

Respiratory Care Education Annual

*The American Association
for Respiratory Care*

Volume 20

Fall 2011

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Utilization of Interdisciplinary Education In Respiratory Care Curricula

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Abstract

Background: A greater emphasis on interdisciplinary education (IDE) of health professionals is needed to promote collaborative, cost-effective and patient-centered care. The purpose of this study was to examine the use of IDE in respiratory care (RC) educational programs across the United States (US) and to determine the attitudes of program directors (PDs) regarding IDE activities. **Methods:** A questionnaire addressing the practices of, and perceived needs for IDE was developed and field tested. All PDs (n=202) listed by the Commission on Accreditation for Respiratory Care (CoARC) with e-mail addresses were invited to participate in the survey. **Results:** Fifty two RC PDs from across the US at a variety of institutions completed the survey (26% response rate). More than half (58%) of the respondents indicated they incorporate planned interdisciplinary activities involving students from two or more disciplines into their program's curriculum. These activities occur most frequently in the clinical setting, during traditional classroom activities, or in web-based courses. Ninety-eight percent (51/52) of survey participants had a positive attitude toward IDE and believe it is or would be beneficial to students. However, only about 50% of the program directors believe that they have the resources needed to implement IDE. **Conclusions:** IDE is important in the preparation of future health professionals and may be incorporated into the education of RC students. More attention should be focused on increasing the number of RC educators who have the resources to teach from an interprofessional perspective and to share best educational practices to promote collaborative patient-centered care. Providing IDE is essential to ensure RC graduates are prepared to work effectively on interprofessional teams within the evolving healthcare system.

Key Words: Interdisciplinary Education, Interprofessional Education, Respiratory Therapy Education

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Utilization of Interdisciplinary Education In Respiratory Care Curricula

Introduction

Education within the health care disciplines has historically been compartmentalized into silo-like structures. In light of international and national policy makers' call for improved collaboration in the delivery of healthcare, a greater emphasis on interdisciplinary education (IDE) is warranted.¹ Interdisciplinary education (also known as interprofessional education), as defined by the United Kingdom Centre for Advancement of Interprofessional Education (CAIPE), occurs "when two or more professions learn with, from and about each other to improve collaboration and the quality of care"². IDE may be used as a tool to better prepare future health professionals entering the workforce. By allowing individuals from different health professions to learn together, it is believed that IDE will develop professionals that "will work better together, improving care and the delivery of service".¹ While there are numerous terms used among those who are advancing IDE, IPE and collaborative practice, the authors of this manuscript use the terms interdisciplinary and interprofessional education interchangeably.

Interprofessional educational activities have been studied and found to be useful and effective.³⁻⁷ Interprofessional and/or interdisciplinary activities have been reported to promote better communication and collaboration between professionals across different disciplines. Furthermore, results from previous studies have demonstrated improved attitudes, increased levels of respect for other members of the healthcare team, and a higher degree of student satisfaction with programs that incorporate IDE into the curricula.

The purpose of this study was to examine the use of IDE in respiratory care (RC) educational programs across the United States (US) and to determine the attitudes of program directors (PDs) regarding IDE activities. For the purposes of the study, an interdisciplinary education activity was defined as "a planned activity which intentionally involves students from two or more health sciences disciplines." Participants were informed that the IDE activities could occur in the classroom, laboratory, clinic, hospital, other health care setting, or on the internet. Examples of IDE listed for participants included: 1) continuing education courses designed for students from radiography and from nuclear medicine; 2) video conferences and telemedicine created for medical students or physician's assistant students; and 3) seminars for physical therapy, occupational therapy, and respiratory therapy students. Information was obtained in the following three areas: 1) demographics, 2) types of interdisciplinary educational activities present in the program, and 3) attitudes for or against IDE, including perceived needs and barriers for its success in the program.

Methods

A group of faculty members from a research discussion group at the College of Health Related Professions at the University of Arkansas for Medical Sciences (UAMS) created a questionnaire addressing the practices of, and perceived needs for IDE across allied health programs. The questionnaire was designed to collect: 1) demographic information, 2) types of IDE activities practiced in programs, and 3) the perceived attitudes for and barriers against IDE activities. The survey was placed online using the software program, Perception. Before the survey was sent to intended participants, it was piloted by the study investigators to determine the length of time required to complete the survey, the clarity of the questions and

for any technical difficulties. Questions on demographics, degrees and certifications offered by the program, types of IDE within the program, perceived interest, barriers and active participation were included in the survey.

All program directors (PDs) (n=248) of accredited RT programs listed on the Commission on Accreditation for Respiratory Care (CoARC) web site in 2008 were considered for inclusion in the study, however, 21 of these PDs did not include an e-mail address. An invitation to participate in the study was electronically mailed to all of the remaining PDs (n=227). Twenty-five of the remaining PDs were not able to be reached because the invitation to participate was undeliverable to the e-mail addresses provided leaving a total of 202 PDs who received the invitation to participate in the study.

Participants were instructed to click on a link that would take them to the online questionnaire. Upon completion of the questionnaire, all answers were compiled in aggregate by "Perception" and sent to the study investigators. Participation was voluntary, anonymous, and took approximately 10 minutes. Participants were advised that they were free to refrain from answering particular questions or to withdraw from the study at any time. Identifying factors were not requested or used and PDs were informed that demographic data would be used for descriptive reporting purposes and to inform other RC educators about the current status of IDE. The study was approved by the UAMS Institutional Review Board.

Findings

Approximately 26% (52 of 202) of PDs returned the surveys. Almost two-thirds (65.4%) of the respondents were from two-year community colleges or technical colleges. Eight of the institutions were identified as universities, five were academic health science centers, three were four-year colleges and two were identified as proprietary institutions. The majority of respondents were located at programs in the central and eastern U.S. (Figure 1).

Figure 1

Location of Respondents by State.



The majority of respondents (80.8%) were PDs of programs that award the associate degree in RC. Seven PDs reported that their programs offer both the associate and bachelor's degrees. Six PDs noted that their institutions offered advanced degrees in RC to include the master's degree (n=3), post-baccalaureate certificate (n=2), and a professional doctorate (n=1).

While IDE was included in the RC curriculum in only 50% of associate degree programs, it was provided in 80% of bachelor's degree or higher programs. When combined, 58% of PDs indicated their programs included planned educational activities involving students from two or more disciplines and 40% of the PDs stated these activities occur most frequently in clinical and/or hospital settings. Other areas in which interdisciplinary activities frequently occurred were during traditional classroom activities and in web-based courses. An example provided by a respondent was the combination of paramedic and RT students in an Advanced Cardiac Life Support (ACLS) course.

Two-thirds of participants indicated that they believed RC was the discipline that most frequently conducts educational activities attended by students from two or more disciplines. Nursing, medicine, and emergency medical sciences were other disciplines that the study participants identified as occasionally or frequently offering IDE activities (Table 1).

Table 1

Specialties that conduct IDE activities for students from two or more disciplines.

Disciplines	Rate of Activity			
	Frequent	Occasional	Never	No Answer
Audiology		1	11	18
Cytotechnology	1	1	12	16
Dental Hygiene	1	4	10	15
Sonography		6	11	13
Dietetics/Nutrition	1	1	11	17
EMS 4	9	8	9	
Genetic Counseling			12	18
Medical Records	2	8	7	13
Medical Dosimetry		2	10	18
Medicine	6	9	3	12
Medical Technology	3	3	10	14
Nuclear Medicine		2	11	17
Nursing	7	14	2	7
Occupational Therapy	1	4	11	14
Ophthalmic Medicine			12	18
Pharmacy	1	4	7	18
Physical Therapy	2	5	9	14
Physician Assistant	3	4	8	15
Public Health	1	2	10	17
Radiation Therapy	1	2	11	16
Radiologic Technology	3	10	6	11
Respiratory Care	20	3		7
Speech-Language Pathology		2	9	19

Table 2

Extent of agreement or disagreement about IDE

(SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree, N/A = Not Applicable).

Statements	Level of Agreement				
	SA	A	D	SD	NA
I am knowledgeable about IDE.	9	30	13		
I have a positive attitude toward IDE.	21	30			1
I believe IDE is (or would be) beneficial.	21	30			1
I believe interdisciplinary education is needed.	17	32	1		2
I have the skills needed to implement IDE.	8	28	14		2
I have the resources needed to implement IDE.	5	19	22	3	3
I have taken steps to implement IDE.	4	24	19	1	4

Courses of instruction most often identified by PDs as being interdisciplinary were anatomy and physiology and American Heart Association’s Basic and Advanced Life Support programs. Topics such as cultural competency, evidence-based medicine, patient assessment, ethics, health disparities, and management and supervision were described as units of instruction in RC curricula that were taught using an interdisciplinary approach.

While 98% of PDs agreed or strongly agreed that they have a positive attitude towards IDE and that it is (or would be) beneficial for students, it is interesting to note that only just over half have taken steps to implement IDE (Table 2). Slightly less than half reported that they actually offer courses in which instructors come from 2 or more different disciplines or professions and less than half (46%) indicated that they had the resources needed to implement IDE. Still, the majority (94%) strongly agreed or agreed that IDE is needed. As a group, 75% of the respondents considered themselves knowledgeable about IDE and 69% were of the opinion that they had the skills needed to implement IDE.

All or almost all of the respondents agreed that important or very important benefits of IDE were its propensity to promote teamwork (98%), improve quality and continuity of patient care (98%), improve patient safety (100%) and improve communication skills of students (100%). Other benefits of IDE that a majority of PDs identified as very important or important included the predisposition for IPE to produce better-educated graduates (98%) and better prepare students for future employment (98%). Benefits that more than one-half of PDs identified as very important or important were improving graduate marketability (89%), promoting educational cost-effectiveness (87%), and making the delivery of education more efficient (92%). Most PDs (65%) also rated IDE’s potential to reduce faculty workload as an important or very important factor (Table 3).

Participants were asked to rate the level of significance of barriers to implementing IDE (Table 4). The largest barriers cited as significant or very significant were scheduling (90%), lack of development time (90%), and other demands of the curriculum that take precedence (94%). Other significant or very significant barriers included lack of interest among faculty (83%), insufficient faculty expertise (75%) and faculty resistance (66%). Additional barriers rated as significant or very significant included financial constraints (79%), and inflexible curriculum (88%). Most PDs indicated that lack of interest among students and licensure

Table 3

Importance of the benefits of IDE.

Benefits	Level of Importance		
	Very Important	Important	Not Important
Cost-effectiveness.	15	30	7
Makes education more efficient.	19	29	4
Reduces faculty workload.	10	24	18
Improves graduate marketability.	14	32	6
Improves quality of patient care.	37	14	1
Improves continuity of patient care.	34	17	1
Improves patient safety.	33	19	
Improves students' communication skills.	36	16	
Promotes teamwork.	40	11	1
Better prepares students for employment.	33	18	1
Produces better-educated graduates.	34	17	1

requirements were not significant barriers to implementation of IDE at their institutions.

