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UNDERSTANDING OF THE EXPERIENCES OF HEALTH LITERACY IN A RURAL POPULATION EXPOSED TO PESTICIDES

COMPREENSÃO SOBRE AS EXPERIÊNCIAS DE LETRAMENTO EM SAÚDE DE UMA POPULAÇÃO RURAL EXPOSTA A AGROTÓXICOS

COMPRENSIÓN SOBRE LAS EXPERIENCIAS DE ALFABETIZACIÓN EN SALUD DE UNA POBLACIÓN RURAL EXPUESTA A AGROTÓXICOS

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Objective: to understand the experiences of health literacy in a rural population exposed to pesticides. Method: qualitative research, of the exploratory type descriptive, with 24 rural workers, users of two basic health units in the rural area, who answered questions about the literacy skills in health in the context of the use of pesticides. The data exploration occurred by thematic analysis of Minayo. Results: the analysis showed five themes: information search; understanding of information; use of health services for complications of pesticides; sharing of information; evaluation of information on pesticides. Final considerations: the health literacy skills of this population are still weak, and there is a need for nurses to develop educational interventions to promote health literacy. Nurses working in rural areas should consider health-work-environment relations in health care.

Descriptors: Health Literacy. Farmers. Health Education. Agrochemicals. Health Promotion.

Objetivo: compreender as experiências de letramento em saúde de uma população rural exposta a agrotóxicos. Método: pesquisa de abordagem qualitativa, do tipo exploratória descritiva, com 24 trabalhadores rurais, usuários de duas unidades básicas de saúde da zona rural, os quais responderam perguntas acerca das habilidades de

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letramento em saúde no contexto da utilização dos agrotóxicos. A exploração dos dados ocorreu pela análise temática de Minayo. Resultados: a análise evidenciou cinco temas: busca de informações; compreensão das informações; utilização dos serviços de saúde por complicações dos agrotóxicos; compartilhamento de informações; avaliação das informações sobre agrotóxicos. Considerações finais: as habilidades de letramento em saúde desta população ainda são frágeis, havendo a necessidade de o enfermeiro desenvolver intervenções educativas para a promoção do letramento em saúde. Os enfermeiros atuantes nas áreas rurais devem considerar, na assistência à saúde, as relações saúde-trabalho-ambiente.

Descritores: Letramento em saúde. Fazendeiros. Educação em saúde. Agroquímicos. Promoção da saúde.

Objetivo: comprender las experiencias de alfabetización en salud de una población rural expuesta a agrotóxicos. Método: investigación de enfoque cualitativo, tipo exploratorio descriptivo, con 24 trabajadores rurales, usuarios de dos unidades básicas de salud de la zona rural, quienes respondieron preguntas sobre las habilidades de alfabetización en salud en el contexto del uso de agrotóxicos. La exploración de los datos se llevó a cabo por el análisis temático de Minayo. Resultados: el análisis evidenció cinco temas: búsqueda de información; comprensión de la información; utilización de los servicios de salud por complicaciones de los agrotóxicos; intercambio de información; evaluación de la información sobre agrotóxicos. Consideraciones finales: las habilidades de lectura en salud de esta población son aún frágiles, y existe la necesidad de que el enfermero desarrolle intervenciones educativas para la promoción de la lectura en salud. Los enfermeros que trabajan en áreas rurales deben considerar, en la asistencia a la salud, las relaciones salud-trabajo-ambiente.

Descriptores: Alfabetización en Salud. Agricultores. Educación en Salud. Agroquímicos. Promoción de la Salud.

Introduction

The term health literacy was first used in the 1970s by Simonds[1] to refer to health education as a political issue that affected the health system. However, only after 14 years health literacy became widely used due to the definition published by Nutbeam[2] and the World Health Organization (WHO)[3].

