# Assessment of the level of knowledge of community health workers about childhood vaccination

**Avaliação do nível de conhecimento dos agentes comunitários de saúde sobre a vacinação infantil**
**Evaluación del nivel de conocimientos de los agentes comunitarios de salud sobre la vacunación infantil**

**RESUMO**
**Objetivo:** Avaliação do nível de conhecimento dos Agentes Comunitários de Saúde sobre a vacinação infantil. **Método:** Estudo observacional, quantitativo, descritivo-analítico, do tipo transversal, realizada na zona urbana do município de Senhor do Bonfim, Bahia com participação de 93 agentes. **Resultado:** A maioria dos sujeitos pesquisados (75,3%) são mulheres, 40,2% possuem idade entre 41 e 50 anos, 89% se autodeclararam preta/parda, 70% possuem ensino médio completo/superior incompleto, pertencentes as classes sociais D/E (77,3%), no que se refere ao perfil profissional, 84,6% dos pesquisados atuam há mais de 11 anos na profissão e 88% fizeram curso introdutório para exercer a função. Dentre as variáveis analisadas, possuir curso introdutório foi a única variável que apresentou associação com conhecimento em vacinação. **Conclusão:** A formação dos agentes impacta nas coberturas vacinais infantil, portanto se faz necessário investimentos na política de educação permanente como estratégia para melhorar as coberturas de vacinação infantil.
**DESCRITORES:** Agente Comunitário de Saúde; Saúde Infantil; Vacinação.

**ABSTRACT**
**Objective:** Assessment of the level of knowledge of Community Health Agents about childhood vaccination **Method:** Observational, quantitative, descriptive-analytical, cross-sectional study, carried out in the urban area of the municipality of Senhor do Bonfim, Bahia with the participation of 93 agents. Result: The majority of the subjects surveyed (75.3%) were women, 40.2% were between 41 and 50 years old, 89% self-identified as Black/Mixed, 70% had completed high school/incomplete higher education, and belonged to social classes D/E (77.3%). Regarding the professional profile, 84.6% of those surveyed had worked in the profession for more than 11 years, and 88% took an introductory course to perform the role. Among the variables analyzed, having completed an introductory course was the only variable that showed an association with vaccination knowledge. **Conclusion:** The training of agents impacts childhood vaccination coverage, therefore, investments in continuing education policy are necessary as a strategy to improve childhood vaccination coverage.
**KEYWORD:** Community Health Worker; Child Health; Vaccination.

**RESUMEN**
Brasil invierte en medidas de control del cáncer de cuello uterino; sin embargo, esta neoplasia sigue siendo la cuarta causa principal de muerte por cáncer en mujeres en el país. **OBJETIVO:** Analizar los indicadores de calidad de las medidas de detección y control del cáncer de cuello uterino en la ciudad de Salvador. **MÉTODO:** Estudio ecológico con registros de resultados de pruebas, utilizando indicadores analizados mediante regresión de Poisson. **RESULTADOS:** De las pruebas analizadas, el 96,84 % presentó resultados satisfactorios, mientras que el 3,01 % fueron insatisfactorios. La representación de la zona de transformación fue inferior a la recomendada, siendo el único indicador que no alcanzó el objetivo establecido. **CONCLUSIÓN:** Los resultados revelaron que los indicadores de calidad cumplieron con las recomendaciones, excepto la representación de la zona de transformación. El grupo de edad influyó en los tipos de alteraciones, y la repetición de las pruebas fue un factor protector para la de-


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tección de la enfermedad.
**PALABRAS CLAVE:** Agente Comunitario de Salud; Salud Infantil; Vacunación.

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## INTRODUCTION

In Brazil, in 2016, there was a significant drop in vaccination coverage for children under one year of age for several reasons, including the lack of structure in vaccination rooms, difficulties in managing the new information system of the National Immunization Program (PNI), and difficulties with human resource management, supplies, and inputs to meet territorial demands [1].

