ABSTRACT

Objectives: to describe the behavior of health professionals regarding the use, frequency of change and why the use the coat; verify the knowledge of these professionals regarding the possible contamination of coats by microorganisms and spread them in the hospital and out-of-door.

Methods: cross-sectional study performed with 100 professionals in inpatient units of medical-surgical clinic of a general, philanthropic and large hospital, located in Minas Gerais, Brazil. Was employed the descriptive statistics and the Chi-square test to analyze the data. The study was approved by the Ethics in Research Committee, ETIC 0430.0.203.000-09.

Results: 90% of the professionals reported wearing coat in non-custodial assistance areas, 68% change the coat daily and 41.2% use the same coat in other workplaces.

Conclusion: it is suggested investment in continuing education programs focused on the aspects of biosafety, hand hygiene, storage, and frequency exchange-coat.

Descriptors: Hospital infection; Clothing; Health Personnel.

RESUMO

Objetivos: descrever o comportamento dos profissionais de saúde em relação ao uso, frequência de troca e motivo pelo qual utilizam o jaleco; verificar o conhecimento destes profissionais em relação à possível contaminação dos jalecos por microrganismos e disseminação deles no ambiente hospitalar e extra-hospitalar.

Método: estudo transversal, realizado com 100 profissionais em unidades de internação de clínica médica-cirúrgica de um hospital geral, filantrópico e de grande porte, localizado no interior de Minas Gerais, Brasil. Foi empregada a estatística descritiva e o Teste Qui-quadrado de Pearson na análise dos dados. O estudo foi aprovado pelo Comitê de Ética em Pesquisa, ETIC 0430.0.203.000-09. Resultados: 90% dos profissionais relataram circular com o jaleco em áreas não privativas de assistência, 68% troca o jaleco diariamente e 41.2% utilizam o mesmo jaleco nos demais locais de trabalho. Conclusão: sugere-se o investimento em programas de educação permanente voltados para os aspectos de biossegurança, higienização das mãos, armazenamento, frequência de troca do jaleco.

Descritores: Infecção Hospitalar; Vestuário; Pessoal de Saúde.

RESUMEN

Objetivos: describir el comportamiento de los profesionales de salud sobre el uso, cambio de frecuencia y por qué usar la bata; verificar el conocimiento de estos profesionales sobre la posible contaminación de las batas por microorganismos y su diseminación en el hospital y extra-hospitalaria. Métodos: estudio transversal hecho con 100 profesionales en las unidades de hospitalización de la clínica médico-quirúrgica de un hospital general, filantrópico y grande, con sede en Minas Gerais, Brasil. Se empleó la estadística descriptiva y el Teste de Chi-cuadrado para analizar los datos. El estudio fue aprobado por el Comité de Ética en Investigación, ETIC 0430.0.203.000-09. Resultados: el 90% de los profesionales informaron andar con la bata por áreas de asistencia no privativas de asistencia, el 68% cambia de la bata diariamente y el 41,2% utiliza la misma bata en otros lugares de trabajo. Conclusión: se sugiere el inversion en programas de educación permanente voltados para los aspectos de bioseguridad, higiene de las manos, el almacenamiento y la frecuencia de cambio de bata.

Descritores: Infección Hospitalaria; Vestuario; Personal de Salud.
INTRODUCTION

Infections related to health care (IRAS) are defined as those acquired during the provision of health care which is often spread by cross contamination. The control of HAIs and the spread of resistant bacteria becomes a challenge in health institutions due to major complications related to patient care.\textsuperscript{1,2} The IRAS prolong the hospital stay impairing economic, social, and professional staff to patients, families and hospitals, increase the rates of morbidity and mortality.\textsuperscript{2-3}

The main route of transmission of microorganisms implicated in the occurrence of HAIs occurs essentially in the hands of health professionals and patients.\textsuperscript{3,4} However, the face of increasing bacterial resistance in healthcare institutions and in the community, is of great importance to investigate the role of environmental factors, including coats of health professionals in the chain of transmission, because if contaminated, become spreading vehicles of a variety of microorganisms with different drug susceptibility profiles.\textsuperscript{5}

In coats, the pockets are a major area of contamination, possibly due to frequent contact with the hands of professionals, after patient care, to guard belongings without performing the same hygiene. The cuffs, waist region, are also commonly contaminated places, which may be associated with direct contact with these places the patient and environmental surfaces, and inanimate objects.\textsuperscript{6-7}

Measures such as the frequency of replacement, use only in patient care, little practiced by professionals in health facilities arouses the attention of researchers, controlling infection and recently the company.\textsuperscript{7,8} The coat consists of a type of dress common to all health professionals, in some institutions may be required to use. Contamination of gowns through direct or indirect contact is almost inevitable in healthcare environments. Fact that can intensify the face of long, double or triple work shifts at different institutions, watching different types of patients using the same clothing. Thus, considering the coats of health professionals as a potential reservoir of susceptible and resistant microorganisms, this study aimed

- To describe the behavior of health professionals regarding the use, frequency exchange and why use the coat.
- To check knowledge of these professionals regarding the possible contamination by microorganisms on the coats, and spread them in the hospital and outpatient settings.

