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ANALYSIS OF HEALTH TECHNOLOGIES EMPLOYED BY NURSING TECHNICIANS IN VACCINE ROOMS

ANÁLISE DAS TECNOLOGIAS EM SAÚDE EMPREGADAS POR TÉCNICOS(AS) DE ENFERMAGEM NAS SALAS DE VACINA

ANÁLISIS DE LAS TECNOLOGÍAS EN SALUD EMPLEADAS POR TÉCNICOS(AS) DE ENFERMERÍA EN SALAS DE VACUNACIÓN

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Objective: to analyze the technologies used by nursing technicians in the vaccine rooms. Method: qualitative study, conducted with nursing technicians of the Primary Health Care of a medium-sized city in the interior of São Paulo, through a semi-structured interview. The information obtained was analyzed by thematic categorial analysis and compared with the theoretical framework of health technologies. Results: the findings comprised three themes: Light technology: communication as satisfaction and challenge; Light-hard technology: learning through professional practice; Hard technology: structural, material and work process challenge. Final considerations: this study made it possible to identify the health technologies used in the vaccine rooms, as well as the facilities and difficulties faced by the nursing team in their work process.

Descriptors: Licensed Practical Nurses. Vaccines. Health Centers. National Health Strategies. Nursing.

Objetivo: analisar as tecnologias em saúde empregadas por técnicos de enfermagem nas salas de vacina. Método: estudo de abordagem qualitativa, realizado com técnicos de enfermagem da Atenção Primária à Saúde de um município de médio porte do interior de São Paulo, por meio de uma entrevista semiestruturada. As informações obtidas foram analisadas mediante análise categorial temática e confrontadas com o referencial teórico das tecnologias em saúde. Resultados: os achados compuseram três temas: Tecnologia leve: comunicação como satisfação e desafio; Tecnologia

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leve-dura: a aprendizagem mediante a prática profissional; Tecnologia dura: o desafio estrutural, material e o processo de trabalho. Considerações finais: este estudo possibilitou identificar as tecnologias de saúde utilizadas nas salas de vacina, além das facilidades e dificuldades enfrentadas pela equipe de enfermagem em seu processo de trabalho.

Descritores: Técnicos de Enfermagem. Vacinas. Centros de Saúde. Estratégias de Saúde Nacionais. Enfermagem.

Objetivo: analizar las tecnologías en salud empleadas por técnicos de enfermería en salas de vacunas. Método: estudio de enfoque cualitativo, realizado con técnicos de enfermería de la Atención Primaria de Salud de un municipio de mediano tamaño del interior de São Paulo, mediante una entrevista semiestructurada. La información obtenida fue analizada mediante análisis temático por categorías y confrontada con el referencial teórico de las tecnologías en salud. Resultados: los hallazgos compusieron tres temas: Tecnología ligera: comunicación como satisfacción y desafío; Tecnología ligera-dura: el aprendizaje mediante la práctica profesional; Tecnología dura: el reto estructural, material y proceso de trabajo. Consideraciones finales: este estudio permitió identificar las tecnologías de salud utilizadas en las salas de vacunas, además de las facilidades y dificultades enfrentadas por el equipo de enfermería en su proceso de trabajo.

Descriptores: Enfermeros no Diplomados. Vacunas. Centros de Salud. Estrategias de Salud Nacionales. Enfermería.

Introduction

The morbidity and mortality profile in Brazil has undergone significant changes in recent decades, especially with regard to infectious and parasitic diseases. These changes are the result of several control measures, especially vaccination, which has become one of the main technologies used in public health policy in the country[1]. The success of the National Immunization Program (NIP) is related to the safety and efficacy of immunobiologics, as well as compliance with specific recommendations for conservation, handling, administration, post-vaccination monitoring, among others, by the nursing team[2].

In this context, the vaccination rooms of the Basic Health Units (BHU) and the Family Health Units (FHU) are under the responsibility of the nurse[3].

The nurse is responsible for guiding and assisting users with responsibility and respect; provide the site with materials and immunobiological, ensuring ideal conditions of conservation; keep equipment in good working condition; to monitor the doses administered according to the pre-established goal; to investigate the adverse effects that occurred; to actively search for people who have missed the vaccination; to disseminate the available vaccines; to train the team; to evaluate and monitor the vaccine coverage; and seek the updating of technical-scientific knowledge according to the guidance of the National Immunization Program (NIP)[3-4].