Although the concept disseminated by WHO is widely known in the scientific community, there is still no unified definition and, for this reason, there are a number of definitions on health literacy[4]. Therefore, seeking to integrate all existing concepts, a study[4] described health literacy as the knowledge, motivation and skills of people to access, understand, evaluate and apply health information, in order to make judgements and decisions about health care, disease prevention and health promotion, to maintain or improve the quality of life. Thus, this was the concept adopted for the present study.

Some population groups may be marginalized in relation to health literacy, such as the elderly, people with low income, people with low education and the rural population[4-5]. It should be noted that the health problems of this last group have specific characteristics due to their constant exposure to pesticides, for example[6].

Individuals exposed to pesticides can develop various complications, such as neurological diseases, hearing disorders, anemia, sexual impotence, headache, insomnia, changes in blood pressure, dystimias, vomiting, dizziness, disorientation, paresthesia, skin and mucosal irritation, respiratory difficulties, bleeding, seizures, immunological and genetic alterations, congenital malformations, cancer, coma and even death[6-7]. These health problems are intrinsically associated with the inappropriate use of pesticides, which may be related to the low level of health literacy in this population[8].

Despite its importance, there is a lack of studies that investigate the health literacy of rural populations. In the international context, a systematic review that aimed to document different educational interventions to develop health literacy among rural workers stands out[5]. In the national context, a study analyzed the knowledge and perceptions of farmers about basic care from the perspective of health promotion, after conducting a health literacy intervention that resulted in empowering

both at the individual and collective levels, as well as in the recognition of the community's potential[9].

The ability of rural workers to understand, assess and use health information to make appropriate decisions is crucial to deal with risks associated with exposure to pesticides. Thus, understanding the perceived experiences of health literacy in this context is fundamental for nurses to develop health education strategies that are sensitive to health literacy. In view of the presented, this study aims to understand the experiences of health literacy of a rural population exposed to pesticides.

Method

This is a study with a qualitative approach that works with the universe of meanings, motives, aspirations, beliefs, values and attitudes in a reality that cannot be quantified[10]. It is exploratory and descriptive, since it aims to describe certain phenomenon[11] and followed the recommendations of the Consolidated Criteria for Reporting Qualitative Research (COREQ)[12].

The study was conducted in two Basic Health Units (BHU), intentionally chosen, located in rural areas belonging to the municipality of Arapiraca, located in the central region of the state of Alagoas. The municipality has a population of 234,696 inhabitants and its Municipal Human Development Index (MHDI) is 0.649.

The study participants were 24 rural workers linked to these BHU. This number was reached when it was possible to identify symbolic patterns and worldviews regarding the universe in question, so that the recurrences reached saturation point and the field work was completed[13].

The inclusion criteria were: be a user of the referred BHUs of Arapiraca; be a rural worker or family of workers who were in the BHUs at the time of data collection; age ≥ 18 years; have direct or indirect contact with pesticides. The exclusion criteria of the study were people who declared not to have conditions to answer the interview, such as hearing or vision problems, which prevented an adequate interaction with the interviewer.

Data collection was carried out in October and November 2022, at the facilities of the BHUs, with users who were waiting for health care and who considered the inclusion criteria. Users who agreed to participate in the study signed an Informed Consent Form (ICF), in two copies, after the provision of information about the objectives, risks and benefits of the study. The interview lasted 60 minutes, in a BHU room that guarantees privacy.

To characterize the participants, a structured questionnaire was used on sociodemographic characteristics (age, sex, marital status, education and income). In order to understand the perspectives of the rural population about perceived experiences of health literacy in the context of pesticide use, a semi-structured questionnaire was used, elaborated by the researchers, composed of five open questions, according to the study objective.

The open questions were divided according to health literacy skills, namely: Information search (Did you need or seek information about pesticides at some point?); Use of health services (Have you used the health service for complications from pesticide use at some point?); Understanding the information (Have you already received some information about the use of pesticides that you did not understand?); Evaluation of the information (Have you received any false news about pesticide use?); Information sharing (Have you shared any information about pesticide use?).

