

Knowledge of undergraduate nursing students about Dengue

Conhecimentos dos alunos de graduação em Enfermagem a respeito da Dengue

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Abstract

Objective – The aim of this study was to assess the knowledge of students entering and graduating nursing school concerning health promotion, prevention and treatment of Dengue due to the great importance of training professionals capable of dealing with this pathology. **Methods** – This investigation is quantitative, non-experimental and descriptive. The study population consisted of university students, enrolled in the morning and evening periods. **Results** – Were made from the assessment of goals, comparing the knowledge of freshmen and seniors. The study shows the importance of awareness in the establishment of effective prevention measures. The result of this survey may be used as support to guide academic activities of educational institutions with respect to this offense. **Conclusion** – The expertise of nurses is directly related to the disease control and implementation of Health Education programs that trigger changes in population habits and seek strategies to engage students in the improvement and continuous updating of knowledge.

Descriptors: Dengue; Dengue virus; Dengue hemorrhagic fever; Dengue vaccines

Resumo

Objetivo – Avaliar o conhecimento dos acadêmicos de Enfermagem, ingressantes e concluintes em relação à promoção de saúde, prevenção e tratamento a respeito da Dengue, devido à grande importância de se formar profissionais capacitados para lidar com essa patologia. **Métodos** – Trata-se de uma investigação do tipo quantitativo, não experimental e descritivo. A população deste estudo foi constituída de estudantes do ensino superior, regularmente matriculados nos períodos manhã e noite. **Resultados** – Os resultados e discussão foram feitos a partir da avaliação dos objetivos, comparando o conhecimento de ingressantes e concluintes. O estudo mostra a importância do conhecimento no estabelecimento de medidas efetivas de prevenção. Os resultados deste inquérito podem servir como subsídios para orientar ações educativas das instituições de ensino com relação a este agravo. **Conclusão** – O conhecimento dos enfermeiros está diretamente relacionado ao controle da doença e à implementação de programas de Educação em Saúde que provoquem mudanças de hábitos na população e busquem estratégias que visem a envolver os estudantes no aprimoramento e atualização contínua do conhecimento.

Descritores: Dengue; Vírus da dengue; Febre hemorrágica da dengue; Vacinas contra dengue

Introduction

Dengue is an acute febrile disease whose etiologic agent is a virus of the genus *Flavivirus*. Four serotypes are currently known, antigenically distinct DEN 1, DEN 2, DEN 3, and DEN 4¹. Clinically, manifestations range from a viral syndrome, nonspecific and benign, to a severe and fatal hemorrhagic disease with shock²⁻⁵. Risk factors for severe cases are: the strain of the serotype of the infecting virus, the immune status and genetics of the patient, the concurrence of other diseases and previous infection by another serotype of the disease⁶⁻¹⁰. Its urban transmission in Brazil is essentially carried out by the mosquito *Aedes aegypti* in an environment in which all the key factors for its occurrence are found: the man, the virus, the vector and especially the political, economic and cultural conditions that form the structure that allows the establishment of the transmission chain⁹⁻¹⁶.

Several risk factors are related to the presence of the disease and the vector. Mondini *et al.*⁷ (2005) highlight as key factors to define the pattern of transmission: population growth, migration, air travel, inadequate urbanization, poor functioning of health systems and population density⁷.

The control of Dengue transmission occurs primarily within the collective sphere and requires the effort of the whole society because of the high capacity for adaptation and dispersion of *Aedes aegypti*. Thus, the population of the areas with occurrence of transmission needs to acquire information that address changes in attitudes that can help in the prevention and control of this disease¹³⁻¹⁶.

The precarious sanitary infrastructure and the demographic explosion in tropical areas emerge as important requirements for the proliferation of the vector and subsequent transmission of the disease¹⁷⁻²³. Furthermore, concentrations of low-income population in remote areas without infrastructure and basic sanitation of large

cities create an environment conducive to development and proliferation of *Aedes aegypti* breeding sites made available by man as a result of precariousness in the services of garbage collection and water supply, hence the urgent need for an effective participation of society in the implementation of effective measures for garbage collection, regularity in the drinking water supply and harmonization of public space aiming to the maximum reduction of potential mosquito breeding sites¹⁹⁻²⁶.