METHOD

Article compiled from the dissertation <<Epidemiological characterization of microorganisms in lab coats for health professionals >> presented to the Graduate Program in Nursing, Federal University of Minas Gerais / UFMG. Belo Horizonte, Brazil, in 2012.

Cross-sectional study conducted from January to August 2011 in inpatient units of medical-surgical clinic of a general hospital, philanthropic and large, located in Minas Gerais, with 403 beds and an average occupancy of 88%. It is a reference in the municipal and Midwest for the care of patients with diseases of medium and high complexity as cardiac surgery, kidney transplant, radiotherapy and chemotherapy, among others.

The inpatient units where the study was performed of patients attending various clinics such as orthopedics, oncology, cardiovascular, neurology, transplantation, gastrointestinal, urology and others from the community, emergency and other municipal hospitals of the city and region. These three units were located first with 39 beds on the 1st floor of the institution, the second with 51 beds on 2nd floor and the third with 53 beds on 3rd floor.

Were invited to participate in the study all eligible health professionals, and the final sample comprised 100 participants. It was considered as a criterion for inclusion of participants: actively carry out the function direct assistance in patient care during the period of data collection. Were excluded from the study professionals who were on vacation or sick leave on probation (admission date less than three months) during the time of data collection, in addition to speech therapists, psychologists and laboratory technicians not to perform service directly to patients.

The first contact with potential participants gave verbal approach by explaining the objectives and purpose of the study, participating voluntarily and no financial benefit.

To collect data a questionnaire was developed consisting of closed questions divided into two parts:

Part 1: Behavior of health professionals regarding the use of the coat in non-private assistance, sites that use the coats, frequency exchange-coat, why use the coat.
Part 2: Knowledge of health professionals for the presence of microorganisms in lab coats and the possible spread of those in hospital and outpatient settings.

For the application of the questionnaire sought to obtain information regarding the knowledge and behavior of health professionals regarding the care with lab coat and use.

Then we proceeded to the collection of microbiological samples from his pocket and the abdomen, through the technique of rolling Swabs (Swab Plastic Hast J.P.). These areas of coats for sampling were selected because of the frequency of touches the hands of professionals and direct or indirect contact with patients, as observed in previous studies.6,8

Thus was rolled dry sterile swab on the pocket and the abdomen. For coats that had more of a pocket set up to roll the swab only one of these, and at the time of specimen collection for microbiological analysis was asked the participant which pocket most used. In the abdominal region was delimited area near the lock buttons, in the central part of the abdomen in order to facilitate the analysis of the area in most contact with the patient during performance of procedures and the environment / unit patients.

The swabs were transferred to tubes with Stuart transport medium. All samples were sent to the microbiology laboratory of this institution. The microbiological samples were obtained during the day from 13:30 to 15:00 for professionals who work from 7:00 to 19:00, at night 22:30 to 24:00 for professionals who work 19:00 to 7:00.

The sowing of each material was performed in culture media sheep blood agar, MacConkey agar, Mannitol salt agar, Sabouraud agar and thioglycolate enrichment broth with indicator resarsurina. All media were incubated in a glasshouse at 35° C for 72 hours.9

The isolated microorganisms were identified in these media as to genus and species in the automated system Vitek® 2 (BioMerieux®) and after this step was performed antibiogram by disc diffusion method (Kirby-Bauer®).

Data analysis used descriptive statistics. The association between knowledge, behavior and the presence or absence of contamination in the lab coat, we adopted the chi-square test using a significance level of 5% (p < 0.05). Data were analyzed using the Statistical Package for Social Science (SPSS) version 15.0 and Stata version 9.0.

The project was based on Resolution 196/96 National Health Research involving humans, was submitted to the Ethics Committee for Research on assessment, and approved under number ETIC 0430.0.203.000-09.

RESULTS

- Demographic profile of health professionals

The study included 100 health professionals accounted for 86% of the active population in inpatient units for medical-surgical clinic. The professional categories of participants were: 76% of nursing staff (nurses, technicians and nursing assistants), doctors and physiotherapists (24%). There was a predominance of females (66%). The age ranged between 19 and 65 years with a mean of 30, 8 and median of 28, 5 years.

