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College Students' Knowledge about Meningococcal Disease and Preferences for Health Information

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ABSTRACT

The purpose of this study was to measure college students' knowledge about meningococcal disease, preferred sources of health information, and vaccine intentions. Participants included 519 students taking online undergraduate courses in public health. We developed and administered a brief, ten-question online survey, which was posted on BlackBoard®. Students demonstrated a high level of knowledge about risk factors for meningococcal disease, but reported a need for more information, preferably delivered through electronic media. About a third of students had received the meningococcal vaccine prior to the survey; students who lived on campus were more likely to be vaccinated. Further research is needed to determine the best methods of preventing meningococcal disease among college students.

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Introduction

Meningococcal disease is an acute bacterial infection, most often caused by *Neisseria meningitidis*, that produces inflammation of the fluid and membranes surrounding the brain and spinal cord (Centers for Disease Control and Prevention [CDC], 2000). The disease is spread through direct exchange of respiratory and throat secretions (i.e., coughing, kissing.). Exposure to smokers, intimate kissing with multiple partners and being a university student, particularly being a first-year college student living in a dormitory setting, are risk factors for the disease (Bruce et al., 2001; Coen, Tully, Stuart, Ashby, Viner, & Booy, 2006; Tully et al., 2006). In the 1990s, the incidence of *N. meningitidis* increased among adolescents and young adults aged 15-24 years, with a fatality rate for serotype C meningococcal disease of up to 14% (American Academy of Pediatrics Committee on Infectious Diseases, 2000). Without early treatment, meningococcal disease can result in permanent disabilities, including brain damage, hearing loss, seizures, or limb amputation (when the bacterial infects the bloodstream) (CDC, 2000).

Researchers estimate that up to 83% of cases of meningococcal disease can be prevented by vaccination in this population (Harrison, Dwyer, Maples, & Billmann, 1999). The American College Health Association (ACHA) (2008), the American Academy of Pediatrics (2000), and the CDC Advisory Committee on Vaccination Practices (2000) recommend that parents and students receive

education about meningococcal disease and the availability of a safe, effective vaccine.

Collins, Dupont, and Nagle (2003) found that pre-matriculation educational efforts increased rates of meningococcal quadrivalent vaccine immunization at one university. However, there has been little research conducted about the most effective ways of educating at-risk college students about meningococcal disease, the vaccination rates of college students, or ways to increase vaccine acceptance (Butler, 2006). A better understanding of students' knowledge about meningococcal disease and their health education preferences would be valuable information for college health services professionals.

After the death of a student living in a sorority house at the University of South Florida (USF), the Educational Technology and Assessment Office from the USF College of Public Health undertook an online survey of undergraduates to test their knowledge of meningococcal disease, their preferences for learning more about the disease, and their attitudes towards vaccination.

Methods

Participants consisted of 519 students taking online undergraduate public health courses at USF during fall semester 2007. Approximately 2780 students were taking online courses and were able to participate in the study, resulting in a response rate of approximately 18%.

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We developed and administered an online meningitis questionnaire to assess students' knowledge about the disease, preferences for learning more information about meningitis, their perceived risk for the disease, and vaccine intentions. Knowledge questions consisted of three policy and risk-related questions (e.g., which individuals are at risk for getting meningitis? Please check all that apply.) Four information questions asked students about their preferences for receiving information about meningitis (e.g., How would you prefer to receive additional information?). Vaccination questions consisted of two questions about vaccination experience and intention (e.g., if you have not received the meningococcal vaccine, why not? Please check all responses that apply.) Two demographic questions asked students whether they lived on or off campus, and how many roommates they had.

Results

The vast majority of students (91.7%) reported living off campus. Most did not live in high-density settings; 37.6% had no roommate and 26.1% had only one roommate. More than 97% of students had heard the recent news reports about a student who had died from meningococcal disease. Most students (501, or 96.5%) correctly identified crowded living conditions as a risk factor for meningococcal disease.

The majority (78.4%) also knew the university's policy for vaccination: optional, but available for all students. Ten percent thought the vaccine was mandatory, whereas 11.6% were unsure.

About one-third of the students (32.6%) reporting having received the vaccine prior to the survey. Approximately 35% of students reported they would get the vaccine in the future, while 6.2% stated they planned to get the vaccine "this week," in the wake of the student tragedy. A sizeable minority of students, 26.4%, felt the vaccine was not necessary and had no plans to obtain it.

More than half of the students felt they had not received enough information about meningitis. Of those who wanted additional information, 78.4% wanted information on prevention, 74.8% wanted information on symptoms, and 65.3% wanted information on treatment. Table 1 shows students' preferred source of health information.

Most students preferred information in an electronic format, with 23.7% preferring an online presentation, 20.6% preferring a broadcast e-mail, and 9.3% wanting an online lecture.

We conducted chi-square analysis of students' living arrangements (on-campus vs. off-campus) with their responses to the other questions. Students reporting living on campus were more likely to have received the meningococcal vaccine (chi-square =7.029, df=1, α = .008).

Table 1: Student Preferences for Information about Meningococcal Disease

	N (% of Respondents)
How would you prefer to receive additional information (about meningococcal disease)?	N=514
Online presentation posted in Blackboard	122 (23.7%)
Presentation during orientation	113 (22.0%)
Broadcast e-mail	106 (20.6%)
Brochure available at Student Health Services	55 (10.7%)
Elective online course	48 (9.3%)
No information needed	37(7.2%)
All other responses	33 (6.5%)

Discussion

Overall, we found a high level of knowledge about risk factors for meningitis. Because many students taking undergraduate public health courses at USF are interested in a medical career (Perrin, McDermott, & DeJoy, 2003), our sample may have had more awareness about health issues than the general undergraduate population. Larger studies with more diverse population are needed to determine

college students' information needs about meningococcal disease.

However, despite their high levels of knowledge, only about one-third of participating students had obtained the meningococcal vaccination. Another one-third expressed an intention to become vaccinated, but it is unclear whether this intention will translate into action, particularly once the death of a student fades from the news. Because there is a

cost for the vaccine at USF Student Health Service, expense may be a factor in vaccination rates. Further research is needed to confirm this possibility. It is encouraging that students at higher risk for contracting meningococcal disease, those living in dormitories, were more likely than their commuting peers to have received the vaccine.

Most students responding to this survey expressed a need for more information about meningococcal disease. In response to students' needs and preferences, the USF College of Public Health plans to develop an online learning module about meningococcal disease. The module will cover disease transmission, symptoms and vaccination, and will be posted on all undergraduate online course sites in *Blackboard*[®]. Instructors will have the option to incorporate the module into their classes, offer it as extra credit, or refer students to the information. In addition, student health services and the county health department are sponsoring a vaccination drive

for residential students, offering students the ability to pay for the vaccine with their university account.

This study is one of the first to ask students directly about their knowledge of meningococcal disease, health education preferences, and vaccination intentions. Results of this study can provide important guidance for student health professionals in developing educational materials. However, our sample was representative of commuter students with a demonstrated interest in health issues. It is probable that the general undergraduate population may have different levels of knowledge about meningococcal disease. Replication of this study at other universities and through other survey methodologies will provide a more comprehensive picture of American college students' health education needs' related to meningococcal disease.

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