http://dx.doi.org/10.1590/0104-070720180004570017

HAND HYGIENE AND INFLUENZA PREVENTION: KNOWLEDGE OF HEALTH STUDENTS

Catarina de Siena Vieira Amorim[1], Isabella Ferreira Pinheiro[2], Vitória Geovana Silva Vieira[3], Rafael Alves Guimarães[4], Patrícia Silva Nunes[5], Tamíris Augusto Marinho[6]

[1] Student of the Full-time Technical Course Integrated to High School Education in Clinical Analysis, *Instituto Federal de Educação, Ciência e Tecnologia de Goiás* (IFG). Scientific Initiation Scholarship recipient. Goiânia, Goiás, Brazil. E-mail: catarinadesiena@gmail.com

[2] Student of the Full-time Technical Course Integrated to High School Education in Nutrition and Dietetics of the IFG and *Programa Institucional de Voluntário em Iniciação Científica* (PIVIC). Goiânia, Goiás, Brazil. E-mail: isats1210@gmail.com

[3] Student of the Full-time Technical Course Integrated to High School Education in Health Surveillance of IFG and of the PIVIC. Goiânia, Goiás, Brazil. E-mail: vitoriageovanasv@gmail.com

[4] Doctoral Student. Graduate Program in Tropical Medicine and Public Health of the Institute of Tropical Pathology and Public Health (IPTSP), *Universidade Federal de Goiás* (UFG). Registered nurse in the Municipality of Senador Canedo. Goiânia, Goiás, Brazil. E-mail: rafaelalvesg5@gmail.com

[5] Doctoral Student. Graduate Program in Tropical Medicine and Public Health, IPTSP/UFG. Professor, Department of Academic Areas, IFG. Goiânia, Goiás, Brazil. E-mail: patricia.nunes@ifg.edu.br

[6] Doctoral Student. Graduate Program in Biotechnology and Biodiversity IPTSP/UFG. Professor, Department of Academic Areas, IFG. Goiânia, Goiás, Brazil. E-mail: tamiris.marinho@ifg.edu.br

ABSTRACT

Objective: to describe and analyze the knowledge of health students regarding hand hygiene and the prevention and transmission of the influenza virus.

Method: a cross-sectional study conducted with students from two campuses of health training of the *Institute Federal de (brazil) Goiás*, conducted in January and February 2017. Scores were evaluated for the level of knowledge regarding hand hygiene (component 1) and the prevention and transmission of the influenza virus (component 2) and both components (global component).

Results: 262 students participated in the study. A higher percentage of errors was found in the questions involving transmission of the influenza virus, sharing of personal use objects and keeping environments ventilated. The study also revealed shortcomings in the knowledge regarding hand hygiene, moments recommended for its performance and some aspects of the technique. The mean knowledge scores were 83.9% (95% CI: 82.6-85.2), 86.2% (95% CI: 84.4-87.9) and 82.8% (CI 95 %: 81.3-84.2) for component 1, component 2 and the global component, respectively.

Conclusion: the study identified gaps in the knowledge of the students regarding hand hygiene and the prevention and transmission of the influenza virus, indicating the importance of the inclusion of this content in the teaching and training practice of future health professionals.

DESCRITORES: Human influenza. Hand hygiene. Knowledge. Students. Vocational education.

HIGIENE DAS MÃOS E PREVENÇÃO DA INFLUENZA: CONHECIMENTO DE DISCENTES DA ÁREA DA SAÚDE

RESUMO

Objetivo: descrever e analisar o conhecimento de discentes da área da saúde sobre higiene das mãos e a prevenção e transmissão do vírus influenza.

Método: estudo transversal conduzido em discentes de dois campus de formação na área da saúde do Instituto Federal de Goiás, realizado nos meses de janeiro e fevereiro de 2017. Foram atribuídos escores para avaliação do nível de conhecimento em relação a higiene das mãos (componente 1), prevenção e transmissão do vírus influenza (componente 2) e ambos os componentes (componente global).

Resultados: participaram da pesquisa 262 discentes. Forai encontradoi maior percentual de erro nos questionamentos envolvendo transmissão do vírus influenza, compartilhamento de objetos de uso pessoal e manutenção de ambientes ventilados. O estudo evidenciou ainda falhas no conhecimento referente à higiene das mãos, momentos preconizados para sua realização, e alguns aspectos da técnica. Os escores médios de conhecimento foram de 83,9% (IC 95%: 82,6 a 85,2), 86,2% (IC 95%: 84,4-87,9) e 82,8% (IC 95%: 81,3-84,2) para os componentes 1, componente 2 e componente global, respectivamente.

Conclusão: o estudo identificou lacunas no conhecimento dos discentes sobre a higiene das mãos, prevenção e transmissão do vírus influenza, apontando para a importância da abordagem dos conteúdos na prática de ensino e formação de futuros profissionais de saúde.

DESCRITORES: Influenza humana. Higiene das mãos. Conhecimento. Estudantes. Educação profissionalizante.

HIGIENE DE LAS MANOS Y PREVENCIÓN DE LA INFLUENZA: CONOCIMIENTO DE LOS DISCENTES DEL ÁREA DE LA SALUD

RESUMEN

Objetivo: describir y analizar el conocimiento de los discentes del área de la salud sobre la higiene de las manos y la prevención y transmisión del virus influenza.

Método: estudio transversal conducido en los discentes de dos campus de formación en el área de la salud del *Instituto Federal de Goiás (Brasil),* realizado durante los meses de enero y febrero del 2017. Fueron atribuidos los resultados para la evaluación del nivel de conocimiento en relación a la higiene de las manos (componente 1), prevención y transmisión del virus influenza (componente 2) y ambos componentes (componente global).

Resultados: participaron del estudio 262 discentes. Se encontró un porcentaje mayor de errores en las preguntas relacionadas con la transmisión del virus influenza, compartimiento de objetos de uso personal y mantenimiento de ambientes ventilados. El estudio evidenció, además, la falta de conocimiento referente a la higiene de las manos, los momentos preconizados para su realización y algunos aspectos de la técnica. Los resultados medios del conocimiento fueron de 83,9% (IC 95%: 82,6 a 85,2), 86,2% (IC 95%: 84,4-87,9) y 82,8% (IC 95%: 81,3-84,2) para el componente 1, el componente 2 y el componente global, respectivamente.

Conclusión: el estudio identificó algunos vacíos en el conocimiento de los discentes sobre la higiene de las manos, prevención y transmisión del virus influenza, mostrando la importancia del abordaje de los contenidos en la práctica de la enseñanza y formación de futuros profesionales de la salud.

DESCRIPTORES: Influenza humana. Higiene de las manos. Conocimiento. Estudiantes. Educación profesionalizadora.

