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BIOSAFETY TRAINING FOR HOSPITAL CLEANING STAFF: INSTITUTIONAL SUPPORT A'ND CHANGES IN WORK PRACTICES[1]

TREINAMENTO EM BIOSSEGURANÇA PARA EQUIPE DE LIMPEZA HOSPITALAR: APOIO INSTITUCIONAL E MUDANÇAS NAS PRÁTICAS DE TRABALHO

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ABSTRACT

Objective: To evaluate changes in the work process and the institutional support offered by the organization for the application of new skills after professional training on biosafety with hospital cleaning and sanitation workers. **Method:** This is a quantitative study, developed at Hospital Geral de Palmas (TO) with 44 workers from February to April 2024. The data collection instrument consisted of the Institutional Support Assessment and Changes in the Work Process questionnaires. After collection, the data were converted into a Microsoft Excel spreadsheet and transported the Statistical Package for the Social Sciences, where they were analyzed.

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The research was approved by the Research Ethics Committee. **Results:** 77.3% of the participants were female, with a mean age of 46 years. There is a strong positive correlation between institutional support and changes in the work process, indicating that the higher the mean scores attributed to Institutional Support, the higher the mean scores related to changes in the work process. Furthermore, flaws in institutional support were found, evidenced by complaints of understaffing and work overload. **Conclusion:** It is necessary to constantly monitor the actions carried out, seeking improvement through the weaknesses and strengths identified.

Keywords: Continuing Education. Occupational Health. Hospital Cleaning Services.

RESUMO

Objetivo: avaliar as modificações no processo de trabalho e o suporte institucional oferecido pela organização para a aplicação das novas habilidades após a qualificação profissional sobre biossegurança entre os trabalhadores da limpeza e higienização hospitalar. **Método**: trata-se de um estudo quantitativo, desenvolvido no Hospital Geral de Palmas (TO), com 44 trabalhadores, no período de fevereiro a abril de 2024. O instrumento de coleta de dados foi constituído pelos questionários de Avaliação do Suporte Institucional e Modificações no Processo de Trabalho. Após a coleta, os dados foram convertidos em planilha do *Microsoft Excel* e transferidos para o *Statistical Package for the Social Sciences*, onde foram analisados. A pesquisa foi aprovada pelo Comitê de Ética em Pesquisa. **Resultados**: 77,3% dos participantes são do sexo feminino, com idade média de 46 anos. Há correlação forte positiva entre o suporte institucional e as modificações no processo de trabalho, indicando que, quanto maior as médias atribuídas ao suporte institucional, maiores foram as médias relacionadas às modificações no processo de trabalho. Ademais, constataram-se falhas no suporte institucional, evidenciadas por queixas de falta de pessoal e sobrecarga de trabalho. **Conclusão**: faz-se necessário o monitoramento constante das ações realizadas, buscando o aprimoramento por meio das fragilidades e potencialidades encontradas**.**

Palavras-chave: Educação continuada. Saúde ocupacional. Serviço hospitalar de limpeza.

INTRODUCTION

It is known that workers who occupy environments with potential risks of contamination, such as healthcare professionals, need to adhere to a routine of biosafety practices to reduce the risk of occupational accidents involving biological

material. Occupational exposure to biological material may occur through percutaneous routes (needle sticks or injuries caused by sharp objects) or through direct contact with blood and/or body fluids on mucous membranes or non-intact skin[1].

Hospital cleaning and sanitation workers are part of the hospital support services, which comprise non-clinical healthcare services[2,3]. This group is predominantly composed of workers with low levels of education and low wages, who entered the labor market early and perform activities that require intense physical effort. They are generally subject to precarious employment conditions, with a risk of musculoskeletal disorders and a need for health promotion actions[4].

In Brazil, Regulatory Standard 32 (NR 32) establishes guidelines for the protection and safety of healthcare workers. This standard includes biosafety measures such as proper surface cleaning, the use of Personal Protective Equipment (PPE), and the correct disposal of materials[5]. However, in daily work routines, the lack of Continuing Education (CE), improper use of PPE, and inadequate disposal of sharps are factors associated with the occurrence of occupational accidents[6].