The NIP recommends that the team should preferably be composed of two technicians or nursing assistants for each shift and a nurse responsible for supervising the activities of the vaccine room and for training the team. For such supervision, the nurse is required to have a Technical Responsibility (TR) for the service, which is clarified in Resolution n. 302 of 2005 of the Federal Nursing Council[4-5].

In Primary Health Care (PHC) there is the use of several technologies in health. The term technology is not limited to technological equipment, such as machines and instruments, but also refers to the use of knowledge and skills that permeate human actions[6].

The technologies used in the health work process can be classified as light, light-hard and hard, which refer to human relations, structured knowledge and equipment, respectively. All these technologies are necessary for the production of health care and there should be no hierarchy between them, because they are all relevant and used in the daily process of work in

health, highlighting light technologies, which are always used, independent of context[7].

Within the vaccine rooms there are some technological challenges of different orders, some of them being: the non-fulfillment of the requirements of conditions and space for immunization assistance; the similarity presented in labels and bottles, which can induce error; changes in the vaccination schedule with the inclusion of new immunobiologics and new ages for application; the modernization of equipment in the vaccine room, requiring professionals to be in constant learning and improvement[8-9]. All these technologies are necessary in health production because they reflect the local health process, from the simplest to the most complex[10], raising questions about which of them are more used in the context of vaccine rooms.

It is known the relevance of good communication among the team itself and among this and the users (light technology), in addition to the necessary care in updates (light-hard technology) and conditioning and administration of immunobiologics (hard technology). Thus, the data presented contribute to the explanation of the technologies used by nursing technicians in the development of their professional practice in the vaccine rooms, offering necessary conditions for the beaconing of actions in favor of the continuous improvement of the assistance provided in this instance to the population.

Therefore, the objective of this study was to analyze the technologies used by nursing technicians in the vaccine rooms.

Method

This is a descriptive study, with a qualitative approach, based on the theoretical framework of health technologies[11]. The criteria of the Consolidated Criteria for Reporting Qualitative Research (COREQ)[12] were adopted for its development.

The study city has 21 FHS teams and 12 BHU registered in the Ministry of Health (MH) and is located in the state of São Paulo. The inclusion criteria of the participants in the research were: to be a technician or nursing assistant at the FHS or BHU of the studied municipality and have more than six months of experience. The exclusion criteria were: those who did not attend the research schedule after the fifth attempt of the researchers and professionals who were on vacation and/or health/maternity leave and/or away from their work activities within the health unit, at the time of data collection.

This research involved 16 technicians or nursing assistants, for unintentional recruitment carried out through direct telephone calls to health units and scheduling of interviews. The interviews ended by the process of saturation of the qualitative sample, that is, at the moment when it was identified that new lines would not add new relevant information to be incorporated into the analytical scope of the study, the result of the quantity and intensity of the dimensions of the researched phenomenon added to the quality of the interactions obtained with the research[13].

Data collection was performed from November 2023 to March 2024, through individual semi-structured interviews, previously scheduled, by telephone contact and conducted in the health units that the professionals worked.

The interviews were conducted with the following guiding questions: Talk about what you develop inside the vaccine room of your unit; Talk about the facilities and/ or difficulties that you find in the development of your functions within the vaccine room of your unit; How do you see that the current context of the Covid-19 pandemic has reflected in the development of your functions within the vaccine room? However, this did not prevent other relevant points of the routine of the vaccine room from being addressed by professionals. The interviews were recorded with the consent of the professionals, transcribed and analyzed later.

The information obtained was analyzed by thematic categorical analysis[14]. Thematic categorical analysis allows the construction of categories through semantic groupings of words in sentences. This fact requires sensitivity and flexibility on the part of the encoder, in order to apprehend the

thematic nuclei capable of composing the sense of the desired communication[14].

It is composed by the following stages: pre-analysis, which will include the transcription of interviews, textual corpus composition, floating reading and definition of provisional hypotheses about the content read; exploration of the material, in which the data will be coded based on the units of record; treatment of the results and interpretation, which consists in the classification of the elements based on their similarities and by differentiation, with subsequent grouping, before the common characteristics presented[14-15]

These data were interpreted and analyzed through association with health technologies, as stated in the theoretical framework that founded this study.

This study composed a end of course work (ECW) of Undergraduate in Nursing[16], deposited in the repository of theses, dissertations and scientific productions of the Federal University of São Carlos (UFSCar), allowing information, scientific data and research results were widely accessible, directly and coherently dialoguing with the open science proposition.

