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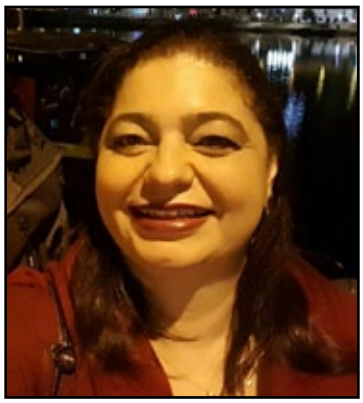

Glove use in nursing practice and its implications: a methodological study

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ABSTRACT

This article originated from the second category that emerged on the professional master's dissertation entitled "Educational technology as a strategy for the use of gloves by nursing professionals aiming the contact precaution", presented to the Review Board of the nursing school Aurora de Afonso Costa, Universidade Federal Fluminense (UFF – Fluminense Federal University). **Aim:** to identify the factors that interfere in the adhesion and/or adequacy of the precautionary contact measures in the use of procedure sterile gloves by the nursing team. **Method:** this is a methodological study using a quantitative approach, with a total of 66 participants distributed in four stages. In the first stage, 45 nursing professionals from the surgical clinics were interviewed in a university hospital between January and March 2014. **Results:** 93% of the professionals report a failure in the use of gloves and only 7% do not observe failures. **Conclusion:** the suitability of gloves is crucial for the safety of patients, professionals, society and the environment.

Descriptors: Gloves, Surgical; Gloves, Protective; Cross Infection; Nursing; Educational Technology.

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INTRODUCTION

One of the major global health challenges *is* healthcare associated infections (HAI), which leads to high levels of morbidity and mortality and increased hospitalization and costs for health care users. These factors have repercussions on patients, families and the community, and generate social, economic and spiritual costs[1].

The transmissibility of infectious agents occurs through direct and indirect contact and the hospital environment is considered favorable to this. In recent years, microorganism resistance and the incidence of hospital infections have increased in many parts of the world. There are reports that in the United States, 70% of the isolated bacteria are resistant to some type of antibiotic[1].

In Brazil, HAI are considered a public health problem and government intervention is supported by the strategies and norms determined by the Ministry of Health (MoH) such as the creation of specific legislation for the prevention and control of HAI and the formation of Hospital Infection Control Commissions (HICC)[2].

Some recommendations are essential for IRAS control such as the training of professionals. The increased use of human resources, culture of surveillance, implementation of standard and contact precautions for suspect or confirmed patients of colonization/infection by resistance germs, personal hygiene, surface disinfection, restriction of the use of antimicrobial agents, the feeding of a database to control these patients and patients' education[2] are included in the determinations of HICC for HAI control[2,3].

On the discovery of the acquired immunodeficiency syndrome (AIDS) in the 1980s, the *Centers for Disease Control and Prevention* introduced the concept of universal precautions, now known as Standard Precautions. This moment was also marked by the concern with the protection of the professional, and with this there was a great increase in the use of gloves[1,3]. Some researchers point out that health team professionals do not adhere to or maintain a nonconformity of use of this material, even though it is available in the institutions and the norms for its use are determined[1,3,3,4].

Gloves can be surgical and are designed for procedures that require aseptic techniques. They are intended to reduce the possibility of transmission of microorganisms from the hands of the professional to the operative or sterile field. Procedure gloves are used for procedures that do not require aseptic techniques and are intended to reduce the risks of contamination of professionals' hands through the dissemination to the environment and transmission of biological fluids such as blood and secretions from professional to patient and vice-versa. They are part of the personal protective equipment and their use in the precaution of contact in pertinent situations is determined by the *Agência Nacional de Vigilância Sanitária* (ANVISA – National Agency of Sanitary Surveillance). Therefore, it is necessary that professionals have some knowledge about them and use them in an appropriate way so that the IRAS control is effective[5,6].