INTRODUCTION

Brazil is currently facing episodes of the influenza virus epidemic, characterized by its high dissemination power and high morbidity and mortality rates.[1] The disease caused by the influenza virus, commonly known as flu, is characterized by a usually benign and self-limiting, acute, febrile, viral infection, which affects the respiratory system. It presents high rates of transmission and global distribution, with a tendency to spread in seasonal epidemics. Contamination occurs through contact with contaminated airway secretions of the infected individual, through sneezing, coughing, speaking or by hand, which can also carry the virus to the mouth, eyes and nose after contact with newly contaminated surfaces.[2] There are three disease types: seasonal (viruses that circulate annually with predominance in winter in temperate countries), pandemic (globally disseminated virus that have not previously been detected as circulating from which most people do not have immunity) and zoonotic (viruses routinely circulating in animals that infect humans).[3]

Data from the World Health Organization (WHO) show that the influenza virus causes 3 to 5 million serious cases and 250,000 to 500,000 deaths per year. The disease is caused by the influenza A, B and C viruses. The influenza A virus presents subtypes according to the rearrangement of viral surface proteins, having greater clinical representativeness, being the only one responsible for pandemics. Influenza type B virus is not classified into subtypes. Viruses A and B are the cause of seasonal outbreaks and epidemics and are included in the seasonal influenza vaccines. Type C influenza virus, however, is detected less frequently, causing mild infections and rarely serious illness, therefore, has little significant public health implications.[4]

Immunization is the most effective measure to prevent this disease. Each year the vaccine is made available free of charge to groups considered to be most at risk of acquiring the virus. However, there is a restriction on the number of viral subtypes that make up the immunobiologicals each year. Thus, it is essential to adopt preventive and control measures for influenza caused by the virus, as well as the monitoring of viral circulation data, aiming to reduce cases of the disease.[5]

In addition, other measures, such as hand hygiene (HH) before meals, the use of disposable tissues for nasal hygiene after sneezing or coughing, avoiding touching the ocular mucosa, mouth and nasal cavity, avoiding the sharing of personal objects, such as plates, cups and cutlery and keeping environments well-ventilated, are key to preventing infection. It is also recommended to avoid leaving the home during the stages of high transmissibility, restricting close contact with people who show signs or symptoms of influenza, and temporary withdrawal (work, school and other activities) until 24 hours after the end of the fever period.[6]

The importance of HH is due to the fact that the hands have the capacity to harbor microorganisms, constituting the main route of transmission during healthcare. Microorganisms can be transferred between surfaces, through direct contact (skin to skin) or indirect, via recently contaminated objects and surfaces. Thus, HH is the simplest and least costly measure to prevent healthcare-associated infections,

aiming to interrupt the chain of transmission of contact-transmitted microorganisms.[7-8]

It is recommended that the HH theme be included in all training and continuing education actions aiming to reinforce the technique and the moments of its performance. It should follow a strict technique, after the removal of adornments, using water and liquid soap or alcohol solution (mandatory in all health services of the country, in a place of easy access and high visibility).[9-10] With the aim of reducing or eliminating microorganisms from the skin over the entire hands and wrists through mechanical and chemical action, this procedure strengthens the national and international movement for the prevention of communicable diseases and reinforces the ethical and social commitment of health professionals by providing quality services and reducing risks to an acceptable minimum.[11-13]

The Federal Institutes of Education, Science and Technology (FIs), aim to provide improvement in the access and level of education for individuals corroborating in the development of the Brazilian states and the federation. Here, the consolidation of health concepts and practices becomes a priority in education. In this context, the present study aimed to describe and analyze the knowledge of students from the health area of the Federal Institute of Education, Science and Technology of the State of Goiás (IFG)(Brazil) regarding HH and the prevention and transmission of the influenza virus.

METHOD

This was a cross-sectional study conducted between January and February 2017. The population was made up of all the health students of the IFG, who study in two campuses of the institution that provide these courses. One of the campuses is located in the metropolitan region of Goiânia (campus X) and the other in the interior of the state 206 kilometers from the capital (campus Y). The campuses provide full-time technical courses in health, integrated to high school education in Clinical Analysis, Nutrition and Dietetics, Health Surveillance, and an integrated technical course in Nursing, in the Youth and Adult Education (*Educação de Jovens e Adultos* - EJA) modality.

The IFG health student population met the following eligibility criteria: to be enrolled in one of the health courses, and to be on campus on the days of data collection. Of the 410 students enrolled, 156 were from campus X and 254 from campus Y. After collecting the data, it was observed that 43 students reported not having received the content (influenza prevention and HH) in the class, with these being excluded from the study, totaling 262 questionnaires for data analysis, 137 from campus X and 125 from campus Y.

The students were invited to participate in the study and were informed about the importance of the study, its objectives, their voluntary participation and anonymity and other aspects. After verbal consent regarding participation in the study, the consent form was signed. The legal guardians of students under the age of 18 years were informed about the aforementioned aspects and after authorization, were required to sign the consent form and the Terms of Assent (TA) for the minor. Data collection was performed through a self-administered questionnaire composed of two parts, the first with information on sociodemographic data and the second on knowledge of HH and the prevention and transmission of the influenza virus.

The questionnaire was designed by a researcher with expertise in the subject based on the technical recommendations provided by the Brazilian Health Regulatory Agency and by the National Health Surveillance Department in the following documents: Patient Safety in Health Services - Hand Hygiene, Influenza Treatment Protocol and Protocol for the practice of hand hygiene in health services.[6,8,12] It included 35 questions on the prevention and transmission of the influenza virus (contamination pathways and vaccination, among others) and HH (sites, moments and technique). The questions were judged by the participants as R (right) or W (wrong).

The questions were given specific weights and were then grouped into six items: i) influenza virus transmission methods (4 questions); (ii) methods of prevention of the influenza virus (8 questions); (iii) HH sites (8 questions); (iv) HH methods (5 questions); (v) hand hygiene technique (8 questions) and (vi) perception regarding HH (2 questions). The weights of the questions were awarded by two independent researchers, based on the importance given to the question by the researchers. In cases of divergence, a third researcher was consulted.[15]

To describe the level of knowledge, the following nomenclatures were attributed: component 1 (knowledge regarding prevention and transmission of the influenza virus), component 2 (knowledge regarding HH) and global component (items related to components 1 and 2).