The project that gave rise to this study was approved by the Ethics Committee in Research with Human Beings, obtaining Opinion n. 5188674. All ethical precepts were followed, aiming to meet the Resolution n. 466/12 and the other ones in force in the country. Nursing teams were approached and invited to participate in the research. In the health units, researchers addressed nursing technicians, requesting collaboration to conduct the research, after explanation of its content and objectives. Subsequently, after the consent to participate, the Free and Informed Consent Form (FICF) was presented and signed, followed by the application of the questionnaire. In order to maintain the anonymity of those who agreed to collaborate on the research, the interviews were numbered sequentially and the names of the interviewees replaced by "NT" followed by their respective interview number.

Theoretical-methodological framework

This research was supported by the theoretical framework of health technologies because it understands that health work is technological, composed of material and immaterial technologies, which are indispensable for work to happen in fact[11].

Within the material technologies, there are hard technologies, which consist of tools and instruments developed to be used by professionals in certain situations[11]. In the present study, they are translated into the information systems necessary for the vaccination process to be fed and incorporated into national data; the physical space for immunization assistance; the bottles of immunizants; the existing equipment within the vaccination rooms, such as refrigerator, syringes, needles, cotton etc.

Within the immaterial technologies, there are: a) light-hard technologies, which correspond to the structured knowledge of health professionals that, in this case, would be the expertise of the technique of conservation and application of the vaccine; knowledge about cold network, disinfection of spaces and surfaces and feeding data in information systems, among other issues; b) the light technologies, which consist of everything that is used for the meeting between health professional and service user, which, in the present context, corresponds to listening, empathy, recognition, porosity, permanent health education and everything that involves the relational issues and professional-user bond[11].

Every model of health care corresponds to the way in which technologies are organized within a system, seeking to respond to the health needs of a given population[11]. Furthermore, proper emphasis should be given to light technologies both in the process of training future health professionals and in improving the quality of care provided to users of health services, being this a variable that is very much highlighted in the studies of the area[17-19].

Results

This survey invited 22 technicians or nursing assistants to participate in the research. However, two professionals were excluded from the study because they were on vacation and two because they were working on COVID-19 vaccination outside their respective health units. Moreover, two professionals did not agree to participate in the research.

The findings comprised three themes: Light technology: communication as satisfaction and challenge; Light-hard technology: learning through professional practice; Hard technology: structural, material challenge and work overload.

Theme 1 – Light technology: communication as satisfaction and challenge

With regard to light technologies, it was possible to identify that communication with users is a cause of satisfaction and make them feel active, within the proposal of awareness and guidance on the vaccine.

> *Because like this, we always talk for a few minutes, to reassure the mother, the father, and so on, and those who are in favor of vaccinations, are in favor of vaccinations, those who support vaccinations even though a mother cries when a 2-month-old baby is going to get 2 vaccines in one little leg, but she is aware of the good that it will do.* (NT2).

> *This communication with the family makes us feel part of the proposal, right? Participating and active, really the protagonist..* (NT5).

> *Regardless of whether there are people waiting or not, I do one thing at a time, I see that patient and answer all their questions.* (NT7).

However, this same communication was also pointed out as a challenge, added to the awareness of keeping the vaccine portfolio up-to-date, claiming that, often, users only seek the service by charge, at the time of finding a job, in the school registration and to obtain *Bolsa Família*.

> *But we usually, when there is a campaign, we try to put it in order and guide the family. Usually it's a child who comes with a vaccination card that is not in order, we leave it correctly, or when it's an adult, we end up carrying out the vaccination when they come for an admission exam, and then the company asks us to put it in order, because we can't actively search for all users..* (NT3).

> *So there are some mothers who are convinced that vaccines are bad, that there is no need to vaccinate, that children do not need them, but the difficulty lies in this, mothers who do not, who feel bad about saying that they are going to stab their children and do not have the notion of what prevention is.* (NT4).

> *During the childcare consultation, the doctor or nurse, when they see that the vaccinations are late, tells the mother to update everything and the milk delivery requires this and the Bolsa Família also requires it..* (NT6).

Theme 2 – Soft-hard technology: learning through professional practice

In the case of light-hard technologies, it was emphasized the knowledge acquired through practice and how they dealt with the implementation of the vaccine against Covid-19.

> *I think it would be more like this through day-to-day self-knowledge. A kind of improvement so that when an adverse situation arises, you, even if you don't know how to solve it, at least have a path, a vision, until you can get better and more enlightened guidance with vigilance.* (NT1).

> *There was an increase in volume because the vaccines were arriving, so there was a lot of training to qualify us, depending on the type of vaccine that was available, right?* (NT5).