This study aimed to identify the factors that interfere in the adherence and/or adequacy of the precautionary measures of contact by nursing professionals. From the above, the goal is to construct a tool that helps those professionals to incorporate knowledge into their praxis so that their actions are effective.

METHOD

This is a methodological study that used a quantitative and qualitative approach in a university hospital in the State of Rio de Janeiro. The theoretical processes used are presented in

the theory of the elaboration of measurement instruments. The elaboration and validation of educational technology in the form of audiovisual media is focused as a strategy to motivate and incorporate adequacy in the use of gloves in contact precautions[7].

This study was divided into four stages, with a total of 66 participants. The first and second stages were devoted to the elaboration of educational technology based on the testimonies of 45 nursing professionals who worked in the surgical clinics. The third stage was dedicated to the evaluation, and 12 specialist judges participated in it and participation of nine nursing professionals for the target audience; the fourth stage referred to the adequacy of educational technology in the form of audiovisual media.

In the first stage, which was the elaboration of educational technology, the second category, "*The use of gloves in nursing practice and its implications*", emerged as the origin of this article. Semi-structured interviews were conducted with 45 nursing professionals in the surgical clinics of a university hospital from January to March 2014, of which 14 were nurses, 30 were nursing technicians and 1 was a nursing assistant. These stages were addressed in the interview, considering that it is essential to identify what the chosen professionals know in terms of the subject matter of this research, even for the technology to meet their needs, and that the knowledge acquired is not always applied to professional your practice, as already mentioned in other studies.

The inclusion criteria were as follows: professionals from the surgical clinics who agreed to participate in the survey, day care workers and day and night caregivers, and temporary employees or civil servants. The exclusion criteria were as follows: professionals on vacation and/or on medical leave.

In the script, the identification items of the professionals and the approach on the use and its applicability were divided into the following: use of the techniques, wearing preparation, environment where these techniques will be used, observed failures, the moment when their attribution was processed, difficulty or not in handling them and the use of the team regarding use suitability.

The interviews were done at the surgical clinics in a reserved place, focusing on privacy. They were recorded in audio from January to March 2014 and transcribed by the researcher. The interviews took from 8 to 30 minutes and were conducted by means of prior telephone contact or in person. Participants were identified by the word "Voice" followed by an Arabic number relating to the recording order of the interview. The analysis and interpretation of the findings were made based on Bardin[8]. The categories that emerged allowed the development of educational technology as audiovisual media.

All participants signed the Informed Consent Form, as determined by Resolution 466/2012. The research project was approved by the Ethics Committee, Consubstantiated Opinion No. 447297, on October 4, 2013 and it was authorized by the institution.

RESULTS

In the analysis of the results, three categories emerged: "*General knowledge regarding the use of gloves*", "*Use of gloves in nursing practice and its implications*" and "*Evaluation of glove material*". This article brings as a study cutout the second category, "*Use of gloves in nursing practice and its implications*".

The profile of the participants verified that the majority, that is, 82% of the 45 participants interviewed, were female and in the age group

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between 20 and 70 years. Most were between 30 and 40 years old, or 50 and 60 years old.

As for education, it was observed that 33% of the nursing staff had an incomplete higher education; 33% had a complete education, distributed as follows: 31% had concluded post-graduation and 2% had a master's degree. Nursing bachelors performing the role of nursing technicians corresponded to 67%. Regarding the employment relationship of the participants, 53% were statutory and 47% had a temporary contract.

The second category includes in its analysis the professionals in their practical experience regarding the use of the gloves and the possible factors that interfere in the adherence/suitability of use, according to the data collected in the interviews.

The following table shows and highlights the practice within the studied scenario.

The categories generated subcategories and thematic references. In these subcategories, the most important topics are, first, the *preparation for putting on gloves*: 82% mention doing it and 18% do not mention it, which is not a constant day-to-day practice.

> (Voice 033) " In a simple touch of the patient, gloves should be used in my opinion."