The interviews were audio recorded to maintain the accuracy of the reports and the audios were transcribed and analyzed through thematic analysis[10], consisting of three stages: pre-analysis, exploration of the material and treatment of the results and interpretation.

Therefore, for the thematic analysis, the categories previously established were the questions guiding the open questionnaire, organized based on health literacy skills. These categories gave rise to five themes, namely: search for information on pesticides; understanding of information on pesticides; use of health services by complications of pesticides; sharing of information on pesticides; Evaluation of information on pesticides.

The research was approved by the Research Ethics Committee (REC) of the Federal University of Alagoas (UFAL), Certificate of Presentation of Ethical Appreciation (CAEE) n. 40254120.6.0000.5013,

with Opinion n. 4.482.481. The anonymity of the participants was maintained to ensure their privacy and avoid any constraints, being identified by the letter P of the *participant* code name and the corresponding numbering, sequential to the order of the interview.

Results

The participants were 24 people participated in the study, of which 58.8% (n=14) were female and 41.6% (n=10) male, aged between 21 and 81 years, predominantly in the age group from 61 to 69 years (29.1%). Regarding schooling, 16.6% (n=4) declared not to have studied, 58.3% (n=14) had three to eight years of study and 25% (n=6) studied for more than 8 years. The income of these participants varied from 600.00 to 1,212.00 BRL.

Based on the health literacy skills, the following categories emerged: Search for information about pesticides; Understanding of information about pesticides; Use of health services due to complications of pesticides; Sharing of information on pesticides; Evaluation of information on pesticides; presented below.

Search for information about pesticides

The reports showed that 29.2% (n=7) of workers who used pesticides in their plantations did not seek information about these products. Among these workers, one reported not having had the opportunity, highlighting in the following speech:

> *Because I had no opportunity, the person had no creation* [study]. (P7).

Most respondents (n=17) stated that, at some time in their lives, they had already carried out the search, and 16.6% (n=4) obtained information in commercial houses, considering the sellers of agrochemicals as the main source of instructions, both for obtaining the pesticide prescriptions and measures to be used in plantations, as can be seen in the extracts below:

> *In the comercial houses... with people that work there.* (P13).

> *In the comercial house with the vendor or responsible, which I buy in the producer's house in Arapiraca.* (P14).

> *With the vendor because he says everything, the way we use it … It already comes with the right measures* [the pesticide]. (P18).

A minority (n=3) of the farmers reported seeking information on pesticide labels to subsidize their practices and/or behaviors. At this juncture, the speeches of two participants who understood the information on the labels as sufficient stand out, stating that there is no need to seek information in other ways:

> *No, the label has almost everything in it.* (P11).

> *My daughter read the label and explained how to use it.* (P12).

Moreover, 12.5% (n=3) sought information with other workers, 8.3% (n=2) of the participants mentioned seeking information on the internet, 4.1% (n=1) with relatives, 4.1% (n=1) with the association and only 4.1% (n=1) with the health service.

Understanding of information about pesticides

This topic evidenced that most of the interviewees (n=10) reported not understanding the information transmitted by the sources of aforementioned information. The following were highlighted as misunderstood information: the coming from popular knowledge (n=1), the questioning of farmers not to use Personal Protective Equipment (PPE) (n=1) and information about the handling of certain pesticide (n=1), as explained in the speeches:

> *No, not all of them. I mean... when you're going to use poison, you have to drink milk to avoid some complication, but people don't drink milk everyday, there's no milk.* (P5).

> *I understand some things, but I don't understand other things. Because sometimes people think they're doing the right thing when they're doing the wrong thing. Why did the person use that product without protection, they didn't wear gloves, they didn't wear a helmet, a mask, they didn't wear anything. It's just like we are here, it's normal. That's why I didn't understand why people didn't use it.* (P8).

> *Yes, there is a poison there that I don't understand* [how to prepare before use]. (P22).