> *Everything was online, so that's how we did this training and gained confidence and proficiency to get vaccinated.* (NT4).

> *At first, we were only a little concerned about Pfizer, which said it had to be diluted, that we had to wait a while to take it out of the fridge, but we've gotten used to that now.* (NT9).

Theme 3 – Hard technology: the structural and material challenge and the work process

In the hard technologies, the main placements were concentrated on the existence of materials necessary for the application of vaccines routinely and to have a minimum infrastructure capable of providing the care and hygiene required for preparation, vaccine conservation and handling.

> *We have proper hygiene, the sink, the alcohol gel, there, in the vaccination room, the temperature, everything is well organized.* (NT10).

> *The conservative that we didn't have has arrived, we're already using it.* (NT7).

> *It's as much as possible, there are few materials that are missing. Generally, the city hall, within the vaccination room, I think it's easier to run out of the vaccine that's missing at the municipal level, than during the pandemic. There was a shortage of syringes and needles, but we quickly corrected that.* (NT11).

> *Oh! It's difficult, you know? Lack of materials, once in a while something is missing, but it doesn't get to the extreme.* (NT8).

In the case of hard technologies, there were difficulties with space issues in the vaccine room and work overload, especially after the incorporation of vaccination against Covid-19.

> *I think the only bad thing is that it's a little small here, you know, so sometimes when you go to vaccinate children, the parents don't handle it properly, right? So sometimes you end up getting punched.* (NT4).

> *Wow! We are having a really hard time because the campaign is being carried out in that room. So, one day an employee from one team stays, another from another team, and when, even though they are from our team, the routine person arrives, there is someone there who is typing the COVID vaccines and we have to use the table. You have to dilute this vaccine and share this space with whoever is there, so we have to alternate. So, the one who is vaccinating for COVID stops for a while. Then we go there, prepare it, administer it, and then she comes back. So it is getting a bit chaotic.* (NT13).

> *It's really tough. Now, with this pandemic, a lot of Covid vaccines have arrived. So, it's really tough because one stays there, the other has to stay in the reception area, the procedure.* (NT5).

Discussion

The factors that contribute to professional satisfaction and dissatisfaction are linked to working conditions and relationships established in the exercise of it. The analysis of the reasons that lead to satisfaction and dissatisfaction in PHC work highlighted routine situations of the health work process involving professionals, management and users of PHC[20].

The satisfaction of these professionals is effectively associated with being able to strengthen a relationship with the user. This bond between professional and user is realized by the expression of interest of the professional in the community in which he is inserted, through acts of trust and respect[21].

Communication between the nursing team and the user is essential in the health work process, especially in the context of vaccination. Here, it refers to light technology, which should be used as a tool to promote health education, especially in the construction of knowledge about vaccines and the importance of complying with the vaccination calendar[22].

The increase in anti-vaccine movement has been a barrier to health institutions and professionals, as well as to society as a whole. The World Health Organization (WHO) has recorded vaccine rejection or hesitation as one of the ten major health risks. In addition, the growth of the anti-vaccine movement, which spreads the belief that immunobiologics cause more harm than benefit, also favors unfounded questioning about the safety of the vaccination process[23].

Study[24] showed that after 2015, for all immunobiologics recommended for children under one year in the state of Minas Gerais, the target was not reached. The year 2020 presented the lowest proportion, making distant the recommended targets of vaccination coverage for the immunobiologics studied[23-24].

People fail to get vaccinated for different reasons: forgetfulness, lack of time, long lines in health centers, adverse events, culture and lack of knowledge, influence of friends or even false information. It is significant the intervention of effective communication by PHC professionals and correct information about the importance of vaccination, as they are considered as safe sources of information for the population[6,9,23].

Since the nursing team has greater contact with the user, it is of fundamental importance to emphasize that this team has the power of intervention in health education, by guiding mothers and/or caregivers to the importance of vaccination[9,24]. As a vaccinator, the nursing professional, in appropriate circumstances, acts as a mentor at the time of vaccination, transmits fundamental and relevant information to disease prevention, contributing to families realize the value of immunization, defined as the method capable of preventing diseases[24].

Although the nurse must supervise the work processes in immunization, the nursing technician is the most active professional in vaccine rooms[3,25].

The importance of using light technologies when it comes to PHC becomes clear. In this scenario of health care, it is relevant to

the appreciation of living work, subjective relationships and interactions, enabling the creation of a bond between professionals and the community, with a view to achieving their goals, as health care and promotion and prevention of diseases[21-22].

