

CONSTRUCTION AND VALIDATION OF AN EDUCATIONAL VIDEO FOR IMPROVING ADHERENCE OF NURSING PROFESSIONALS TO STANDARD PRECAUTIONS

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ABSTRACT

Objective: build and validate an educational video as a strategy to encourage adherence of nursing professionals to Standard Precautions.

Methods: In the first phase, a descriptive study was conducted with 197 nursing professionals from two hospitals in Cuiabá, Mato Grosso, Brazil, to identify knowledge and factors affecting adherence to Standard Precautions; data were collected using the Questionnaire for Knowledge and Compliance with Standard Precaution (Portuguese version). In the second phase, a methodological study and an educational video were developed with the results obtained in the first phase, structured according to Nola Pender's Revised Health Promotion Model. The Delphi technique was used in video validation, a process involving 13 specialists.

Results: knowledge of nursing professionals about Standard Precautions ranged from 6.1% to 99%. The major deficits were related to the objectives and purposes of Standard Precautions. Adherence ranged from 36.0% to 95.4% and was low regarding the proper use of some personal protective equipment, recapping of used needles, hand washing after removing gloves, and procedures after exposure to biological materials. The script was validated in two rounds, reaching 82.3% and 92.8% of consensus, respectively, and the video was validated in the third round, with a 92.3% consensus.

Conclusion: lack of knowledge about the objectives and purposes of Standard Precautions was observed among nursing professionals, and many of them do not fully adopt them. The video was considered valid by the specialists and can be used to expand knowledge and, consequently, encourage adherence of nursing professionals to Standard Precautions.

DESCRIPTORS: Containment of biological risks. Universal precautions. Work accidents. Audiovisual media. Methodological study in nursing.

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CONSTRUÇÃO E VALIDAÇÃO DE VÍDEO EDUCATIVO PARA ADESÃO ÀS PRECAUÇÕES-PADRÃO POR PROFISSIONAIS DE ENFERMAGEM

RESUMO

Objetivo: construir e validar um vídeo educativo como uma estratégia para estimular a adesão às Precauções-Padrão por trabalhadores de enfermagem.

Métodos: na primeira fase da pesquisa, realizou-se um estudo descritivo com 197 trabalhadores de enfermagem de dois hospitais de Cuiabá, Mato Grosso, Brasil, para identificação do conhecimento e fatores que interferem na adesão às Precauções-Padrão com dados coletados pelo *Questionnaire for Knowledge and Compliance with Standard Precaution* (versão Português). Na segunda fase, construíram-se um estudo metodológico e um vídeo educativo, com base nos resultados obtidos na primeira fase da pesquisa e estruturados no Modelo Revisado de Promoção da Saúde de Nola Pender. A validação do vídeo foi guiada pela técnica Delphi e feita por 13 especialistas.

Resultados: o conhecimento dos profissionais sobre as Precauções-Padrão variou de 6,1% a 99%. Os maiores *déficit* relacionaram-se aos objetivos e finalidades das Precauções-Padrão. A adesão variou de 36,0% a 95,4% e foi baixa quanto ao adequado uso de alguns equipamentos de proteção individual, não encape de agulhas usadas e higienização das mãos após a retirada de luvas e também às condutas pós-exposição a material biológico. A validação do roteiro ocorreu em duas rodadas, alcançando 82,3% e 92,8%, respectivamente, e do vídeo, na terceira rodada, com 92,3% de consenso.

Conclusão: constatou-se desconhecimento de trabalhadores sobre os objetivos e finalidades das Precauções-Padrão e que vários não as adotam integralmente. O vídeo foi considerado válido pelos especialistas e pode ser utilizado para ampliar conhecimento e, conseqüentemente, estimular a adesão às Precauções-Padrão por profissionais de enfermagem.

DESCRITORES: Contenção de riscos biológicos. Precauções universais. Acidentes de trabalho. Mídia audiovisual. Pesquisa metodológica em enfermagem.