Hospital cleaning and sanitation workers remain an often overlooked group in the context of biosafety; however, within the hospital environment, they are directly exposed to contamination risks, as they handle infectious materials that may lead to occupational accidents[6], in addition to circulating between both clean environments and high-risk areas, such as those with patients affected by infectious diseases.

In this context, Continuing Health Education (CHE) aims to guide the process of training and qualification of healthcare professionals, to transform professional practices and the organization of work based on the identification of needs[7].

Monitoring CHE actions is essential for the continuous improvement of healthcare service delivery, as it promotes the ongoing evaluation and adjustment of educational practices and strategies. In this way, the process allows training activities to be aligned with the real needs of both the population and professionals, thereby improving the quality of care provided[8].

Hospital cleaning and sanitation workers at Hospital Geral de Palmas (TO) participated in an educational intervention on biosafety in April 2023, developed using active learning methodologies, taking into account the professionals' prior knowledge and their needs, to improve professional practice and reduce the risk of occupational accidents. Thus, this study aims to analyze Changes in the Work Process and the Institutional Support provided by the organization for the application of new

skills following professional training on biosafety among hospital cleaning and sanitation workers.

METHODS

This is a descriptive, cross-sectional study with a quantitative approach, conducted at HGP Dr. Francisco Ayres, in Palmas (TO), selected because it is a setting where cleaning and sanitation teams work in environments with a high risk of infection from biological material.

The study participants were hospital cleaning and sanitation workers. The inclusion criteria comprised the 106 workers who participated, in April 2023, in the educational intervention on the prevention of harm caused by biological agents. After consulting the institution's employee records, it was verified that only 55 remained employed. Of this total, 44 hospital cleaning and sanitation workers participated in the study, constituting the final sample.

The exclusion criteria included hospital cleaning and sanitation professionals who were reassigned to different roles and those who did not respond to at least 80% of the data collection questionnaire.

The educational intervention on the prevention of harm caused by biological agents was developed based on CE needs identified among workers through questionnaires on the topic and direct observation by the researchers in the practice setting. The educational activities were conducted in a theoretical-practical workshop format, using active learning methodologies, addressing Hand Hygiene Practice in the "Truth Box"; the play "Simulation of Contamination Risk", which explained the transmissibility of biological agents; a workshop on donning and doffing personal protective equipment; and the "Error Game", using images and simulations of work situations in which participants identified errors related to the use of PPE.

The study used the Institutional Support Assessment questionnaire as a data collection instrument to evaluate the institutional support provided to workers, divided into three factors (Psychosocial Support, Psychosocial Support - consequences associated with the use of new skills; and Material Support), consisting of 16 questions on a 5-point Likert scale ranging from "always" to "never", and the Changes in the Work Process questionnaire, consisting of 12 questions with a 5-point Likert scale ranging from "strongly agree" to "strongly disagree". Both were extracted from the Guidelines Manual for Monitoring and Evaluation of the National Policy on Continuing Health Education, from the Ministry of Health. The questionnaire also

includes three open-ended questions regarding the activities that changed after the educational intervention; the lessons learned that improved performance; and the main challenges[9].

Data collection took place from February to April 2024, through an electronic form on the Google Forms platform, administered individually to each worker in the workplace setting at HGP (TO). After contacting and obtaining approval from management, the researcher approached hospital cleaning and sanitation workers and invited them to participate in the study. Those who agreed, in a private setting, responded verbally to the questions from the data collection instruments, which were recorded in electronic form.

This research is part of a larger project entitled "Educational intervention with hospital cleaning and sanitation workers in the prevention of harm caused by biological agents." The research project was submitted for institutional review and approval to authorize data collection and was approved. It was also reviewed by the Research Ethics Committee (REC) of the Universidade Federal do Tocantins (UFT), receiving a favorable opinion under protocol no. 5,694,479. All participants provided consent to participate in the study by signing the Free and Informed Consent Term (FICT).