According to the latest balance released by the Ministry of Health, until July 3, 2010, 482,284 cases of Dengue were confirmed and 306,771 are still under investigation. This number is 159% higher compared to the same period of 2009²⁷⁻²⁸.

There have been reported 9,688 cases of severe Dengue, 2,271 being cases of Dengue Hemorrhagic Fever/Dengue Shock Syndrome, and 7,417 cases with complications, as well as 367 deaths. It is noteworthy that seven states (SP, RJ, MS, MT, MG, GO and RO) concentrate 78.4% of severe cases and 82.3% of deaths²⁷⁻²⁸.

For the Ministry of Health, the increase in cases may be related to the predominance of serotype DEN 1, which circulated with greater intensity in the 1990s and returned to some states in the end of 2009. In 2010, DEN 1 was already identified in 22 states (except in Amazonas, Amapá, Maranhão, Paraíba, Sergipe)²⁷⁻²⁸.

In August 2010, the state of Roraima has presented the country's first cases of serotype 4, while Rio de Janeiro reported the resurgence of type 1 after 20 years²⁸.

Factors such as temperature increase and the intensification of rainfall, as well as environmental issues such as garbage accumulation and irregular distribution of water in many municipalities, have also contributed to the scenario of the disease in 2010²⁷⁻²⁸.

Due to the complexity and extent of the problem Dengue, an investigation among students of the nursing school of a private university in Campinas was proposed in order to assess their know-

ledge, main concerns, attitudes and information about the transmission, prevention and control of this disease, because of the great importance of training professionals capable of dealing with this pathology.

The objective was to assess the knowledge of students entering and graduating nursing school concerning health promotion, prevention and treatment related to Dengue.

Methods

This study was quantitative, non-experimental and descriptive. It was carried out in a private university located in Campinas, SP. The study population consisted of university students, enrolled in the morning and evening periods, all aged over 18 who voluntarily consented to participate and signed the Informed Consent (IC).

For the present study, it was used a data collection instrument adapted from Gonçalves Neto *et al.*²⁹ (2006). This instrument was a questionnaire comprising 20 closed questions.

The work was submitted to the examination and judgment of the Ethics in Research Committee of University Paulista of Campinas, recognized by the National Human Research (CONEP), sent to the presidency along with the standard cover sheet and approved under protocol n° 109/10.

The request for data collection was made to the responsible for the institution and field of research, along with the authorization for disclosure of data.

Following approval, data collection was carried out during the period of July-August 2010 by the researchers.

The obtained data were compiled and tabulated in Excel spreadsheet according to the sequence of questions. Afterwards, they were submitted to simple percentage calculation for quantification of variables.

Each question was tested individually from each other. For each one, a response whether the degree of understanding of the seniors was higher than the freshmen was obtained. The test used was the ratio test for two populations: seniors and freshmen.

Therefore, the hypothesis tested was Ho.

Ho: proportion seniors correct answers > proportion successes freshmen.

The error used in case of wrongly rejecting Ho was 5%.

The p-value of the test was calculated and through it, Ho could be rejected or accepted.

Results and Discussion

From a total of 124 students surveyed, 82 were freshmen and 42 were seniors.

The study showed that knowledge about Dengue is extremely necessary for effective prevention measures to be established. The nursing care for the control of the disease lies in the implementation of health education programs that lead to changes in the habits of the population regarding their housing conditions and hygiene, because the actions implemented are not sufficient due to the lack of basic sanitation conditions and commitment to solve the problems^{6-8,11,15,23}. In all the variables studied, it is evident the relative knowledge concerning the means of transmission, prevention and treatment of Dengue, because such information is not adequately passed to the population, nor are basic sanitation measures taken. The analyzed articles showed the increasing number of cases in recent years, highlighting the lack of action to solve the problem and the need to extensively foster health education to the community for them to acquire knowledge and be aware of the problem in order to participate effectively, a fact that proves the necessity for training educators more and more qualified at educating as the best way to prevent this grievance^{11,13,17,23}. The population should be informed about the disease (mode of transmission, clinical features, treatment, etc.), the vector (habits, breeding and natural home) and the measures of prevention and control.