CONSTRUCCIÓN Y VALIDACIÓN DE VIDEO EDUCATIVO PARA ADHESIÓN A PRECAUCIONES ESTÁNDAR DE PROFESIONALES DE ENFERMERÍA

RESUMEN

Objetivo: construir y validar un video educativo como estrategia para fomentar la adhesión a las Precauciones Estándar de trabajadores de enfermería.

Métodos: En la primera fase investigativa se realizó estudio descriptivo con 197 trabajadores de enfermería de dos hospitales de Cuiabá, Mato Grosso, Brasil, para identificar conocimiento y factores que interfieren en la adhesión a las Precauciones Estándar, con datos recolectados por el *Questionnaire for Knowledge and Compliance with Standard Precautions* (versión portugués). En la segunda fase se elaboraron un estudio metodológico y un video educativo con base en los resultados de la primera fase, estructurados según Modelo Revisado de Promoción de Salud de Nola Pender. Video validado por técnica Delphi, realizado por 13 especialistas.

Resultados: el conocimiento de los profesionales sobre las Precauciones Estándar varió de 6,1% a 99%. Los mayores *déficits* se refirieron a los objetivos y finalidades de las Precauciones Estándar. La adhesión varió del 36,0% al 95,4% y fue baja respecto del uso adecuado de algunos equipos de protección individual, tratamiento de agujas usadas, higiene de manos luego del retiro de guantes y también en conductas posexposición a material biológico. Rutina validada en dos rondas, alcanzándose 82,3% y 92,8% de consenso.

Conclusión: se constató desconocimiento de los trabajadores respecto de los objetivos y finalidades de las Precauciones Estándar, así como que varios no las adoptan integralmente. El video fue considerado válido por los especialistas y puede utilizarse para ampliar el conocimiento y, conseqüentemente, estimular la adhesión a las PE de los profesionales de enfermería.

DESCRITORES: Contención de Riesgos Biológicos; Precauciones Universales; Accidentes de Trabajo; Medios Audiovisuales; Investigación Metodológica en Enfermería.

INTRODUCTION

Biological risks in health and nursing work environments refer to risks of viruses, fungi, bacteria, parasites, prions, among others, which may be present in blood and other body fluids, such as vomiting, feces, urine, and sweat, and cause diseases including AIDS and hepatitis.¹

Occupational exposure to biological materials can be avoided or minimized by adopting the Standard Precaution (SP) measures whenever nursing professionals are exposed to blood and other body fluids of patients, regardless of their diagnosis.²

SP consist of routine use of barriers (gloves, safety glasses, apron) in any exposure to blood or body fluids, cleaning of hands and other skin surfaces before and after performing any procedure with the possibility of exposure to potentially contaminated materials, proper/careful handling and disposal of instruments during and after use, correct use of safety devices of sharp objects, proper disposal of syringes and needles and other sharp objects into specific containers, recapping of used needles, immunization against hepatitis B whose vaccination schedule consists of a series of three doses, specific recommendations for visitors and family members of patients, specific recommendations for health professionals about handling and disposal of potentially contaminated materials, among other precautions.³⁻⁴

Prevention of accidents and diseases must be a priority in work environments; however, given the impossibility of preventing accidents, every institution must be prepared to assist victims by adopting a protocol for exposure, offering support to workers and reporting accidents.⁵

In general, educational interventions are recommended to encourage the use of SPs, reporting of work accidents (WAs), risk management, enforcement of SPs, proper availability of personal protective equipment (PPE) and good working conditions to fulfill the demand, as these factors influence adherence to SPs.⁶

Among the strategies for educational intervention, videos can be used for this purpose as they are easy to access, use and handle; also their audiovisual characteristics help memorize information and attract interest of viewers.⁷ Because of these resources, videos have been successfully used in different educational contexts, representing an alternative for in-service education. Other studies show the contributions of educational videos to the learning process in different contexts.⁸⁻⁹