After assigning the weights, the level of knowledge of the participants was calculated. The first two items encompassed the knowledge regard-

ing component 1 and the other four knowledge regarding component 2. A score was also calculated integrating components 1 and 2 (global component). Initially, the mean scores for each component were calculated, which corresponded to the sum of the scores of each item of each component. Thus, the gross scores for each component varied as follows: component 1 (0 to 3 points), component 2 (0 to 6 points) and global component (0 to 9 points). The scores were then transformed into a scale from 0 to 100, dividing the number of the gross scores found by the total score of the component x 100. For example: if a student scored a gross score in component 1 of 1.5, he had obtained a level of knowledge related to this component of 50%, i.e. (1.5/3)x100. Thus, the level of knowledge for each component and the global component could range from 0 to 100%. Minimum and maximum values indicate the lowest and the highest level of knowledge, respectively.

The instrument was reviewed by the other researchers involved and, to verify the clarity and objectivity of the questionnaire, a pilot test was applied with ten of those in the study population. As no need for adjustment was detected, these were included in the overall analysis. The instrument can be made available by e-mail to all other researchers interested in the subject.

The data were analyzed using the STATA statistical program, version 14.0. First, a descriptive analysis of the sociodemographic variables and knowledge regarding the prevention of the influenza virus and HH was carried out. All qualitative variables were presented with absolute and relative frequency and 95% confidence interval (95% CI). Quantitative variables were presented as mean and 95% CI.

The calculation of normality of the distribution of the variables related to the level of knowledge was performed using the Kolmogorov-Smirnov test with Lillifors correction. The level of knowledge was compared according to the course using the Kruskal-Wallis test, due to the asymmetric distribution of the variables.

In the analysis of the factors associated with the level of knowledge, linear regression was performed through the ordinary squares method. Analyses were performed for the total sample and for the study site (campus X and Y). For the total sample, the models were adjusted by gender, year of course, technical course and campus. For the modeling of each campus, the adjustments were made for the gender, year of course and technical course variables. Age was not included in the adjustments due to the high correlation with the course year. The models were evaluated for multicollinearity using the variance inflation factor (VIF). Due to the absence of heteroscedasticity, robust analysis was used to correct the standard errors and 95% CI. Values of $p<0.05$ were considered statistically significant.

This study was approved by the Ethics Committee for Research with Human Subjects of the Federal Institute Goiano, authorization No. CAAE: 59311316.1.0000.0036.

RESULTS

Characteristics of the population

Regarding the sociodemographic characteristics (Table 1), 77.5% of the sample was female, 57.3% under 18 years of age and 52.3% belonged to campus X. In the distribution by courses, 37.8% was from the Technical Nursing course, 25.2% Clinical Analysis, 19.5% Health Surveillance and 17.6% Nutrition and Dietetics. Regarding the year of the course, the majority (53.8%) were in the first year, 27.9% in the second year and 18.3% in the third year.

Table 1 - Socio-demographic profile of health area students, campus X and Y. Goiás, Brazil, 2017. (n=262)

Variables	n	%	(95.0% CI)*
Sex			
Female	203	77.5	(72.0-82.2)
Male	59	22.5	(17.8-28.0)
Age (years)			
< 18	150	57.3	(51.1-63.1)
≥ 18	112	42.7	(36.9-48.8)
Campus			
X	137	52.3	(46.2-58.3)
Y	125	47.7	(41.7-53.8)
Course			

Nursing	99	37.8	(32.1-43.8)
Clinical analysis	66	25.2	(20.3-30.8)
Surveillance	51	19.5	(15.1-24.7)
Nutrition	46	17.6	(13.4-22.7)
Years of the course			
First	141	53.8	(47.7-59.8)
Second	73	27.9	(22.7-33.6)
Third	48	18.3	(14.0-23.5)

* 95% confidence interval.

Knowledge level profile regarding influenza prevention and hand hygiene

Table 2 presents the description of the variables regarding influenza prevention and HH, judged to be right or wrong by the participants. In the questions related to influenza prevention methods, the variables that deal with the sharing of personal use objects and keeping environments well-ventilated, presented lower indices of correct responses. The moments of HH before and after the use of procedure gloves and between procedures with the same client presented lower indices of correct responses among the participants. With regard to the HH technique, the variables with the lowest percentage of correct responses were: duration of the technique, rinsing and drying in one direction and place to discard the paper towel.

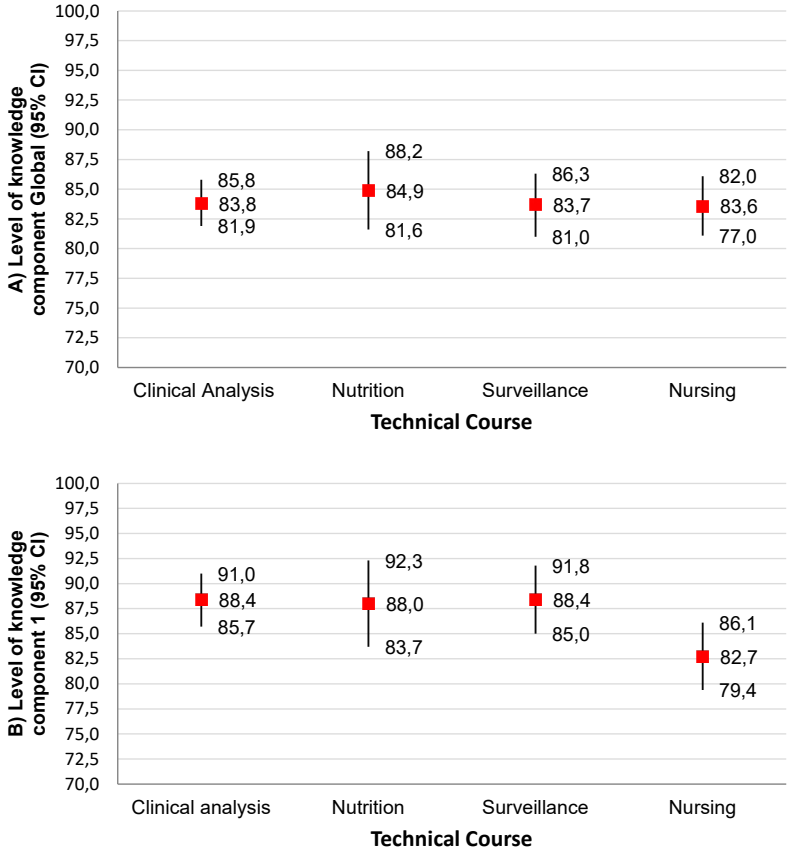
Table 2 - Description of the variables regarding knowledge of influenza prevention and hand hygiene of the health students. Goiás, Brazil, 2017. (n=262)