Table 1 shows the stratified knowledge of freshmen and seniors from nursing school regarding Dengue. The numbers and percentages express all the difficulties found by students before and af-

Table 1. Knowledge of nursing school freshmen and graduates regarding Dengue. Campinas, 2010

Knowledge about Dengue	Freshmen				Graduates			
	Wrong answers		Correct answers		Wrong answers		Correct answers	
	N°	%	N°	%	N°	%	N°	%
1. Public Health Problem	02	2.4	80	97.6	–	–	42	100
2. Cause	59	59.7	23	23.3	16	38.0	26	62
3. Origin	50	61.0	32	39.0	25	59.5	17	40.5
4. Serotype	77	93.9	05	6.1	22	52.3	20	47.7
5. Types	22	26.8	60	73.2	15	35.7	27	64.3
6. Transmission	04	4.9	78	95.1	–	–	42	100
7. Enabling environment	13	15.8	69	84.2	04	9.6	38	90.4
8. Where females lay their eggs	32	39.0	50	61.0	16	38.0	26	62.0
9. Where the eggs are transported	29	35.3	53	64.7	11	26.1	31	73.9
10. Mosquito larvae	46	56.0	36	44.0	20	47.3	22	52.3
11. Time that eggs can withstand without hatch in a dry place	69	84.1	13	15.9	25	59.5	17	40.5
12. Characteristics of <i>Aedes aegypti</i>	24	29.2	58	70.8	06	14.2	36	85.8
13. First symptoms	45	54.8	37	45.2	17	40.4	25	59.6
14. Symptoms of classic Dengue	19	23.1	63	76.9	04	9.5	38	90.5
15. Warning signs	11	13.4	71	86.6	02	4.7	40	95.3
16. Medicines	39	47.5	43	52.5	04	9.5	38	90.5
17. Treatment	43	52.4	39	47.6	04	9.5	38	90.5
18. Contamination	48	58.5	34	41.5	19	45.2	23	54.8
19. Complication of classic Dengue fever	39	47.5	43	52.5	08	19.0	34	81.0
20. Complication of the severe form	26	31.7	56	68.3	12	28.5	30	71.5
Average	35	41.8	47	57.2	11.5	27.3	30	72.6

ter receiving health information about the disease, and clarify the importance of knowledge for a healthier living condition, emphasizing the quality of the knowledge of this professional, who experiences closely control, care, treatment and prevention of a pathology that leads each year to numerous cases of sick people⁵⁻⁹.

Information on Dengue, especially the ways of transmission and forms of prevention, are constantly supplied through the media, school and health services. However, it is difficult to infer whether they are assimilated and transformed into knowledge, since, receiving information does not necessarily mean acquiring knowledge¹¹⁻¹⁴.

Moreover, the recognition of Dengue as a serious public health problem leads the future nursing professionals to look into the various aspects of the epidemic in Brazil, raises learning opportunities, and reawakens interest in the subject. This learning makes it possible to formulate appropriate responses to the various facets of this challenge to global public health, and bring to discussion other aspects of health for their formation¹³⁻¹⁶.

Among the variables studied, listed in Table 1, the freshmen had an average of 57.2% of knowledge about Dengue, compared with 72.6% of the seniors, which amounts to a 15.4% difference in knowledge between the admission and the conclusion of the nursing course.

At the level of education and health, especially regarding the prevention of Dengue, it is important to note individual and social aspects possibly related to a greater vulnerability to the appearance of cases of the disease among the population. The degree of this professional's knowledge is directly related to the prevention of this aggravation, since their work is frankly enrolled to education as the best way to prevent illnesses. This analysis can be done by identifying the knowledge, opinions, attitudes, beliefs, and values that may be influencing risk behaviors of individuals toward Dengue¹⁷⁻¹⁸. In this comparison, seniors have a high level of knowledge, expressing an overall average over 70%, at the evaluation to which they have been submitted.

The most significant differences were found in three points. Regarding the treatment of Dengue, the freshmen showed 47.6% accuracy and the seniors, 90.5%, a difference of 42.9%. Then, with regard to the existing serotypes, the freshmen showed 6.1% of knowledge, in contrast to 47.7% of seniors', a variation of 41.6%. Finally, with regard to drugs that should be avoided, the freshmen had a hit rate of 52.5% against 90.5% of the seniors', a difference of 38%.