On the other hand, most (n=14) of the participants stated that they had already received information about the use of pesticides and

understood them. The speech of a respondent who declared to understand is highlighted, but only if the information is summarized:

> *So, only when it is summarized, because when there is a lot of information, we ask our friends.* (P10).

Only a small proportion (n=3) of farmers said they understood the information received about the use of PPE, as shown by the excerpts:

> *No, today I understand, that we can't use it if we don't protect ourselves, with gloves, boots, mask and, very uncomfortably with socks..* (P12).

> *That I could not, therefore, get the poisons in my hands, or be without the mask.* (P16).

> *I understood, I always used a towel, just to be sure, to have greater security..* (P11).

Use of health services due to complications of pesticides

Regarding the use of health services due to complications from pesticides, it was identified that a large part (75%) of the participants did not seek care from health services. Among the workers who reported seeking health services (25%), only one interviewee mentioned a lack of information to prove whether the health situation was really due to the use of pesticides, as described below.

> *I used hospitals and health centers, but if I was harmed by pesticides, it was not disclosed to me. They prescribe the medication and I go home, take it and get better, but I had no information from the doctor because information only comes out through tests, right?* (P3).

The report of another participant deserves to be highlighted, because he mentions how was his experience in the health service in face of intoxication:

> *I had a headache, my skin was irritated* [...] *There [st the hospital] They gave me medication, then I was told to go home and drink water with sugar, milk... Sometimes I got a little better when I was vomiting a lot, then I took these things and rested for a few days, right, and then it all started again.* [when in contact with the pesticide]. (P7).

Also worth mentioning are the participants' speeches that talked about the symptoms they had, possibly due to intoxication by the products.

> *I suffered. The symptoms I had were because my boy was using* [pesticide] *in the cabbage and I smelled it, and with that smell, my tongue turned black. Then I went to the doctor and he said it was poisoning that I got from something, then I remembered that it was from the poison, that it was all I felt, just the smell. Then every time the neighbors in the fields were using and I smelled it, then I knew... I felt my tongue burning, when I noticed it, it was black as coal.* (P13).

> *I didn't look for it, but I got drunk once, right? The first few days I didn't get used to it, but after I got used to it, that's it. Because the smoke was strong, right? I had a lot of headaches, but then I got used to it.* (P17).

> *I've already vomited, had a headache and stayed at home, I drank some garapa and I got better.* (P19).

Participants also identified the following symptoms related to intoxication: 20.8% (n=5) headache, 12.5% (n=3) irritated/itchy skin, 12.5% (n=3) dizziness, 8.3% (n=2) vomiting, 4.16% (n=1) nausea, 4.1% (n=1) diarrhea, 4.1% (n=1) intestinal gases, 4.1% (n=1) black/burning tongue. Regarding the conductions to reverse intoxication, 12.5% (n=3) mentioned the use of drugs, 8.3% (n=2) the use of serum, 8.3% (n=2) the use of *garapa* (water with sugar) and the use of milk 8.3% (n=2).

It is also noteworthy that 12.5% (n=3) of the workers, although they did not seek health care due to the effects of the pesticide, reported that family or friends sought health services, highlighting the following speech:

> *No, I have never needed to use health services, but a relative of mine did. He had diarrhea and a headache and they gave him the right medications [at the health service].* (P24).

> *No, I never needed it, a neighbor of mine was poisoned and ended up in the hospital.* (P22).

Sharing of information on pesticides

Concerning the sharing of information on pesticides, 54.1% (n=13) of participants reported not sharing information with others. Of the 45.9% (n=11) who shared, 16.6% (n=4) mentioned informing other rural workers, 12.5% (n=3) declared having shared with family members, 12.5% (n=3) in the neighborhood association and 4.1% (n=1) with neighbors.