In 2018, only the Bacillus Calmette-Guérin (BCG) vaccine achieved the 90% target among children under one year of age (95.87% coverage), while the other vaccines fell well below the target for the same age group. The other vaccines, such as the Rotavirus vaccine (88.12%, target 90%), Polio (86.58%, target 95%), and Yellow Fever (57.63%, target 95%), achieved results lower than in previous years (() (2) ()) .

In the same year, Bahia was among the states with low vaccination coverage, specifically in children under one year of age: BCG 81.66% (target 90%), Rotavirus 77.90% (target 90%), Polio 76.27% (target 95%), and Yellow Fever 67.44% (target 95%) (() (3) ()) .

Among the municipalities that have contributed to the low immunization indicators in the state of Bahia is Senhor do Bonfim, which has shown significant declines in relation to the national target for childhood vaccination. In 2018, for example, the municipality reported coverage for the age group in question of 43.43% for the pentavalent vaccine (target of 95%), 43.43% for hepatitis B (target of 95%), and 79.96% for yellow fever (target of 95%) (() (4) ()).

The low vaccination coverage observed in most Brazilian municipalities is considered an important public health problem, which is worrying, since this behavior compromises Brazil's PNI, which has always been considered an international benchmark for successful public policy (1) .

The success of the PNI includes the eradication of diseases such as smallpox and polio, as well as significantly reducing deaths from various vaccine-preventable diseases over decades. This is due to the decentralization of vaccination in Basic Health Units (UBS) throughout the country, guaranteeing citizens the right to free access to


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immunization services (() (2) ()) .

With the disappearance of such diseases and the rise of anti-vaccine groups around the world, many people today are unaware of the risk of illness resulting from anti-vaccination behaviors. The spread of false information has been instrumental in preventing the eradication of measles, which in 2019 affected 10,302 people and was responsible for 12 deaths in Brazil alone ((5-7)) .

Over the years, the PNI has brought about numerous advances, such as maintaining the eradication of polio, eliminating neonatal tetanus and measles, and controlling several vaccine-preventable diseases. However, concerns about low vaccination coverage raise alarm bells about the severity and magnitude of exposure to vaccine-preventable diseases, which not only children face, but also the entire population, given the risks of illness and death (() (8) ()) .

The non-vaccination of a single individual puts not only their own health at risk, but also the health of their family and community, enabling the circulation of infectious agents among the population. In this context, the act of "not vaccinating" is not only a public health problem, but also a social issue (8) .

Low vaccination coverage in Brazil presents a controversial scenario, since the decentralization of UBSs has facilitated access to health services, enabling vaccination throughout the country. It is important to highlight that despite the expansion of health services, acute health conditions are still prioritized over surveillance, prevention, and health promotion actions (() (6) ()) .

Considering Primary Health Care (PHC) as the organizer of care, which continuously provides health services to the population, childhood vaccination should be one of the priority health actions in the prevention of vaccine-preventable diseases, with the aim of avoiding child morbidity and mortality, even in the face of social adversities (9) .

In this context, Community Health Agents (CHAs), as professionals who act as a link between the health team and the community, play a fundamental and decisive role in the results of health actions ranging from educational activities to the active search for individuals with incomplete vaccination schedules (6) .

Therefore, this study aimed to assess the level of knowledge of Community Health Agents about childhood vaccination in a medium-sized municipality in the hinterland of Bahia.

## METHOD

This was a quantitative, descriptive-analytical, cross-sectional observational study. It is part of a larger study entitled "Influence of the work of Community Health Agents on vaccination coverage of children under one year of age."

The research was conducted in the urban area of the municipality of Senhor do Bonfim, located in the north of the state of Bahia, Brazil, 375 kilometers from the capital Salvador, with an estimated population in 2022 of 74,490 inhabitants and a Human Development Index (HDI) of 0.666 (10).

The municipality has a total of 23 Family Health Teams, distributed between urban and rural areas as follows: 15 ESF (Family Health Strategy) teams in urban areas, 8 health teams in rural areas (6 ESF and 2 primary care teams – formerly PACS), according to the National Register of Health Establishments (CNES) on August 5, 2021 (() (11) ()) .