PDs were asked to identify the level of availability of resources for implementation of IDE as being currently available, planned for the future or currently not available (Table 5). Fifty percent (50%) of PDs were of the opinion that current accreditation requirements allow interdisciplinary activities and only 39% indicated that licensure requirements that allow for interdisciplinary activities were available. While 43% of respondents conveyed that faculty expertise for implementation of interprofessional activities was currently available at their institutions, 33% said that faculty expertise was not available. The remaining PDs (24%) indicated that resources to address faculty expertise were planned for the future. Forty four percent believed that support of administration was available and another 31% reported

Table 4

Barriers to implementation of IDE activities

Barriers	Level of Importance		
	Very Significant	Significant	Not Significant
Scheduling	31	16	5
Financial constraints	18	23	11
Lack of interest among faculty	18	25	9
Lack of interest among students	4	18	30
Inflexible curriculum	23	23	6
Lack of development time	24	23	5
Licensure requirements	12	8	31
Accreditation requirements	11	15	25
Insufficient faculty expertise	17	21	13
Other demands on curriculum take precedence	30	19	3
Inadequate classroom, lab or clinical resources	15	20	17
Faculty resistance	17	16	17

Table 5

Availability of resources for implementation of IDE

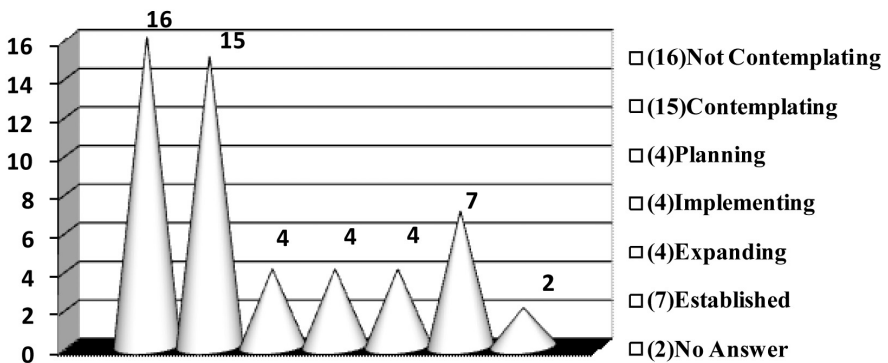
Resources	Level of Availability		
	Currently Available	Planned for Future	Not Available
Flexible scheduling	9	12	31
Adequate financial support	5	18	29
Interest among faculty	15	16	21
Interest among students	19	13	19
Flexible curriculum	8	11	32
Development time	4	14	34
Licensure requirements allow ID activities	20	10	20
Accreditation requirements allow ID activities	26	9	14
Faculty expertise	22	12	17
IDE activities take precedence in curriculum	7	14	25
Adequate classroom, lab or clinical resources	17	18	16
Support of administration	21	15	12

that support of administration was planned for the future and 25% of respondents reported that support of administration for implementation of interdisciplinary activities was not available.

When asked to describe their program’s current stage of development of IDE, 31% of respondents reported that they were not currently contemplating IDE activities. However, another 29% of PDs were contemplating adding IDE activities. In addition, 8% were in the planning stage, 8% were implementing activities, and another 8% were expanding IDE activities in their programs. Fourteen percent of PDs described the IDE activities at their programs as established (Figure 2).

Figure 2

Current stage of development of IDE activities in RC programs.



Discussion

The majority of respondents in this study had positive attitudes about IDE and agree that it is (or would be) beneficial for RC students. Further, over half of the respondents indicated that their programs' graduates received some form of IDE. Regardless of the awareness of the benefits and need for IDE, there were many obstacles to its utilization in RC programs. This may explain why less than half of the participants in the study actually offered interdisciplinary courses.

Participant demographics indicated that the majority (65%) were PDs in two-year community colleges or technical colleges. The 2009 AARC Human Resource Survey of Educational Programs⁸ reported that 74% of RC programs are located in 2-year community/vocational colleges. Thus, this study included a slightly higher percentage of PDs from baccalaureate programs than are represented in the national average. Respondents to this survey included programs from the US Census Divisions of New England, Middle Atlantic, South Atlantic, East North Central, West North Central, West South Central, and Pacific states. However, there were only 2 respondents from the Mountain Division which was reported to have 14 programs by the 2009 AARC Human Resource Survey.⁸

Previous health profession education studies, surveys, and reviews indicate that IDE activities require an extensive commitment of time and effort by administration and faculty for successful continuation of these types of programs.^{4-7, 9-11} Our results confirm previous studies' findings regarding important barriers to IDE. Chief among these are student scheduling issues across multiple disciplines and the heavy demands of discipline-specific curricular requirements. Almost 50% of PDs in this study did not feel that they had the necessary resources to put IDE into practice. A key factor in executing and maintaining interprofessional initiatives is the availability of resources such as time, spatial factors, and faculty and administrative support.¹

Attitudes towards IDE can be a major barrier to its implementation and success. Team learning activities require a high level of organization and coordination to allow students from various disciplines to participate in a single learning activity. Almost half of the educators who responded indicated that they faced significant obstacles to implementation of IDE. These included insufficient faculty expertise and the lack of development time and/or interest of faculty to commit to making curricular changes to promote IDE. Previous studies of IDE have primarily focused on medical and nursing students, with other health professions being studied less often.^{1,4-6,10,11,13} Additionally, many of these studies pertained to single institution evaluations. We were unable to identify any previous studies of the effectiveness of IDE delivered to RC students. This study examined the use of IDE in RC programs across the US.

Encouragement, patience, support for, and interest in IDE have been reported as major motivators for faculty, students, and clinical staff to continue interdisciplinary activities. Faculty members typically need special training to adopt new types of teaching methods to promote communication and collaboration across disciplines. Additionally, conflict management and negotiation skills are essential to develop and maintain a sense of enthusiasm among faculty. Almost one-third of the survey respondents reported that faculty expertise in implementing interdisciplinary activities was not currently available and more than half reported that they did not have administrative support for the implementation of

such activities at the time of the survey. Maintaining the focus to build a strong interdisciplinary program will clearly be a challenge for many PDs.

While IDE is understood to occur when students from 2 or more professions learn side by side whatever the purpose, Hammick et al espouse that IDE demands an 'interactive element in the learning experience'.¹ These scholars further advocate that shared listening alone does not lead to interdisciplinary learning. Yet, 40% of the respondents in our study indicated that interdisciplinary activities occur most frequently in clinical and/or hospital settings. It is possible that these PDs regard the exchange of information during patient-care rounds as IDE. However, these 'serendipitous' encounters between different professionals may or may not require the RC student to actually interact in the exchange of information.¹ Thus, there may be a need for RC educators to plan formal activities that clearly have interdisciplinary methods, goals, and objectives (i.e., clinical simulation laboratories involving simulated patients for students from medicine, nursing, respiratory therapy, and other health professions in which clinical scenarios mimic difficult situation(s) from real-world practice. Further, these educational activities should incorporate a plan for measurement of learning outcomes.

The limitations of this study include the survey response rate of 26%. While we cannot be sure that survey respondents and nonrespondents were similar, the proportion of associate degree to baccalaureate degree survey participants was fairly similar to the proportion for the population of all schools and the respondents were generally geographically well distributed, though the Mountain states may have been under represented. We believe that the study findings are an important addition to the body of knowledge currently available on this topic.

Conclusion

It will be important for RC educators to develop an organized, multidisciplinary approach to preparing its graduates for a future of greater collaboration and to deliver truly patient-centered, team-oriented care. Much of the literature on interdisciplinary practice "is generated by and focuses on the 2 dominant health professions of medicine and nursing, whereas the health professions collectively encompass many more discrete fields of expertise, without which the quality of health care individuals and populations receive would be greatly compromised."¹⁴ The only health care professional that receives specialized dedicated education and training on the diagnosis, management, and education of patients with respiratory diseases is the respiratory therapist.¹⁵

New educational strategies that are interdisciplinary and complement the shared curricular elements for students in RC and other health professions are necessary because both the educational and healthcare environments are changing at an unprecedented pace. Interdisciplinary education is crucial in the preparation of future health professionals and has the potential to be incorporated into the education of RC students. An investigation of attitudes and practices in RC programs across the country reveals that RC PDs have positive attitudes toward IDE and believe that they are knowledgeable about the process. However, more attention should be focused on increasing the number of RC educators who have the resources needed to teach from an interdisciplinary perspective and to share best educational ap-

proaches for collaborative patient-centered practice. Faculty development to ensure competence and confidence of facilitators of interdisciplinary learning is critical to providing learning experiences that lead to positive behavior changes and improved patient care delivery. Providing IDE is essential to ensure RC graduates are prepared to work effectively on inter-professional teams within the evolving healthcare system.

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Implementing Computerized Patient Simulations as a Measure of Student Learning on Patient Management in Respiratory Therapy Education

Arzu Ari, PhD, RRT, PT, CPFT

Abstract

Background: Although many respiratory therapy programs implement computer simulations to train their students in patient management, the effect of computer simulations as a measure of patient management skills of respiratory therapy students is unknown. The objective of this study was to determine the impact of computerized patient stimulations on students' information gathering and decision making skills. **Methods:** A retrospective analysis of 29 respiratory therapy students taking a pulmonary disease course at a southeastern university was used in this study. The types of computerized patient simulations (C&S Solutions) used in this study included heart failure, acute respiratory distress syndrome, myasthenia gravis, cystic fibrosis, and near drowning. Students were assigned to take each computer simulation at a designated computer laboratory, following the lecture on the above diseases. The simulations and subsequent scorings occurred throughout the semester approximately once every three weeks. Students' pre- and post-computer simulation scores on each disease were compared. **Results:** All post-computer simulation scores were significantly higher than the pre-computer simulation scores for all the respiratory therapy students ($p < 0.05$). Although computer simulations did not influence the student's information skills ($p > 0.05$) over time, they did improve the students' decision making skills significantly ($p < 0.05$). **Conclusions:** The use of computer simulations improves and reinforces student learning in patient management and effectively stimulates their decision making skills in respiratory therapy. Therefore, computer simulations should be implemented more universally to benefit respiratory therapy programs and be used as an objective and effective measure of student learning in patient management.

Key Words: Computer simulation, student learning, respiratory therapy, patient management, information gathering skills, patient simulation, critical thinking, and decision making skills.

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Implementing Computerized Patient Simulations as a Measure of Student Learning on Patient Management in Respiratory Therapy Education

Introduction

Computer simulations have been used widely as a teaching tool for training students in medicine and health care education. A growing literature has studied the effectiveness of computer simulations on student learning in various disciplines.¹⁻⁸ Evidence indicates that computer simulations improve students' cognitive and critical thinking abilities such as differential diagnosis, decision making and treatment planning as well as practical skills needed for the management of the patient.⁹⁻¹⁷ While computer simulations are effective as a training and skill assessment tool for students, it has been reported that knowledge gained from computer simulations are retained longer than knowledge learned from traditional lectures.^{1-5, 17} Computer simulations also lead to an increased rate of skill acquisition compared to conventional training methods and improve confidence and competencies in students' critical thinking and problem solving abilities.^{14, 15, 18-21}

Most research on computer simulation has evolved around medical education and other health care disciplines. Although many respiratory therapy programs implement computer simulations to train their students, the effect of computer simulations as a measure of respiratory therapy student's patient management skills is lacking. Therefore, the objective of this study was to determine the impact of computerized patient stimulations on students' information gathering and decision making skills by implementing computer simulations as a measure of how effective student learning on patient management occurs.