Regarding the length of training 53% had between one and three years. The shift of most respondents was daytime (57%), followed by those professionals who performed duty in both rounds (43%).

As for the number of jobs, 83% of the sample reported working only in that institution, 17% reported having two or more jobs Doctors were professionals with more jobs.

Considering the type of service, the majority stated work in primary care units and emergency rooms (70.6%) and 29.4% in other hospitals.

- Behavior of health professionals regarding the use, the frequency of change and why use the coat

Regarding the behavior of professionals in the use of the coat 90% (90) ensured not only use it in environments Private patient care and 77% said that circulate in the same areas in the external units (cafeteria, cafeteria ) support services assistance and administrative areas, and 13% in support services. Only three respondents said they eventually attend public places carrying coat.

Most professionals (68%) reported the habit of changing the coat every call, 27% exchange every two shifts and 5% every three shifts. With regard to why use the coat, 83% of participants reported aspect of personal protection, 14% use it because it is a requirement of the hospital and 3% are due to the use of the same elegance and symbolism.

Among the professionals who work in other health services, 41, 2% stated that they used
the same coat in other workplaces. In case of contact with the coat bodily secretion or excretion during manipulation of the patient, 69% of participants reported substitute another piece of clean clothing provided by the institution, only 18% return if the dirt is visible and 13% did not do the exchange, i.e., remain with the coat until the end of the work shift.

- Knowledge of health professionals in relation to contamination of lab coats and dissemination of microorganisms in the hospital and extra hospital environment

Regarding the presence of microorganisms in the lab coat 98% believe that coats can harbor microorganisms. However, this statement seems inconsistent when compared to the other answers regarding the spread of microorganisms and presented below. As the spread of microorganisms, 93% responded that they can be disseminated in the hospital and outpatient settings.

For measures to reduce the spread of microorganisms in the hospital environment, 92% said it was possible through actions such as hand hygiene, use of lab coat only in patient care, as well as the frequency of exchange and washing.

In the extra-hospital environment, 89% reported believing that care for the correct storage of it after use, non-circulation with the same frequency and in public washing of them could prevent the spread of microorganisms in the community.

- Microorganisms present in the analyzed areas of coats of health professionals

100 samples were collected in the region of the pockets of the coat and 100 of the abdominal region. Of the 200 samples collected, 94 (47%) were positive after 72 hours of incubation, and positive samples, we obtained 144 bacterial isolates.

In the region of the pocket of the total of 100 samples 51% were positive, and the microorganisms: Staphylococcus spp (39,7%), Kocuria ssp (8,4%), Micrococcus spp (4,2%), Streptococcus spp (2,8%), Enterococcus faecalis (0,7%) Serratia spp (0,7%), Acinetobacter baumannii (0,7%).

In the abdomen of the total of 100 samples, 43% were positive for these organisms: Staphylococcus spp (25,7%), Micrococcus spp (10,4%), Kocuria ssp (2%), Enterococcus faecalis (2%) , Acinetobacter baumannii (2%), Streptococcus spp (0,7%).

Staphylococcus spp was the predominant genus in the two areas analyzed (pocket and abdomen), with recovery of 57 (39,6%) strains in his pockets and 37 (25,7%) strains in the region of the abdomen.

The coagulase negative Staphylococcus (69,5%), Kocuria ssp (14,6%), Streptococcus spp (4,9%), Serratia spp (1,2%), showed up the most in the pockets. Staphylococcus aureus was recovered only one strain in the abdomen. The Micrococcus spp (24,1%), Acinetobacter baumannii (4,8%), Enterococcus faecalis (4,8%) were predominant in the region of the abdomen.

The distribution of behavioral variables and knowledge regarding the presence of microorganisms in the pockets of jackets are shown in Table 1.

We observed a significant difference p < 0.05 compared to frequency trading lab coat, and professionals who reported changing the coat every duty, had higher percentage of contamination in pockets.
In referring to the behavior, the participants of this study reported almost in its entirety using the coat elsewhere in the institution, and not only at the time of patient care. Importantly, the sites are common cafeteria, the cafeteria, administrative areas.

It becomes a habit increasingly common, the use of lab coats in public places such as restaurants, cafeterias, supermarkets, among others, in various parts of the country.

In Brazil, the municipal government of Maceio sanctioned Law nº 124/2009 that restricts the use of lab coats in public places. In Paraná, the Legislative Assembly passed the bill number 16.491/2010 which prohibits the use of lab coats and other protective equipment by health professionals, in areas extra hospital. Furthermore, stipulated a fine in the amount of one hundred and ninety-three Reais and seventy cents for professionals who do not comply, may be charged twice for the recurrences, the states of São Paulo, Minas Gerais, Mato Grosso do Sul also deployed similar laws.