The 15 ESF teams in the urban area together cover 122 areas, of which 9 are not covered by ACS for the following reasons: leave of absence; retirement; dismissal; death; areas that have experienced population growth, requiring territorial reorganization.

Therefore, in 2021, the municipality had 113 areas in the urban zone with active ACS. However, of the 113 ACS registered in the urban zone of the municipality, one ACS, despite being registered with the ESF of Alto da Maravilha, considered an urban zone team, serves a totally rural area linked to the urban health unit.

As a result, the surveyed population consisted of 112 ACS. The inclusion criteria adopted were: being active in the ACS role for at least six months and working in the urban area of the municipality. However, there were 19 losses after applying the eligibility criteria (five on vacation, five on leave from work, and nine who refused to participate in the survey), resulting in a final sample of 93 CHWs.

Data collection took place between August 2021 and January 2022.

To collect data from the CHWs (self-administered questionnaire), a meeting was held with each team, previously scheduled with the nurse responsible for the CHW team, to explain the research project and clarify any doubts, followed by scheduling the best day and time for the research team to return to the unit and administer the instrument at the health unit where they work.

On the scheduled day and time, all CHWs gathered in a separate room (at the UBS itself), where they received guidance on the study, details on the application of the questionnaire, which was filled out by the professionals themselves, and read and signed the Free and Informed Consent Form (TCLE).

Throughout the application of the instrument, the interviewer remained in the room to answer questions when requested by the CHWs, as well as to ensure that no professional consulted cell phones, tablets, physical materials, or their colleagues to obtain answers to the questionnaire.

In case of absence from the previously scheduled meeting, the absent CHWs were contacted to reschedule the date and time, according to the professional's availability, to complete the instrument under the supervision of the interviewer, with up to three attempts at scheduling on different days and times.

After this number of attempts, if unsuccessful, the professional was considered a loss. The self-administered questionnaire, completed by the CHWs, was developed based on a review of the literature on the characteristics of CHW work and immunization, consisting of four sections, totaling


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57 questions.

The Brazilian Economic Classification Criterion used in the study aimed to define social classes based on household budget surveys assessing the purchasing power of consumer groups based on asset ownership rather than household income.

The database was constructed and double-entered using Statistical Package for the Social Sciences (SPSS) software, version 22.0.0.0, which was also used for the analysis. After data entry, the simple frequencies of the variables were compared between the two databases, followed by correction of typing errors. From there, the descriptive analysis of the variables began, using simple and relative frequencies.

Next, the independent and dependent variables were established, following the following analysis model:

- Bivariate analysis – Initially performed using the chi-square/Fisher's exact test (considered an association when $p < 0.05$), odds ratio (OR), and confidence interval (95%).
- Adjusted analysis – Performed after the bivariate analysis, developed using Multiple Logistic Regression, with three analysis models calculated to then verify which one best fit the proposal of this study. Model 1 – All independent variables verified in the bivariate analysis and that could be related to the researched outcome were included in the regression model. Model 2 – Only variables whose p-value in the bivariate analysis was less than 0.25 were included in the adjusted analysis. Model 3 – Stepwise, from model 1, variables were selected one by one, based on the p-value.

To choose the model that best fit the present study, the lowest Akaike value was used, with Stepwise Multiple Logistic Regression being the best model for the adjusted analysis performed in this study.

The data were analyzed and organized into tables by sociodemographic variables, professional profile, and knowledge about vaccination.

Next, a group comparison analysis was performed to verify the factors associated with the outcome "CHW knowledge about vaccination," a variable developed based on the number of correct and incorrect answers to the 11 questions in section C (knowledge about vaccination) of the questionnaire completed by the CHWs.

This variable was categorized based on the median of the total number of correct answers to the 11 questions, with the following classification: CHWs who answered up to 8 questions correctly were classified as having "low knowledge about vaccination," and those who answered more than 8 questions correctly were considered to have "high knowledge about vaccination."

To verify the factors associated with CHW knowledge about vaccination, a bivariate and adjusted analysis was performed.