The acquisition of knowledge and experience as a way to incorporate wisdom is understood, then, from its dynamic nature, considering that it involves not only information processing but also the transmission of this knowledge effectively. The knowledge acquired during the course is also reverted into a movement of disclosure, where those who receive the information get hold of it, interpreting it and producing new knowledge. This is the basic difference between freshmen and seniors which represents a radical shift in the awareness of the importance of learning for their future career, as this professional is directly involved in the prevention and treatment of this aggravation¹⁹⁻²².

With regard to the difficulties found by the students, issues that can be highlighted include the origin of Dengue, the resistance of eggs and the existing serotypes, in which seniors showed performance below 50%. On item 3 of Table 1, which deals with knowledge about the origin of Dengue, the index was 40.5%, followed by item 11, about the time that the eggs can withstand without hatch in dry conditions, also with 40.5%, and by the fourth item, which assesses the existing knowledge concerning the serotypes, with 47.7%.

Given this situation, it is necessary to reflect critically and raise a discussion about what knowledge is being passed to nursing students in the epidemiology of great importance diseases as is Dengue, which identifies itself as a discipline, and if this knowledge has been sufficient and appropriate to provide the educational foundations for the practice of prevention and action in Care, which is the object of work of nursing practice^{1-5,14-16}.

Regarding the knowledge about transmission, discussed in item 6 of Table 1, both freshmen and seniors showed excellent performance with an index of 95.13% of correct answers of freshmen and 100% of seniors. With respect to climate conducive to the development of the mosquito *Aedes aegypti*, in item 7, freshmen got 84.2% and seniors, 90.4%.

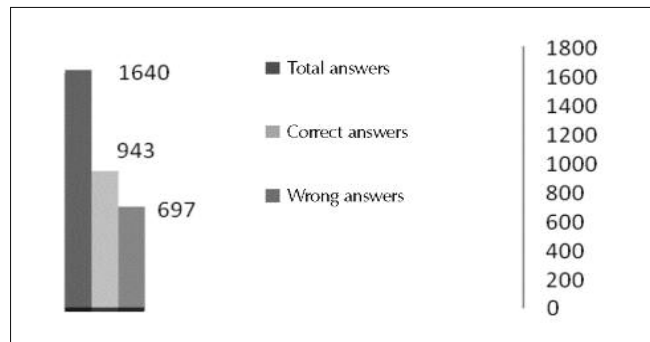
With regard to where the females lay their eggs, it was found that there was no significant difference between the knowledge of freshmen when compared to seniors, as the freshman got 61% and the seniors, 62%, a difference not very expressive of information on this item.

Table 1 also draws attention to item 13, which deals with the manifestation of symptoms of Dengue, because of their great importance in the knowledge of nursing professionals, since the freshmen got 45.2% of correct answers, while the seniors had a not very expressive result of 59.6%. It also emphasizes item 18, which addresses how the contamination by the mosquito *Aedes aegypti* can be avoided, in which freshmen showed 41.5% accuracy and seniors, 54.8%, result of little significance for the concepts of prevention of this grievance.

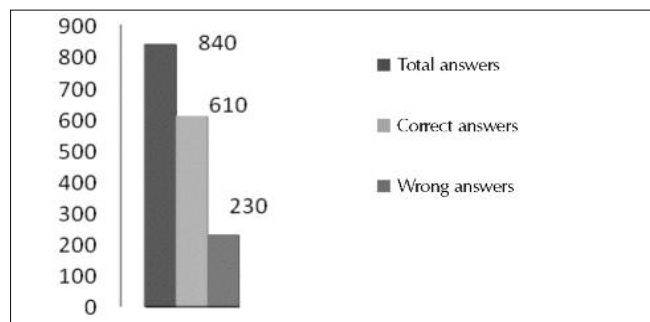
The communication process is inherent to scientific activities and the contact among the staff becomes indispensable to trigger the flow of information and knowledge.

