaccines are, in fact, safe and effective in protecting against vaccine-preventable diseases (Matos et al., 2022).

CONCLUSION

The National Immunization Program (PNI), created in 1973 - even before the creation, in 1988, of the Unified Health System (SUS), was decisive for the successful control of vaccine-preventable diseases in Brazil, thus, it is essential that there be a more effective monitoring of the child's card, not only by health professionals, but also by professionals working in the daycare centers-schools. In addition, it is necessary to know the importance of media outlets in the dissemination of relevant information, which aims to demystify erroneous ideas arising from the marked post-pandemic denialism.

Therefore, other studies should explore aspects that involve the investigation of structural and organizational factors that interfere with the achievement of desirable vaccination coverage, thus intending to recognize the actions that hinder the search for immunobiologicals by parents and/or caregivers, in addition to promoting strategies capable of dealing with this problem. In this way, the intention is to enable the greatest reach of childhood vaccination, contributing with data that highlights the goals presented in the immunization program.

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