To comply with ethical aspects, this study followed the rules set out in Resolution 466/12 of the National Health Council, which regulates research involving human beings in Brazil.

Data collection only began after the project was approved by the Research Ethics Committee (CEP), included in the Brazil Platform (PB) of the National Health Council (CNS), with a substantiated opinion number: 4,629,968, approved on April 5, 2021.

## RESULTS

**Table 1 – Socio-demographic characteristics of Community Health Agents in the urban area of Senhor do Bonfim – BA, 2021-2022.**

| Socio-demographic variables | Frequency (N) | Percentage |
|---|---|---|
| Age (N=92) | | |
| ≤ 40 | 22 | 23,9 |
| 41 to 50 | 37 | 40,2 |
| ≥ 51 years | 33 | 35,9 |
| Gender (N=93) | | |
| Female | 70 | 75,3 |
| Male | 23 | 24,7 |
| Skin color (N=91) | | |
| Black/brown | 81 | 89,0 |
| Not black/brown(a) | 10 | 11,0 |
| Children (N=93) | | |
| Yes | 78 | 83,9 |
| No | 15 | 16,1 |
| Number of children (N=78) | | |

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| | | |
|---|---|---|
| 1 to 2 | 53 | 67,9 |
| 3 or more | 25 | 32,1 |
| Education (N=93) | | |
| Illiterate/Incomplete elementary education | 1 | 1,0 |
| Complete elementary school/incomplete secondary school | 2 | 2,0 |
| Complete elementary education/incomplete secondary education | 4 | 4,0 |
| High school complete/Incomplete higher education | 65 | 70,0 |
| Higher education | 21 | 23,0 |
| Years of schooling (N=79) | | |
| Up to 11 years | 16 | 20,3 |
| 12 or more | 63 | 79,7 |
| Technical course in health (N=92) | | |
| Yes | 35 | 38,0 |
| No | 57 | 62,0 |
| Which course (N=35) | | |
| Radiology technician | 2 | 5,7 |
| Nursing technician/assistant | 28 | 80,0 |
| Other | 5 | 14,3 |
| Social class (N=88)b | | |
| C | 20 | 22,7 |
| D/E | 68 | 77,3 |

aWhite and Asian/yellow 02 ACS. bAverage monthly income for classes A > 10 and ≤ 23 minimum wages, B > 3 and ≤ 10 minimum wages, C ≥ 1 and ≤ 3 minimum wages, D and E < 1 minimum wage. The minimum wage in Brazil at the time of the survey in 2021 was 1,100.00 reais

Among the 93 CHWs surveyed, 40.2% were between 41 and 50 years old, 75.3% were women, 89% self-identified as black/brown, 83.9% had children, and of these, 67.9% reported having between one and two children (Table 1).

Regarding education, 70% of CHWs had completed high school/incomplete higher education, and 79.7% reported twelve or more years of schooling. When asked if they had any technical training in health, only 38% said yes, and of these, 80% responded that they had technical training/nursing assistant training. In terms of social class, D/E prevailed (77.3%) (Table 1).

**Table 2 – Professional characteristics of Community Health Agents in the urban area of Senhor do Bonfim – BA, 2021-2022.**

| Professional variables | Frequency (N) | Percentage (%) |
|---|---|---|
| Length of service as CHW (N=91) | | |
| ≤ 10 years | 14 | 15,4 |
| 11 to 30 years | 77 | 84,6 |
| Introductory ACS course (N=92) | | |
| Yes | 81 | 88,0 |
| No | 11 | 12,0 |
| Length of service at current health facility (N=93) | | |
| ≤ 10 years | 35 | 37,6 |
| 11 to 30 years | 58 | 62,4 |
| Lives in the area of operation (N=93) | | |


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| | | |
|---|---|---|
| Yes | 77 | 82,8 |
| No | 16 | 17,2 |
| Number of people in the area of operation (N=93) | | |
| Up to 500 people | 67 | 72,0 |
| From 501 to 783 people | 26 | 28,0 |
| Engaged in other paid work besides ACS (N=88) | | |
| Yes | 10 | 11,4 |
| No | 78 | 88,6 |

ACS – Community Health Agent

Regarding professional profile, 84.6% of respondents have been working as CHWs for more than 11 years, 88% took an introductory course to perform the job, and 62.4% have been working at their current UBS for more than 11 years (Table 2).