Methods

Sample: The target population of this study was first year respiratory therapy students enrolled in a baccalaureate degree respiratory therapy program. A retrospective analysis of 29 respiratory therapy students (20 female and 9 male) enrolled in a pulmonary disease course at a southeastern university was conducted.

Study Variables: The independent variable of this study was computerized patient simulations (C&S Solutions Innovative Software Applications, Vincennes, IN) including the topics of: heart failure (HF), acute respiratory distress syndrome (ARDS), myasthenia gravis, cystic fibrosis (CF), and near drowning. While computerized patient simulations are designed to allow the student to obtain results of a medical history, physical examination, laboratory and other studies, they can also assess the students' information gathering and decision making skills by using multiple choice test items at the end of each simulation. Student selected procedures are graded as approved, neutral and inappropriate, and then each decision is scored based on student understanding of patient management. Students took both pre- and post-computer simulations at a designated computer laboratory. The dependent variable of this study was the students' pre- and post-scores on the computerized simulations. The first score was used as the initial measure (pre-computer simulation score) and the last score as the final measure (post-computer simulation score) for each of the pre-selected simulations. Both pre- and post-computer simulations included the same case and

questions. Students had only one attempt at each computer simulation to eliminate memorization of questions through the completion of each simulation multiple times and to determine the unique effect of computer simulations on student learning.

Data Collection: Students were assigned to complete each computer simulation at a designated computer laboratory following a lecture on each pre-selected disease. Computer simulation exercises were proctored by a graduate research assistant who did not assist students at any time. Students' pre- and post-computer simulation scores were recorded. The total number of simulations used in this study was five and scorings of computer simulations occurred throughout the semester approximately once every three weeks.

Data Analysis: Descriptive and inferential statistics were used to analyze student scores on the simulation exercises using the Statistical Package for the Social Sciences (SPSS), version 16.0. A paired t-test with an alpha level of <0.05 was selected to compare students' pre- and post-scores on each computer simulation. Repeated measures analysis of variance was utilized to determine the impact of computerized patient simulations on students' information gathering and decision making skills.

Results

Table 1 presents the mean scores and standard deviations for the pre- and post-computerized simulations. The results of this study show that all post-computer simulation scores were significantly higher than pre-computer simulation scores for all students enrolled in the pulmonary disease course ($p < 0.05$). Since computer simulations were offered throughout the semester approximately once every three weeks, students' progress on information gathering and decision making skills were evaluated. Although computer simulations did not make a significant difference on students' information gathering skills ($p > 0.05$) over time, they did improve the students' decision making skills significantly ($p < 0.05$) in this study.

Discussion

Computer simulations are important tools in respiratory therapy education. The goal of using simulations is to increase students' critical thinking skills by emphasizing clinical aspects of a patient case such as history taking, physical examination, radiography interpretation, laboratory evaluation, and patient management. To the best of our knowledge, this is the second study evaluating the effectiveness of computer-based patient simulations as a training and assessment tool for respiratory therapy students. The results of this study are consistent with previous research^{18, 22-24} as our findings indicated that computer simula-

Table 1

Mean group scores and standard deviations by the computerized patient simulations

	HF	ARDS	Myastenia Gravis	CF	Near Drowning
Pre	61.22±20.4	51.47±18.6	58.07±19.8	63.84±12.6	59.53±11.3
Post	91.81±7.1*	88.56±7.7*	90.28±7.9*	93.32±7.5*	93.35±6.2*

* Significant difference between pre and post mean group scores ($p < 0.05$).

tions increase students' learning of patient management and improve their decision-making skills.

This study provides a framework about how to implement and evaluate computer simulations that are used as a teaching strategy in a pulmonary disease course. The benefits of using computerized patient simulations in respiratory therapy education are numerous. First, student learning on patient management can be measured immediately through computer simulations and students are given constructive feedback at each step of case management. Thus, the necessary skills of students can be developed before the actual patient encounter. Second, students can become more skillful respiratory therapists by improving their competence and confidence in patient management. Third, according to Gould et al,²⁵ computer simulations are powerful tools for students preparing for licensing or board examinations. Therefore, respiratory therapy students may perform better on the Clinical Simulations given by the National Board for Respiratory Care that utilizes performance-based testing in the form of computerized patient simulations. Fourth, evaluating students' information gathering and decision making skills through computerized patient simulators, may be an efficient way to allow early identification of students who are likely to perform poorly and to improve their chances of success in the treatment of patients with respiratory diseases. Student's acceptance of computer simulations and its sustainability were influenced by the instructor's integration of computer simulations into their classroom teaching.²⁶ Thus, respiratory therapy educators may consider incorporating computer simulations into the respiratory therapy curriculum in order to achieve learning objectives on patient management skills of respiratory therapy students.

While use of computer simulations is considered a powerful and efficient tool for teaching students about the real world of health care, still many questions need to be answered in this area of research. For example, this study investigates the effect of computer simulations on short-term learning because computer-based learning was combined with traditional teaching of pulmonary diseases in one academic semester with the hope of improving student learning of patient management. Therefore, the effect of computer simulations on long-term learning should form the basis of future studies.

Although there was general acceptance of the use of computer simulations as part of the pulmonary disease class and most students expressed satisfaction with simulations, no qualitative analyses of their opinions were undertaken in this study. Therefore, students' perception and satisfaction on use of computerized-patient simulations in the undergraduate RT education need to be studied in the future.

Because the results of this study are based on the data obtained from a single institution, conducting a multicenter study over several academic years will further validate computer simulations as a training tool in respiratory therapy education and provide evidence about general applicability of this study.

Conclusions

The use of computer simulations improves and reinforces RT students' learning patient management and effectively stimulates their decision making skills. Therefore, computerized patient simulations should be implemented more universally to benefit RT and other health

care educational programs and be used as an objective and effective measure of student learning in patient management.

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Impact of the TEACH Act and Other Copyright Laws on Distance Education

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Introduction

A number of Respiratory Therapy (RT) programs currently engage in providing distance education as an option for their students. The University of North Carolina at Charlotte (UNCC) and Georgia State University (GSU) both allow students to bridge over from an associate's degree (AS) to a bachelor's degree (BS) utilizing this format. While not allowing for the face-to-face instruction necessary for clinical education, the virtual classroom of today may be considered an effective method for teaching some of the non-clinical coursework found in the RT curriculum. Considering the prominence of distance education across all curriculums, one might expect a definitive network of both state and federal laws to be in place to govern the digital distribution of content that was once limited to use in the digital classroom. The reality of the situation involves a web of federal laws, both old and new, that leave much open to interpretation. It is considered the responsibility of instructor and institution alike to ensure that any materials digitally distributed during the course of teaching are in full compliance with current federal regulations.

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Impact of the TEACH Act and Other Copyright Laws on Distance Education

Brief History of the TEACH Act

In October 2002 the United States Congress passed the Technology, Education, and Copyright Harmonization (TEACH) Act.¹ On November 2nd of the same year, President George W. Bush signed the TEACH Act into law.² The TEACH Act was written largely in an effort to fill the gaps in copyright law left by both the Copyright Act of 1976 and the Digital Millennium Copyright Act (DMCA) of 1998.^{3,4} Prior to the passage of the TEACH Act, there existed very little law that an institute of higher education could rely upon to explain the “ins and outs” of potential copyright infringement as it applied to the concept of distance education. At least one scholar found that the new law demanded “a full reconsideration of the ability to use existing copyright-protected materials in distance education.”⁵

Enrollment in online post-secondary education programs is currently at an all-time high. The National Center for Education Statistics found that during the 2000-2001 academic school year, 90% of public 2-year institutions and 89% of public 4-year institutions offered distance education courses.⁶ The popularity of the distance format led the University System of Georgia to create the Department of Independent and Distance Learning, a program under which students may complete the first 2 years of their Bachelor’s Degree via online education. The current offerings of the program include more than 160 academic credit courses.

Much of case law involving copyright infringement deals not with distance education and digital distribution of materials, but with publishers of written work and the legality of photocopying the written work for public distribution. In *Princeton University Press v. Michigan Document Services* the court found that under the doctrine of fair use, the courts were allowed to “avoid rigid application of the copyright statute when, on occasion, it would stifle the very creativity which the law is designed to foster,” but that no “blanket immunity” exists with regard to the right to copy and distribute materials in a way that may cause a “diminution in potential market value” of said materials.⁷ *Elsevier Science v. Custom Copies* saw the court render a similar verdict, as the defendant settled with the plaintiff for an undisclosed amount of money.⁸

The Concept of Fair Use as it Applies to Education

The concept of “fair use” as it applies to statutory copyright law and distance education was first seen in Section 107 of the U.S. Copyright Act of 1976.³ Section 107 specifically deals with limitations on exclusive rights to copyrighted material and states that “the fair use of a copyrighted work...for purposes such as teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright.” Prior to 1976, the concept of fair use was left almost completely up to the discretion of the court. The lack of substance found in the definition led the United States District Court for the Southern District of New York to state that the doctrine was “so flexible as virtually to defy definition.”¹³ Whether or not the use of copyrighted material is allowed under the fair use doctrine as laid out in the Copyright Act of 1976 depends upon the application of four guiding principles.¹⁰

The first factor to be considered under Section 107 involves the purpose and character of the use, including whether such use is of a commercial nature or is for non-profit educational purposes. The court will consider whether the defendant was commercial or noncommercial and whether the use was for commercial or noncommercial purposes.¹¹ Generally speaking, noncommercial use is more likely to be seen as fair use under Section 107.

The second factor to be considered involves the nature of the copyrighted work. Both works that have not yet been published and works of fiction tend to be viewed by the court as material that is ineligible for protection under the fair use clause, although this notion is by no means absolute.¹¹

The third factor to be considered involves the amount and substantiality of the portion [of work] used in relation to the copyrighted work as a whole. The fundamental principle the court seems to follow regarding this factor is the more material taken from a copyrighted work, the more likely the court is to determine that the use is unfair.¹¹ The amount of material used may have both a quantitative and a qualitative value. A quantitative measure would involve a simple determination of the percentage of words or other material used, while a qualitative value would be derived from determining whether or not the essence or “heart” of the original material was compromised.

The fourth and final factor in need of consideration under the fair use doctrine involves the effect of the use [of said copyrighted material] on the potential value of the copyrighted work. In order to prove that a plaintiff has violated this portion of the fair use policy, the burden is on the copyright holder to show a causal relationship between the copyright violation and loss of revenue and that continued infringement would cause further financial loss.

While the U.S. Copyright Act of 1976 may be seen as an outward attempt by Congress to codify the concept of fair use and make certain education exceptions to the doctrine, some scholars believe that the Act itself was outdated prior to its actual passage.^{12, 13} Apparently the distance education clause found in the Copyright Act prior to passage of the TEACH Act applied only to the use of closed circuit television, and allowed works to be transmitted for educational purposes only in conjunction with the live delivery of an instructor-led class. Since that time, modern technology has completely changed the manner in which students can receive an education. Perhaps the best example of this phenomenon is seen when the reader considers the prevalence of such online programs of study as those offered by the University of Phoenix. According to an article in *The Chronicle of Higher Education* total enrollment for the school was approximately 443,000 for the fall term of 2009.¹⁴ This number represents an increase of 22.3% over the enrollment for the same term one year prior. By February of 2010 that number had grown to approximately 455,600 students studying at a single institution that offers the majority of its courses in an online format.¹⁴ One would find it difficult to argue that distance education is not prevalent enough among today’s colleges and universities to deserve being addressed by modern copyright law.