The knowledge needed to skill development and retention of information occurs through a process subsidized by information from the beginning up to the conclusion. This information comes primarily from the literature and then the experience and knowledge held by the experts, and the relationship with students and advisees. It was observed in this study that the knowledge of seniors showed to be not very expressive in aspects related to care and contamination, which may be related to lack of practice, since the purpose of sharing the information when exercised in very important and, in many cases, facilitate the apprenticeship¹⁸⁻²⁸.

Graph 1 shows the results of the evaluation of 82 freshmen, who answered 1640 questions and obtained 943 correct answers, accounting for 57.5% of the total, and 697 wrong answers, representing 42.5%.

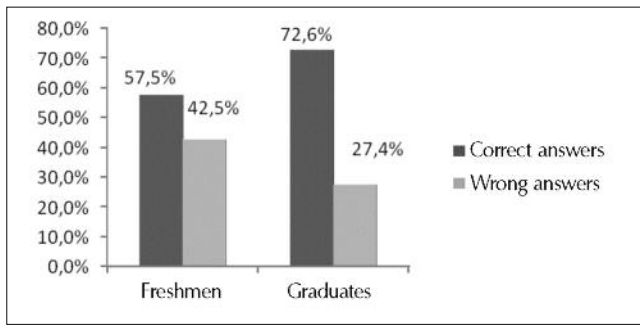


Graph 1. Results obtained by nursing school freshmen. Campinas, 2010



Graph 2. Results obtained by nursing school graduates. Campinas, 2010

Graph 2 presents the results obtained by the students graduating on Nursing. The 42 students answered to 840 questions, which resulted in 610 correct responses, representing 72.6% of the total, and 230 wrong answers, the remaining 27.4%.



Graph 3. Results obtained by nursing school freshmen and graduates. Campinas, 2010

Graph 3 presents the results obtained by freshmen and seniors from nursing school, and shows the comparison between knowledge when entering university and by the time of completion. The freshmen feature 15% difference between right and wrong, in contrast with 45.2% of seniors, which shows a significant improvement in acquired knowledge, but with a margin of 27.4% resulting from a lack of knowledge about this grievance.

The analysis of the 2007 curricular matrix of the nursing school, year of inclusion of the senior students, showed that the curricular content broadly addressed the issue Dengue in the disciplines of Epidemiology and Practice in Health Education, Physiology, Regulatory System Physiology, Propaedeutics and Process of Care in Adult Health, Health Care Policy and Practice of Adult Care Process, Family Nursing, Traineeship and Health Care for the Person / Family at Risk, Integrated Nursing, and General Training Topics, and Integrated Nursing in the Process of Health Recovery. Thus, the gap in knowledge of seniors and

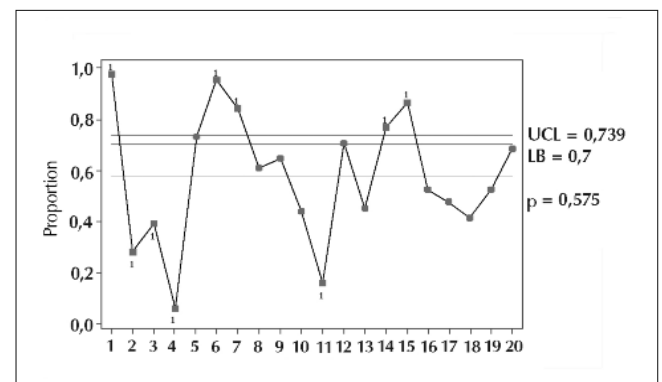
freshmen is justified, since the freshmen have not yet had these contents. It was also found that the freshmen will have 500 hours more than those graduating in their education due to an increase in the workload of the course, which will probably contribute to adding knowledge to these students and provide conditions to compensate for possible deficits in understanding with regard to this grievance.

It is noted in Table 2 that there is evidence to accept H_0 for questions 2, 4, 6, 11, 12, 14, 15, 16, 17, and 19, that is, on such issues the hitting ratio is statistically significantly higher among seniors.

In questions 3, 5, 7, 8, 9, 10, and 20 the proportion of successes is statistically equal for both groups and, in questions 1, 13 and 18, the result is inconclusive.