The data from the electronic form were converted into a Microsoft Excel spreadsheet and transferred to the Statistical Package for the Social Sciences (SPSS), version 20®, where they were analyzed using simple descriptive statistics (relative frequency, absolute frequency, mean, standard deviation, minimum, maximum) and inferential statistics. Due to the parametric distribution of the data, assessed by the Shapiro-Wilk test ($p > 0.05$), Pearson's test was used to correlate Institutional Support and Changes in the Work Process, considering correlation values between 0.30 and 0.5 as moderate and above 0.5 as strong[10].

RESULTS

Based on the analysis of demographic and occupational data of 44 cleaning and sanitation workers from a large hospital in the Northern Region of Brazil, in the municipality of Palmas (TO), the workers' profile can be identified. The mean age was 46 years (SD 9.97), with a minimum of 23 and a maximum of 67 years. Regarding personal characteristics, Table 1 shows that 70.5% are aged 40 years or older and 77.3% are female; in terms of education, 47.7% of the workers have completed Elementary School, and only 6.9% have Higher Education. Regarding occupational characteristics, the mean length of employment was 69 months, equivalent to 5.7

years (SD 65.9 months), with a minimum of 19 months (1.6 years) and a maximum of 217 months (18.1 years). Also in Table 1, it can be observed that 68.1% have worked for two years or more, and 45.4% work night shifts.

Table 1: Profile of hospital cleaning and sanitation workers. Palmas (TO), Brazil, 2024.

Variable	Absolute Frequency	Relative Frequency (%)
Age		
23 to 39 years old	13	29.5
40 to 67 years old	31	70.5
Sex		
Female	34	77.3
Male	10	22.7
Education		
Completed Elementary School	21	47.7
Incomplete High School	4	9.1
Completed High School	14	31.8
Incomplete Higher Education	2	4.5
Completed Higher Education	3	6.9
Work shift		
Day shift	19	43.2
Night shift	20	45.4
Not specified	5	11.4
Duration		
Up to 2 years	9	20.5
From 2 years and 1 month to 18 years	30	68.1
Not specified	5	11.4

Source: Prepared by the authors (2024).

Table 2 shows the overall mean value of the Institutional Support Assessment and Changes in the Work Process, as well as the mean values of the factors related to institutional support. Notably, the values for psychosocial support - consequences associated with the use of new skills present the lowest mean, at 3.61, and also the lowest minimum value of 2.33.