Most (82.8%) live in the locality where they work, and 72% are responsible for up to 500 people in their work area. Regarding whether they have another paid job in addition to being a CHW, 88.6% said they do not have another job, and all stated that they work 40 hours per week in the FHS teams (Table 2).

**Table 1 - Knowledge of Community Health Agents about vaccination, Senhor do Bonfim, BA, 2021-2022.**

| Statements presented: | Acerto | Erro | Não sabe |
|---|---|---|---|
| | N (%) | N (%) | N (%) |
| Weighing, measuring, and evaluating the health records of children registered in the area are part of the monthly routine of the CHW. (V) | 92 (98,9) | 1 (1,1) | 0 |
| Encouraging compliance with the vaccination schedule and actively seeking out those who have missed vaccinations are among the main health actions of the ACS. (V) | 92 (98,9) | 1 (1,1) | 0 |
| It is part of the role of the ACS to identify knowledge, doubts, beliefs, myths, taboos, and prejudices about vaccines, encouraging reflection on the benefits to the health of the community. (V) | 90 (96,8) | 3 (3,2) | 0 |
| If the rotavirus vaccine is not available at the basic health unit, the child can wait until they are one year old without any harm to their health. (F) | 85 (91,4) | 4 (4,3) | 4 (4,3) |
| In influenza vaccination campaigns, children aged six months to under five years are not part of the priority group. (F) | 66 (71,7) | 25 (27,2) | 1 (1,1) |
| The yellow fever vaccine is administered in the ninth month of life, in a single dose. (T) | 66 (71,7) | 24 (26,1) | 2 (2,2) |
| During vaccination campaigns, CHWs notify those responsible for children in advance about vaccinations, so there is no need to work on the day of the campaign. (F) | 65 (69,9) | 26 (28,0) | 2 (2,2) |
| The pentavalent vaccine protects against the following diseases: diphtheria, tetanus, pertussis, meningitis caused by Haemophilus influenzae type b, and hepatitis B. (V) | 61 (65,6) | 24 (25,8) | 8 (8,6) |
| Children born weighing less than 2 kilograms should leave the maternity ward vaccinated with BCG (Bacillus Calmette-Guérin) to protect against tuberculosis. (F) | 49 (53,3) | 33 (35,9) | 10 (10,9) |
| The meningitis C vaccine is administered in the third and fifth months of life, meaning that two doses are sufficient to ensure protection without the need for a booster dose. (F) | 45 (48,4) | 33 (35,5) | 15 (16,1) |

Table 1 shows the level of knowledge of CHWs about vaccination. The majority (98.4%) agree that weighing and measuring children, in addition to assessing their vaccination cards, are part of the monthly routine of CHWs (Table 1).

For 96.8% of those surveyed, encouraging compliance with the vaccination schedule and actively seeking out those who have missed vaccinations are among the main health actions of CHWs. The same percentage of professionals (96.8%) believe that it is part of the CHW's role to identify knowledge, doubts, beliefs, myths, taboos, and prejudices about vaccines in order to encourage the population to reflect on their benefits (Table 1).

However, 58.1% of CHWs were incorrect or did not know that by the second month of life, children should have received one dose of Rotavirus, one dose of

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Pneumo10 valent, and one dose of Pentavalent (Table 1).

For 51.6% of CHWs, the meningitis C vaccine should be administered in the third and fifth months of life, with only two doses sufficient to ensure protection against the disease (Table 1). Of the 93 CHWs, 35.9% stated that children born weighing less than two kilograms should leave the maternity ward vaccinated against BCG (Table 1).