> (Voice 052) "I believe that whenever you are in the unit, when it comes to patients you must always be wearing gloves, because we don't know who has handled things there, the table, the bed, the stand. So it's a matter of you protecting yourself and protecting the patient. I understand it's best this way. It's the patient's, it's the same glove; you used it first on the patient, then you can use that same glove on the bed, on the little table that is taken to the patient. Because I understand that the patient is as clean as possible. So you have to get to him with previously unused gloves."

Regarding *use failures*, in this subcategory, the professionals interviewed indicated that 93% failed in their use and only 7% did not observe any failure.

> (Voice 005) "Some dressings that should be done with sterile gloves are made with procedures gloves."

> (Voice 049) "Sometimes I see this exchange; they exchange the sterile gloves for the procedure ones."

> (Voice 018,019,020) "But then I'll see someone holding the doorknob. I'll say no."

As for the disposal of unused procedure or sterile gloves in the unit where the patient is at discharge and/or death in contact and/or standard precautions, 75% disregarded disposable and procedure gloves, while 25% had different behaviors for similar situations.

> (Voice 017) "If I do not use the procedure gloves, and they are out of the box where they are, they are discarded. And if the sterile gloves are inside the closed package, they return to the exit unit dressing room."

> (Voice 024) "I believe that if the sterile gloves are packed, you can't throw them away. Now, the procedure gloves you throw away, discard them. And the contact/standard precaution gloves are all discarded."

Table 1: Subcategories and frequency of the respective themes that comprised the category of analysis "The use of gloves in nursing practice and its implications". Niterói, RJ, 2014

Category 2- The use of gloves in nursing practice and its implications			%
Subcategory	Themes that have emerged	F	
2.1 Use of the technique for putting on gloves	Confirm the use of the technique	45	100
	Do not confirm the use of the technique		
	Total	45	100
2.2 Use of some preparation to put on the gloves	Mention the use of preparation	37	82
	Do not mention the use of preparation	8	18
	Total	45	100
2.3 In the environment considered as the patient unit, how and when gloves may be used and/or changed	Contact with the patient in the unit	21	30
	Perform procedures (bath, medication, capillary glycemia)	20	28
	Manipulating the patient unit	16	23
	Contact precaution	8	11
	Switching from patient to patient	3	6
	Change of procedure	2	2
	Total	70	100
2.4 Referral of unused procedure or sterile gloves in the unit of the patient at the time of discharge and/or death in contact and/or standard precaution	To discard	45	75
	Sterile gloves that are not precautionary return to origin	4	7
	Procedures: contact precaution, descard	4	7
	Procedure: inside box it returns to the source	3	5
	No precaution of contact: out of the box, descard	2	3
	Sterile gloves - contact precaution	2	3
	Total	60	100
2.5 Observation of failures in the use of gloves	The professionals register that they observe failures	42	93
	The professionals do not observe failures	3	7
	Total	45	100
2.6 At what time failures were observed in the use of gloves	Use of undue glove for procedure	30	42
	Quality - fragility	16	23
	Failure to wear gloves	8	11
	Professional haste	5	7
	Professional not wearing glove	5	7
	Did not answer	4	6
	Excessive talc	2	3
	Appropriate size availability	1	1
	Total	71	100
2.7 Failures attributed in the use of gloves	Habit - misuse	16	28
	Bad quality	13	22
	Lack of manners	12	20
	Professional haste	8	13
	Attention	5	8
	Restricted use	2	3
	Lack of planning	2	3
	Work overload	2	3
	Total	60	100

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...continuação.

