

Knowledge of nursing undergraduate students about the use of contact precautions measures

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Abstract

Objective. To assess knowledge of nursing undergraduate students about the use of contact precautions. **Methodology.** There were 106 nursing undergraduate students from three universities within the state of São Paulo. The data collection was done between April and May 2012. A questionnaire was elaborated with questions assessing knowledge regarding contact precautions. The data were submitted to statistical procedures in the package MINITAB version 16. The knowledge were rated as adequate, partially adequate and inadequate. **Results.** There was a predominance of females (86%) and age group between 20 and 29 years (70%). Regarding the definition of contact precaution of diseases in which these measures are used, undergraduate's knowledge was partially adequate (92% and 44%, respectively). The knowledge was considered adequate for the preventive measures used during assistance (86%). As difficulties mentioned in the use of these measures were discomfort, lack of material, personnel and time. **Conclusion.** Although undergraduate students know what measures to be used in contact precaution, they do not have adequate knowledge about which diseases they should use them. The three participating universities should reflect on the quality of training for nursing students regarding biosecurity and contact precautions.

Key words: cross infection; patient isolation; students; nursing.

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Conocimiento de los graduados en enfermería acerca del uso de las medidas de precaución de contacto

Resumen

Objetivo. Evaluar el conocimiento de los graduados en enfermería acerca del uso de las medidas de precaución de contacto. **Metodología.** Entrevista a 106 graduados del pregrado de enfermería de tres universidades del interior del estado de São Paulo. La recolección de la información se hizo entre abril y mayo

de 2012; se elaboró un formulario con preguntas que evaluaban conocimiento acerca de las precauciones de contacto. Los datos fueron sometidos a procedimientos estadísticos en el paquete MINITAB, versión 16. Los conocimientos fueron calificados como adecuados, parcialmente adecuados e inadecuados. **Resultados.** Hubo predominio del sexo femenino (86%) y del grupo etario entre 20 y 29 años (70%). En cuanto a la definición de precaución de contacto y de las enfermedades en las que se utilizan estas medidas el conocimiento de los graduados fue parcialmente adecuado (92% y 44%, respectivamente). El conocimiento fue adecuado en las medidas preventivas a ser utilizadas durante la asistencia (86%). Como dificultades en la utilización de estas medidas citaron la incomodidad, la falta de material, personal y tiempo. **Conclusión.** Aunque los graduados conocen cuáles son las medidas a ser implementadas en la precaución de contacto, no tienen un conocimiento adecuado sobre las enfermedades en las cuales deben utilizarlas. En las tres universidades participantes debe reflexionarse sobre la calidad de la formación a los estudiantes de enfermería en bioseguridad y precauciones de contacto.

Palabras clave: infección hospitalaria; aislamiento de pacientes; estudiantes de enfermería.

Conhecimento dos graduados em enfermagem sobre o uso das medidas de precauções de contato

■ Resumo ■

Objetivo. Avaliar o conhecimento dos graduados em enfermagem a respeito do uso das medidas de precaução de contato. **Metodologia.** 106 graduandos da pré-graduação de enfermagem de três universidades do interior do estado de São Paulo. A recolha da informação se fez entre abril e maio de 2012; elaborou-se um formulário com perguntas que avaliavam conhecimento a respeito das precauções de contato. Os dados foram submetidos a procedimentos estatísticos no pacote MINITAB versão 16. Os conhecimentos foram qualificados como adequados, parcialmente adequados, e inadequados. **Resultados.** Teve predomínio do sexo feminino (86%) e do grupo etário entre 20 e 29 anos (70%). Quanto à definição de precaução de contato e das doenças nas que se utilizam estas medidas o conhecimento dos graduandos foi parcialmente adequado (92% e 44%, respectivamente). O conhecimento foi adequado nas medidas preventivas a ser utilizadas durante à assistência (86%). Como dificuldades na utilização destas medidas foram citadas a incomodidade, a falta de material, pessoal e tempo. **Conclusão.** Apesar de que os graduandos conhecem quais são as medidas a ser utilizadas na precaução de contato, não têm um conhecimento adequado sobre as doenças em que devem utilizá-las. Nas três universidades participantes deve reflexionar-se sobre a qualidade da formação aos estudantes de enfermagem em biossegurança e precauções de contato.

Palavras chaves: infecção hospitalar; isolamento de pacientes; estudantes de enfermagem.