The Digital Millennium Copyright Act of 1998

On October 12, 1998 Congress passed the Digital Millennium Copyright Act (DMCA), and President William Jefferson Clinton signed the Act into law 16 days later.⁴ The DMCA was partially an effort to comply with the requirements of treaties signed by the United

States in 1996 during the Geneva conference of the World Intellectual Property Organization. With regard to distance education, the highlights include:

- (SEC. 103 Sec. 1201) Making the circumvention of built-in anti-piracy measure in commercially available software products a criminal offense.
- (SEC. 103 Sec. 1203) Providing anti-piracy exemptions for educational institutions if the violation occurred unknowingly in the course of an attempt made in good faith to determine the legality of the material in question.
- (SEC. 202 Sec. 512) Limits the liability of non-profit educational institutions as long as the following criteria are met:
 - The online material may not have been required by students within the previous 3 years.
 - The institution may not have had more than 2 notifications of copyright infringement within the previous 3 years.
 - The institution must provide all students, faculty, and staff with materials that describe and promote compliance with existing copyright law.

Perhaps the greatest impact the DMCA had on distance education can be seen in section 403 of the Act, which states that the Register of Copyrights is to submit to Congress any recommendations promoting distance education by digital technologies, including interactive digital networks, while maintaining an appropriate balance between the rights of copyright owners and the users of copyrighted works. Essentially, through passage of the DMCA, Congress opened the door to future legislation regarding distance education. The stage was now set for consideration of bills such as that which would eventually become the TEACH Act.

Current Status of the Law under the TEACH Act

Under the TEACH Act there exists a number of requirements that must be met by institutions seeking safe harbor regarding the use of copyrighted material. In general terms, the Act updates section 110(2) of U.S. Copyright law.¹⁵ The Act itself places most of the responsibility for compliance on the institution as a whole, rather than placing the majority of the burden upon individual faculty members. This being said, certain tasks affecting protection under the TEACH Act are still left to the course instructor.

Benefits of the TEACH Act include (1) an expansion of the types of works that may be legally used in distance education, (2) the expansion of locations in which students are allowed to receive the material, (3) the continued ability of institutions to record and retain copies of materials used in transmission, and (4) the ability to digitalize analog works for transmission under certain circumstances.⁵ The requirements of the TEACH Act fall under three general headings: those seen as the responsibility of the instructor, those seen as the responsibility of the institutional administration, and those seen as the responsibility of the institutional department of informational technology.

Responsibilities of the Instructor

Under the guidance of the TEACH Act, instructors are responsible for making decisions relevant to how the material in question is to be used. This includes using only works that

are explicitly allowed under the law, such as (1) performances of nondramatic literary works and nondramatic musical works, (2) the use of other works only in “reasonable and limited portions,” and (3) the use of other works only in amounts “comparable to that which is typically displayed in the course of a live classroom session.” Instructors must be knowledgeable of the types of works that are explicitly excluded from protection under the Act, such as (1) those designed and marketed specifically for use as “part of mediated instructional activities transmitted via digital networks,” and (2) those works which the instructor or institution “had reason to believe” were not lawfully made or copied under existing copyright law. Instructors are also burdened with oversight regulations under the TEACH Act. Any display used in relation to distance education must be made by or under the supervision of an instructor. It is the responsibility of the instructor to make sure that all transmissions are an integral part of a class offered as a regular part of instructional activities, and that any and all copyrighted materials being used are directly related to the teaching content. With regard to digitalizing analog materials, the amount converted must be limited to an appropriate amount, and not already be available for purchase by the institution in a digital format. The responsibility for making these determinations also falls mostly on the shoulders of the instructor of record.

Responsibilities of the Institutional Administration

The TEACH Act requires that institutional policymakers adhere to certain requirements put forth in the act. One of these involves assuring that the institution in question is in fact an accredited non-profit institution, as the wording of the Act is such that it applies only to a non-profit educational institution. It is also the responsibility of the administration to institute a copyright policy that aims to specify what steps faculty must follow when incorporating copyrighted works into the online instruction programs and to provide specific notice to students that the materials used in connection with the given coursework may be subject to copyright law. In addition to adopting an official policy, the administration must also provide information regarding copyright compliance to all students, faculty, and staff.

Responsibilities of the Institutional Department of Informational Technology

Under the TEACH Act, technology officials must make certain that the materials in question are made available only to students enrolled in the course to the extent that is technologically feasible. Most course management software, such as Blackboard or ULearn, is capable of providing such password protection. Technology officials also bear the responsibility of placing controls on storage and dissemination of materials used in distance education. This includes limiting the time during which the material may be viewed to one class session or the amount of time that is reasonably necessary to facilitate the transmissions for which it was made, and disabling the students’ ability to copy or download any protected information.

Issues and Recommendations

While seen as a great improvement over the vague doctrine found in both the Copyright Act of 1976 and the DMCA, the current status of the TEACH Act still leaves much to be

desired. Much of the terminology found in the TEACH Act is ambiguous at best, and the courts will still be charged with the task of providing a working definition of the law. The verbiage of the TEACH Act allows the use of a reasonable and limited portion of copyrighted material. What the Act fails to do is give a concise definition of what is considered a reasonable portion of work. The courts may interpret this term in a variety of ways, and will more than likely do so until a more definitive meaning is offered. An effort by Congress to quantify the term would make it much less subjective and relieve the court of the burden of rendering a definition on a case-by-case basis. Another issue at stake is the meaning of "one class session" in relation to distance education. By definition, distance education offers students the opportunity to fit study into their life schedule without the necessity of being in close physical proximity to a learning institution. Also of benefit is the opportunity for the student to engage in study at a time that is conducive to his or her schedule. In face-to-face learning, the definition of "one class session" is obviously clear; however, just exactly how is the term defined for the online student? Does one session equal one day? If so, the convenience of fitting study time into a weekly work schedule is drastically reduced. Many students rely on the flexibility of online classes to participate in post-secondary education. An example of this can be seen when considering the men and women of the United States Military who take online classes while deployed overseas. A more extended definition of "one (online) class session" would be more beneficial to such a population of students; however, no formal definition exists to date.

Many of the technical requirements of the TEACH Act involve an attempt to "reasonably prevent" the downloading or copying of protected materials. The definition of reasonable prevention is one of rapid evolution, as advances in computer technology occur with great frequency. Any attempt by Congress to develop a formal description of the term may result in an outdated definition before the act could be amended. Although the wording may leave something to be desired, perhaps this term is best defined by the court in an effort to keep pace with technology.

Shared responsibility for complying with modern copyright law as seen in the TEACH Act may be seen as an improvement over previous law. Dividing accountability between the faculty, the administration, and department of information technology removes the sole burden of compliance from any one being. Shared accountability can be akin to shared liability, which, when properly enforced may lead to a system of checks and balances that ensures compliance among all parties involved.

Perhaps the answer to simplifying the concept of copyright law and distance education lies in the marketing of the materials in question. If educational materials were packaged differently for sale to be used in face-to-face education than for distance education, copyright holders could arrange price points that would reduce their fear of lost revenue. The negative impact of such packaging, however, would be clearly felt by institutions such as Kaplan University, who engage strictly in online education. An interesting point to note is that for-profit institutions such as Kaplan University, The University of Phoenix, and many other online schools are not eligible for shelter under modern copyright laws such as those detailed in the TEACH Act.

The University System of Georgia produced an eight-tiered intellectual property protocol in 2006 in an effort to aid faculty with copyright compliance in accordance with the laws

of managing intellectual property (IP) for distance education.¹⁶ The protocol acts as a filter that determines which pieces of intellectual property require written permission for online use and which pieces fall under the protection of either the TEACH Act or the fair use guidelines of the Copyright Act of 1976. The first steps involve giving preference to original content created by members of the University System, determining if a piece of IP lies in the public domain and therefore may be used without fear of litigation, and attempting to form a Collective Work agreement that allows use of the product. If IP is available on the internet via a stable website, the protocol recommends posting the link online rather than downloading or streaming the materials. The next step involves searching the university's online library system for a full-text version of the work. If none of the aforementioned steps allow use of the IP, the next remedy is to decide if the material in question qualifies for use under the terms of the TEACH Act. If it does not, then an attempt is made to find a fair use qualification under other copyright laws. Only as a last resort must the university attempt to secure license for use through the copyright holder.

Just as the concept of distance education in the United States has evolved since the 1970s, so have the laws that govern use of copyrighted material. The evolution has been anything but timely, as the early laws governing distance education were grossly unable to keep up with modern technology. Writing for the majority in *Feist v. Rural Telephone Service*, Justice O'Connor stated that the "primary objective of copyright is not to reward the labor of authors, but to promote the progress of science and useful arts."¹⁷ Passage of the TEACH Act in 2002 was a noble attempt to bring the concept of copyright and distance education into the 21st century; however, the rapid pace of technological advancement and vague wording will continue to burden the courts with defining such concepts as "reasonable and limited portion" and "one class session" until further clarity is provided by Congress. Until that time, it is largely unclear what hurdles institutions such as UCLA will face in their attempt to offer distance education to students who are either unwilling or unable to attend face-to-face instruction.

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An Experiential Learning Module: Changing Students' Attitudes Towards Patient Involvement in Decision-Making

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Abstract

Background: Creating a strong patient-provider partnership is vital for effective management of asthma. To accomplish this goal, respiratory care (RC) students need to learn how to identify patients' diverse asthma beliefs and treatment strategies. This study tested whether an experiential learning module could improve RC students' beliefs about using a partnership approach and identify complementary therapies used by patients with asthma. **Methods:** Respiratory care students interviewed 2 people with asthma to determine their beliefs about asthma and its treatment using a semi-structured interview form. Measurements pre- and post-module were made with the Leeds Attitude to Concordance scale (LATCon II) which measures practitioners' views about involving patients as equal partners in medical decision-making. The scale responses are measured on a 4-point Likert scale, yielding a maximum score of 60. **Results:** A total of 15 of the 21 RC students completed both pre and post module versions of the LATCon II scale. Scores ranged from 19-51. The pre-module score ($M = 40.73$, $SD = 1.96$) and post-module score ($M = 44.67$, $SD = 1.28$) demonstrated a change in partnership attitudes; the Sign Test was statistically significant at $\alpha = 0.05$ ($Z = -5.295$, $p < 0.001$). Students identified several complementary asthma therapies. In addition to routine asthma medications, interviewees ($n = 32$) used (frequency in parentheses) vitamins (27%), herbal remedies (21.6%), no complementary approaches (21.6%), exercise or yoga and eat healthy (21.6%), acupuncture (5.4%), and 2.7% tried a complementary therapy but stopped because it did not work. **Conclusions:** A variety of complementary approaches are practiced in a diverse urban community. Future health professionals need to understand the diverse beliefs about asthma and how it should be treated. Use of an experiential learning module is an effective way to help RC students discover and appreciate these differences and value a shared decision-making role.