Category 2- The use of gloves in nursing practice and its implications		F	%
Subcategory	Themes that have emerged		
2.8 Presence or not of difficulties in the use of gloves	There are indications of difficulty in the use of gloves	11	24
	There are no indications of difficulty in the use of gloves.	34	76
	Total	45	100
2.9 The staff knows how to use the PPE* gloves properly	The professionals state that the team knows how to use gloves properly.	38	84
	The professionals state that the team does not know how to use gloves properly.	7	16
	Total	45	100

** Personal Protection Equipment.*
Source: Research Data, 2014

Regarding the subcategory *difficulty in the use of gloves*, one can notice a reversal in the statements showing a greater percentage: 76% did not have difficulties and 24% did have difficulties.

> (Voice 050) "Yes. But I believe people are leading. I do not know if it's the rush or if they do not even care how important it is to know how to use the gloves at the right time, the procedure and sterile ones."

> (Voice 054) "For me, the issue is people's lack of interest. They don't believe what they see; they think they are protected and don't care about protection."

Regarding the failure in the *use of gloves*, there is a contradiction in that 93% affirmed that there are flaws and, consequently, difficulties in adhesion and suitability to gloves, whether in use or handling, regarding the quality of the material, the size and the quantity of talc.

> (Voice 009) "Sometimes there are gaps at the time of tracheostomy suction, suction tube, airways and mouth. The question is what kind of glove to use, you know? ... Then, sometimes, the personnel suck the tube with non-sterile gloves, with procedure gloves. They suck the tracheotomy with procedure gloves ... These are the issues I see."

> (Voice 022) "Sometimes, when we're in trouble, they want a diaper, then we take care of it. We grab the diaper without taking off the gloves. We know it's wrong, but it happens. "

> (Voice 038) "During use, the gloves tear very easily."

Regarding the factors that contribute to the failure in terms of glove use, it was identified that 28% of the statements regarding the improper use of gloves are related to the habits acquired by professionals in the daily routine of the practice; 22% of failures occurred due to the poor quality of the gloves, especially of the procedure gloves; 20% pointed to the low adherence of the knowledge acquired in professional nursing practice; and 13% revealed that the failures are due to the professional's haste when performing their activities in their work day.

> (Voice 015) "Yes, there is a risk of contamination, mostly because of the rush,

when you put the sterile gloves on if you don't do it calmly, if you use gloves on top of accessories and if you work without discarding the gloves from one patient to another. These are things we observe every day. "

(Voice 033) "I don't know if it's laziness or a lack of information because you see highly educated people doing that sort of thing. Although there are gloves in our sector, you can't find them everywhere, or it is the lack of habit, do you understand? "

(Voice 016) "There's bad manufacturing, you know? Poor quality material."

DISCUSSION

It was observed with these data that the participants have a high level of schooling in regular training, but they do not perform the function that they proposed to study. Most countersigned by the Regional Nursing Council are women and 50% of them have a temporary contract and function below their training. This data reinforces the findings of some studies that demonstrate how training and education are compromised, not allowing professionals to feel secure in their function.

The categories have generated subcategories and thematic references. In the thematic subcategories regarding the use of preparation to put on gloves, 82% of the participants mentioned doing it and 18% did not; this demonstrates that they do not have a recommended frequency in praxis, which should be incorporated as the first action for the use of the technique.

In 2011, a UK survey of 15 hospitals revealed the use of gloves with no specific indication for certain procedures and a much lower hand hygiene rate compared to glove wearing. According to WHO Guidelines, gloves may be used for the indicated procedure, but there is a drop in handwashing when gloves are in use. This behavior is not recommended in the preparation to put them on[9].

In the subcategory *environment in the unit of the patient in relation to the way and the moment when the gloves can be used and/or changed*, the professionals demonstrated a great concern in terms of the contact with the patient and the procedure; however, they do not consider the exchange of gloves between one patient and another, or the exchange in changing procedures in the same patient, to be priorities.

There was a great concern in terms of the protection of the professional to the detriment of the patient, demonstrated in Voices 033 and 052. The need to educate the professionals is evident. Some authors refer to indiscriminate use and non-use criteria[10].