It is observed that the Departments of Health does not inspect these decrees, however, claim that educational campaigns are needed to better awareness and adherence to the law of each region of the country.

Their use in public places such as restaurants, bars, cafeteria, bus, may reflect the need for health professionals to rethink this approach and its implications for the possible spread of microorganisms in the community.7,12

Among the professionals who have registered more than one job they said they use a single coat on all jobs. In respect of contamination of lab coats, it is important to highlight the frequency and location of washing, use of the same coat, in different sectors; favoring contamination and the spread of bacteria between different environments and patients.8

The restricted use of the coat, only in private areas of patient care contributes to lower contamination. In a study conducted in Nigeria over the possible contamination of white coats of doctors the same when used in locations outside hospitals as bookstores and cafeterias had a higher level of contamination in relation to doctors who said they use it only in private assistance.7

It is noteworthy that the registration microorganisms can survive for more than 60 days, depending on the organic matter present in the tissue, such as Staphylococcus aureus have been recovered in synthetic and cotton fabrics in the presence of blood in an average of 60 to 90 days.13

In the present study another important finding was the observation that almost all participants in this study demonstrated believing that the coat is a possible reservoir and vehicle of microorganisms which when present can be disseminated in the hospital and in the community.

However, the responses to the measures to prevent spread in the hospital environment...

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**DISCUSSION**

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However, the responses to the measures to prevent spread in the hospital environment...
and extra hospital contradict this statement. Fact leads us to infer that this knowledge may have been influenced by the recent articles published in the media on the topic, and may have contributed to socially acceptable answers, or may not have expressed the true mindset of respondents in part or in mostly.

The presence of Staphylococcus aureus resistant to methicillin in coats of medical students in areas of patient care has been reported and suggests the spread of microorganisms in the hospital environment and extra hospital.14 There are also records recovery of Acinetobacter baumannii, Enterobacteriaceae, Pseudomonas, in coats of doctors and nurses after contact with patients.5

Contamination of gowns by SCN is mainly based on how often they are touched by the hands of professionals, in the case of pockets for safekeeping of belongings, possibly without hand hygiene before and / or after the completion of patient care. The region of the abdomen that commonly has contact with patients and inanimate objects that surround SCN was also recovered. Remembering that these are part of the normal flora of the human skin and mucosa.

In coats of health of this institution, several species of Staphylococcus spp were isolated. The coagulase-negative Staphylococcus (SCN) has emerged with one of the main etiologic agents of HAIs, Staphylococcus epidermidis as prevalent.15 16 the predominant form found in 37.23% of the 94 positive samples in this study. Staphylococcus epidermidis is also considered opportunistic microorganisms leading to the occurrence of infections in immunocompromised patients.17

Acinetobacter baumannii was predominant in the region of the abdomen, which is associated with frequent contact with surfaces of this area of the hospital environment. The recovery of Enterococcus faecalis coats of health professionals in the region of the abdomen suggests the possible contamination during procedures such as bathing, handling bodily excretions, change clothes cover, one that these are pathogens that colonize the gastrointestinal tract.

Patients colonized or infected are the main source for the spread of microorganisms. However, health professionals colonized the inanimate environment, equipment on patients and often played by professionals may also constitute potential reservoirs of microorganisms.18

The results of this study confirm that the coat can become contaminated and possibly constitutes a vehicle for the spread of microorganisms. Also point to the need for investment in continuing education, with themes related to biosafety, hand hygiene, and the role of the environment including the coat with potential reservoirs of microorganisms. Also, publicize the importance of care related to the frequency of exchange, storage for loss of use in public places are required, and may thus reduce the risk of exposure to the professional society, and especially encourage the safe handling and risk free the patient.

**CONCLUSION**

Most professionals reported that circulate with coats in non-custodial care as canteen, cafeteria services, welfare support and administrative areas. The frequency trading lab coat every duty was prevalent among the study participants. The reason we use personal protective coat looks prevailed among participants.

Regarding knowledge greater percentage of professionals responded that coats may contain microorganisms and that these can be disseminated in the hospital and out of these.

Verification of concern by society with greater attention to the issue, often serving the media and proposing laws aimed at prohibiting the use of these outside the work environment reinforces the need to invest in training in order to conduct an indication of the use, care storage and use since graduation, favoring the formation of proper habits with lower risk of exposure to themselves, to society and especially to patient safety.

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