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The Impact of Student Diversity on Interest, Design, and Promotion of Web-based Tailored Nutrition and Physical Activity Programs for Community Colleges

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Abstract

Objective—To examine an organizational level perspective of the process of adopting Web-based tailored nutrition and physical activity programs for community college students.

Methods—In this qualitative study, 21 individual key informant interviews of community college student services and health center administrators were used to examine organizational-level perceptions of interest in, design characteristics of, and ways to promote health programs. A cross-classification matrix of a priori and emergent themes related to student diversity was created to describe cross-cutting patterns.

Results—Findings revealed 5 emergent themes for consideration in program development related to student diversity: (1) multiple roles played by students, (2) limited access to financial resources, (3) varied student demographics, (4) different levels of understanding, and (5) commuting to campus.

Conclusions and Implications—Nutrition and physical activity programs for community colleges need to specifically address the diverse nature of their students to increase the potential of adoption.

Keywords

qualitative research; students; Internet; organizations; risk-reduction behavior

INTRODUCTION

Although most health promotion research among college students focuses on those enrolled in 4-year institutions,^{1,2} 2-year community colleges offer an opportunity to reach a large and

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growing number of diverse students.³ Nationwide, compared with students at 4-year institutions, 53% of community college students (vs 30%) are 24 years old or older and 40% of community college students (vs 31%) are from racial/ethnic minority groups.⁴

Surveillance data demonstrate that community college students are at risk for obesity. For instance, results from a nationally representative survey indicate prevalence of overweight is higher among students at 2-year colleges compared with those at 4-year colleges (24.8% vs 16.9%).⁵ In addition, the demographics that characterize subsets of the community college population, such as older age and belonging to a racial/ethnic minority group, are significantly related to obesity levels in the National Health and Nutrition Examination Survey.⁶ Therefore, community college settings may serve as an opportune channel in which to address nutrition and physical activity behaviors associated with obesity for populations that traditionally have had less access to these interventions.

There is a lack of health-related interventions across a range of behaviors among community college students, particularly those that are related to nutrition and physical activity. Although some studies include community colleges in the sample of colleges from which participants are recruited⁷ or have examined specific intervention strategies (eg, problem solving for dietary behavior⁸) in this population, there is a lack of health programs designed for community college students. Web-based programs, in particular, may be an appealing programming option because they can efficiently deliver health information owing to their potential lower cost and greater reach compared with more intensive methods, such as in-person counseling.⁹

An important element in determining the value of Web-based programs is the degree to which institutions will adopt them. These issues are presented in the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework, which is used to guide the dissemination of interventions to research and practice settings.¹⁰ Although little is known about which characteristics are most relevant for promoting adoption of Web-based programs, cost and infrastructure considerations are likely to be at the forefront.⁹ This issue pointed the research team to examine the perceptions of community college administrators, who served as key informants.

The purpose of this exploratory study is to gain a better understanding of the process of adopting Web-based programs by examining perceptions of interest in, design characteristics of, and ways to promote a tailored Web-based nutrition and physical activity program. This information will help guide future efforts to develop and subsequently test the efficacy and effectiveness of these programs for community college students.

METHODS

Study Design

This qualitative study was conducted with administrators employed in the community college system in Massachusetts (MA). These 15 public, 2-year colleges have an average annual enrollment of 8,523 students (range: 3,103–14,448), have an average enrollment of

students from racial/ethnic minority groups of 31.7% (range: 11.4%–91.9%), and tuition and fees equal 4.7% of the median family income in MA.¹¹

Participants and Recruitment

A table of participants and their contact information was created from all 15 MA community colleges. Each participant was placed in 1 of 2 groups: student services (eg, dean of student affairs and enrollment) and health center personnel (eg, directors). This table included 29 participants (2 from each college, minus 1 because 1 college did not have a health center). Student services personnel generally direct several aspects of students' college experience including health, disability, enrollment, financial aid, and admissions services. All participants were chosen because they were thought to have unique experiences at community colleges given their role in providing and/or allocating health-related resources for students. Because of this institutional focus, demographic information about individual participants was not obtained. All possible cases in the population were sampled. An individual's contact information was generated from information available on each college's Web site. Because contact information for nursing personnel was often not available from the college's Web site, upon speaking to an individual at a health center, the interviewer asked whether a nurse responsible for student care was available.