The light-hard technologies are linked to this training process, and because the vaccine rooms are complex and dynamic environments, Permanent Health Education (PHE) is essential[11]. The complexity is due to the fact that knowledge on vaccination is constantly changing. In recent years, there have been several changes in the vaccination schedules, with the incorporation of new vaccines, and the expansion of age groups under vaccination recommendation. The standards are constantly modified/updated, requiring the problematization of the work process in the vaccination rooms, as well as specific situations that occur in everyday practice and that are problem situations that favor learning[26].

Before the COVID-19 pandemic, the overload of work in the vaccine rooms was already highlighted, as well as the obligation to maintain the quality of immunobiological and ensure safe vaccination, in addition to other functions such as administration of immunobiologics; recording of administered doses and return of next doses in the vaccination carnets of users; guidance on immunobiological and possible adverse reactions expected after administration; maintain recommended temperature for conservation of immunobiologics; keep track of the lots and their expiration dates[34].

The results of this study are in agreement with research conducted both in Brazil and in other countries, such as Chile and China. The reports are of excess demand, overload of work, work under pressure, multiple functions and human resources not proportionate to the user's demand, lack of management support and intention of rotation[27-28].

The nursing team is overburdened, poorly paid for its duties in terms of workload, demand being greater than human resources and accumulation of functions[20,27].

In the hard technologies, vaccine rooms were shown to be inadequate due to demand. One of the responsibilities described in Ordinance n. 2.436, of 21 September 2017, is to ensure adequate infrastructure and good conditions for the functioning of BHU/FHU, guaranteeing space, furniture and equipment, as well as accessibility for people with disabilities, according to the current standards[3].

The physical structure was found to be insufficient to meet the demand of the unit. In addition, shortages of materials and resources such as tables and benches were reported. This situation is also observed in other municipalities, where there are similar problems, such as blocked rooms, unfinished renovations, lack of space, and the absence of internet, telephony, ventilation and adequate lighting, in disagreement with the guidelines of the Ministry of Health[3,20,24].

The pandemic has shown the worsening of a chronic precariousness of nursing work, already pointed out in previous studies on the pandemic context. These surveys indicated a professional history marked by lack of respect and cordiality between managers, teams and population served, discrimination and labor violence, unsafe and stressful work environments, deficit of infrastructure for the exercise of the work, low wages, high levels of physical and mental wear, work accidents and absences[28-29].

In the last decades, the development of nursing occurred under paradoxical circumstances. If, on the one hand, training in skills and material and technological resources for professional performance have improved substantially, on the other hand, working conditions have become more harsh, complex and difficult[28]. Considering that nursing is the professional category that provides care and assistance to the user in PHC, the appreciation of light technologies would be a fundamental point in the development of their work process[27].

The study's limitation is that it was developed only with technicians and nursing assistants from a medium-sized municipality. Thus, the view of only one professional category responsible for

the development of vaccination activities in the context of PHC was obtained.

The study contributes to nursing by pointing out deep issues related to the nursing work process in the context of vaccine room.

Final Considerations

This study allowed to better understand how the nursing technician's work routine occurs within the vaccine room, identifying the health technologies used in their daily lives and the facilities and difficulties that pervade their work process.

The vaccine room is strictly managed and experienced by the nursing team. The professional practice developed by the nursing technician in the vaccination process reflects on the use of light technologies, such as reception, listening and bonding. The reality of PHC indicates that there is still no adequate use of all health technologies for effective care in the vaccination process.

In this perspective, it is reiterated that the skills required for vaccine room professionals involve the integrated use of light, light-hard and hard technologies. All these technologies, together, have the potential to transform the work process in the vaccine rooms, ensuring the humanization of care and compliance with the guiding principles of SUS.

Collaborations:

1 – conception and planning of the project: Amanda Caetano dos Santos and Flávio Adriano Borges;

2 – analysis and interpretation of data: Amanda Caetano dos Santos, Flávio Adriano Borges and Natália Sevilha Stofel;

3 – writing and/or critical review: Amanda Caetano dos Santos, Flávio Adriano Borges, Janaína Ferreira de Lima, Floriane Darius and Bruno Torelli de Camargo;

4 – approval of the final version: Amanda Caetano dos Santos, Flávio Adriano Borges, Janaína Ferreira de Lima, Floriane Darius, Natália Sevilha Stofel and Bruno Torelli de Camargo.

Competing interests

There are no competing interests.

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