In these statements, a concern regarding professional protection was observed; however, for the patient, there was a low frequency of statements, which indicates a need to review the techniques and the safety of patients and the environment. The adequacies of glove use, present distortions and nonconformities are misrepresented in terms of knowledge in some accounts, making education and tools necessary strategies.

Florence stated in her environmental theory that cleaning the environment is important for patient recovery and health promotion. The current relevance of her findings is related to the care of the environment for the promotion of health and the non-dissemination of infection by the environment. The author also refers to behavior change and the incorporation of healthy habits for the promotion of health[11].

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In the subcategory *referral of non-used procedure or sterile gloves in the patient unit at the moment of discharge or death and in case of standard and contact precaution*, disagreements are observed. In these statements - Voice 024 and Voice 017 - there are some misunderstandings in terms of knowledge regarding whether or not to discard them. It is observed, then, that everyone within the praxis should have the same conduct in relation to the same situations or circumstances in the work processes. Thus, permanent education must be a continuous process so that the protocols are fulfilled in a standardized way.

In the subcategory *use failures*, the professionals interviewed indicated that 93% fail in their use and only 7% did not observe any failure. In Voices 005, 009 and 022, regarding nursing techniques, it was observed that the knowledge and use of gloves are incipient. The misuse and/or difficulty in terms of procedure choice was highlighted as follows: dressing change, tracheal aspiration in use and other procedures by nursing and health professionals. In addition to these, other failures were pointed out such as material fragility, lack of technique for wearing them, professional haste, non-adherence to gloves, excessive talc and unavailability of size.

It is observed in Voice 038 that the failures are related to the material of the gloves, which compromises professionals and patients' care and safety.

There was also a reference to professionals' haste, causing the transmission of pathogens and the contamination of the environment, and nonconformities such as the use of accessories, as endorsed in Voice 015. These statements demonstrate the determinants and the inadequacies in the use of gloves as the contact precautions. Therefore, the techniques must be reviewed and incorporated into the daily routine during the work processes.

The lack of planning in the tasks to be performed was evidenced in Voice 006.

The reports highlighted by the participants, regarding the factors that condition the use of gloves, can mean high costs for the health of users and compromise the health of nursing professionals. Some authors validate these assertions when they affirm that the use must be conscious, since the final product and the costs can be affected in increasing degrees and different instances[1,11,12].

As for the subcategory *difficulty in the use of gloves*, there was a reversal in the frequency of statements, with a higher percentage: 76% for no difficulties and 24% revealed having difficulty. The team did not realize major obstacles. However, when confronted with another subcategory, in terms of *failure to use gloves*, there was a contradiction: 93% affirmed that there are flaws and, consequently, difficulties in adhesion and adequacy in terms of glove use, both in the use regarding handling and in relation to the material, as regards quality, size and talc, as discussed below.

Studies emphasize that the theoretical knowledge of the professionals may not revert to practical actions, revealing that their activities can be mechanized and present little critical reflection. That is, the knowledge acquired is not fully evident in practice[1,13]. In this research, the professionals detected some errors in the daily care of glove use; however, this fact was attributed to haste while working and the non-incorporation of knowledge by the team, as can be seen in Voices 050, 052 and 054.

It is troubling that the professionals see failures happening in their professional routine and do not care about it, as highlighted in Voices 049, 018, 019 and 020.

It has been shown that the knowledge acquired is not always present in the behavior of the professional and in their care practice. Stu-

dies have shown that there are a low number of professionals with adequate knowledge on contact precautions and that adequate knowledge is not always translated into practice[1,12,13,14].

In the subcategory to which *failures are attributed*, it was identified that 28% of the statements regarding improper glove use is related to the habits acquired by professionals in the practice routine: 22% of failures occurred due to the poor quality of the gloves, especially those of procedures; 20% pointed to the low adherence of the knowledge acquired in professional nursing practice; and 13% revealed that the failures are due to professionals' haste when performing their activities in their work day.