Key terms: Asthma beliefs, concordance, partnership, education, respiratory care students

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An Experiential Learning Module: Changing Students' Attitudes Towards Patient Involvement in Decision-Making

Introduction

For the past 25 years, asthma rates have increased amongst adults and children in industrialized countries.¹ During the same time span, more people have received formal asthma education² resulting in a decrease in asthma mortality. The National Heart Lung and Blood Institute (NHLBI) created evidence-based guidelines for health care providers originally in 1991³ and made significant updates in 1997⁴ and 2007.⁵ Locally in the Brooklyn community, hospitalization rates decreased by 8% and mortality rates by 11%, but emergency department (ED) visits remained stable.⁶ The racial and ethnic groups requiring the most asthma hospitalizations and ED visits, and with the highest mortality come from non-Hispanic Black and Hispanic communities.⁶

Taking long-term control medications regularly significantly decreases asthma symptoms. However, one study that evaluated asthma care in the United States reports of individuals using long-term controller medication, 42% stopped taking their controller medication for 1 week or longer.⁷ This may result from the way asthma plans are developed and communicated. For example, compliance and adherence are the degree to which patients follow advice from the physician and health educator.⁸ Although decades of research suggests that integrating patient perspectives in therapeutic decision-making can help improve compliance,⁹ patients' concerns are not necessarily considered in the original plan.

The Royal Pharmaceutical Society of Great Britain introduced the concordance model in 1997.¹⁰ Concordance is described as a partnership or alliance between educator and patient¹¹ and "shared decision-making and consensual agreement between doctors and patients" based on a partnership of equals.^{11(p. 81)} Adherence to therapy improves when the asthma management plan is adapted to the ethnic and social characteristics of specific populations.¹²

Recent literature suggests that therapeutic outcome is directly related to the quality of alliance or partnership between therapist and patient.¹³ Several studies have looked at the degree of partnership between healthcare providers, such as nurses and physicians and patients, and identified a need to create training programs for healthcare professionals that will help develop partnership skills.¹⁴ Accordingly, training modules are being developed and tested for nursing,^{15,16} medical, and pharmacy students.^{17, 18} Respiratory care (RC) students also must learn how to identify and work with different beliefs and treatment strategies in order to develop effective partnerships. Therefore, this study tested whether an experiential learning module could influence RC students' beliefs about using a partnership approach to care. Additionally, the study sought to identify complementary medical practices used in a locally diverse, urban community.

Methods

Twenty-one senior respiratory care students from a diverse urban campus participated in an experiential learning module. The students were in the first semester of their final year. Classroom sessions reviewed asthma pathophysiology and tools to measure asthma severity (e.g., patient history, spirometry, peak flows, etc.). The partnership role in the NHLBI Ex-

pert Panel Report-3 was also emphasized.⁵ Next, students were given an assignment to interview two people with asthma, using a semi-structured interview form, to elicit beliefs about asthma and its treatment. Interview questions are located in Appendix A. During their interviews, students took written notes and later summarized these notes in a paper submitted to the course instructor. Students completed institutional review board (IRB) training in advance of this assignment and an exempt status from the IRB was obtained for this study.

The students' attitudes towards including patients as partners in care was measured pre- and post-module with the Leeds Attitude to Concordance scale (LATCon II), a 20-item valid and reliable scale (Cronbach's alpha = 0.83).¹⁹ The responses were measured on a 4-point Likert scale ranging from strongly agree (3) to strongly disagree (0), which provided a maximal score of 60 for the scale. Students completed the survey through the Blackboard course management system. Data from the surveys were downloaded from the course management system and uploaded in to SPSS version 15.0 for analysis. Five items on the scale were negatively-worded. These negatively-worded items were reverse coded so that a higher score corresponded to disagreeing with negative partnership statements.

Pre- and post-module group scores were compared and descriptive statistics obtained. Due to the small sample size, changes in the mean values for each item were analyzed using the Sign Test with an $\alpha = 0.05$. Demographic information was obtained from student records and descriptive statistics were reported. The names of complementary therapies reported in the interviews were transcribed and the frequencies computed.

Results

Most respiratory care students successfully found individuals with asthma on their own to conduct interviews for this project. Initially a few students were anxious about finding study participants, but most located individuals through their own social networks given the high asthma prevalence and dense population in the region. After two weeks of searching, respiratory care faculty referred a few students who had difficulty locating an interview candidate to someone with asthma.

Fifteen of the 21 (71.4%) RC students completed both parts of the LATCon II scale. Scores ranged from 19-51. The results showed an improvement in attitude towards concordance (partnership) between the pre-module total score ($M = 40.73$, $SD = 1.96$) and the post-module total score ($M = 44.67$, $SD = 1.28$). Results from the Sign Test showed statistical significance at $\alpha = 0.05$ ($Z = -5.295$, $p < 0.001$). Table 1 shows the items ranked in order from the highest pre-module mean score to the lowest.

Prior to the module, students consistently rated items that referred to what the doctor should do much higher than phrases describing an active patient role. Four of the 5 negatively worded items received the lowest scores. These scores showed that students strongly agreed with statements where the physician takes the lead role in treatment decisions and the patients' role is lesser.

After the module, the greatest changes in scores occurred in the 4 of the 5 negatively-worded items. The reverse coding for these questions means that a lower score indicates a stronger agreement for the undesirable outcome. Students disagreed in the post-module assessment more strongly with statements (mean change score in parentheses) that the doctor

is the expert and the patient should do what the doctor says (1.87); it is not always necessary to account for patient priorities (0.86); the patient's decision is the most important in the doctor-patient consultation (-0.73); and, it is not necessary to account for the patient's views about medication (0.47). Note that students agreed more strongly after the module that the patient's decision is more important than the doctor's. Other questions where there was a relatively higher degree of agreement after the module were that both the doctor and the patient should state their views about the treatment (0.53); patient involvement in the prescribing process leads to better outcomes (0.40); and, doctors should make clear when the benefits of medication are uncertain (0.40).

A few items on the scale moved in an unexpected direction. Change scores after the module showed that the patient's decision is the most important in the doctor-patient consultation (-0.73); patients do not need to take on as much responsibility for their own treatment (-0.40); the best treatment is what the patient wants and is able to achieve (-0.21); and, prescribing should take account of the patient's expectations of treatment (-0.14).

Sixteen of 21 students identified several complementary approaches used by individuals with asthma during their semi-structured interviews. Five students did not include this information in their assigned papers. In addition to routine asthma medications, the individuals interviewed ($n = 32$) used (frequency in parentheses) vitamins (27%), herbal remedies (21.6%), no complementary approaches (21.6%), exercise or yoga & eat healthy (21.6%), acupuncture (5.4%), and 2.7% tried a complementary therapy but stopped because it did not work.

Individuals in this study were predominantly female, a slightly older cohort, and racially diverse. The class consisted of 16 females and 5 males. Frequencies for age groups were (frequency in parentheses) ≤ 25 years (12), 26-30 years (3), 31-35 years (4), and 36 years (2). The racial mix of the class was 8 Asian students, 7 Caucasian students, 5 Black students, and 1 Hispanic student.

Discussion

The experiential module showed an improved attitude towards concordance (partnership) between the pre-module score ($M = 40.73$, $SD = 1.96$) and the post-module score. In the majority of cases, students moved in the expected direction towards a greater partnership in care. It was noteworthy how the statements with "doctor" as the subject were consistently rated higher than other statements in the pre-module score. Students viewed the doctor as an authority figure rather than a partner in care. The most strongly worded item on the survey referred to the doctor as an expert and the patient needing to do as the doctor said. Students provided the highest agreement to (lower score after reverse-coding) this statement before the experiential module contrasted with strongly disagreeing with it (higher score after reverse-coding) after the module. This showed that students understood the vital role that patients have in effecting their own care.

Interestingly, students did not feel as strongly about the patient's role in a few areas after the module. They did not feel that patients should take on as much responsibility as they wish; that the patient treatment was what the patient wanted and was able to achieve, and that prescribing should take into account the patient's expectation of the treatment. Perhaps as students were learning more about asthma management and evidence-based medicine

CHANGING STUDENTS' ATTITUDES TOWARDS PATIENT INVOLVEMENT IN DECISION-MAKING

Table 1
Pre- and Post-Module Scores on LATCon II Scale

Item	Pre-Mean	Pre-SD*	Pre-Range	Post-Mean	Post-SD	Post-Range	Change
It is always important for doctors to listen to patients' personal understanding of their condition	2.67	0.82	0-3	2.87	0.35	2-3	0.2
Doctors should try to help patients to make as informed a choice as possible about benefits and risks of alternative treatments	2.6	0.83	0-3	2.67	0.49	2-3	0.07
Doctors should give patients the opportunity to talk through their thoughts about their illness	2.6	0.83	0-3	2.6	0.51	2-3	0
The best use of treatments is when it is what the patient wants and is able to achieve	2.54	0.52	0-3	2.33	0.9	0-3	-0.21
Doctors should make clear when the benefits of the medicine are uncertain	2.47	0.83	0-3	2.87	0.35	2-3	0.4
Doctors should be more sensitive to how patients react to the information they give	2.4	0.99	0-3	2.6	0.74	1-3	0.2
Doctors should encourage patients to express their concerns about medicine taking	2.4	0.83	0-3	2.4	0.74	1-3	0
Prescribing should take account of patients' expectations of treatment	2.27	0.8	0-3	2.13	0.94	1-3	-0.14
Doctors and patients should agree to a treatment plan that takes into account both of their views	2.27	1.03	0-3	2.6	0.51	2-3	0.33
The doctor and patient should find common ground on what the problem is and jointly agree on what to do	2.13	0.74	1-3	1.93	0.6	1-3	-0.2
A good treatment decision is made when both the doctor and patient agree on the treatment to use	2.13	1.06	0-3	2.47	0.92	0-3	0.34
During the consultation both the doctor and patient should state their views about possible treatments	2.07	0.88	0-3	2.6	0.51	2-3	0.53
The consultation between the doctor and the patient should be viewed as a negotiation between equals	2	0.76	1-3	2	0.66	0-3	0
During the doctor-patient consultation the patient's decision is the most important†	2	0.85	0-3	1.27	0.88	0-3	-0.73
Patient involvement in the prescribing process always leads to better outcomes	1.8	0.94	0-3	2.2	0.94	1-3	0.4
Patients should be able to take on as much responsibility as they wish for their own treatment	1.67	0.49	1-3	1.27	0.8	0-2	-0.4
It is sometimes appropriate for the doctor to make treatment decisions without the patient's input†	1.47	0.92	0-3	1.8	0.78	1-3	0.33
Taking account of patients' views about medicines is not always necessary for appropriate prescribing†	1.4	0.91	0-3	1.87	0.92	0-3	0.47
It is not always necessary for doctors to take account of patients' priorities†	1.07	0.96	1-2	1.93	0.8	1-3	0.86
The doctor is the expert and the patient's role is to do as the doctor says†	0.8	0.56	0-2	2.67	1.03	0-3	1.87

*SD = Standard deviation

†Item reverse coded

they did not balance the behavioral considerations when forming a treatment plan. Morrow, et. al., suggested, "simply providing information does not arm providers with the skills to adequately manage patients."²⁰(p. 49-50)

The LATCon II scale measures attitude across five major components; the level of participation and involvement that respondents feel patients have with the consultation (Component 1), the continued use of a paternalistic style of interaction (Component 2), the necessity to find common ground and be in agreement over decisions (Component 3), the perceived benefits of partnership in medicine taking (Component 4), and the equality and shared control with the interaction (Component 5).¹⁹ The greatest changes in student opinions were spread evenly across the different components of the scale. Thus, the attitudinal change students experienced was multidimensional.