In our study, an educational video was produced to go beyond the reproduction of techniques or procedures and provide scientific information and knowledge that can positively influence the adoption of safe behaviors by nursing professionals to prevent work-related accidents and diseases. In this context, in order to support the adoption of safe practices while performing nursing work and preventing accidental exposure to biological materials, this study proposed the construction and validation of an educational video based on the recommendations of SPs⁵⁻⁶ and the guidelines of the Revised Health Promotion Model (RHPM).¹⁰

These guidelines have been widely used in health promotion programs in the workplace, offering ideas and concepts from social and cognitive theories and an assessment of expectations that explores determinants of individual behavior in relation to health, based on cognitive factors and their interaction with the work and social environment. Then, this instrument helps identify factors that can lead individuals to adhere to health promotion practices and behaviors; in this specific case, the measures of SPs.¹⁰

The RHPM categories are related to the construction of the educational video script, including: personal factors (relevant to explain or predict a certain behavior), prior behavior (to the adoption of SPs), benefits of the action (health-promoting behaviors and perceived benefits of behavior), perception of barriers (obstacles that can prevent safe behavior), strategies to encourage adherence to SPs addressed by self-efficacy (judgment of personal ability to do something), feelings related to

the activity (positive and negative thoughts of professionals about adherence to SPs), interpersonal influences (interpersonal relationships and collective efforts to prevent Work Accidents with Biological Material - WABM), situational influences (risks of exposure, working conditions, provision of PPE, supervision), and health-promoting behaviors or actions.

From an individual point of view, the cognitive, affective and behavioral aspects, such as risk behavior assumed by nursing professionals of non-adherence to SPs, the reductionist perception of SPs, the judgment of low-risk patient, and excessive self-confidence of care providers are identified as causes of low adherence to SPs¹¹; and in relation to the organizational aspect, deficient supervision of work, absence of effective management for the implementation of SPs, and non-existent or deficient management of occupational safety influence adherence to SPs.⁶ Regarding knowledge about the subject, studies emphasize deficient training, insufficient qualification, poor knowledge about SPs and biosafety directly impact the adoption of these preventive measures.¹¹ Therefore, this study aimed to build and validate an educational video as a strategy to encourage adherence of nursing professionals to Standard Precautions.

METHOD

This study was conducted in two phases, as shown in Figure 1.

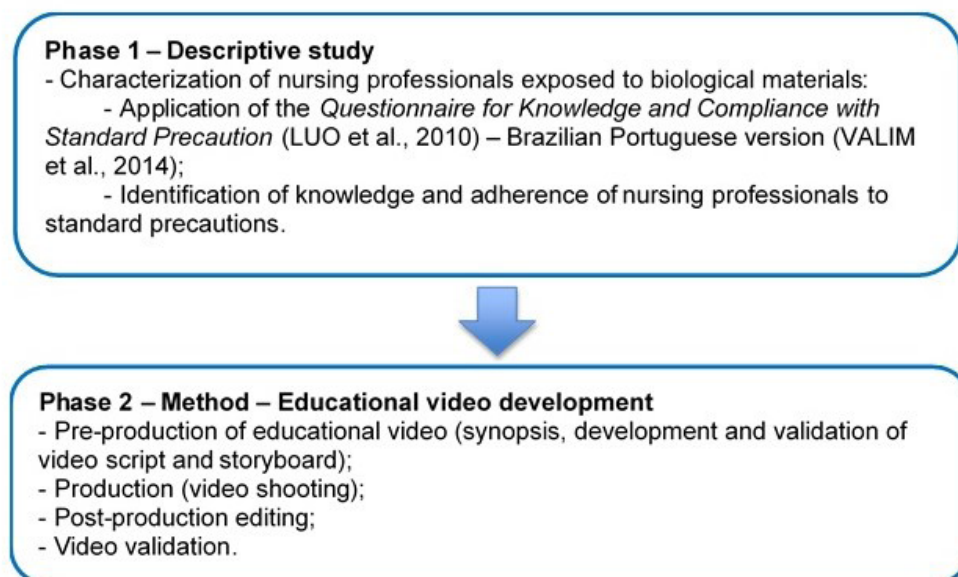


Figure 1 – Study procedures.