In total, 21 interviews were conducted: 10 with student services personnel and 11 with health center personnel (2 of whom were nurses). At the college level, 14 out of 15 colleges (93%) were represented by interviewing at least 1 administrator; 6 out of 15 colleges (40%) had 2 or more interviews (ie, 1 college had 3 interviews: 1 student services and 2 health center administrators). This study was determined to be exempt by the Harvard School of Public Health's Human Subjects Committee.

Procedures

Participants were contacted up to 3 times in an effort to schedule or conduct a telephone interview. First, an e-mail was sent by the lead researcher (LMQ) or a graduate student research assistant, which was followed approximately 1 week later by a phone call and another e-mail. If no response was received, a third and final e-mail was sent. All interviews were conducted via phone in 2007 or 2008 by 1 of 2 trained interviewers following a standardized script. The interviewer first described that she was interested in learning about their perspectives of an interactive Web-based program, in which students could enter information about their current eating and physical activity habits and then receive personalized feedback to help them improve their habits. A structured 11- to 13-question (health center personnel were asked 2 additional questions about health resources at their college), open-ended interview guide was developed drawing from relevant topics related to adoption of Web-based programs found in the literature. The guide was structured to allow the interviewer to cover these topics with open-ended questions followed by more specific probing questions, allowing the participant to give both nondirected and directed responses.

The 3 main topics covered were *interest* (how interested administrators would be in having this program available for students); *design characteristics* (what features of the program would be most important); and *promotion* (what recommendations they would have for

advertising the program). Each interview was audiorecorded with the participants' permission and then professionally transcribed. Two participants declined to be recorded and 1 recording device malfunctioned, thus, detailed interviewer notes were used to document these 3 interviews.

Audiorecorded interviews averaged 18 minutes, with a range of 6–41 minutes. However, even short interviews provided descriptive detail used in the analyses. All transcripts were compared with the original recording for accuracy and supplemented with any additional notes from the interviewer. Following completion of the interviews, 5 small group discussions were conducted over the phone to serve as a member check.¹² Ten administrators participated. The member check indicated that thematic saturation had been reached.¹²

Data Analysis

Analysis began with a list of a priori descriptive codes for the 3 adoption topics in the interview guide (ie, interest, design characteristics, and promotion).¹³ The lead researcher (LMQ), who had prior qualitative coursework and research experience, coded portions of text from the transcripts, with the assistance of ATLAS.ti data management software (version 4.2, ATLAS.ti GmbH, Berlin, Germany, 1997–2000). Next, the lead researcher looked for themes that were emergent from the data and created codes for each emergent theme.¹⁴ The most cohesive emergent theme was student diversity, thus emergent codes were created for each subcategory under student diversity. A cross-classification matrix was created by examining the transcripts for instances in which a student diversity subcategory was discussed in relation to an adoption topic in the interview guide to gain a richer description of cross-cutting patterns.¹⁴ These patterns are displayed in the Table. During the analysis, 2 peer debriefing sessions were conducted in which the lead researcher presented 2 peers (SFW and MDJ), who were not involved with data collection, with excerpts of coded text and then led a discussion about the appropriateness of the coding and interpretation of data. Coding categories were discussed and revised during this process. Peer debriefing is a recognized qualitative practice that serves to increase analysis credibility.¹²

RESULTS

The analysis revealed 5 emergent codes corresponding to subcategories of student diversity that cut across 3 a priori descriptive codes of interest in, design of, and promotion of a Web-based program. The 5 diversity subcategories were: (1) *multiple roles* played by students, primarily family and work responsibilities; (2) *access to resources* such as limited financial means and health care access; (3) *demographics* of students, including age range, being a parent, using a language besides English, having learning disabilities, having physical disabilities, and having a chronic illness; (4) *different levels of understanding* encompassing a range of learning styles and comfort using computers; and (5) *commuting*, which indicated that students needed to commute to campus.