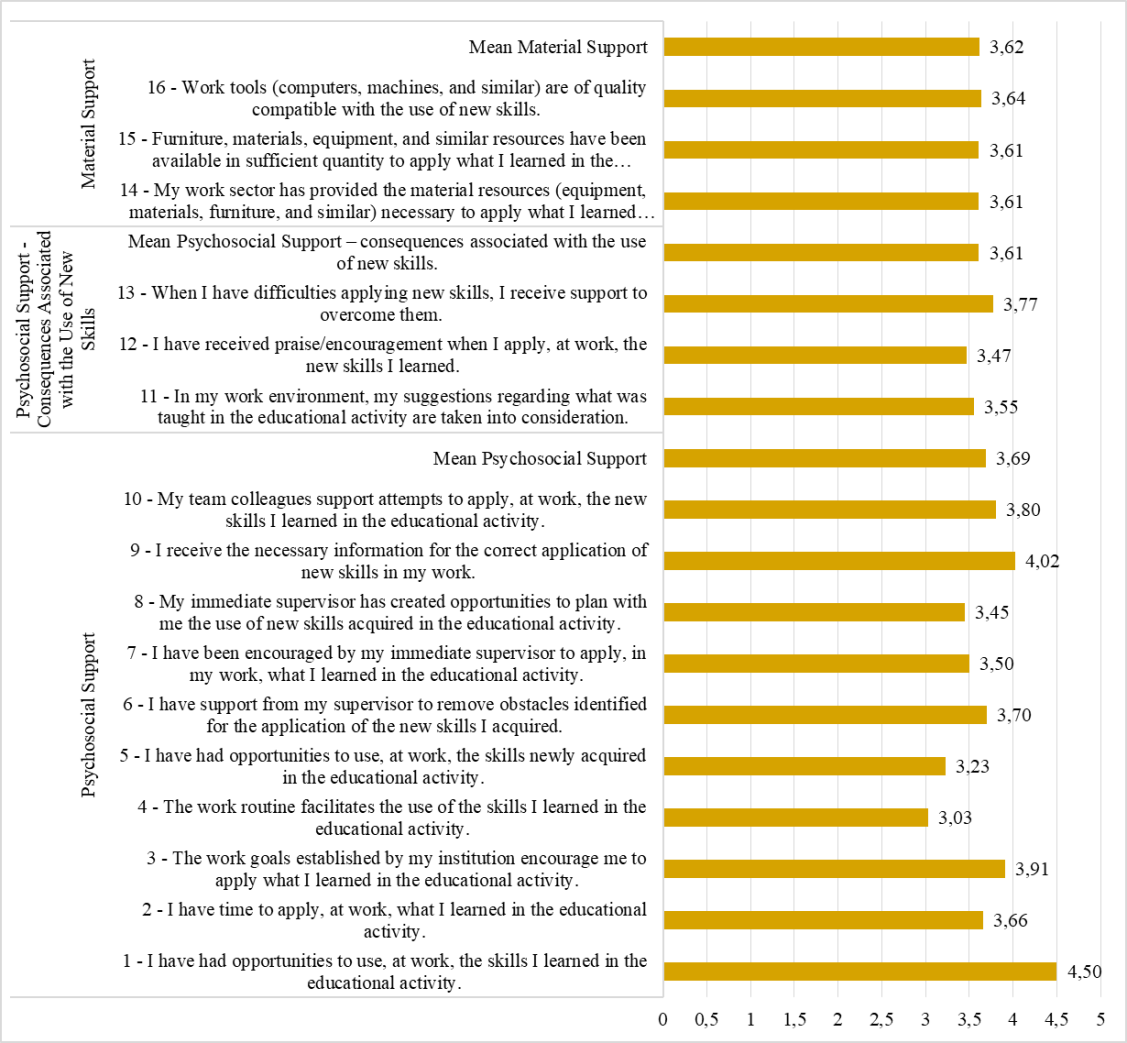
Table 2: Distribution of scores related to the assessment of Institutional Support and Changes in the Work Process among hospital cleaning and sanitation workers. Palmas (TO), Brazil, 2024.

	Mean	Standard deviation	Minimum	Maximum
Institutional Support	3.66	0.55	2.76	4.88
Psychosocial Support	3.69	0.59	2.70	4.80
Psychosocial Support - consequences associated with the use of new skills	3.61	0.71	2.33	5.00
Material Support	3.62	0.77	2.67	5.00
Changes in the Work Process	4.06	0.46	3.08	5.00

Source: Prepared by the authors (2024).

Graph 1 presents the evaluation of Institutional Support for the application of new skills following professional training and its respective factors. In the evaluation of Psychosocial Support, the lowest mean (3.03) was found for the item addressing whether the work routine facilitates the use of newly acquired skills; in Psychosocial Support - consequences associated with the use of new skills, the lowest mean (3.47) was for "I have received praise/encouragement when I apply the new skills learned at work"; and in Material Support, the lowest mean was 3.61 for the following items: "Furniture, materials, equipment, and similar resources have been available in sufficient quantity to apply what I learned in the educational activity" and "Work tools (computers, machines, and similar) are of quality compatible with the use of new skills." It is worth highlighting the positive effects found, represented by the highest means in each factor: 4.50 - "I have had opportunities to use, at work, the skills I learned in the educational activity"; 3.77 - "When I have difficulties applying new skills, I receive support to overcome them"; and 3.64 - "Work tools (computers, machines, and similar) are of quality compatible with the use of new skills."