items	%	(95.0% CI)*
Methods of influenza transmission		
Air	97.7	(95.1-99.0)
Contact with contaminated water or feces	93.5	(78.8-95.9)
Physical contact with the sick person	88.5	(84.1-91.9)
Contact with surfaces or objects contaminated with the virus	77.5	(72.0-82.2)
Methods of influenza prevention		
Hand hygiene before eating	97.3	(94.5-98.7)
Consuming untreated water	96.6	(93.5-98.2)
Not having a sewer at home	94.3	(90.7-96.5)
Vaccination	91.6	(87.5-94.4)
Keeping the environment well-ventilated.	83.6	(78.6-87.6)
Not sharing personal use objects	75.6	(70.0-80.4)
Temporary withdrawal up to 24 hours after the end of fever	55.3	(49.2-61.3)
Avoiding close contact with people that show signs or symptoms of influenza	79.0	(73.6-83.5)
Hand hygiene places		
Palm	98.5	(96.0-99.4)
Fist	96.6	(93.5-98.2)
Tip of the fingers and nails	95.4	(92.1-97.4)
Interdigital spaces	91.2	(87.1-99.1)
Elbow	83.6	(78.6-87.6)
Forearm	67.9	(62.0-73.3)
Back of hand	95.0	(91.6-97.1)
Thumb	97.0	(94.0-98.5)
Hand hygiene moments		
Before and after contact with the client	96.2	(93.0-97.7)
After contact with blood, body fluids and secretions	95.4	(92.1-97.4)
Before and after use of procedures gloves	85.9	(81.1-89.6)
Before and after contact with surfaces close to the client	83.2	(78.1-87.3)
Between procedures with the same client	66.0	(60.0-71.5)
Hand hygiene technique		

Not using bar of soap in hospital settings	93.9	(90.2-96.2)
Applying enough liquid soap to the palm of the hand	91.2	(87.1-94.1)
Rinse and dry in one direction	90.5	(86.2-93.5)
Use the paper towel to turn off the tap	90.1	(85.8-93.2)
Remove only rings, watch does not interfere with the technique	77.9	(72.4-82.5)
Avoid very hot or very cold water in order to prevent dryness	52.3	(46.2-58.3)
Duration between 40 and 60 seconds	58.0	(51.9-63.9)
Discard the paper towel in the bin intended for infectious waste	76.0	(70.4-80.8)
Perception about hand hygiene		
The health professional can teach the technique to the client or family members	99.2	(97.0-99.8)
Only healthcare professionals from hospital environments should perform hand hygiene	97.7	(95.0-99.0)

* 95% confidence interval.

Figure 1 shows the level of knowledge in campuses X and Y, stratified by course. The mean scores for the total sample were 83.9% (95% CI: 82.6-85.2), 86.2% (95% CI: 84.4-87.9) and 82.8% (95% CI: 81.3-84.2) for the global component (Figure 1A), component 1 (Figure 1B) and component 2 (Figure 1C), respectively. There was no statistical difference between the courses investigated for the three components (Kruskall-Wallis test: $p>0.05$).



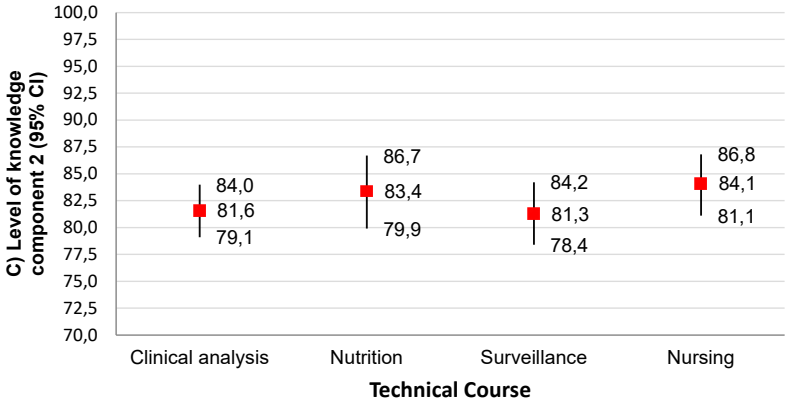


Figure 1 - A) Level of knowledge of the global components in campuses X and Y; B) Level of knowledge of component 1 in X and Y; C) Level of knowledge of component 2 in campuses X and Y. Goáis, Brazil, 2017. (n=262)

Table 3 shows the factors associated with the level of knowledge in students of both campuses. After adjusting in the multiple regression model, a negative association was observed between the level of knowledge of the global component, male gender and the second year of the course. With regard to knowledge about component 1, a positive association was observed with campus Y and the technical course on nutrition and a negative association with the nursing technical course and the second year of the course. The models did not present multicollinearity problems (VIF<4.0).

Table 4 shows the factors associated with the level of knowledge of the global component, component 1 and component 2 stratified by campus (X and Y). In Campus X, in relation to the global component, the nutrition course was positively associated, while in the year of the course variable, the second year had a negative association. Regarding the level of knowledge of component 1, the technical course in clinical analysis and the nutrition and dietetics course were positively associated and the second and third years of the course were negatively associated. It is observed that being in the third year of the course was positively associated with the knowledge of component 2.

In campus Y, regarding the global component, in the course year variable, the third year presented a positive association. The technical courses in health surveillance and in nursing had negative associations and the third year had a positive association with the knowledge level of component 1. The models did not present multicollinearity problems (VIF<4.0) (Table 4).

Table 3 - Factors associated with the level of global knowledge of the health students. Goiás, Brazil, 2017. (n=262)

Variables	Global component	Multivariate analysis†		Component 1	Multivariate analysis†		Component 2	Multivariate analysis†	
	% (95% CI)*	β (95% CI)*	*P*	% (95% CI)*	β (95% CI)*	*P*	% (95% CI)*	β (95% CI)*	*P*
Sex									
Female	84.7 (83.2-86.2)	1.00		87.0 (85.1-88.9)	1.00		83.6 (81.9-85.2)	1.00	
Male	81.2 (78.3-84.0)	-3.57(-6.78; -0.37)	0.029	83.3 (79.2-87.4)	-4.05 (-8.15; 0.04)	0.052	80.1 (76.8-83.3)	-3.33 (-6.96; 0.29)	0.071
Age (years)									
< 18	84.1 (82.6-85.6)			88.0 (86.1-90.0)			82.1 (80.4-83.8)		
≥ 18	83.7 (81.4-86.0)			83.7 (80.6-86.8)			83.7 (81.2-86.2)		
Campus									
X	83.0 (81.0-84.9)	1.00		83.1 (80.5-85.8)	1.00		82.9 (80.7-85.0)	1.00	
Y	85.0 (83.2-86.7)	2.67 (-0.61; 5.95)	0.110	89.5 (87.4-91.7)	8.99 (4.72; 13.27)	< 0.001	82.7 (80.7-84.6)	-0.49 (-4.27; 3.29)	0.798