Topic 1: Interest in Offering a Web-based Program

Four emergent student diversity themes were related to interest in the program (Table). Most administrators agreed that offering a program that is Web-based is appealing because it was

thought to be able to accommodate students' need for a program that they could access easily and that would fit into their small windows of available time owing to the multiple roles students' play in their daily lives. For example, a dean of student services noted:

... [students are] working, have families, and ... it's probably very difficult sometimes for them to ... get nutritious meals... and I think that [a program like this] would be very helpful to them; quick access to information.

In relation to student demographics, administrators noted that their non-traditional student population would increase their interest level. For example, a dean of student services noted that they have:

... a lot of urban students. They're by definition at risk for ... nutritional issues, obesity and everything related to that ...[nutrition and physical activity is] probably up within our top 3 or 4 priorities ... given the nature of our students.

However, interest in the program was tempered by space and funding constraints at community colleges, concerns about student use of the program, and students' knowledge of using computers. For example, a health center administrator noted:

I don't know how much our students would ... use that program. I think at a 4-year school, you would have a much higher percentage of usage and people referring back to it. I would have to be convinced that it would be used and I would have my doubts.

The same person went on to say:

If you're going to be promoting it to schools that have health educators and students that have computers in their room, you're going to get more business ... Our students probably need [the information] more but ... it's like everything else. People who have less, less money, have less access to health care. They have less access to education about health care.

Topic 2: Design Characteristics

Three emergent student diversity themes were related to design characteristics of the program (Table). These themes had implications for program design, including increasing the breadth of behaviors targeted, recommendations presented to improve behaviors, and how the information should be presented. The wide variety in student demographics, including age, multiple languages, disability status, chronic illnesses, and being parents, was already being considered in health programming design and was thought to increase the breadth of behaviors to target. One dean of student services noted:

We have a younger student who might benefit from learning things about high-risk behaviors, like ... STDs, or alcohol, or drug use, or smoking ... And then, we have an older, nontraditional student who ...in addition to all of those things ... also might have more concerns about things like weight loss, or dietary needs, or ... parenting, child-rearing, you name it.

Strategies to address the targeted behaviors would also need to take into account access to resources, particularly financial resources. As noted by a health center administrator,

[an educational program] would have to take into account [the] resources that the students would have, both financial and also environmental, in terms of being able to cook ... or get certain foods.

The theme of access to money would also affect how the Web-based program would be made available to students, as noted by a dean of student services:

If it were fee-for-service, I would be concerned about that. [P]articularly with our student population, we work with a lot of students who are economically disadvantaged.

Different levels of student understanding and presence of learning and physical disabilities were noted as important in determining how information should be presented, so that all students would be able to use the program. One administrator noted that a Web-based program is still not a convenience for some people. Another health center administrator noted:

We run the gamut here with students. We have high school students on campus, and we have sixty and seventy-year-olds on campus. So there's all kinds of skill with getting on the computer and finding what you want. So I think the first thing, it would have to be pretty user friendly.

Although the administrators did not specify exactly how these issues should be dealt with, a health center administrator noted:

The information on the site would have to be reviewed by someone who was knowledgeable in that area, in making information more easily accessible to people who might have a more difficult time understanding and interpreting.

Topic 3: Program Promotion

Two emergent student diversity themes were related to promotion of the program (Table). Promotion was widely thought to be difficult and affected by the short amount of time students are on campus for class, commuting versus not living on campus in residence halls, and varying amounts of time spent in the college system altogether, from only a semester to multiple years. As noted by a health center administrator:

One of the interesting things about a community college is that most of the people who come here have jobs and they're here for a short amount of time to do their classes. So you have to bring the information to them whether it's a classroom, or the cafeteria.... Working with community colleges is quite a challenge.

Administrators noted that multiple channels would be necessary to effectively promote the program, potentially including faculty involvement, mailings to students' homes, pamphlets at the health center, and information on Web sites and bulletin boards.

DISCUSSION

Among this sample of administrators, it is clear that a "one-size-fits-all" intervention approach developed for any type of college student is not in line with their perspectives on providing health-related resources. Rather, the influence of multiple life roles, limited access

to resources, diverse demographics, different levels of understanding, and commuting to campus needs to be incorporated into program development.