Introduction

Not using measurements of standard precautions and isolation precautions, favors the spread of microorganisms in the hospital environment and community. The main challenge for the prevention of this spread is to make sure efficient and continuing recommendations of practices¹ are implemented. The first isolation recommendations were published in 1877 in the U.S.A. in the form of handbook. The recommendations were

concerned to the accommodation of patients with infectious diseases apart from non-infected patients. Despite these recommendations, the transmission of infections remained high because there was no compliance with these measures and only a few aseptic procedures were used.²

With the emergence of the epidemic of Acquired Immunodeficiency Syndrome (AIDS), in the 80s,

the Pan American Health Organization introduced universal precautions that included the use of barriers (gloves, gown, goggles and masks) and hand-washing right after removal of gloves. The applications of these precautions were expanded to all patients, regardless of medical diagnosis, because they considered that all patients were potential sources of infection, however, these measures were not comprehensive, they did not include some body fluids such as feces, urine, nasal secretions, sputum, sweat, tears and vomit, except when they had visible blood.² It was only in 1996 that the term "standard precautions" emerged, and then built a new handbook synthesizing universal precautions and body substance isolation aimed at reducing hospital infections, the risk of transmission of resistant microorganisms and occupational diseases.²

The measures established by the Centers for Disease Control and Prevention (CDC) to be used in standard precautions are: hand hygiene, use of gloves, use of gown, use of mask and goggles, decontaminating surfaces, items and equipment and disposal of puncture-resistant material.³ In conjunction with standard precautions, transmission based on precautions were established, indicated for infected patients or patients who are under suspicious, presenting highly transmissible pathogens or important epidemiologically pathogens for which related measures standard precautions were necessary to discontinue transmission. There are three types of transmission-based precautions: respiratory precautions; droplets precautions; and contact precautions. Singly used or in combination, they are always used simultaneous with the standard precautions.⁴

Contact precautions were designed to prevent the risk of transmission of epidemiologically important agents by direct or indirect contact. This type of transmission involves skin to skin contact and physical transfer of people infected or colonized by microorganisms for the susceptible host.⁵ For the CDC, the measures to be used in contact precautions are: private room or cohort of patients with the same disease or microorganism; use of gloves for any contact with patient; use of gown, if

there is a possibility of contact with the practitioner clothes area or infectious material, being required for cleaning of a patient with diarrhea, urinary or fecal incontinence and wound with copious secretion not contained by dressing; removal of the gown soon after contact; patient care items such as thermometers and stethoscopes should be of single use and properly processed; maintain standard precautions; restricted and guided visits; hand hygiene before and after the procedures; logistics information: placing signs describing the type of precautionary measures to be used; perform patient transport with gloves.³

There is a deficiency in the training of nurses, as their awareness of biosecurity measures in practice. This is due to deficiency in the content approach in undergraduate nursing courses, because it is common to be addressed succinctly, in different programs and workloads, resulting in insufficient knowledge.⁶ Thus, the major challenge in nursing education is transpose which is determined by the new National Educational Bases and Guidelines Law for New Curriculum Guidelines to train professionals to overcome the theory-practical domain required by the labor market, as agents of innovation and transforming reality. The new curriculum provides nurse training in four areas: assistance, management, teaching and research and has as its horizon, education as a possibility of transformation, leading nurses to reflect on professional practice and commitment to society.⁷

Given the relevance of the issue on the use of measures of contact precautions in order to prevent the spread of resistant microorganisms to other patients and professionals, this research worked with students in their last year of undergraduate nursing course with the objective of knowing the knowledge of nursing students on contact precautions. The aim of this study was to assess the knowledge of nursing students about the use contact precautions measures.

Methodology

We conducted a quantitative research through a descriptive study. The quantitative method

is used to determine a profile of a group of people using statistical analysis to the data analysis.⁸ Three universities from the state of São Paulo (Brazil), which have Nursing undergraduate course, two private (identified in the results as B and C) and one public (identified in the results as A) participated of this study. These universities are credentialed/authorized by the Ministry of Education and Culture (MEC) of the State of São Paulo. The participants were all students who were enrolled in their last year of Nursing undergraduate course, agreed and signed the Consent Form. The total number of participants were 106 undergraduates. We excluded 26 undergraduates who refused to sign the Consent Form.

For data collection, we designed an instrument consisting of open and closed questions. Subdivided into two parts: Part I: composed by the characterization of the student: gender, age, college/university studying, and Part II: composed of open and closed questions about the knowledge of the undergraduate on contact precautions. The responsible person for data collection was the researcher. Data collection took place in the classroom, with prior appointment and occurred during April and May 2012. The collected data were transcribed to a spreadsheet of the software Microsoft Office Excel in which data were organized and categorized and subsequently submitted to statistical analysis in MINITAB version 16.