Course									
Analysis	83.9 (83.9-85.8)	1.00		88.4 (85.7-91.0)	1.00		81.6 (79.1-84.0)	1.00	
Nutrition	84.9 (81.6-88.2)	3.98 (-1.29; 9.27)	0.138	88.0 (83.7-92.3)	7.11 (0.40. 13.83)	0.038	83.4 (79.9-86.8)	2.42 (-3.34; 8.19)	0.409
Surveillance	83.7 (81.0-86.3)	-1.01 (-4.33; 2.31)	0.550	88.4 (85.0-91.8)	-0.072 (-4.43; 4.28)	0.974	81.3 (78.4-84.2)	-1.47 (-5.37; 2.41)	0.455
Nursing	83.9 (81.1-86.1)	-1.02 (-5.15; 3.10)	0.626	82.7 (79.4-86.1)	-5.75 (-10.82; -0.69)	0.026	84.0 (81.3-86.8)	1.34 (-3.30; 5.98)	0.570
Years of the course									
First	84.1 (82.4-85.7)	1.00		86.9 (84.8-89.0)	1.00		82.6 (80.8-84.5)	1.00	
Second	80.8 (77.9-83.8)	-4.76 (-9.04; -0.47)	0.029	82.1 (78.3-85.9)	-6.31 (-11.32; -1.31)	0.014	80.2 (77.0-83.4)	-3.98 (-8.67; 0.69)	0.095
Third	88.2 (85.7-90.6)	3.91 (-0.48; 8.32)	0.081	90.3 (86.1-94.5)	3.63 (-2.51; 9.78)	0.246	87.1 (84.1-90.1)	4.06 (-0.88; 9.01)	0.107

* 95% confidence interval; † Model adjusted by sex, campus, course and year of the course.

Table 4 - Factors associated with the level of global knowledge of the health students Goiás, Brazil, 2017, stratified by Campuses X and Y. Goiás, Brazil, 2017. (n=262)

Variables	Global component	Multivariate analysis†		Component 1 (Influenza)	Multivariate analysis†		Component 2 (HH)	Multivariate analysis†	
	% (95% CI)[a]	β (95% CI)*	*P*	% (95% CI)[a]	β (95% CI)[a]	*P*	% (95% CI)[a]	β (95% CI)[a]	*P*
Campus X									
Sex									
Female	85.8 (84.0-87.6)	1.00		90.4 (88.2-92.7)	1.00		93.5(81.4-85.6)	1.00	
Male	82.2 (77.7-86.8)	-3.56 (-8.07; 0.93)	0.119	86.7 (81.3-92.1)	-4.23 (-9.10; 0.63)	0.088	80.0(75.1-85.0)	-3.23(-8.43; 1.96)	0.220
Age (years)									
< 18	85.8 (83.5-88.0)			92.3(90.0-94.6)			82.5(79.7-85.3)		
≥ 18	84.3 (81.7-86.9)			87.4(84.0-90.7)			82.8(80.0-85.6)		
Course									
Analysis	86.0 (83.6-88.4)	1.00		93.0(90.8-95.3)	1.00		82.5(79.4-85.5)	1.00	
Surveillance	84.2 (80.0-88.4)	-4.49 (-9.64; 0.65)	0.087	90.0(85.0-95.0)	-7.69(-13.6;-1.76)	0.011	81.3(76.5-86.1)	-2.89(-8.79; 2.99)	0.332
Nursing	84.5 (81.6-87.5)	-5.50 (-11.12; 0.11)	0.055	86.8(83.1-90.5)	-12.99(-18.9;-7.03)	0.001	83.4(80.2-86.6)	-1.75(-8.40; 4.88)	0.601
Years of the course									
First	84.4 (81.6-87.2)	1.00		90.1(87.1-93.2)	1.00		81.6(78.3-84.8)	1.00	
Second	81.5 (78.1-85.8)	-1.41 (-6.77; 3.93)	0.601	83.1(78.4-87.8)	-2.06(-7.66; 3.53)	0.466	80.6(77.0-84.3)	-1.09(-7.46; 5.27)	0.735
Third	88.8 (86.0-91.5)	7.59 (1.31; 13.87)	0.018	94.6(91.6-97.5)	12.68(5.55; 19.80)	0.001	85.8(82.4-89.3)	5.05(-2.06; 12.17)	0.162
Campus Y									
Sex									
Female	83.7(81.5-86.0)	1.00		84.0(81.1-86.9)	1.00		83.6(81.2-86.1)	1.00	
Male	80.0(76.4-83.7)	-3.18(-7.90; 1.52)	0.183	79.9(73.6-86.1)	-2.48(-8.64; 3.66)	0.425	80.1(75.7-84.6)	-3.53(-8.75; 1.67)	0.182
Age (years)									
< 18	83.1(81.1-85.1)			85.6(82.9-88.3)			81.8(79.6-84.0)		
≥ 18	82.7(78.1-87.2)			77.6(71.7-83.4)			85.2(80.2-90.2)		
Course									
Analysis	80.1(76.9-83.4)	1.00		80.2(75.6-84.8)	1.00		80.1(79.9-86.9)	1.00	
Nutrition	84.9(81.6-88.2)	8.25(1.94; 14.57)	0.011	88.0(83.8-92.3)	12.07(3.77; 20.37)	0.005	83.4(79.9-86.9)	6.34(-0.59; 13.29)	0.073
Surveillance	83.2(79.6-86.7)	3.22(-1.23; 7.67)	0.155	86.9(82.0-91.7)	6.78(0.38; 13.18)	0.038	81.3(77.5-85.2)	1.43(-3.90; 6.77)	0.595
Nursing	82.3(77.7-87.0)	3.56(-2.19; 9.33)	0.223	77.0(81.1-82.9)	1.36(-6.13; 8.85)	0.720	85.0 (79.9-90.0)	4.67(-1.97; 11.31)	0.167
Years of the course									
First	83.9(81.8-85.9)	1.00		85.2(82.5-88.0)	1.00		83.2(80.9-85.0)	1.00	

Second	80.2(75.2-85.3)	-7.25(-13.87;-0.63)	0.032	81.1(74.9-87.2)	-8.40(-16.17;-0.64)	0.034	79.8(74.5-85.1)	-6.67(-13.77; 0.41)	0.067
Third	85.2(80.3-90.1)	1.78(-4.03; 7.61)	0.544	68.8(54.5-83.0)	-12.61(-25.0;-0.19)	0.047	93.4(90.4-96.4)	8.99(3.04; 14.94)	0.003

*95% confidence interval; †Model adjusted by sex, campus, course and year of the course.

DISCUSSION

Regarding the socio-demographic data, the predominance of women found in this study is similar to that presented in other studies conducted in the health area.[16-18] It can be observed that the technical course in nursing, being of the youth and adult education modality, showed a greater number of respondents aged 18 years or over (88.3%).