In general, reviews of effectiveness of technology-based interventions for nutrition and physical activity promotion are promising yet inconclusive.^{15,16} A challenge to delivering promising technology-based (including Web-based) interventions to a wide audience is the ability to reach traditionally underserved populations. In addition to increasing access to Internet services, eliciting a broad array of factors from users is 1 approach that may help to extend the reach of technology-driven interventions to traditionally underserved populations.¹⁷ In contrast to programs that focus solely on individual-level characteristics of the targeted population such as racial/ ethnic minority group or income level, programs that also include key contextual characteristics, such as the 5 factors identified in this study, may aid in intervention reach, relevance, and effectiveness. Indeed, there is a wealth of literature that supports incorporation of the broader social and cultural context into health promotion programs.^{18,19}

Qualitative methods have been used to elicit user perceptions for incorporation into the design of Web-based interventions among culturally diverse adults,^{20,21} adults with low income and low literacy,²² and traditional college students;²³ these populations share characteristics with community college students. Although these studies examined perceptions from the users themselves, the present study identified relevant characteristics from the potential adoption settings. These characteristics could then be integrated into intervention development, potentially facilitating dissemination into practice settings, a goal of the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework.¹⁰ Eliciting perceptions directly from students and then integrating them with those from administrators is a logical next step in this line of research.

Limitations

This study has limitations that should be considered. Although not generalizeable to all community colleges, this study may provide insights for program adoption and development in comparable settings that also have diverse student populations. Further research may aim to assess the importance and application of student diversity in a quantitative survey to achieve more generalizeable results. The interview guide was not pretested among participants. Strengths of this study include increased credibility, as well as descriptive and interpretative validity of findings owing to the use of member checking and peer debriefing analytic procedures.

IMPLICATIONS FOR RESEARCH AND PRACTICE

A number of considerations can be drawn from these results for researchers and practitioners who wish to develop tailored Web-based nutrition and physical activity programs for adoption in community colleges. Primarily, program developers should aim to establish a good fit between students' diverse needs and program delivery, content, and promotion. To increase administrators' interest in the program, the program developer could highlight how tailoring is designed to offer personalized content based on user characteristics, such as disability and/or employment status and that the Internet is an appealing delivery channel for

students with multiple life roles to access at their convenience. The program could be further customized to the needs of students by allowing students greater choice in using the program, for example by allowing the student to choose the behavior they would like to work on first from a list of multiple nutrition and physical activity options.

In terms of program content, expert review by specialists in learning and physical disabilities may be warranted. For example, to accommodate those with low levels of computer literacy or learning disabilities, one could consider 3 best practices: (1) employing a combination of text and voiceover techniques (ie, spoken description of text); (2) allowing students to view the program as many times as desired; and (3) allowing access to family members to facilitate sharing of ideas.²⁴

Developers should also be responsive to working with students with financial constraints by presenting lower-cost strategies to improve behaviors, for example free or on-campus physical activity opportunities included in their tuition. It was also clear that a “fee-for-service” model in which students pay to access the program would likely not work. Rather, tying use of the program to existing college offerings, such as orientation or coursework, would respond to this financial limitation as well as to busy commuting students who are typically on campus for short periods of time. Tying programs into the curriculum has been identified in other studies as a means to accommodate such students.^{25,26}

In combination with perspectives in interest, design, and promotion from students’ perspectives, tailored Web-based nutrition and physical activity programs responsive to student diversity is a promising approach in community colleges.

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Table

Intersections Between Student Diversity and Interest in, Design Characteristics of, and Promotion of a Nutrition and Physical Activity Web-based Tailored Program in Community Colleges

Emergent Codes: Student Diversity Themes	Descriptive Codes: Adoption themes		
	Interest in Offering Program	Design Characteristics	Program Promotion
1. Multiple roles: employment, family	✓	–	✓
2. Access to resources: money, health care	✓	✓	–
3. Demographics: age, learning disability, physical disability, language, chronic illness	✓	✓	–
4. Different levels of understanding: learning style, computer literacy	✓	✓	–
5. Commuting	–	–	✓

✓indicates there were intersections in the data between the emergent student diversity theme and the descriptive adoption themes; –, no intersection in the data.