The data from answers related to the definition of contact precautions were classified according to the definition of contact precautions: methods used to prevent the transmission of microorganisms capable of transmission by direct and indirect contact.⁹ After defining Contact precautions, answers were categorized as complete (adequate), incomplete (partially adequate) or incorrect (inadequate). Data from answers related to diseases that require measures of contact precautions were classified as right and wrong according to CDC requirements,³ and each undergraduate could relate one or more diseases that needed such measures.

We considered as correct answers the diseases that required only measures of contact precaution, and excluded all diseases that need more than one precaution during assistance, such as contact and aerosols or contact and droplets, as those only classified as contact precautions under specific conditions (for example: Varicella). The answers related to the measures to be used in assisting individuals in contact precautions were considered correct by those who responded to recommendations of contact precautions standardized by APECIH¹⁰ and CDC,³ to differentiation of right and wrong. Each undergraduate could name one or more recommended measures.

After the answers were judged right and wrong, they were categorized accordingly; adequate (two or more correct); partially adequate (one correct) and inadequate (all incorrect). The research project was based on Resolution 196/96 of the National Health Council and its respective Consent Form were reviewed and approved by the Ethics Committee in Research of the Faculty of Medicine of Botucatu/UNESP, on 07/11/2011 with protocol: 4061-2011.

Results

There were 80 undergraduate nursing students participants who were attending the final last of under graduation. By characterizing these participants, we found 86.3% were female. The predominant age group ranges from 20 to 29 years (70%), the minimum age among undergraduates were 20 years and maximum 55 years. Regarding taking the nursing technician and nursing assistant course prior to under graduation, there is a predominance of undergraduates who did not attend any of the two courses before graduation (43.8%), as shown in Table 1.

Table 1. Characterization of the 80 participants stratified by demographic profile

Variable	n	%
School		
A	26	32.5
B	10	12.5
C	44	55.0
Female gender	69	86.3
Age		
20 to 29 years	56	70.0
30 years or more	23	28.7
Did not answer	1	1.3
He/she took nurse technician or nurse assistant course before Nurse under graduation course	35	43.8

Regarding the definition of contact precautions 32.5% of undergraduates defines as measures to protect the professional and 26.3% as a method

to prevent the spread of disease, followed by other definitions (Table 2).

Table 2. Characterization of the 80 participants stratified by definition of contact precautions

Definition	n	%
Measures to protect the professional	26	32.5
Prevent spread of disease	21	26.3
Measures to protect the professional and avoid spread of disease	9	11.3
Measures to protect the professional and the patient	7	8.8
Measures for personal protection and to avoid spread of disease	4	5.0
Measures for individual protection	4	5.0
Diseases that can be transmitted through contact	4	5.0
Use of personal protective equipment	1	1.3
Measures to protect against infectious diseases	1	1.3
Prevent secondary infection	1	1.3
Avoid contact with contagious diseases	1	1.3
Not answered	1	1.3

Regarding the proper definition of contact precautions considering the CDC definition, it is clear that among the participants, there were no adequate answers, 92.5% partially defined the theme and 6.3% answered it inadequately. One student did not answer. Concerning students'

answers about for which diseases measures of contact precaution are used, tuberculosis was the most mentioned by study participants, in 14.8% of answers, followed by multiresistant bacteria in 12.9%, meningitis in 10.1% and in other diseases as shown in Table 3.

Table 3. Distribution of answers stratified by diseases that require contact isolation precaution (n=209).

Mentioned diseases	n	%
Tuberculosis	31	14.8
Multiresistant bacteria	27	12.9
Meningitis	21	10.1
Scabious	18	8.6
Influenza A virus subtype H1N1	14	6.7
Pediculosis	14	6.7
Infectious contagious diseases	12	5.7
Herpes zoster	11	5.3
Hanseniasis	8	3.8
Staphilo infected wounds,	7	3.4
Pseudomonads, streptococci, MRSA	7	3.4
Varicella	6	2.9
Conjunctivitis	4	1.9
Dermatitis	4	1.9
Immunocompromised patients	4	1.9
Acquired immunodeficiency syndrome (Aids)	3	1.4
Human papilloma virus (HPV)	3	1.4
Pertussis	2	1.0
Viral and bacterial diseases	2	1.0
Hepatitis	2	1.0
Pneumonia	2	1.0
Chronic obstructive pulmonary disease (COPD)	1	1.0
Transmission modes	1	0.5
Neurotoxoplasmosis	1	0.5
Surgical patients	1	0.5
Septicemia	1	0.5
Not answered	2	1.0

In relation to the diseases that use measures of contact precautions, considering right and wrong answers, most students (43.8%) answered partially adequate, ie, they related only 1 or 2 correct diseases, and only 31.3% of undergraduates related over two diseases that use correct measures of contact precautions and 22.5% of the answers were inadequate, ie, they were unable to relate any disease. Two students did not answer.