**Table 3 – Analysis of the relationship between the sociodemographic and work characteristics of CHWs and their knowledge about vaccination, Senhor do Bonfim – BA, 2021-2022.**

| Socio-demographic/professional variables | Total | Knowledge about vaccination | | OR (IC95%) | P |
|---|---|---|---|---|---|
| | N (%) | Baixo N (%) | Alto N (%) | | |
| Age (years) (N=89) | | | | | 0,78 |
| 18 to 40 | 21(23,6) | 11(23,0) | 10(25,0) | 1 | |
| 41 | 35(39,3) | 19(40,0) | 16(40,0) | 0,9 (0,27 – 3,15) | |
| 51 and over | 33(37,1) | 19(40,0) | 14(35,0) | 0,8 (0.23 - 2.80) | |
| Children (N=90) | | | | | 1 |
| No | 15 (16,7) | 8 (16,3) | 7 (17,1) | 1 | |
| Yes | 75 (83,3) | 41(83,7) | 34 (82,9) | 1,4 (0,26 – 3,41) | |
| Years studied (N=78) | | | | | 0,70 |
| ≤11 years | 16 (20,5) | 10 (23,3) | 6 (17,1) | 1 | |
| >11 years | 62 (79,5) | 33 (76,7) | 29 (82,9) | 0,1 (0,41 – 5,52) | |
| Social classa (N=85) | | | | | 0,77 |
| D/E | 67(78,8) | 36 (76,6) | 31 (81,6) | 1 | |
| C | 18 (21,2) | 11 (23,4) | 7 (18,4) | 0,1 (0,21 – 2,39) | |
| Technical course in health (N=89) | | | | | 0,92 |
| No | 55 (61,8) | 31 (63,3) | 24 (60,0) | 1 | |
| Yes | 34 (38,2) | 18 (36,7) | 16 (40,0) | 0,01 (0,44 – 2,95) | |
| Length of service as CHW (N=89) | | | | | 1 |
| ≤ 10 years | 14(15,7) | 8(16,7) | 6 (14,6) | 1 | |
| > 10 years | 75(84,3) | 40 (83,3) | 35 (85,4) | 3,8 (0,31 – 4,50) | |
| Introductory ACS course (N=89) | | | | | 0,33 |
| No | 11(12,4) | 4 (8,3) | 7 (17,1) | 1 | |
| Yes | 78 (87,6) | 44 (91,7) | 34 (82,9) | 0,4 (0,08 – 1,92) | |
| Meets with nurse monthly (N=90) | | | | | 0,13 |
| No | 62 (68,9) | 30 (61,2) | 32 (78,1) | 1 | |
| Yes | 28 (31,1) | 19 (38,8) | 8 (21,9) | 2,2 (0,15 – 1,23) | |
| Receives vaccination update (N=89) | | | | | 0,58 |
| No | 57 (64,0) | 29 (60,4) | 28 (68,3) | 1 | |
| Yes | 32 (36,0) | 19 (39,6) | 13 (31,7) | 0,3 (0,26 – 1,85) | |
| Possesses work tools (N=87) | | | | | * |
| No | 67 (77,0) | 35 (76,1) | 32 (78,1) | * | |
| Yes | 20 (23,0) | 11 (23,9) | 9 (21,9) | * | |

aAverage monthly income for classes A > 10 and ≤ 23 minimum wages, B > 3 and ≤ 10 minimum wages, C ≥ 1 and ≤ 3 minimum wages, D and E < 1 minimum wage. The minimum wage in Brazil at the time of the survey, in 2021, was 1,100.00 Brazilian reais.

ACS – Community Health Agent; CI95% - 95% Confidence Intervals; OR - Odds Ratio; P – P value for the Chi-square/Fisher's exact test

* No bivariate analysis was performed due to the existence of the value 0 (zero) in one of the cells


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Regarding the association between the independent variables (sociodemographic and professional profile) and the outcome (knowledge about vaccination), Table 3 shows that there was no association between the variables.