Regarding the specific variables related to the transmission and prevention of influenza, lower indices of correct responses were found in the issues related to the sharing of personal use objects and well-ventilated environments, the data on the environment also generated doubt in older adults of the Federal District in a study on knowledge, attitudes and practices against influenza.[19] Similarly, a study carried out in the city of Rio de Janeiro with health professionals indicated a lack of general knowledge about influenza.[20]

Regarding knowledge about influenza prevention, the above mentioned study carried out with health professionals showed that only 45% of the participants considered their knowledge to be good or very good and 88% of the nursing professionals related hand hygiene as a measure of protection against the disease.[19] Despite the dissemination of the importance of the issue and its prevention measures, especially after the influenza pandemic of 2009, there has still been no representative impact on the behavioral change of health professionals.[21]

The impact related to failures in the hand hygiene technique observed in this and other studies represents a potential risk of an increase in the transmission of healthcare-associated infections. Published works that evaluated the knowledge in students and health professionals, and that observed the adherence to and performance of the HH technique also reported failures in the moments of execution of the technique in several practice scenarios, as well as in the technique and time required for its performance.[22-27]

Regarding the global component, there was no statistical difference between the results according to the course, which may mean that the teaching of the technique is uniform for all teachers who teach this subject in the various technical courses in the health area. Global knowledge and knowledge about HH were similar to other studies carried out with students and health professionals.[28-29] This information confirms that health professionals present knowledge about HH, although it has been noted that many neglect the performance of the technique and do not adhere to the correct moments for its performance, culminating in low adherence in the health work environment.[30-33]

The data show a possible dichotomy between the knowledge and practice in health, confirming the importance of knowledge evaluation among students and professionals as a tool for health education activities. It is believed that low adherence to HH cannot be related only to the lack of knowledge of health professionals, but also to other issues described in the literature, such as: lack or absence of necessary materials, lack of time and physical structure and an absence of continuing education, among other factors.[34-35]

Evaluating the results obtained in the multivariable analysis, it is suggested that the positive association with the technical course in nutrition and dietetics is related to the large workload in biosafety and food handling safety, presenting specific disciplines such as: "Health and Biosafety: Safety at work", "Food microbiology" and "Pathology of Nutrition and Diet Therapy", among others. The teaching performance with articulated teaching-learning methods, stimulating early contact with the practice, as well as the constitution of a teaching body of the specific area in the initial periods of the course are highlighted as positive factors in the process of student training.[36]

The negative association in attending the second year of the course and the performance in correct responses of the questionnaire can be related to the intrinsic issues related to the specific curricular grade of the course, with student complaints due to the complexity of the content of that year noted. Furthermore, the fact that the second year is the transition between the enthusiasm experienced due to success in being accepted in the Institute and the third year, with the expectations of the students with regard to the prospects of technical graduation and entry into the labor market, could also influence the association. Both the data cited were consistent with another study that verified an increase in the

low prevalence of PDQL (Psychological Dimension of the Quality of Life) in the second year of the course.[37] There was also a description of the fall in the quality of life in second year nursing students suggested due to their insertion in the internship environment and immersion in the complexity of healthcare.[38] However, it is suggested that more studies are carried to better analyze the association.

The negative association between influenza prevention and the nursing technical course may be related to the particular characteristics of the courses offered in the EJA modality, in which students usually face specific learning requirements, as well as particular characteristics such as: living in a context of social vulnerability and having a history of school dropout, which may imply learning difficulties and poor performance.[39-40]

The study presents limitations related to the sample size. Furthermore, the cross-sectional nature of the study does not allow the establishment of a cause and effect relationship between the knowledge and the variables investigated.

CONCLUSION

The level of knowledge of influenza in the health students investigated indicates specific issues regarding the prevention and transmission of the influenza virus, ratifying the need to approach these contents in theoretical and practical classes. It is believed that teaching appropriate to the reality of mid-level professionals is fundamental during the training process, as is highlighting the importance of influenza prevention in the context of prevention of healthcare-associated infections.

The misconceptions related to HH were mostly related to the moments, performance and duration of the technique. It is hoped that the relevance of elements such as HH adherence will be widely debated in the context of teaching, broadening the reflection of student on safe care practices. In this context, it is believed that practical training and periodic assessment can have a positive impact on the knowledge of students, verifying the quality of the technique through specific knowledge and skills. The contents must also include diverse actions such as personal motivation and awareness of the professional reality.

The learning environment as a place of social transformation, capable of changing the habits of future professionals and improving the quality of health care should also be noted. The consolidation of this knowledge would enable the formation of health multipliers, capable of providing safe and low risk care.

REFERENCES

1. World Health Organization (WHO). Influenza Update Nº293 [Internet]. 2017 [cited 2017 Ago 28]. Available from: http://www.who.int/influenza/surveillance_monitoring/updates/2017_07_10_update_GIP_surveillance/en/
2. Ministério da Saúde (BR). Informe Técnico 19º Campanha Nacional de Vacinação contra a Influenza [Internet]. Brasília (DF): MS; 2017 [cited 2017 May 02]. Available from: http://pni.datasus.gov.br/sipni/03%2003%202017%20Informe_Cp_Influenza%20_%20final.pdf
3. World Health Organization (WHO). Influenza virus infections in humans [Internet]. 2014 [cited 2017 Apr 28]. Available from: http://www.who.int/influenza/human_animal_interface/virology_laboratories_and_vaccines/influenza_virus_infections_humans_feb14.pdf?ua=1
4. World Health Organization (WHO). Media centre: influenza (Seasonal) [Internet]. 2016 Nov [cited 2017 Apr 28]. Available from: http://www.who.int/mediacentre/factsheets/fs211/en/
5. World Health Organization. Seasonal Influenza vaccine use in low and middle income countries in the tropics and subtropics: a systematic review [Internet]. Geneva: World Health Organization; 2015 [cited 2017 Aug 31]. Available from: http://apps.who.int/iris/bitstream/10665/188785/1/9789241565097_eng.pdf
6. Ministério da Saúde (BR). Protocolo de Tratamento de Influenza 2015 [Internet]. Brasília (DF): MS; 2015 [cited 2017 Apr 28]. Available from: http://www.caism.unicamp.br/PDF/INFLUENZA_PROTOCOLO_2015.pdf
7. Ministério da Saúde (BR). Agência Nacional de Vigilância Sanitária (ANVISA). Higienização das mãos em serviços de saúde [Internet]. Brasília (DF): MS; 2007 [cited 2017 Apr 28]. Available from: http://www.anvisa.gov.br/hotsite/higienizacao_maos/manual_integra.pdf
8. Ministério da Saúde (BR). Agência Nacional de Vigilância Sanitária (ANVISA). Segurança do paciente em serviços de saúde: higienização das mãos [Internet]. Brasília (DF): MS; 2009 [cited 2017 Ago 31]. Available from: http://www.anvisa.gov.br/servicosaude/manuais/paciente_hig_maos.pdf
9. Ministério da Saúde (BR). Agência Nacional de Vigilância Sanitária (ANVISA). Medidas de prevenção de infecção relacionada à assistência a saúde [Internet]. Brasília (DF): MS; 2017 [cited 2017 Ago 31]. Available from: http://portal.anvisa.gov.br/documents/33852/3507912/Caderno+4+-+Medidas+de+Preven%C3%A7%C3%A3o+de+Infec%C3%A7%C3%A3o+Relacionada+%C3%A0+Assist%C3%AA