Ultimately, behavior in clinical practice matters most in patient interactions. According to the Theory of Planned Behavior, attitude is an immediate precursor to behavioral intentions, and behavioral intentions immediately impact actual behavior.²¹ Thus, providing students with experiential activities to influence their attitudes may positively impact their ability to help patients achieve their health care goals.

Theory of Planned Behavior also links underlying beliefs with the development of an attitude. One method of helping students explore their own beliefs about partnerships in care is to have them explain their beliefs about why change scores moved in the less desired direction. Dialogue in small group or classroom discussion may help individuals find better ways to balance the science of medicine with the behavioral aspects of creating effective change. The rich themes that emerged from experiential learning have the potential to improve asthma management. This has been demonstrated with medical students who improved their formulation of asthma management plans by using problem-based learning.²⁰

During their interviews, students discovered that individuals with asthma used a variety of complementary approaches in their asthma management. Students are familiar with the concept of complementary medicine, but are often surprised when they find patients using complementary interventions that may have questionable benefit. This is especially challenging when students are not familiar with the intervention and cannot judge its helpfulness, potential harm, or negative interactions with other prescribed medicine. The types of complementary medical approaches will vary across regions depending upon the origins and beliefs of the local population. In a culturally diverse community, this becomes even more challenging. Providing an experiential learning module gives students exposure to the diverse methods of caring for asthma. The National Center for Complementary and Alternative Medicine (NCCAM) reports that Americans spent between \$36 billion and \$47 billion in complementary therapies. This experience may stimulate a greater willingness to study complementary therapies and utilize resources to evaluate their effects.²²

Limitations of this study are that it used only one cohort consisting of a small number of students. The concordance to care may differ in other groups depending on the curricula's emphasis on patient-provider interaction. Also, the reasons for the changes that occurred in this study may be impacted by numerous contact experiences that occur either in the classroom or in clinical settings. Further, data analyses that looked at paired pre- and post-module score would increase accuracy because it would eliminate the possibility that students completed only a pre- or post-module assessment. Also, similar or greater effects may result

from other activities. Only 71% of the students responded. Non-responders may have had differing views. Wording on the LATCon II scale referred to physicians and patients. This scale did not directly measure how students perceived the respiratory therapist and patient partnership roles.

Conclusions

A variety of complementary approaches are practiced in a diverse urban community. Future health professionals need to be aware of these diverse beliefs about what asthma is and how it should be treated. Culturally-focused approaches that emphasize equal patient-provider partnerships will improve asthma management; thus providing future educators with the tools and creativity to incorporate successful patient-provider partnership strategies is critical. Use of an experiential learning module is an effective way to help RC students discover and appreciate these differences and value patients' perspectives in care decisions.

Acknowledgments

The authors are grateful to the Health and Wellness Institute of Long Island University – Brooklyn Campus for providing funding support for this study.

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Appendix A: Semi-structured Interview

I want to understand how you think about your asthma. This interview will focus on ways that you think about asthma and ways that you have been taught to control asthma or learned to control asthma.

Question 1. Everyone has a different explanation for why they have asthma; tell me, why do you have asthma? What was going on in your life when you first got asthma? How long will you have asthma?

Probes: Family, history, living conditions, test of faith...

Question 2a. Many Patients have learned how to manage their asthma apart from taking prescribed asthma medicines. Others learn about asthma control through trial and error. Friends, family or members of your community may have suggested certain approaches. For example, families often use home remedies for controlling asthma. So tell me, what do you do for your asthma? Do you recall any home remedies used in your family? What were you taught to do to prevent an asthma attack? To cure asthma?

Probes: Protection against germs or the elements, chest rubs, things to drink or inhale, managing your bowels...

Question 2b. In some families, asthma is viewed as the imbalance in the body. What did your family believe?

Probes: beliefs about temperature, fresh air, foods or liquids. Tell me what caused this imbalance. Tell me how balance was restored.

Question 2c. Many families also believe that certain types of foods or liquids are important for asthma. Tell me what your family or community thought about this. Tell me what you believe now.

Probes: water, black coffee, teas, onion tonics, pot licker...

Question 2d. Many people use self-healing, energy healing, diet, plants and herbs, roots and leaves and vitamins for asthma. Tell me what you use.

Probes: herbs, vitamins, acupuncture, yoga, relaxation

The RPSGT vs. SDS: Addressing the Formal Credentials of Sleep Medicine

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Abstract

In December of 2008, the National Board for Respiratory Care (NBRC) introduced a new formal credential to the field of sleep medicine, the Sleep Specialty Disorders (SDS) credential. Until the creation of the SDS credential, the Board of Registered Polysomnographic Technologists (BRPT) had maintained the only formal registered credential for sleep specialists, the Registered Polysomnographic Technologist (RPSGT). With the addition of the SDS credential, respiratory therapists interested in sleep medicine must examine differences between the two formal credentials. Despite the differences between the SDS and RPSGT, polysomnographic technologists' standards for patient care and professionalism will increase because of the two credentials. With the growing demand for polysomnography data collection, the SDS and RPSGT credentials will prove to be valuable assets to the field of sleep medicine by increasing the number of competent and skilled clinicians.

Key Words: polysomnography, Sleep Disorders Specialty examination, Registered Polysomnographic Technologist, sleep medicine, respiratory therapist

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The RPSGT vs. SDS: Addressing the Formal Credentials of Sleep Medicine

Introduction

The need for qualified healthcare professionals to participate in the diagnosis and treatment of sleep disorders is a growing need in order to meet the demand for sleep studies, more important than ever before. Tachibana et al. reported that over 1.1 million polysomnograms are conducted every year in America every year.¹ To meet this demand, the profession of sleep medicine continues to grow and train credentialed practitioners in performing polysomnography data collection. In the past, the Board of Registered Polysomnographic Technologists (BRPT) awarded/maintained the only formal credential accepted in sleep medicine, the Registered Polysomnographic Technologist (RPSGT). In December of 2008, the National Board for Respiratory Care (NBRC) developed an additional formal credential for sleep medicine, the Sleep Disorders Specialist (SDS). The SDS credential provides, providing the field of sleep medicine another avenue for credentialing polysomnographic technologists.² Although the SDS credential will likely draw more attention to the practice of sleep medicine, it has raised questions about the differences between itself and the previously established RPSGT credential.

The scope of practice for polysomnography is viewed differently by various professional organizations in the field of sleep medicine. The American Association for Respiratory Care (AARC) promotes/believes the performance of sleep disorder studies is within the respiratory therapy scope of practice.³ In contrast, the American Association of Sleep Technologist (AAST) believes the practice of polysomnography is a separate entity possessing unique knowledge and skills.⁴ Both the AARC and the AAST are national organizations representing the interests of the profession and its members.

Although the two credentials are described as being noncompetitive, practitioners interested in sleep medicine must educate themselves to determine which credential best suits their needs. The purpose of this article is to provide information on the training and credentialing options for persons interested in sleep medicine.

RPSGT

The RPSGT examination was created in 1979 to establish credentialing standards for sleep technologists. Today there are over 16,000 RPSGT credentialed clinicians in sleep medicine.⁵ To hold the RPSGT credential, clinicians are required to have the necessary clinical experience, basic life support (BLS) certification or its equivalent, and meet professional and ethical behavior standards set by the BRPT Standards of Conduct.⁵

In March of 2010, the BRPT created the Certified Polysomnographic Technologist (CPSGT) credential.⁵ Its purpose was to target clinicians new to the field of sleep medicine. The CPSGT credential is valid for three years, carries an annual continuing education requirement, and establishes a commitment of professionalism for those new to sleep medicine.⁵ The BRPT also maintains that the CPSGT is an excellent first step to acquiring the RPSGT credential. However, the BRPT does not require practitioners to pass the CPSGT prior to taking the RPSGT examination. The RPSGT credential and the CPSGT credential are competency-based exams designed with the goal of developing well-trained technologists for employment in the field of sleep medicine.

In order to meet the eligibility requirements to take the RPSGT examination, 1 of 4 pathways must be completed. Pathway 1 requires candidates to complete a minimum of 18 months clinical experience consisting of at least 21 hours per week per calendar year of job duties that include polysomnography scoring or direct patient recording or both.⁶ In addition, pathway 1 requires candidates to complete the American Academy of Sleep Medicine's (AASM)'s Accredited Sleep Technologist Education Program (A-Step) A-STEP self-study modules or complete the BRPT-designated alternate educational program.⁶ The A-STEP program consists of 18 online modules to be completed while working at a sleep center. Pathway 2 requires candidates to complete a minimum of 6 months clinical experience where at least 21 hours per week per calendar year of job duties include polysomnography scoring or direct patient recording or both.⁶ Duties must be completed within 3 years. In addition, pathway 2 candidates must possess a professional credential accepted by the BRPT (Table 1). Pathway 3 requires candidates to complete a polysomnography program accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) or CoARC.⁶ The final pathway, pathway 4, requires candidates to complete a minimum of 9 months of clinical experience where at least 21 hours per week per calendar year of job duties include polysomnography scoring or direct patient recording or both.⁶ Candidates must complete the AASM A-STEP self-study modules or a BRPT-designated alternate educational program. In addition, the candidate must complete an AASM A-Step Introductory Course offered by an approved provider prior to attempting the A-Step modules. The introductory course consists of 80 hours of focused instruction on normal sleep, sleep disorders and sleep technology. Following completion of the 80 hours, the candidate is required to pass an online introductory course exam to be eligible to complete the AASM A-Step modules. While the 4 pathways are slightly different, each help prepare aspiring polysomnographic technologists to be successful on the RPSGT examination.⁶

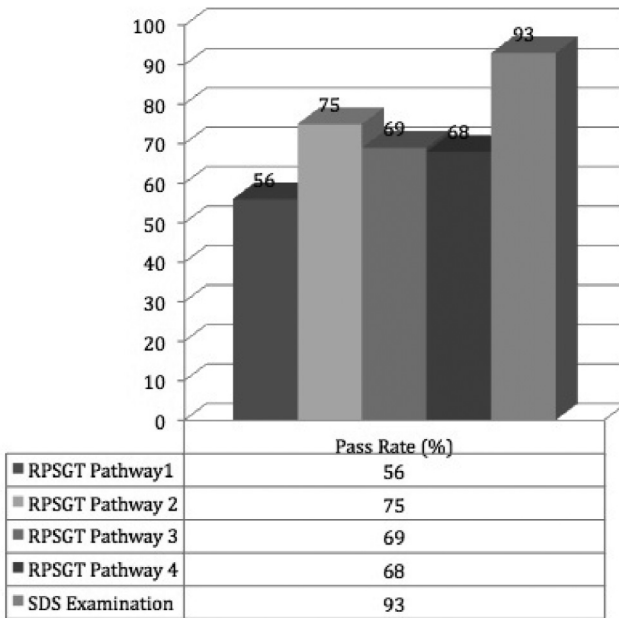
Table 1

BRPT Approved Credential List for Pathway 2

-
- Nursing - (RN, LPN)
 - Respiratory Care - (RRT, CRT)
 - Electroneurodiagnostic - (R. EEG T., R. EP T., CNIM)
 - Physician's Assistant - (PA)
 - Doctor of Philosophy – (PhD)
 - Doctor of Medicine- (MD)
 - Doctor of Osteopathy - (DO)
 - Doctor of Chiropractic - (DC)
 - Paramedic - (EMT-P)
 - Doctor of Dental Surgery - (DDS)
 - Radiology - (RT, RT (R), RT (CT), RT (BD), RT (N))
 - Certified Hyperbaric Technologist - (CHT)
 - Certified Nuclear Medicine Technologist - (CNMT)
 - Certified Cardiographic Technician - (CCT)
 - Doctor of Public Health – (DrPH)
 - Registered Diagnostic Cardiac Sonographer – (RDCS)
-

Figure 1

Pass Rates For RPSGT Pathways and SDS Examination



Since March of 2007, 1,349 respiratory therapists have successfully completed the RPSGT examination.⁷ In 2010, 159 out of 215 (74%) respiratory therapists who attempted the examination achieved a passing score. In total, 73% of the respiratory therapists who attempted the RPSGT exam between March 2007 and December 2010 passed the examination.⁷ Of the 4 different pathway models (Figure 1), the data collected from March 2010 to December 2010 revealed that pathway 2 had the highest pass rate, pathway 1 reported the lowest pass rate, and pathway 3 and pathway 4 both showed similar pass rates.