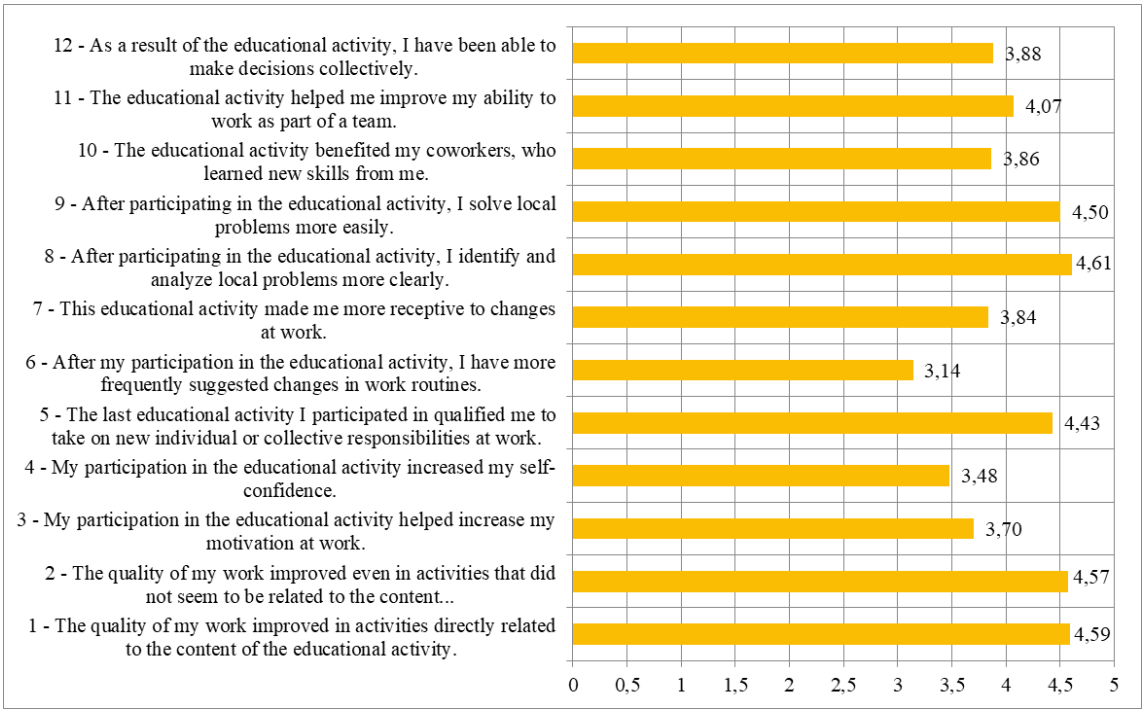
Graph 1: Institutional Support Assessment. Palmas (TO), Brazil, 2024.



Source: Prepared by the authors (2024).

Graph 2 presents the mean values related to the items on Changes in the Work Process. The following items showed the lowest means: 3.13 - “After my participation in the educational activity, I have more frequently suggested changes in work routines” and 3.48 - “My participation in the educational activity increased my self-confidence.” The strengths of the effect of professional training, evidenced by the highest means, are as follows: 4.61 - “After participating in the educational activity, I identify and analyze local problems more clearly”; 4.59 - “The quality of my work improved in activities directly related to the content of the educational activity”; and 4.57 - “The quality of my work improved even in activities that did not seem to be related to the content of the educational activity”.

Graph 2: Changes in the Work Process. Palmas (TO), Brazil, 2024.



Source: Prepared by the authors (2024).

Table 3 presents the correlations between the Institutional Support assessment and its factors with Changes in the Work Process. It is observed that both the factors and the overall mean of Institutional Support showed a strong positive correlation with Changes in the Work Process.

Table 3: Correlations between Institutional Support and Changes in the Work Process. Palmas (TO), Brazil, 2024.