ncia+%C3%A0+Sa%C3%BAde/a3f23dfb-2c54-4e64-881c-fccf9220c373

10. Ministério da Saúde (BR). Resolução-RDC Nº 42, de 25 de outubro de 2010: dispõe sobre a obrigatoriedade de disponibilização de preparação alcoólica para fricção antisséptica das mãos, pelos serviços de saúde do País, e dá outras providências [Internet]. Brasília (DF): MS; 2010 [cited 2017 Apr 28]. Available from: http://bvsms.saude.gov.br/bvs/saudelegis/anvisa/2010/res0042_25_10_2010.html
11. Association of Perioperative Registered Nurses AORN. Perioperative standards and recommended practices: implementing AORN recommended practices for hand hygiene [Internet]. Denver (US): AORN; 2012 [cited 2017 Apr 28]. Available from: https://pdfs.semanticscholar.org/214b/3ae9e141f5888fd08079c8f13a556e7a2a52.pdf
12. Ministério da Saúde (BR). Agência Nacional de Vigilância Sanitária (ANVISA). Programa Nacional de Segurança do paciente. Anexo 01: protocolo para a prática de higiene das mãos em serviços de saúde [Internet]. Brasília (DF): MS; 2013 [cited 2017 Apr 28]. Available from: https://proqualis.net/sites/proqualis.net/files/000002347fQHsQg.pdf
13. Oliveira AC, Paula AO. Interventions to improve the compliance of health care professionals to hand washing: an integrative review. Rev Eletr Enf [Internet]. 2013 [cited 2017 Apr 28]; 15(4):1052-60. Available from: https://www.fen.ufg.br/fen_revista/v15/n4/pdf/v15n4a24.pdf
14. Brasil. Lei nº 11.892, de 29 de dezembro de 2008: institui a Rede Federal de Educação Profissional, Científica e Tecnológica, cria os Institutos Federais de Educação, Ciência e Tecnologia, e dá outras providências. Diário Oficial da União, Brasília; 30 dez. 2008, Seção 1, p. 1. [cited 2017 Sep 03]. Available from: http://pesquisa.in.gov.br/imprensa/jsp/visualiza/index.jsp?data=30/12/2008&jornal=1&pagina=2
15. Kimberly CL, Winterste AG. Validity and reliability of measurement instruments used in research. Am J Health Syst Pharm [Internet]. 2008 [cited 2017 Sep 03]; 65(23):2276-84. Available from: http://www.ajhp.org/content/65/23/2276.long?sso-checked=true
16. Paro CA, Bittencourt ZZLC. Qualidade de vida de graduandos da área da saúde. Rev Bras Educ Médica [Internet]. 2013 Jul [cited 2017 Apr 28]; 37(3):365-75. Available from: http://www.scielo.br/pdf/rbem/v37n3/09.pdf
17. Chaves ECL, Iunes DH, Moura CC, Carvalho LC, Silva AM, Carvalho EC. Anxiety and spirituality in university students: a cross-sectional study. Rev Bra Enferm [Internet]. 2015 May-Jun [cited 2017 Apr 28]; 68(3):504-9. Available from: http://www.scielo.br/pdf/reben/v68n3/en_0034-7167-reben-68-03-0504.pdf
18. Santos TCMM, Martino MMF, Sonati JG, Faria AL, Nascimento EFA. sleep quality and chronotype of nursing students Sleep quality and chronotype of nursing students.
19. Acta Paul Enferm [Internet]. 2016 [cited 2017 Apr 28]; 29(6):658-63. Available from: http://www.scielo.br/pdf/ape/v29n6/en_1982-0194-ape-29-06-0658.pdf
20. Santos GMZ, Oliveira LMC. Avaliação dos conhecimentos, atitudes e práticas dos idosos sobre a vacina contra influenza, na UBS, Taguatinga, DF, 2009. Epidemiol Serv Saúde [Internet]. 2010 Jul-Sep [cited 2017 Apr 28]; 19(3):205-216. Available from: http://scielo.iec.pa.gov.br/pdf/ess/v19n3/v19n3a03.pdf
21. Maximo LMI, Cunha NMB, Queiroz MEP, Figueiredo, ND. Conhecimento sobre influenza entre profissionais de saúde de um hospital geral. Saúde em Redes [Internet]. 2015 [cited 2017 Apr 28]; 1(3):37-48. Available from: http://revista.redeunida.org.br/ojs/index.php/rede-unida/article/view/325
22. Brehmer LCF, Trindade LL, Ramos FRS, Pires DEP, Santos SMAS, Meirelles BHS. Revisão Integrativa da Literatura sobre a influenza AH1N1. Texto Contexto Enferm [Internet]. 2011 [cited 2017 Apr 28]; 20(Esp):272-7. Available from: http://www.scielo.br/pdf/tce/v20nspe/v20nspea34.pdf
23. Silvestrin ES, Lima HM, Messias CA, Silva RG, Coutinho RMC. Higiene das mãos: conhecimento dos profissionais de Saúde em um hospital universitário. Rev Inst Ciênc Saúde [Internet]. 2007 [cited 2017 Apr 28]; 25(1):7-13. Available from: https://www.unip.br/comunicacao/publicacoes/ics/edicoes/2007/01_jan_mar/V25_N1_2007_p7-13.pdf
24. Prado MF, Oliveira ACJ, Nascimento TMB, Melo WA, Prado DB. Estratégia de promoção à higienização das mãos em unidade de terapia intensiva. Cienc Cuid Saude [Internet]. 2012 Jul-Sep [cited 2017 Apr 28]; 11(3):557-64. Available from: http://periodicos.uem.br/ojs/index.php/CiencCuidSaude/article/view/16366
25. Pires FV, Tipple AFV, Freitas LR, Souza ACS, Pereira MS. Moments for hand hygiene in Material and Sterilization Center. Rev Bras Enferm [Internet]. 2016 May-Jun [cited 2017 Apr 28]; 69(3):546-51. Available from: http://www.scielo.br/pdf/reben/v69n3/en_0034-7167-reben-69-03-0546.pdf
26. Costa ED, Ambrosano GMB, Pinelli C. Behavior and perceptions of hand hygiene practices among dental studentes. Rev Gaúch Odontol [Internet]. 2016 Oct-Dec [cited 2017 Apr 28]; 64(4):434-41. Available from: http://www.scielo.br/pdf/rgo/v64n4/1981-8637-rgo-64-04-00434.pdf
27. Souza LM, Ramos MF, Becker ESS, Meirelles LCS, Monteiro SAO. Adherence to the five moments for hand hygiene among intensive care professionals. Rev Gaúcha Enferm [Internet]. 2015 Dec [cited 2017 Apr 28]; 36(4):21-8. Available from: http://www.seer.ufrgs.br/index.php/RevistaGauchadeEnfermagem/article/view/49090/35655