The degree of understanding of the class for each question is considered high if more than 70% of the class settle this question, so watching the Graph 4, it is clear that the understanding was high only in questions 1, 5, 6, 7, 12, 14, and 15. The overall proportion of correct answers was 57.5% for the class of freshmen.

It is worth emphasizing that for questions 2, 3, 4, and 11 the proportion of correct answers was very low, less than 40%.

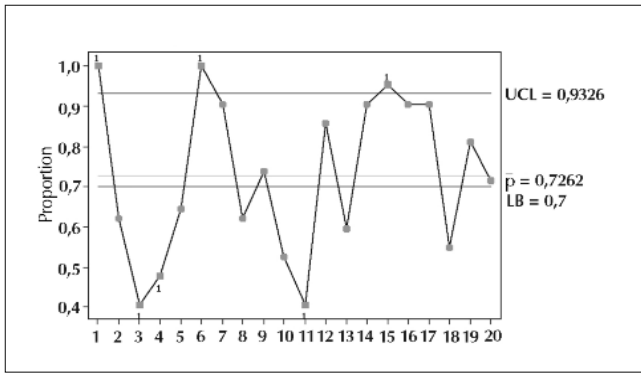


Graph 4. Proportion of correct responses of nursing school freshmen. Campinas, 2010

Table 2. Proportion of correct answers of nursing school freshmen and graduates regarding Dengue. Campinas, 2010

Knowledge about Dengue	% Correct answers Graduates	% Correct answers Freshman	p-value test	H_0 is true
1. Public Health Problem	100%	97.6%	0.076	Maybe
2. Cause	62%	23.3%	0	Yes
3. Origin	40.5%	39%	0.438	No
4. Serotype	47.7%	6.1%	0	Yes
5. Types	64.3%	73.2%	0.842	No
6. Transmission	100%	95.1%	0.020	Yes
7. Enabling environment	90.4%	84.2%	0.148	No
8. Where females lay their eggs	62%	61%	0.460	No
9. Where the eggs are transported	73.9%	64.7%	0.143	No
10. Mosquito larvae	52.3%	44%	0.185	No
11. Time that eggs can withstand without hatch in a dry place	40.5%	15.9%	0.002	Yes
12. Characteristics of <i>Aedes aegypti</i>	85.8%	70.8%	0.021	Yes
13. First symptoms	59.6%	45.2%	0.062	Maybe
14. Symptoms of classic Dengue	90.5%	76.9%	0.018	Yes
15. Warning signs	95.3%	86.6%	0.042	Yes
16. Medicines	90.5%	52.5%	0	Yes
17. Treatment	90.5%	47.6%	0	Yes
18. Contamination	54.8%	41.5%	0.079	Maybe
19. Complication of classic Dengue fever	81%	52.5%	0.001	Yes
20. Complication of the severe form	71.5%	68.3%	0.359	No

If p-value < 0.05, H_0 is accepted.



Graph 5. Proportion of correct answers of nursing school graduates. Campinas, 2010

The degree of understanding of the class for each question is considered high if more than 70% of the group settle this question, then, observing Graph 5 it is verified that the understanding was high for questions 1, 6, 7, 9, 12, 14, 15, 16, 17, 19, and 20.

The overall proportion of correct answers was 72.6%.

For questions 2, 3, 4, 10, 11, 13, and 18 the proportion of correct answers was low for both classes, therefore, these are the questions in which students find more difficulty in assimilating.

Conclusion

Through the present research it is possible to conclude that graduating students have greater knowledge about Dengue, and that the rate of correct answers presented by the freshmen is probably due to the fact that knowledge is not limited only to the school environment, but is also extended to private, family, public and other social relationships.

On the other hand, the fact that students graduating in Nursing had a higher percentage of correct answers in relation to freshmen could indicate the important role played by formal education over the level of information of these young people about the topic in question.

The nursing students' knowledge about the disease is good, but there are some gaps concerning a few specific issues related to Dengue, as evidenced by the low number of correct answers to some of the questions. Further studies aiming the way students are taught and to what extent they are demanded throughout their academic education should be developed.

We also suggest that this matter be more detailed in other aspects, as it is a good topic for future research, given the growing number of Dengue cases in recent years.

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