Among the information shared, it was clear that they referred to the use of PPE, the harm caused by pesticides and on the preparation of the product to be used in crops, as follows:

> *Only with my children, so they know how to use poison, how to apply it, how to use it to put on clothes, gloves, masks, hats.* (P2).

> *I always warned people because... all those who worked in the fields, together with us, we declared, "boy, be careful because this is harmful to your health, it can cause cancer, serious poisoning" and that was what we understood.* (P3)

> *Yes, my nieces always got drunk, right? So when they were with me, I always told her "wear a mask, put a cloth over your nose", because it helps to avoid the smell, right? "wear these clothes too"... when she got home drunk, I told her to drink tea, so she would feel better.* (P20).

> *No, depending on the poison, many people who are going to put it in, then ask "how do you do it", then say "like this, like this…" and then they keep going.* (P22).

Evaluation of information on pesticides

Finally, it was evidenced that the participants were unaware of the meaning of Fake News and that most did not identify dubious news about pesticides (n=21). It was noted that some (n=2) participants who were unaware of the mechanisms for evaluating the information reported receiving the information based on relationships of trust and proximity with the community and even with the vendors of pesticides, as evidenced in the following sentences:

> *I asked for information there* [at the saleshouse] *and used it, nothing ever happened. I don't think so at this stand where I buy, because she is a very responsible lady, her son is also a veterinarian and he understands, he is responsible for that sector there.* (P14).

> *No, it's always real there, people use it because they have to, but there what they put in there is all real, they said the symptoms it gave... where we bought it was all real.* (P7).

In contrast, 12.5% (n=3) of the participants said they had already received fake news, with a particular case of an interviewee who claimed to receive dubious information from sellers about pesticides.

> *Yes. From the people who passed by the door trying to sell to us* [...]*they lied a lot, they said "Hey, this one is good, this one is better, you're using it, this one will save your crops", because cabbage is very pest-prone, so we, right at the beginning, when we didn't know the cure* [ecological farming practices] *that we did, then we used a lot of poison on the farm, and it was harmful, it was harmful to us as well as to others, right? Then, after the meeting, we learned and when he came to the door, we said that it was not interesting. Not on our farm, no.* (P13).

Discussion

Obtaining information about pesticides at the time of purchase is very important for farmers to understand the procedures to be adopted and the care that should be followed in each of the activities related to the handling of pesticides. However, the issuance of agronomic prescription in Brazil often happens irregularly, without a prescription by a qualified professional, thus helping to increase the use of pesticides[14].

Given that the main source of information about pesticides identified were sellers, it is feasible to emphasize that this picture meets the above in another study[15], which identified that most farmers received information about pesticides from the sellers of the product and that they were mostly restricted to technical aspects on dosage of products and pests that affected the plantations.

Although labels are used as a strategy to obtain information about pesticides, it is important to mention that there is a discussion about the real effectiveness of the information contained in them, because they use images and a language that is little understood by workers and, mostly, by those who are not literate[16]. This is because informing in an open and objective way can represent a boycott to the commercialization of the product[16].

In addition, the labels have the practice of delegating to the farmer – with the use of a taxing language as *do, do not, do so* – the responsibility of making its use incorrectly. Thus, the industry disengages itself from the commitment it has through its aggressive sale, causing the worker to be the culprit in the event of an eventual accident by adopting unsafe practices[16]. Thus, the strategy of the large industries producing pesticides is to place the worker, especially those with low health literacy, as the central problem of errors and inadequacies.

When they mention the pesticide as a poison, it is noticeable the understanding of the participants that the product used in their crops

is able to promote damage to health. However, by refraining from using PPE, it is possible to say that the risk perception regarding the toxic potential offered by these products has not been concretely established.

This scenario is also evidenced by other authors[15], since many farmers declared not to use the PPE, although they were aware of these equipment and considered the importance of their use. Thus, it is found that, despite the understanding of the need for the use of PPE, there may still be difficulties in understanding the harms of their non-use.