The RPSGT examination consists of 200 multiple-choice questions with a four-hour time limit.⁶ The examination is composed of 5 domains, with each domain making up a differ-

Table 2

Major content areas listed on the RPSGT and SDS Examination Matrices

RPSGT		SDS	
Pre-Study Procedures	15%	Pre-Testing	12%
Study Performance	25%	Sleep Disorders Testing	30%
Therapeutic Interventions	25%	Study Analysis	31%
Post-Study Procedures	10%	Administrative Functions	9%
Scoring and Data Analysis	25%	Treatment Plan	18%

ent percentage of testing questions (Table 2).⁶ The examination fee for the RPSGT exam is \$450.00 and candidates are allowed 1 year from the date of payment to take the examination.⁶

SDS

The SDS examination was created in 2008 and focuses on competencies that are unique to the diagnosis and treatment of persons with sleep disorders.⁸ Although the examination does not include questions about general respiratory care, it does require a respiratory therapy credential (CRT or RRT) for examination eligibility. The SDS specialty examination assesses a respiratory therapist's ability to conduct sleep-focused testing and correctly intervene with patients suffering from sleep-disordered breathing.⁸

The SDS examination was developed in accordance with standards put forth by the National Commission for Certifying Agencies.⁹ Examination items concerning scoring of sleep results were developed by following the AASM Manual for Sleep Scoring.⁸ To properly determine the examination content, the NBRC conducted a job analysis study to ensure that questions would relate to tasks performed by practitioners working in sleep medicine. The SDS examination was created through a collaborative effort by the American Association for Respiratory Care (AARC), the American College of Chest Physicians (ACCP), the American Society of Anesthesiologists (ASA), and the American Thoracic Society (ATS).⁸ The common goal of the respective organizations was to improve the standards of care for patients who suffer from sleep disorders.

Admission criteria for the SDS examination require candidates to complete 1 of 3 different pathways. Pathway 1 requires an examination candidate to be a Certified Respiratory Therapist (CRT) or a Registered Respiratory Therapist (RRT) who has completed a CoARC or CAAHEP accredited respiratory therapy program that includes a sleep add-on track.⁸ Pathway 2 mandates that following earning the CRT certification, the candidate acquire 6 months of full time clinical experience in a sleep diagnostics and treatment setting under medical supervision by a Doctor of Medicine (MD), Doctor of Osteopathy (DO), or Doctor of Philosophy (PhD).⁸ To meet the full time experience criterion, the clinician must perform a minimum of 21 hours per week per calendar year in a sleep diagnostic and treatment setting under medical supervision by an MD, DO, or PhD. Pathway 3 mandates that following earning the RRT credential, certification as an RRT the candidate acquire three months of full time clinical experience in a sleep diagnostics and treatment setting under medical supervision by an MD, DO, or PhD.⁸ Once again, clinical experience is defined as 21 hours per week per calendar year.⁸

In 2010, 93.9% of credentialed respiratory care practitioners that attempted the SDS examination passed (Figure 1). Since the introduction start of the SDS examination in 2008, the pass rate for respiratory therapists is 96%.¹⁰ A total of 159 respiratory care practitioners now hold the CRT-SDS or RRT-SDS credential.¹⁰

Candidates taking the SDS examination have 4 hours to complete a 180-question (160 scored items and 20 pretest items) test.¹¹ The examination fee for the SDS exam is \$300.00 for first-time applicants and \$250.00 for re-applicants. The SDS examination's content area is separated into 5 different sections: Pre-Testing, Sleep Disorders Testing, Study Analysis, Administrative Functions, and Treatment Plan (Table 2).¹¹

Choosing an Examination

From a pulmonary perspective, the American College of Chest Physicians supports both examinations and recognizes that both examinations have met the credentialing requirements of the National Commission for Certifying Agencies (NCCA).¹² Therefore, respiratory therapists trying to decide which examination is best suited to their needs, may find useful information when reviewing the content outlines for each examination. A summary of each content outline can be found in Table 2. One difference relates to the emphasis the SDS examination places on performing the sleep study and analyzing the data (e.g. scoring). The SDS examination has 61% of the exam in these two areas versus the RPSGT examination with 50%.^{6,11} Also, treatment questions make up 25% of the RPSGT examination versus 18% coverage on the SDS examination.^{6,11} This difference probably relates to prior exposure of positive pressure treatment modalities by respiratory therapists during their RT clinical experience and while employed in a hospital setting. One similarity between the RPSGT and the SDS is the coverage of post-sleep study functions, 10% versus 9% respectively.^{6,11} In addition to examination content differences, the RPSGT may be thought of as a separate, stand-alone sleep credential, whereas the SDS is a specialty credential of respiratory care.

In the field of respiratory care, the RRT credential is the “gold standard” for clinical practitioners. With the addition of the SDS credential, questions have developed as to which credential, RPSGT or SDS, will be valued more by employers. Concerns over job placement and job function must be addressed when considering the two examinations. According to AASM Standards for Accreditation, independent sleep disorders centers must employ at least one sleep technologist holding the RPSGT credential.⁴ The RPSGT credential may be more appealing when one considers its necessity for those independent sleep centers. The Centers for Medicare & Medicaid Services (CMS) recognizes the practitioner that has obtained the RPSGT credential as qualified to perform sleep studies¹³. This is important given the fact that CMS reimbursement for sleep studies, as well as other diagnostic testing, is contingent upon qualified technicians supervising the sleep study.

For the respiratory therapist, the SDS credential may be more appealing because it encompasses their current field of practice. However, unlike the RPSGT credential, the SDS is not listed by CMS as a qualified credential for the supervising technician of sleep studies.¹³ Even though the SDS has not been established by CMS as a qualified credential, CMS does list the following NBRC credentials on the Trailblazer Health Enterprises, LLC website as qualified to supervise a sleep study: Certified Pulmonary Function Technologist (CPFT), Registered Pulmonary Function Technologist (RPFT), CRT and RRT credential. If CMS recognizes the aforementioned NBRC credentials as meeting the requirement for a “qualified technician” in the supervision of sleep studies, what advantage does the respiratory therapist gain in obtaining the SDS credential? This question will probably be answered when the respiratory therapist applies for a position at a sleep center without a sleep credential. Sleep Centers, as employers, will seek to hire the most competent and qualified sleep technologists. Employers may not view a sleep technologist without a sleep credential as a competitive candidate for a polysomnographic position.

Continuing education credits (CECs) are another factor to consider when choosing between the two examinations. CECs are cornerstones to best practice and enhancement of

professional development. The RPSGT credential recently made changes to its CEC program. Persons holding the RPSGT credential are now required to have 50 CECs in a 5-year time period.¹⁴ Technologists may choose to re-take the RPSGT exam for recertification purposes but must still pay all examination fees in addition to a \$100.00 recertification fee.¹⁴ Fees for RPSGT recertification include several options. Tracking CECs through www.brpt.org allows for recertification at no cost. Online recertification completed before expiration of the credential includes a fee of \$100.00. The fee to renew prior to expiration by mail is \$150.00. Technologists who fail to complete the recertification requirements prior to their deadline may apply for a 90-day extension for a fee of \$125.00 plus a \$100.00 recertification fee.¹⁴

The SDS credential follows guidelines outlined in the NBRCs continuing competency program (CCP). The program has 3 renewal options available that must be completed within a 5 year time period. Option 1 requires for credentialed practitioners to provide proof of completion of a minimum of 30 hours of continuing education acceptable to the NBRC. The CCP does not require for all 30 hours to be sleep related for persons holding the SDS credential. For example, practitioners holding the RRT and SDS credentials are required to complete 15 hours in general respiratory care subjects and 15 hours in sleep disorders testing. Option 2 of the CCP allows for practitioners to retake and pass the respective examination anytime in a 5-year time period. The final option, option 3, allows for CCP requirements to be fulfilled by passing a NBRC credentialing exam that was not previously completed.¹⁵

Program fees for the CCP include 3 options. Individuals who maintained an active member status with the NBRC in each year of the 5-year term do not have a fee for renewal. Individuals who do not have an active member status are charged with a \$25.00 per inactive renewal period during the 5 years of the credentialed term. The third optioned for individuals who fail to complete options for renewal. The fee is \$150.00 plus current examination fee.¹⁵

Although the addition of the SDS credential has provided positive growth for the field of sleep medicine, advocates of sleep medicine must be leery of problems caused by a wide variety of associations offering professional credentials. Beginning November 11, 2011 the American Board of Sleep Medicine (ABSM) will begin offering another professional credential for sleep medicine, the Registered Sleep Technologists (RST) credential.¹⁶ Already, BRPT and NBRC sleep advocates have begun questioning the validity of the RST. Questions concerning the RST examination's eligibility pathways and recertification process appear to be cause for concern. The ABSM has yet to release details for the recertification process for the RST credential and some pathways require experience only in an AASM accredited sleep center to be eligible for the examination.¹⁷ With the addition of another sleep credential, sleep technologists and employers once again will have to decide which credential best suits the field of sleep medicine.

Other health care professions experience similar concerns of multiple professional credentialing associations. Clinical laboratory science (CLS) is an example of a health care profession with multiple credentialing associations. Clinical laboratory personnel may receive certification from the Board of Registry of the American Society for Clinical Pathology (ASCP), the American Medical Technologists (AMT), or the Board of Registry of the Amer-

ican Association of Bioanalysts (AAB). Although the AMT and AAB are welcomed certifications by employers, it does appear that the ASCP is strongly preferred by employers. CLS personnel have stated concerns that multiple associations providing certification could in fact be hurting the CLS profession.¹⁸

Summary

The emergence of the SDS has caused some confusion for clinicians as to which credential is ideal for their situation. Despite the confusion, sleep medicine will continue to benefit greatly from the level of competency clinicians achieve as a result of the RPSGT and SDS requirements. Although the 2 credentials claim to be noncompetitive, a healthy competition between the credentials is welcomed, as they both raise the level of clinical and administrative skills needed for sleep technologists to be recognized as essential members of the health-care team.