**Table 4 – Estimated adjusted odds ratios, corresponding confidence intervals (95%) and variance inflation factor for the variables analyzed in the three multiple logistic regression models, in relation to knowledge about vaccination among CHWs in the urban area of Senhor do Bonfim, BA, 2021-2022.**

| Socio-demographic/professional variables | Modelo 1 | | Modelo 2 | | Modelo 3 | |
|---|---|---|---|---|---|---|
| | OR (IC95%) | VIF | OR (IC95%) | VIF | OR (IC95%) | VIF |
| Age | | | | | | |
| 41 to 50 | 0,57 ( 0,12 – 2,51) | 9,11 | | | | |
| ≥ 51 | 0,58 ( 0,12 – 2,62) | 10,06 | | | | |
| Children | | | | | | |
| Yes | 0,92 ( 0,22 – 3,99) | 4,76 | | | | |
| Years of schooling | | | | | | |
| 12 or more | 0,85 ( 0,23 – 3,21) | 5,12 | | | | |
| Technical course in health | | | | | | |
| Yes | 1,00 (0,33 – 2,98) | 4,92 | | | | |
| Social class | | | | | | |
| C | 1,48 ( 0,41 – 5,47) | 4,76 | | | | |
| Introductory ACS Course | | | | | | |
| Yes | 0,09 (0,004 – 0,659) | 9,59 | 0,11 (0,005 – 0,684) | 8,66 | 0,10 (0,005 – 0,611) | 8,57 |
| Length of service as a CHW | | | | | | |
| 11 to 30 years | 1,64 (0,31 – 9,69) | 7,37 | | | | |
| Meets with nurse monthly | | | | | | |
| Yes | 0,52 (0,15 – 1,67) | 5,38 | 0,52 (0,167 – 1,542) | 4,64 | | |
| Receives vaccination update | | | | | | |
| Yes | 1,10 ( 0,37 – 3,30) | 5,05 | | | | |
| Has work tools | | | | | | |
| Yes | 0,97 ( 0,24 – 3,73) | | 6,23 | | | |
| Akaike | 112,96 | | 96,02 | | 95,43 | |

VIF – Variance Inflation Factor; CHW – Community Health Worker; 95% CI – 95% Confidence Interval; OR – Odds Ratio.

In the adjusted analysis, using multiple logistic regression to verify the factors associated with knowledge about vaccination, having an introductory course was the only variable associated with knowledge about vaccination (Table 4).

## DISCUSSION

In the present study, the prevalent age group among CHWs was 41 to 50 years old (40.2%), similar to that observed in studies conducted in Brazil and other countries, such as Bangladesh, Ethiopia, and Indonesia ((12-14)).The presence of women in the CHW profession is directly related to the origin of the profession, a trend that continues to this day ((15)).

With regard to race/color, the vast majority of CHWs in Senhor do Bonfim self-identified as brown/black (89%), a characteristic also found among CHWs in municipalities in the Northeast Region of

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Brazil and other countries. The ethnic and racial inequalities that exist in Brazil condition the black population to remain in jobs that require less education and schooling, with longer working hours and lower pay, such as the job of CHW, which only requires a high school diploma ((16,17)).

In terms of social class, classes D/E prevailed in the research findings, unlike the predominant class in the municipality of Vitória in Espírito Santo, which was class C. This difference can be understood when comparing the HDI of these municipalities, where Senhor do Bonfim is 0.666 and Vitória is 0.845, considered the fourth city and second capital of Brazil, with the best development and income indicators ((10,16-17)).

The educational level of the CHWs involved in the study can be considered adequate, since the majority have completed high school and higher education (70%), which is above the minimum required by the Ministry of Health (MS), as stated in Law No. 13,595, of January 5, 2018 (18).

In Brazil, candidates with elementary school education may only be admitted in situations where there are no registered candidates who meet the requirement of high school completion, on the condition that they complete high school within a maximum of three years after entering the ACS career ((18)).

Since the ACS category, as of Law No. 14,536 of January 20, 2023, is now considered a health profession, regulated in accordance with the Federal Constitution, with labor rights guaranteed by law, education is required to perform the function (18).

Although, in the present analysis, most ACSs have taken an introductory course to perform the function (88%), corroborating studies carried out in Bahia and Paraíba, the inadequacy of this training to perform the function is noticeable in terms of the quality of response to the demands of the population (19-20) .