Test - Pearson's Correlation	Institutional Support - Psychosocial Support	Institutional Support - Psychosocial Support - consequences associated with the use of new skills	Institutional Support - Material Support	Institutional Support Overall Mean	Changes in the Work Process Overall Mean
Institutional Support - Psychosocial Support	1	0.555	0.483	0.958	0.706
Institutional Support - Psychosocial Support - consequences associated with the use of new skills		1	0.348	0.727	0.626
Institutional Support - Material Support			1	0.627	0.526
Institutional Support - Overall Mean				1	0.776

Changes in the work process - Overall mean					1

Source: Prepared by the authors (2024).

The open-ended questions addressed which activities underwent changes after the educational intervention, with most workers reporting improvements in hand hygiene techniques, identification of risks involving needles, types of precautions, and the donning of PPE. In the second question, regarding lessons learned from the educational intervention, most participants mentioned increased knowledge in identifying risks within the hospital environment. In the third open-ended question, concerning the main challenges currently faced by cleaning and sanitation workers, the following were reported: staff shortages, which consequently lead to work overload; lack of a designated rest area; lack of materials; and poor distribution of work.

DISCUSSION

Participants' Profile

This study evaluated the effects of a CE activity on biosafety among hospital cleaning and sanitation workers, in relation to the Institutional Support provided by the organization for the application of new skills and to Changes in the Work Process.

The profile identified in this study consists mostly of professionals aged 40 years or older, transitioning from young adulthood to older age, which is consistent with a study on occupational accidents conducted in 2013 with hospital cleaning and sanitation workers, in which the predominant age group was 45–60 years[11]. Regarding biological sex, the results are also similar to another study[12], in which the majority of the workforce was composed of women. This is historically associated with the link between women and domestic work and care-related activities[13]. The gender-based division present in the labor market follows a logic in which women are more likely to be subjected to precarious work, lower wages, and a lack of prospects for career advancement[14].

The literature indicates that the educational level of hospital cleaning and sanitation workers has increased over the years. In 2004, among 50 cleaning and sanitation workers from a university hospital in the interior of São Paulo, only 6% had completed high school[15]. Among 199 cleaning workers from six hospitals in São Luís, Maranhão, who participated in a study between 2012 and 2015, 14.57% had an educational level below complete high schoo[16]. In the present study, approximately 56% of the workers have an educational level below complete high school.

Nevertheless, the use of adapted language remains necessary, considering the level of education.

A study conducted at the Hospital Universitário da Universidade of São Paulo showed that hospital cleaning and sanitation workers rank second in the occurrence of occupational accidents and have a higher risk of exposure to accidents when comparing risk coefficients across work areas in that hospital[16]. These findings reinforce the need to promote biosafety actions to minimize such risks and provide greater safety and protection for this group of workers.

Considering scores ranging from 1 to 5, the hospital cleaning and sanitation workers who participated in this study positively evaluated the effects of professional training on biosafety, as demonstrated by mean scores above 3.6 for Institutional Support and its factors, as well as in the assessment of Changes in the Work Process, which reached a mean score above 4.0. Institutional Support showed a strong positive correlation with Changes in the Work Process. This suggests that interventions targeting weaknesses in Institutional Support may further enhance positive outcomes in Changes in the Work Process.

Institutional Support

Regarding Material Support, according to the Ministry of Health, it is the employer's obligation to ensure access to PPE for all workers. It is essential to emphasize that this equipment must be available in adequate quantity and appropriate sizes. In addition, the employer must provide proper training, supervision of equipment use, and the necessary maintenance and replacement, in accordance with the manufacturer's guidelines[5]. However, this study shows that institutional Material Support for the practical implementation of the content learned in the biosafety educational activity had a mean of 3.62, suggesting possible shortcomings in the provision of general and personal protective equipment.

The literature states that the study of motivation applies to all areas of human activity. Thus, the importance of effective people management is evident, as it fosters greater team collaboration and motivation. These factors serve as tools to increase productivity, improve the quality of services provided, and contribute to the recognition of workers' role and protagonism[17].

In this study, the item regarding receiving praise when applying newly learned skills from the educational activity had a mean of 3.47. Recognition and appreciation at work are related to job satisfaction, and their absence may result in demotivation, with consequences for workers' health[18]. A study conducted with 157 cleaning

service workers from a public university hospital in Rio Grande do Sul indicated that a significant portion of workers reported being satisfied with their jobs[19]. However, the literature points out that only a minority of professionals express dissatisfaction with their work[20].