Other factors are also presented as causes of failure regarding the use of gloves: 8% featured problems related to professional attention during their activities and 3% mentioned that the failures are due to the restrictions that occur in the health institution regarding the material *deficit*. They also record the lack of planning and workload of nursing professionals.

There are multiple factors related to failure regarding the use of gloves, but the habit is consolidated as a determinant factor for misuse, which is something that can be worked on with professionals by means of permanent health education. Voice 33 emphasizes habit as a factor for possible failure in the use of gloves.

The quality of the glove material, not only exposes professionals in various situations, but also corroborates failure due to its fragility and the inadequacies of use regarding the size that are incompatible with the specific numbering of the professional, leading, in some moments, to the use of gloves. This statement is observed in Voice 016.

Even to a lesser extent, haste, lack of attention and work overload, are not less important as factors that cause possible failures in the use of gloves by nursing professionals. Such items are connected to infrastructure and they collaborate with factors that trigger failures or facilitate their presence. The rush of professionals to carry out their activities without reflecting on their quality is recorded in Voice 054.

The statements show that professionals do know how to proceed for their safety and that of their patients when it comes to glove use; however, their behavior does not conform to what they know, according to Voices 006 and 035.

Other factors emphasized in the speeches are the lack of planning for the activities and the work overload.

Participants' statements point to factors that contribute to poor glove use and can mean high costs to both the health of users and professionals. Authors validate these assertions when they emphasize that one should always think about the final product and the cost it generates in increasing degrees and different instances[1,11,12].

In the subcategory *there is difficulty in terms of use*, 76% of the statements referred to the difficulty of use and 24% mentioned that there is difficulty using them. As for the difficulty, the team did not see great obstacles. However, when this category is compared with another, i.e., *failure to use gloves*, there is a contradiction: 93% affirmed that there are flaws and, consequently, difficulties regarding adherence and the adequacy in relation to glove use, whether in terms of handling or in relation to material such as quality, size and talc.

Cognitive factors associated with social context determine positive and negative behaviors[13,14,15,16]. The fact that professionals see the failures happening in their daily routine and do not care about them, as highlighted by Voices 050, 052 and 054, is extremely troubling.

The behavior of professionals is in dissonance during some periods and inadequacies in decision-making reveal that in everyday life

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that there is an imbalance between knowledge, attitudes and practices regarding the object of health[14,15,16].

Knowledge is information processed and constituted in incorporated actions. This way, it can be ensured that information becomes knowledge when there is a human interaction capable of absorbing it and relating it to other knowledge, processing the internalization and transforming it into part of a belief system of the individual himself. Thus, knowledge is the information associated with the potential of people, skills, competencies, ideas, intuitions, commitments and motivations[14,15].

Practice means making a decision to take action. Thus, it is observed in the data of the research that the professionals present positive and negative practices regarding the adherence and adequacy in the use of gloves in nursing care.

Based on this evidence, continuous health education of nursing professionals, based on educational technology that favors changing behavior, is preponderant, along with reinforcing essential content about the conscious use of gloves, already evoked in the literature.

CONCLUSION

This article demonstrated that nursing professionals have knowledge regarding the use of gloves, but there are low adhesion and nonconformities between the acquired knowledge and its application in practice. It was observed that knowledge does not imply action in its activities in the assistance provided. Factors that interfere with poor adherence and/or inadequacies in glove wear and contact precautionary measures have been identified. The nursing professionals identified a number of failures and generating factors such as the lack of habit, poor quality, lack of education and professional haste.

Given the knowledge and development of nursing care, it is necessary to expand the domains and skills of these professionals and to promote actions in order to understand the situations and to convert them into practical action regarding the adhesion and use of gloves; all of this aims to incorporate knowledge through training, capacity building, permanent continuous education and successful technologies.

Excellence in care and good practices should be the goals of all professionals and they are crucial to the safety of patients, professionals, society and the environment.

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