On the answers of undergraduates regarding measures to be used during patient care in contact isolation precautions, we found the need to use

gloves with 22.64%, followed by the use of gown with 20.75% and other measures, as shown in Table 4.

Considering right and wrong answers of students in relation to the measures used in patient care in contact isolation precautions, we found that 88.8% of answers were adequate, i.e. undergraduates related over 2 correct measurements to be used during patient care on contact precautions, only 8.8% of students gave a partially adequate answer, relating only 1 or 2 correct measures and no undergraduates answered inadequately. Two students did not answer.

Table 4. Distribution of answers stratified by preventive measures used during patient care in contact isolation precautions (n=318)

Categories	n	%
Gloves	72	22.6
Gown	66	20.8
Mask	52	16.4
Bonnet	37	11.6
Googles	35	11.0
Hand washing	35	11.0
Materials for individual use	8	2.5
Personal protective equipment	4	1.3
N95 mask	1	0.3
Private room	1	0.3
Lab coat	1	0.3
Room dividers	1	0.3
Appropriate shoes	1	0.3
Sterile material	1	0.3
Avoid close contact	1	0.3
Not Answered	2	0.6

Discussion

When participants were characterized, it was evident that the majority is female (86.25%). In another study that relates the knowledge of nursing undergraduates on personal protective equipment, most of the participants were also female.¹¹ These data are in agreement with

records from the Federal Nursing Council (COFEN) in which 87.2% of nursing professionals are female and among the nurses category 88.0% are women working in the area.¹² Considering the history of Nursing, we found that this is a female profession in which the responsible person for the

practice of health assistance were the religious women confirming our findings.

Most participants were in the age range of 21 to 23 years. It shows us that the students mostly enroll in college/university between 18 and 20 years and, therefore will be attending the fourth year of under graduation in this age range. According to records of COFEN, the majority of Nursing professionals (43.79%) are between 26 and 35 years.¹² A research conducted at the Federal University of Goias demonstrates similar results, where most undergraduates were found to be in the range of 22 to 29 years, 70.9%.¹⁰ This shows us that independently of the state of Brazil, São Paulo and Goias, respectively, young people are deciding their professional future and enrolling in College/University at increasingly early.

Analyzing the definition of the theme on the use of contact precautions measures, we obtained most of the answers as partially adequate. This study found contrary results from a research conducted in several Nursing Higher Education Institutions from the State of Goias, where the majority of students in nursing knows how to describe what are the personal protective equipment, but they cannot define what is the purpose of them.¹³ In a research conducted with undergraduates from medical course, it was shown that most of them do not know the standard precautions.¹⁴ These results show that undergraduates of health know partially, or sometimes they do not even know, contact precautions, standard precautions and personal protection, and thus they may spread microorganisms to patients and even generate a biohazard.

By analyzing the diseases requiring contact precautions, most undergraduates did not know how to report more than two diseases that require contact precautions. These data corroborate findings in literature, in which the majority of health professionals, who work in the ICU, also did not know how to relate about this matter.¹⁵ This suggests that during the assistance, the practitioners may not use the contact precaution measures necessary due to lack of knowledge on

which diseases to use them and so there is the risk of spread to other patients and even take the microorganisms home that should be restricted to the hospital environment.

Regarding knowledge of the necessity of the measures of contact precautions, most answers of the students were correct referring to the measures recommended by ANVISA, these data are in agreement to a research conducted in the state of Goias, but with several courses in the health area,¹⁶ that reported that 98.6% of students use PPE during their practical activities. These data suggest that in spite of the students knowledge on what measures to be taken in contact precautions, they will not use them properly because they do not know in what diseases to use them.

Conclusion

Considering our results, we observed that undergraduate students despite knowing the measures to be adopted in contact precautions, they partially known the diseases that require such measures. These data suggest the need for reflection on the teaching of biosafety and contact precautions for undergraduate students, and the development of research on how this content is being taught to ensure future professional safe conditions to work. The use of contact precautions prevent the spread of microorganisms to other patients besides resulting in a safe and quality care.

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