In Phase 1, a descriptive quantitative study was conducted to analyze knowledge and adherence of nursing professionals in relation to standard precautions to support the development of educational materials; data were collected using the Questionnaires for Knowledge and Compliance with Standard Precautions¹² (version translated into Portuguese from Brazil)¹³ with reliability expressed by Cronbach's alpha coefficient of 0.632 for knowledge about SPs and 0.80 for adherence to SPs. This instrument was applied to 197 nursing professionals from two hospitals in Cuiabá, Brazil, corresponding to 45.9% of all nursing professionals working in both hospitals. Data were collected in June 2016 by one of the authors, stored and organized in spreadsheets, with double data entry, analyzed in Epi Info, version 7.2. The cut-off point adopted to define good knowledge and good adherence was the percentage of answers $\geq 75\%$.¹⁴⁻¹⁵ The instruments collected sociodemographic information and knowledge about standard precautions and adherence to these measures.

In Phase 2, a methodological study was conducted with construction and validation of an educational video, based on the results obtained in the first phase and scientific evidence described in national and international literature. The video was structured according to Nola Pender's Revised Health Promotion Model (RHPM)¹⁰ and validated by 13 specialists using the Delphi¹⁶ technique in three steps.

Figure 2 shows Nola Pender's Revised Health Promotion Model (RHPM).