In a study involving administrative-operational workers, including hospital cleaning staff, in which significant distress related to the experience of invisibility was identified, it was observed that low self-esteem linked to the devaluation of manual labor persists in the work experience of cleaning workers. This is corroborated by the findings of the present study, in which workers reported not having a designated rest area[21].

Work overload is a facilitating condition for the occurrence of occupational accidents[22]. In line with this, many workers reported that the work routine, combined with staff shortages within the institution, hinders the quality of the service provided and increases the risk of accidents.

Changes in the Work Process

The data revealed that more than half of the hospital cleaning and sanitation workers reported that the quality of their work improved in activities directly related to the educational intervention. According to Porto et al., in the process of health education, expanding the focus toward the cleaning team can impact the actions performed by these professionals. Thus, the importance of CHE actions for a safer hospital environment is evident[23].

A recent study with specialists in occupational health and safety reaffirmed the exposure to occupational risks in the hospital work environment, in addition to the high workloads of cleaning service workers, highlighting the lack of knowledge about risks, as well as the vulnerability and precarious working conditions of these workers[24].

In this study, the results showed that hospital cleaning and sanitation workers are able to analyze and identify local problems more clearly after training, which reinforces the encouragement of CHE aimed at the continuous improvement of these workers. In this context, research has identified different approaches to health education actions aimed at modifying the behavior of healthcare professionals, primarily regarding the consistent use of PPE, seeking to increase professional awareness for safe practice[25,26].

It is worth noting that, in this study, hand hygiene was cited by participants as an activity that changed after the educational actions, reinforcing the importance of

educational initiatives aimed at improving and updating biosafety techniques. Hand hygiene is an essential step for individual and collective care in service provision, contributing to the reduction of healthcare-associated infections; however, its proper execution by healthcare professionals is around 38%[27]. Within the World Health Organization's multimodal strategy for improving hand hygiene, there is an emphasis on the use of alcohol-based hand rub due to the shorter time required for the procedure, as well as on the education of healthcare professionals as a key component, focusing mainly on the importance of hand hygiene and on when and how to perform it using recommended techniques[28].

Based on the results obtained, it can be inferred that the greater the institutional support, the greater the Changes in the Work Process. However, some points of concern should be highlighted: the item referring to whether the work routine facilitates the use of newly acquired skills had the lowest mean, and, together with the responses to the open-ended questions that indicated work overload and staff shortages, it suggests that a demanding work routine hinders the practical application of these skills.

It is known that there is a direct relationship between biosafety practices and the health of workers and patients, being essential for the provision of safe and high-quality services. In this sense, biosafety serves as an important tool for promoting protection for all those involved in healthcare.

However, CHE monitoring and evaluation are not limited to defining only quantitative criteria but also aim to mobilize information to guide the development of new educational approaches. This contributes to workforce improvement, as well as to management qualification and the provision of healthcare services[9].

The study's major limitation is that it was conducted in a specific municipality and had a small sample size, primarily due to worker turnover. Nevertheless, this fact underscores the need for Continuing Education on biosafety.

CONCLUSION

It was possible to verify that the hospital cleaning and sanitation workers who participated in this study positively evaluated the Changes in the Work Process and the Institutional Support provided by the organization for the application of new skills after professional training on biosafety. Institutional Support showed a strong positive correlation with Changes in the Work Process, indicating that, among the study participants, the higher the mean scores attributed to Institutional Support, the higher were also the mean scores for Changes in the Work Process.

However, based on the diagnosis, it was possible to identify shortcomings, such as complaints about staff shortages within the institution, which generate work overload, resulting in team dissatisfaction and exposure to risks. It is essential that these professionals have adequate support in the workplace to ensure biosafety and to put into practice the content learned in CE activities. Continuous monitoring of the actions carried out is necessary, seeking to improve them through the identification and intervention in weaknesses and strengths, according to the local context.

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