28. Martinez MR, Campos LAAF, Nogueira PCK. Adesão à técnica de lavagem de mãos em Unidade de Terapia Intensiva Neonatal. Rev Paul Pediatr [Internet]. 2009 [cited 2017 Apr 28]; 27(2):179-85. Available from: http://www.spsp.org.br/spsp_2008/revista/RPPv27n2p179-85.pdf

29. Martinez J, Roseira CE, Passos IPBD, Figueiredo RM. Higienização das mãos: conhecimento dos estudantes. Cien Cuid Saude [Internet]. 2014 Jul-Sep [cited 2017 Apr 28]; 13(3):455-63. Available from: http://www.periodicos.uem.br/ojs/index.php/CiencCuidSaude/article/view/19118

30. Santos TCR, Roseira CE, Piai-de-Morais TH, Figueredo RM. Hand hygiene in hospital environments: use of conformity indicators. Rev Gáucha Enferm [Internet]. 2014 [cited 2017 Apr 28]. Available from: http://www.seer.ufrgs.br/index.php/RevistaGauchadeEnfermagem/article/view/40930/28936

31. Ministério da Saúde (BR). Agência Nacional de Vigilância Sanitária (ANVISA). Segurança do paciente: relatório sobre auto-avaliação para higiene das mãos [Internet]. Brasília (DF): MS; 2014 [cited 2017 Apr 28]. Available from: http://www20.anvisa.gov.br/segurancadopaciente/index.php/publicacoes/item/seguranca-do-paciente-relatorio-sobre-autoavaliacao-para-higiene-das-maos

32. Martins KA, Tipple AFV, Souza ACS, Barreto RAS, Siqueira KM, Barbosa JM. Adesão as medidas de prevenção e controle de infecção de acesso vascular periférico pelos profissionais da equipe de enfermagem. Cienc Cuid Saúde [Internet]. 2014 [cited 2017 Apr 28]; 7(4):485-92. Available from: http://eduem.uem.br/ojs/index.php/CiencCuidSaude/article/viewFile/6634/3908

33. Primo MGB, Ribeiro LCM, Figueiredo LFS, Sirico SCA, Souza MA. Adesão as práticas de higienização das mãos por profissionais da área da saúde de um hospital universitário. Rev Eletr Enferm [Internet]. 2010 [cited 2017 Apr 28]; 12(2):266-71. Available from: https://www.fen.ufg.br/fen_revista/v12/n2/v12n2a06.htm.

34. Barreto RAS, Rocha LO, Souza ACS, Tipple AFV, Suzuki K, Bisinoto AS. Higienização das mãos: a adesão entre profissionais de enfermagem da sala de recuperação pós-anestésica. Rev Eletr Enferm [Internet]. 2009 [cited 2017 Apr 28]; 11(2):334-40. Available from: https://www.fen.ufg.br/fen_revista/v11/n2/pdf/v11n2a14.pdf

35. Tipple AFV, Mendonça KM, Melo MC, Souza ACS, Pereira MS, Santos SLV. Higienização das mãos: O ensino e a prática entre graduandos da área da saúde. Acta Sci Health Sci [Internet]. 2007 [cited 2017 Apr 28]; 29(2):107-14. Available from: http://periodicos.uem.br/ojs/index.php/ActaSciHealthSci/article/view/1079

36. Skodová M, Gimeno-Benitez A, Martinez-Redondo H, Morán-Cortéz JF, Gimenez-Romano R, Gimeno-Ortiz A. Hand hygiene technique quality evaluation in nursing and medicine students of two academic courses. Rev Latino-am Enfermagem [Internet]. 2015 Jul-Aug [cited 2017 Apr 28]; 23(4):708-17. Available from: https://www.revistas.usp.br/rlae/article/view/105678/104400

37. Teo CRPA, Alves SM, Gallina LS. Nas trilhas da utopia: tecendo o projeto político-pedagógico em um curso de nutrição. Trab Educ Saúde [Internet]. 2016 Sep-Dez [cited 2017 Apr 28]; 14(3):723-45. Available from: http://www.scielo.br/pdf/tes/v14n3/1981-7746-tes-1981-7746-sip00123.pdf

38. Gonçalves SS, Neto AMS. Psychological dimension of quality of life among medical students. Rev Bras Educ Med [Internet]. 2013 [cited 2017 Sep 01]; 37(3):385-95. Available from: http://www.scielo.br/pdf/rbem/v37n3/11.pdf

39. Kawakame PMG, Miyadahira AMK. Qualidade de vida de estudantes de graduação em enfermagem. Rev Esc Enferm USP [Internet]. 2005 [cited 2017 Sep 01]; 39(2):164-72. Available from: http://www.ee.usp.br/reeusp/upload/pdf/19.pdf

40. Schneider SM, Fonseca MCF. Esse é o meu lugar... esse não é o meu lugar: Inclusão e Exclusão de jovens e de adultos na escola. Educ Soc [Internet]. 2013 Jan-Mar [cited 2017 Apr 28]; 34(122):227-44. Available from: http://www.scielo.br/scielo.php?pid=S0101-73302013000100013&script=sci_abstract&tlng=es

41. Gonçalves LG. O saber e o fazer do técnico em enfermagem como evocações de uma inteligência popular a ser reconstruído na educação de jovens e adultos. Rev Bras Educ Jovens Adultos [Internet]. 2013 [cited 2017 Apr 28]; 1(1). Available from: https://www.revistas.uneb.br/index.php/educajovenseadultos/article/view/249

Correspondence: Tamíris Augusto Marinho
Avenida C-198, quadra 500
74270-040 - Setor Jardim América, Goiânia, GO, Brazil
E-mail: tamiris.marinho@ifg.edu.br

Recived: July 15, 2017
Approved: November 20, 2017.

This is an Open Access article distributed under the terms of the Creative Commons (CC BY).