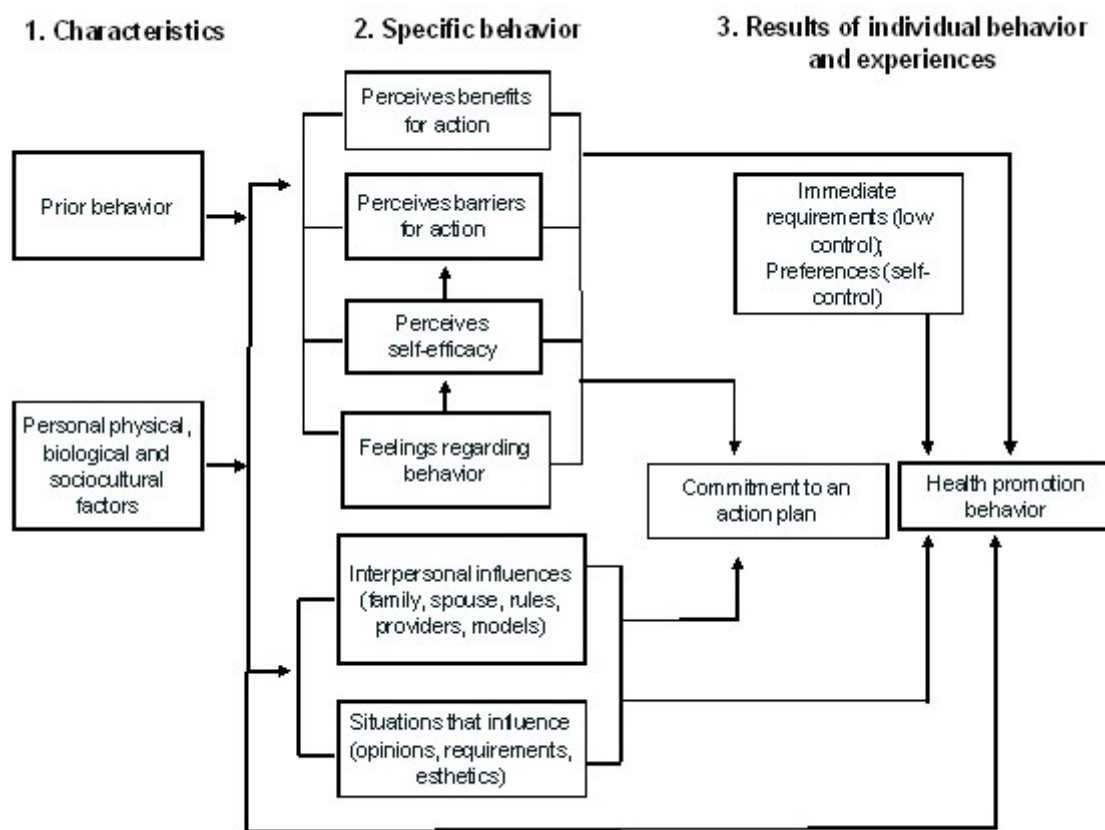


Figure 2 – Diagram of Health Promotion Model, translated from *Health Promotion in Nursing Practice*¹⁷ apud Lopes, Oliveira, Barbosa, 2005.¹⁸

The video development involved the following phases: pre-production, production and post-production. In the pre-production phase, which took around eight months, a synopsis was created, the script was developed and validated, and the storyboard was created; in the production phase, which took around two months, the video was shot; and in the post-production phase, of around six months, the video was edited and validated.¹⁹

Specialists for the validation process were selected according to the following criteria²⁰: nursing professionals, knowledge and experience with educational videos, experience in promoting health at work, and experience with educational practices. They were identified from research groups and scientific articles related to the topic accessed during the doctoral program. All names identified in this phase were contacted via Lattes platform to check whether they met the inclusion criteria and to complement their information. The invitation was sent electronically to 17 professionals, providing relevant information. All of them accepted and participated in the first round, but 4 withdrew during the process, so 13 specialists ended the validation phase.

For script and video validation, the instruments developed in another study for educational video production²¹ were used and adapted to the theme, with the authorization from the author. The script

validation instrument helped the specialists assess the objectives, content, relevance, environment, verbal language, and the need or not to include new topics. The video validation instrument helped them assess aspects such as functionality, usability and efficiency, audiovisual technique, environment and procedures adopted to achieve the objectives. These instruments were sent to the specialists by email, as well as the script (first and second rounds of the validation process) and the educational video (third round of the validation process). The specialists were instructed to circle the answer that best represented their opinion, based on the degree of agreement: 'strongly agree,' 'agree,' 'neither agree nor disagree,' 'disagree,' 'strongly disagree,' and at the end insert suggestions and comments. An 80% consensus level was considered, with the sum of answers 'strongly agree' and 'agree.'¹⁶

Video shooting was made by a third-party video producer and took place in a professional studio, outdoor areas, hospital and homes of participants, seeking to ensure good acoustic and lighting conditions, the best camera angle and good image quality. Technical resources were used to simulate practices, images of the work environment, testimonials, animation, photos and audiovisual effects. A professional actor, with experience in the production of audiovisual materials, was hired for video presentation/narration. People from the institutions involved and health professionals who voluntarily participated in video were invited for the scenes and testimonies.

RESULTS

In the first phase of the study, nursing professionals were characterized, and their knowledge about SPs and adherence were identified.

The sample consisted of 197 nursing professionals, 79.2% nursing technicians and 20.8% nurses, with a predominance of female professionals (91.9%) aged 30 to 39 years (47.2 %), mean age 36.6 years, professional experience between 6 and 10 years (35.5%). The sectors where 80.0% of all participants worked were healthcare units, such as medical and surgical areas, emergency care and intensive care units; 20.0% of the participants worked in other units of the hospitals, and some reported work in more than one area in the same institution; 34.5% reported several jobs, of which 6.4% reported 3 or more employment bonds. Of the total sample, 37.6% of nursing professionals experienced work accidents with exposure to biological materials; of these, injuries by sharp objects were reported by 27.9%. And, of the total professionals who reported accidents of this nature, 67.3% reported one exposure, 27.3% from 2 to 5 exposures, and 3 did not inform it. Exposure of mucosa and/or unhealthy skin was reported by 20.3% professionals; of these, 40.0% mentioned one exposure, 45.0% from 2 to 9 exposures, and 6 did not inform it. Of the total number of professionals who reported work accidents, 64.9% of the victims answered that they always reported accidents, the others did not always report, never reported, or did not report them. Proper disposal of sharp objects was reported by 87.8% of the participants; 90.4% reported complete immunization against hepatitis B, 21.8% of them had anti-HBs reagent, 13.2% unknown serology and 5.1% did not inform it.