Although the Brazilian Ministry of Health promotes specific courses for this category, research conducted in four municipalities in Ceará reveals deficiencies in the training process throughout the career, with brief and intermittent qualifications that are used as an alternative to specific service demands (21) .

Thus, it can be seen that occasional training courses are strategies used over the years as an immediate solution, but in the medium and long term, they become a problem, as none of them converge towards true professionalization or promote consistent training, in addition to camouflaging the functional illiteracy of these workers (21).

Therefore, it was identified that the knowledge of the CHWs in Senhor do Bonfim about vaccination was associated with the fact that the professionals had taken an introductory CHW course.

This association highlights the training of CHWs as an indispensable element in the qualification of the work process. According to Law No. 11,350/2006, the introductory course is established as a basic requirement for the exercise of the profession, as a strategy for the professional regularization of CHWs (22).

In addition to the introductory course, the law stipulates that every two years, CHWs must attend refresher courses on general health topics, according to the demands presented in the territory. The incentive for professional training enables the valorization of workers through a career plan, with salary incentives and the permanent hiring of CHWs in the profession ((22) (,23) ()) .

With Law No. 11,350 of October 5, 2006, it was understood that the introductory course for CHWs, with a workload of 40 hours, met the basic needs of the profession, based on health education. Despite the strong influence of ACS on the (re) education of the health-disease process of individuals, investments in the training of these workers were uneven compared to other ESF professionals (24) .

The disparity in training investments is understandable when, in 2006, the Ministry of Health offered higher education professionals in primary care, especially doctors and nurses, residency courses and specializations in family health with a heavier workload and more complex content (24).

Managers understood that greater investment in the training of doctors was justified by the lack of these professionals to meet the demand of the ESF teams, and that the cultural and subjective attributes of the ACS were sufficient for them to carry out their work, without requiring specific qualifications (24) .

Although CHWs are considered important professionals for sustaining the care model based on prevention and health promotion, they are still subject to the biomedical model of care. Therefore, it is the responsibility of public governance to ensure the training of CHWs, giving them security to perform their work and guarantee the principles and guidelines of the SUS ((15-16,21)).

It is necessary to provide ongoing training for CHWs in Brazil, rather than short, intermittent courses, a strategy adopted over the years as an alternative to immediate demands, configured as "firefighting," without long-term planning (25) .

In 2006, with the professional achievement of direct ties with states and municipalities and initial and continuing training, CHWs gained strength as a category, consolidating themselves in 2015 with the regulation of minimum wages, bringing stability and, consequently, opportunities for higher education and professional training (22-24).

In 2020, the Ministry of Health established the Health with Agents Program, aimed at the technical training of CHWs. The course included training with a view to revising the duties of CHWs and meeting the new duties established in the 2017 PNAB, incorporating activities traditionally linked to nursing, such as blood pressure and axillary temperature measurement, capillary blood glucose measurement, and clean dressing techniques (23-25).

However, the course proposal contradicts the principles of the ESF, in which the role of the ACS is to prevent and promote health, based on specific skills for education, community mobilization, and health surveillance. This training reinforces the biomedical model, which can distort the


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role of the ACS in the community (23-25).

The management strategy of assigning activities that nurses perform in primary care to CHWs may be a strategy to reduce the workforce specific to care and, consequently, overload CHWs, negatively impacting the work process and bringing harmful results to the FHS model, adopted in Brazil for over 30 years.

## CONCLUSION

The work of CHWs in primary care is fundamental to the quality of care. These professionals should be considered a core element in health actions, carrying out activities that promote the prevention and surveillance of vaccine-preventable diseases.

Despite the biomedical model, historically rooted in healthcare in Brazil, the work of CHWs follows a strategy based on health education, with the aim of changing the healthcare model, which until then had been curative, encouraging health promotion and disease prevention.

This study showed that CHWs' knowledge about vaccination is directly linked to their training, which in turn should be ongoing, established through a policy of continuing education for primary care professionals.

The research showed that there were significant misconceptions about immunization, which can lead to failures in the care provided to children, interfering with the quality of care and its management indicators.

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