Furthermore, it is worth mentioning that the use of a towel as a substitute for an PPE may not only be related to the lack of understanding of the worker, but also to economic restrictions, as well as discomfort, mainly thermal[17]. In this context, there is the question of why PPE, in an era with so much technology, are still so uncomfortable.

It is important to emphasize that the discomfort provided by such equipment occurs because the materials used for making it interfere with physiological mechanisms of thermoregulation[17]. In addition, the authors emphasize that there are several other factors that aggravate this discomfort, such as intense sun exposure and significant physical effort involved in agricultural work.

Given the lack of knowledge evidenced by many rural workers, the nurse – promoter agent of health care guidelines[18] – can offer actions so that the rural population, who attends BHUs, is informed, objectively, about the PPE and other issues related to pesticides, including the risk of poisoning.

In this panorama, it is necessary to highlight the possibility of developing health literacy interventions, since they cooperate so that a greater bond between the population and the nurse is established. Moreover, promoting health literacy can stimulate the development of indispensable skills to promote the autonomy of rural workers and correct management of health problems[19].

For this, the use of strategies such as health education for groups of workers or even guidance in nursing consultations are of great importance to these individuals. After the development of these actions, it is pertinent to identify if the information provided was properly understood.

Thus, the use of the Teach-Back method, which requires patients to repeat the instructions that were shared, to verify whether individuals understood the health information, is crucial, because it seeks the patient's feedback through the following request: *I want to be sure I was able to explain right. Can you repeat what you understood about what I said?*[20].

The scarce search for health services, as it was observed, occurs, possibly, because the obstacles to access them (due to the location, the service hours incompatible with the working day or even low expectations regarding the ability of the service to solve the problems) discourage workers from going in search of attention to clinical manifestations[21].

In line with this, the nurse has few clinical instruments to guide the screening of intoxications and define criteria to determine the relationship between these intoxications and work[22]. Furthermore, in the care actions, health-work-environment relations are hardly considered, due to limitations in the training of health professionals and nurses in universities and in the training provided to health services[21].

Due to the absence of these resources, sick rural workers are not aware of the damages caused by pesticides and there is an underreporting of cases and invisibility of the costs generated by these intoxications for the Brazilian National Health System (UHS)[22].

The symptoms mentioned by the workers are in agreement with those listed by the Ministry of Health, which divides them into acute and chronic poisoning symptoms. Symptoms of acute poisoning include nausea, dizziness, vomiting, disorientation, difficulty breathing, sweating, diarrhea, coma and death. In chronic intoxication, behavioral disorders such as irritability, anxiety, changes in sleep patterns and attention, depression, headache, fatigue and paresthesia may occur[23].

In this context, the nurse should develop the health literacy skills of the rural population so that they can understand, access and use

health services in case of poisoning by the use of pesticides. With the promotion of health literacy of workers, this professional provides collective and critical-social empowerment, as well as changes scenarios of submission to the production system and inequalities that substantially compromise health, in the face of a panorama of vulnerabilities as experienced by the rural population[11].

The present study showed that few workers share information about pesticides. For those who share, the information of basic character and with little deepening of content stand out. Nevertheless, it is important to emphasize that sharing information about these products, provided they are reliable, is of utmost importance for the rural population. Much of the information available about pesticides is difficult to understand for these individuals, which leads to an increased risk associated with pesticide use. Strategies are needed that privilege a risk communication based on the beliefs and perceptions of the rural population[16].

In this sense, educational interventions should be proposed so that the acquisition and sharing of information is effective among the rural community[24]. Thus, knowing that health literacy values a liberating education, health education allows the rural population to be aware of themselves and other individuals, with the sharing of information about individual and collective health care[9].

In addition, it was surprising that the interviewees valued the established bond and did not judge/evaluate the content of the information, considering that all the information they received in the commercial houses were reliable. Once again, the figure of the seller stands out as a great promoter for the massive use of pesticides. It is also worth mentioning the scarcity of information search with a health professional/nurse, who should be an important agent promoting health information, with a view to developing health literacy in this population.