Most professionals (77.7%) reported having participated in training about the topic in the past two years and 93.9% reported the desire to participate. Knowledge about SPs ranged from 6.0% to 99.0%, mean 79.2%, and was deficient regarding the objectives of SPs and use while assisting hepatitis B patients. In these items, the percentage of correct answers was less than 75.0%, the cutoff point adopted in the study to define 'good knowledge' ($\geq 75\%$) or 'poor knowledge' ($< 75\%$). The same cutoff point was adopted for adherence to SPs, indicating 'good adherence' when the answer was 'always' for the adoption of a certain procedure. Adherence ranged between 36.0% and 95.4%, with a mean of 78.4%. The following items showed low adherence: wearing safety glasses (59.4%); apron (66.5%); caps (62.4%); recapping of used needles (36.0%); and post-exposure procedures (47.2%). Wearing gloves for intramuscular and subcutaneous injection and hand washing after removing gloves showed results close to the cutoff point (around 76.0%). The cutoff point adopted aimed to obtain a

reference value for good knowledge and good adherence based on other similar studies, allowing the identification of the most deficient items to be addressed in the educational video.

The results of the first phase supported the construction of an educational video in the second phase of the study, which also considered evidence from the literature and was guided by Nola Pender's Revised Health Promotion Model¹⁴. This way, the educational video script was constructed, based on the following constructs: perception of barriers and benefits of the action, feelings related to the activity, interpersonal and situational influences. Then, the script was submitted to the specialists for validation.

Script validation

The validation process took place in three evaluation rounds, two for the script and one for the video. The committee of specialists had 13 nurses, aged from 27 to 62 years, with Fehring's score between 9 and 14. They participated in the entire process of validation for the script and later the educational video, given the importance of their participation from the beginning to the end of the video production.

The first round of script evaluation reached the consensus level of 82.3%. Despite reaching the minimum level (80.0%), a new evaluation was conducted after adjustments, since these alterations changed the structure and part of the script content. In the second round, 92.8% consensus was reached, validating the script for the video recording.

Such alterations resulted in changes in title, replacement of negative scenes and testimonies with positive ones, the term 'hand washing' was replaced with 'hand sanitization,' insertion of content about the anti-HBs test, duties of institutions, care while washing instruments, highlighting the reasons for the adoption of SPs, exclusion of flows and protocols (as they frequently change) and terms referring to material trademarks, warning about ethical aspects and copyrights, inversion in the order of two items in the script and wording corrections. All suggestions were accepted.

Educational video recording

The video was structured with the following topics: objective, presentation of occupational risks, emphasis on biological risks, transmission of diseases by occupational exposure, concepts and use of SPs, risk behaviors, prevention of work accidents, the institution's role in preventing work accidents with biological material (WABM), post-accident behavior, importance of post-exposure treatment, and the benefits of accident prevention. The video duration was 16 minutes and 5 seconds. The content strictly followed the script, but the images, scenes, background, testimonials and infographics were adjusted during the storyboard production and video recording.

Educational video validation

The following aspects of the video were evaluated: functionality, usability, efficiency, audiovisual technique, environment, and procedures. When submitted to the committee of specialists for evaluation, it reached 92.3% consensus and few suggestions were made. No 'disagree' or 'strongly disagree' answers were provided by the specialists. Then, the alterations suggested by the committee were made and, in view of the consensus obtained, the video was considered valid and the validation process ended.

The suggestions were related to the focus of some images, insertion of psychosocial risks on the screen (lettering), the term 'fictitious name' next to the interviewee identification, scenes with a focus on multiprofessional work in health, re-editing of statements, incorrect procedures with a

'prohibited' warning sign, enlargement of scenes to show the whole environment and reduction of the reproduction speed, and alteration to the instrument washing scene.

Enlargement of scenes to show the whole environment and reduction of the reproduction speed were not accepted as they would increase the video duration. Regarding video duration, only one specialist reported the video was long, but she did not suggest any change and said this fact did not affect the video quality and objectives.

Figure 3 illustrates the validation process of the script and educational video in three rounds and their respective percentage of consensus.

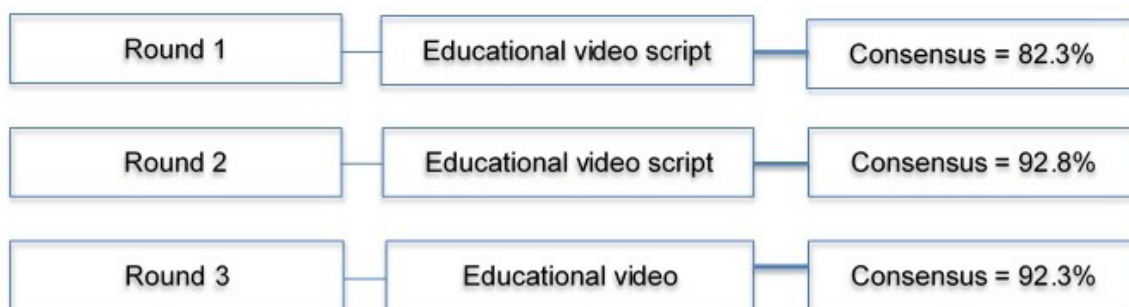


Figure 3 – Steps of the educational video validation process.

DISCUSSION

Information/knowledge and adherence to SPs

The study participants had similar sociodemographic characteristics to those described in other studies conducted in Brazil, with a predominance of female young nursing technicians.²²⁻²³ About 40% (74) of the participants experienced WABM. A study conducted with the same instruments with nurses found near 50.0% of WABM, with 30.0% of the professionals with more than one accidental exposure.⁷ Around 25.0% of the professionals did not report participation in training and most of them (93.9%) mentioned the desire to participate in training about the topic.

The implementation of strategies for safe practice awareness in nursing work involves the elimination of risky behaviors, and adherence to SPs by professionals can be one of these strategies.²⁴

According to Regulation n° 32, item 32.2.4.9, 'the employer must ensure training to workers before starting the activities, and on continued basis'^{25:3}. This regulation details and emphasizes specific precautions to prevent exposure to biological materials in health facilities.

Knowledge is a prerequisite for changing attitudes, directly influencing the adoption of the desired behavior.²⁶ Then, investments are required in actions to expand knowledge of nursing professionals in relation to SPs and enforce their full and habitual use.

Regarding information/knowledge of SPs, a deficit was observed mainly about the objectives of SPs, when they should be used, and recommendations when providing care to hepatitis B patients. The level of information/knowledge was high regarding the use of PPE and hand washing. On the other hand, low adherence to PPE (safety glasses, apron, caps) was observed in contrast to a high level of knowledge identified about the need for PPE use. The items related to recapping of used needles and procedures after occupational exposure also showed low adherence.