Therefore, the importance of nurses is emphasized, so that they direct care according to the singularities of each individual, aiming at improving communication, understanding of health information and evaluation of information[25]. It is essential that the nurse addresses the issue of pesticides within the BHUs, using effective communication mechanisms, with objective and synthesized information, in order to promote health literacy through educational interventions, with illustrative health materials and environments that improve care.

A limitation of the research concerns the fact that it was developed only in two BHUs. Thus, it is emphasized the need for studies that give continuity in other BHUs, territories and services that provide assistance to rural workers, in order to understand the experiences of health literacy of these individuals, seeking to enrich the results obtained here.

This study brings relevant contributions to rural workers, the academic community and health professionals. This is because the need for the use of PPE when handling pesticides was highlighted, aas well as the importance of the worker seeking care in health facilities when presenting with symptoms of intoxication and the need for nurses to consider the occupation of users. Moreover, it was also possible to emphasize the need for activities aimed at developing health literacy of the rural population and arousing the interest of the academic community regarding research on the subject that relates health literacy and the population rural.

Final Considerations:

The development of this study allowed verifying that the health literacy of the rural population is still limited. This is largely due to the low level of education reported by participants, socioeconomic vulnerability and also the lack of health education activities promoted in health services, especially in the BHUs. After analyzing the data, five themes were highlighted, related to the health literacy skills of the rural population.

Regarding the search for information on pesticides, the main source of information mentioned by participants were the vendors themselves. Concerning the understanding of

information on pesticides, although most participants stated to understand the information received, it was reflected whether there is, in fact, the understanding about the information received, since it was observed in some speeches little knowledge about the use of PPE.

When asked about the use of health services due to complications from pesticides, most participants mentioned that they did not seek them, although they developed symptoms characteristic of pesticide poisoning. The sharing of information on pesticides was non-existent among most participants. In relation to the evaluation of information on pesticides, almost all participants reported not having identified false information about pesticides, which demonstrates the lack of evaluation to determine whether the information obtained was real.

It is possible to infer that the health literacy skills of these individuals are still fragile, with the need for educational interventions that can cooperate in the development of health literacy. Furthermore, There is need for intersectoral actions that aim to reduce social vulnerability and improve the quality of life of this population.

It should be mentioned that the participants of this study had low expectations regarding the resolvability of health services, especially in demonstrating the need for nurses to create care strategies that are accessible and resolvable for the community exposed to pesticides. In addition, health professionals and nurses working in rural areas should consider health-work-environment relations in health care based on the health conditions presented by the rural population.

For future studies, it is suggested the development of research aimed at health promotion through the development of innovative and sensitive health education actions to health literacy skills not only in the BHUs but also in schools located in rural areas, so that not only the workers, but the entire rural community can develop health literacy skills.

Collaborations:

1 – conception and planning of the project: Thais Sousa da Silva, Mykaelle Yasmin Alexandre da Silva, Ana Karla Alves de Almeida, Mairy Edith Batista Sampaio and Andreivna Kharenine Serbim;

2 – analysis and interpretation of data: Thais Sousa da Silva, Mykaelle Yasmin Alexandre da Silva, Ana Karla Alves de Almeida, Mairy Edith Batista Sampaio and Andreivna Kharenine Serbim;

3 – writing and/or critical review: Thais Sousa da Silva, Cláudia Cristina Rolim da Silva, Meirielly Kellya Holanda da Silva and Andreivna Kharenine Serbim;

4 – approval of the final version: Thais Sousa da Silva, MykaelleYasmin Alexandre da Silva, Ana Karla Alves de Almeida, Mairy Edith Batista Sampaio, Cláudia Cristina Rolim da Silva, Meirielly Kellya Holanda da Silva and Andreivna Kharenine Serbim.

Competing interests

There are no competing interests.

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