Results close to the cutoff point were identified regarding adherence to the use of gloves in intramuscular and subcutaneous injection and hand washing after removing gloves. The lowest percentage of adherence was reported in recapping of used needles. Another study of this nature corroborates these findings.¹⁵

Inadequate supply of materials, poor knowledge and ineffective or non-existent management are described as reasons for low adherence to SPs.⁶

A study conducted in Italy identified 52% adherence to SPs among health professionals. Nurses showed greater adherence in terms of hand washing (81%), but almost 50% of incorrect answers were identified regarding cleaning, disinfection and sterilization of materials.²⁷ In Brazil, some studies have reported low adherence to SPs, especially regarding the use of PPE, disposal of sharp objects, hand washing, and recapping of used needles.²⁸⁻³⁰

The educational video was constructed from these data and the theoretical information from the RHPM.¹⁰

Educational video

Educational programs drive changes in behaviors in the workplace as they are able to encourage adoption of SPs and reduce accidental exposure to potentially contaminated biological materials.⁵

The various audiovisual elements used in the educational video named "Safety at work in health services: adherence to standard precautions" enabled the production of dynamic material and helped achieve the proposed objectives. The content validated with a 92.8% consensus received adjustments in the validation process, in line with the recommendations found in the literature.

Initially, the script had 12 minutes, but it ended up with 16 minutes, due to the changes in the process of video recording and validation. Such increase in duration did not affect the quality and objectives of the material, as evaluated by the specialists. These changes are expected in video production and enrich the final product.¹⁹

With regard to the theoretical framework, the RHPM categories were considered when inserting the narration content, the testimonies, scenes and images: personal factors were relevant to explain or predict a certain behavior (sociodemographic characteristics); prior conduct related to the adoption of SPs; benefits of the action (health-promoting behavior and perception of the benefits of adherence to SPs); perception of barriers (obstacles that hinder adherence to SPs); strategies to encourage adherence, addressed by self-efficacy (judgment of personal ability to accomplish something); feelings related to the activity (positive and negative thoughts favoring or not the use of SPs); interpersonal influences (interpersonal relationships and collective efforts to prevent WABM); situational influences (exposure risks, working conditions, provision of PPE, supervision); and health-promoting behaviors.

Low adherence to SPs can be influenced by poor knowledge, but knowledge is a condition for changing behaviors.¹⁰ However, a high level of knowledge with low adherence may be observed, as seen with the use of some protective equipment items, concluding that educational strategies should not focus only on information, but also on actions to encourage, mobilize, and highlight behavior changes.

The results of the validation process by specialists in the topic were significant, demonstrating that this educational tool can support health promotion programs at work to encourage adherence to SPs. As the video is on YouTube (in Portuguese and with English subtitles) on https://www.youtube.com/watch?v=g7thU_XdUqI, it will benefit multidisciplinary groups of health professionals from different regions of Brazil and other countries. The video has had more than 40,000 views.

Study limitation refers to the fact that the video validation process was restricted to content validation due to the schedule, which did not allow a psychometric validation, thus requiring further studies.

CONCLUSION

Part of the nursing professionals had a lack of information/knowledge about when to use the SPs. In general, good adherence to standard precautions was observed, but it was low regarding the proper use of some PPE items, recapping of used needles, and hand washing after removing gloves, and conducts after the exposure to biological materials.

These results are alarming, given that most nursing professionals reported having participated in training. Therefore, training strategies used by the institutions must be reviewed.

The educational video proved to be valid for integrating health promotion programs and encouraging the adherence of nursing professionals to SPs; however, systematic continuing education programs in health services and investments are required for a better organization of the work process and more suitable working conditions in order to reduce occupational accidents. Then, new possibilities will be available for the promotion and maintenance of the health of nursing professionals and patients assisted by them.

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NOTES

ORIGIN OF THE ARTICLE

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CONTRIBUTION OF AUTHORITY

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Discussion of results: Porto JS, Marziale MHP.

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APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Study approved by the Research Ethics Committee of the *Universidade de São Paulo, Escola de Enfermagem de Ribeirão Preto*, certificate 53488816.7.0000.5393.

CONFLICT OF INTEREST

There is no conflict of interest.

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