The limited availability of literature concerning the integration of the SDS credential into sleep medicine makes it difficult to determine its level of acceptance by the sleep medicine professional community, however, the SDS credential's clinical pathway and solid examination content will help to establish its permanence in the field of sleep medicine. Currently, the RPSGT examination's long standing history and establishment in sleep medicine, as well as its high standards for clinical competence, continue to make it a valuable credential in sleep medicine. Though clinicians may have a difficult time deciding between the two, it is certain that the level of competency and the commitment to professionalism signified by both the RPSGT and SDS credentials will continue to benefit both patients and clinicians in sleep medicine.

Acknowledgment

The authors would like to thank Christopher Russian, MEd, RRT-NPS, RPSGT, Associate Professor, Department of Respiratory Care, Texas State University for his assistance in the editing of the manuscript.

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Survey of Knowledge and Confidence of Respiratory Therapy Students Regarding Tuberculosis

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Abstract

Background: With respiratory therapists on the front-line in treating respiratory conditions, it is imperative that their knowledge regarding tuberculosis (TB) be accurate and wide-ranging in order to successfully treat patients, participate in transmission reduction education, as well as protect themselves from tuberculosis infection.

Methods: Students enrolled in a bachelor degree program in Respiratory Therapy (RT) were surveyed prior to and following tuberculosis education to compare their knowledge and confidence regarding tuberculosis. The pre-TB education survey was administered to 40 first year RT students prior to any academic or clinical instruction. The post-TB education survey was administered to 35 of the same first year RT students had received one hour of TB education in lecture format and participated in approximately 64 hours of clinical education.

Results: Questions that focused on TB knowledge, the pre-TB education surveyed student's average grade was 44.5% and the post-TB education surveyed students demonstrated improvement with an average score of 72.4%. The respondents in the pre-TB education survey were generally confident that they could identify the need for airborne infection isolation precautions to prevent transmission of suspected or confirmed TB. The post-TB survey answers to the same question showed improved confidence.

Conclusions: The RT student's overall level of knowledge regarding TB increased and their responses indicated an improvement in confidence. Further research is needed to evaluate if surveying the knowledge and confidence of the RT student regarding TB can be used to make conclusions about a respiratory therapy program's effectiveness regarding TB education.

Key Words: Knowledge, confidence, tuberculosis, respiratory therapy student

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Survey of Knowledge and Confidence of Respiratory Therapy Students Regarding Tuberculosis

Introduction

Tuberculosis (TB) is a highly contagious disease which caused active TB infections in 13,293 people in the United States in 2006¹. With respiratory therapists on the front-line in treating all types of respiratory conditions, it is imperative that their knowledge regarding tuberculosis be accurate and wide-ranging in order to successfully treat patients, participate in transmission reduction education, as well as protect themselves from tuberculosis infection. One of the goals of the National Tuberculosis Curriculum Consortium (NTCC) is to ensure undergraduate and graduate health care students are sufficiently educated on controlling the spread of tuberculosis². An objective implemented by the NTCC to accomplish this goal is to standardize TB curriculum and educational competencies for the respiratory therapy student in the United States. The NTCC believes that surveying a student's knowledge and confidence is one way to evaluate a program's effectiveness regarding TB education. Currently, tools for program evaluation are deficient in published literature.

The purpose of this study was to evaluate students enrolled in a bachelor's degree respiratory therapy program prior to and following tuberculosis education and compare their knowledge and confidence regarding tuberculosis by asking the following questions:

1. What is the RT student's level of knowledge regarding TB?
2. What is the RT student's level of confidence regarding TB?
3. Can a respiratory therapy program be evaluated based on the RT student's knowledge and confidence?

Knowledge and confidence were determined by how the student answers a specific group of survey questions. This is significant because student assessment surveys could be a practical way of determining the efficacy of a respiratory therapy's tuberculosis education curriculum. This type of student self-assessment can be a practical way of determining the efficacy of a respiratory therapy's TB education curriculum.

Review of the Literature

The most relevant study was done by Jackson, et al. which used a survey to evaluate the knowledge, attitudes, and confidence regarding tuberculosis in health profession students³. Two thousand ninety-five students were surveyed with 1,480 students in seven clinically-related disciplines returning a completed survey. Of those 1,480 students, only 42 were respiratory therapy students. Selected questions (from 18 questions common to all discipline surveys) were asked in order to evaluate knowledge and confidence. The article concluded improvements could be made in these student's knowledge, attitudes, and confidence regarding TB. However, evaluation of these students' baseline knowledge of TB prior to instruction regarding TB in their program was lacking.

A 2006 review of the literature looked at the topic of nursing student competencies for tuberculosis education⁴. Two articles were reviewed. The first investigated the tuberculin skin test (TST) guidelines and educational practices of TB education in associate and baccalaureate degree nursing programs throughout the United States. It was reported that 95%

of these programs require a TST upon admission into the nursing program with 82.6% programs requiring an annual test. They also found that more than 50% of these programs spent less than 3 hours on TB materials throughout the curriculum. The second article discussed how faculty could implement a course designed to teach nursing students how to administer, read, and record a Mantoux skin test. This article suggested that integration of infectious disease epidemiology, like TB, would strengthen community health, control, and surveillance techniques in the curriculum.

Another study conducted by Stone analyzes the tuberculosis education nursing students received in a BSN curriculum⁵. Nursing program students at Indiana University were the subjects in this article. As a part of the University's didactic nursing program, students were required to take a basic TB skin test course. The class was divided up into different sections that included TB transmission, its pathogenesis and classification, along with global TB statistics. The practicum included 2 activities, demonstrating proper intra-dermal injections and reading TB skin tests. Results from the class year 1997-1998 were positive. Of the 209 students eligible to take the class, 182 (87%) successfully completed and passed the course. The author concluded this program can easily be integrated into the nursing curriculum and offers benefits such as, supporting education and service learning in the community, and incorporating academic principles of TB to practical issues.

In summary, there is a substantial lack of published literature pertaining to the respiratory therapy student's knowledge and confidence regarding tuberculosis. Articles that were found offered no baseline evaluation of TB knowledge and confidence prior to formal education. In addition, the surveys were administered only once in the educational setting. Therefore, pre and post TB education improvements in a student's knowledge and confidence could not be evaluated.

Methods

A convenience sample of students enrolled in a large southeastern university's bachelor degree respiratory therapy (RT) program was used for this survey. A total of 40 students participated in the first part of the study (pre-TB education) and 35 students participated in the second part of the study (post-TB education). Participation was completely voluntary and no incentives to participate were offered. Attendance was not taken prior to the pre or post-TB education surveys and names were not tracked to determine who had taken only one or both surveys.

The survey used in this study was designed by the NTCC and incorporated 2 publications by The Centers for Disease Control and Prevention publications, *The Core Curriculum on Tuberculosis*, and the *Self-Study Modules on Tuberculosis*^{6,7}. The survey is described by Jackson and is included in Appendix A.

Survey Administration

A protocol for survey administration was approved by the university's Institutional Review Board (IRB) prior to the study. The pre-TB education survey was administered in November 2008 to the first-year RT class prior to any academic or clinical instruction by the RT program. The post-TB education survey was administered in February 2009 after the same first-year RT class had received 1 hour of TB education in lecture format and participated in approximately 64 hours of clinical education. The amount of TB education during clin-

ical time varies from student to student and clinic site to site. Survey answer sheets were coded with a number that did not allow for students to be identified by name, but were used to score the surveys and delineate between pre-TB education surveys and post-TB education surveys. The students were made aware that their knowledge and confidence regarding TB was to be evaluated as part of both pre and post-TB education surveys but were not aware the identical survey would be given as the post-TB education evaluation. Both the pre and post-TB surveys were completed in-class during a twenty minute time frame. Data was analyzed using SPSS 16.0. Descriptive statistics included frequencies and percentages to evaluate the RT student’s responses to survey questions.

Results

Data from 40 pre-TB surveys and 35 post-TB surveys was separated into 4 sections: general information, general beliefs about TB education and its importance in their chosen career, general questions about TB, and questions specifically for RT students regarding TB knowledge, a case study, and confidence assessment regarding TB.

Table 1
General information, Pre and Post-TB Education Surveys

Question/Responses	Pre-TB survey (40 students) N (%)	Post-TB survey (35 students) N (%)
2. During your academic program to date, have you attended at least one lecture where tuberculosis (TB) was a primary focus?		
• Yes	0 (0)	35 (100)
3. Approximately how many hours of lecture/instruction on TB have you attended?		
• None	17 (42.5)	2 (5.7)
• 1–2 hours	20 (50)	28 (80)
• 3–4 hours	3 (7.5)	5 (14.3)
• 5–6 hours	0 (0)	0 (0)
• More than 6 hours	0 (0)	0 (0)
4. From which of the following teaching modalities have you received TB education? (mark all that apply)		
• None	5 (12.5)	0 (0)
• Lecture	30 (75)	35 (100)
• Case discussion at conference or case study	4 (10)	15 (42.9)
• Seminar	2 (5)	3 (8.6)
• Standardized patient	3 (7.5)	2 (5.7)
• Game show format (e.g., Millionaire or Jeopardy)	1 (2.5)	0 (0)
• Computer simulation	1 (2.5)	2 (5.7)
• Completion of a module on a computer, followed by a series of questions answered on-line (computer based learning)	2 (5)	0 (0)
• Other	3 (7.5)	1 (2.9)
5. Have you sought out and independently reviewed additional information about TB beyond requirements for a class or seminar?		
• Yes	5 (12.5)	7 (20)

Table 2

General Beliefs about TB Education and its Importance

A=strongly disagree B= disagree C= Agree D= Strongly Agree

Question number	Pre Survey (40)	Post Survey (35)
9 Only minimal need for more education on TB because it is not likely I will need it in my chosen career	A 31 77.5%	A 26 74.3%
	B 5 12.5%	B 2 5.7%
	C 1 2.5%	C 0
	D 3 7.5%	D 7 20%
10 TB education is very important to my academic program	A 7 17.5%	A 5 14.3%
	B 0	B 0
	C 4 10%	C 5 14.3%
	D 29 72.5%	D 25 71.4%
11 The current emphasis on TB in my academic program is adequate	A 5 12.5%	A 1 2.9%
	B 8 20%	B 13 37.1%
	C 18 45%	C 14 40%
	D 9 22.5%	D 7 20%
12 The career path I have chosen will not require me to know much about TB	A 32 80%	A 27 77.1%
	B 4 10%	B 5 14.3%
	C 0	C 1 2.9%
	D 4 10%	D 2 5.7%
13 In my future plans as a health professional I am confident that the level of TB knowledge I have attained is adequate to prepare me for my needs	A 11 27.5%	A 1 2.9%
	B 13 32.5%	B 19 54.3%
	C 9 22.5%	C 11 31.4%
	D 7 17.5%	D 4 11.4%

Table 1 presents general information selected from both pre and post-TB education surveys. At least 3 quarters of the program instruction was given in lecture format. Students rarely sought out additional information about TB beyond the program requirements. Survey question 2 refers only to RT program instruction regarding TB. The means by which students had received TB education prior to program instruction was not determined.

Questions 9 through 13 dealt with the student's general beliefs about TB education and its importance in their chosen career (Table 2). The pre-TB education survey revealed that 7.5% (3/40) of the students, compared to 20% (7/35) of the post-TB education surveyed students, strongly agreed that there is only minimal need for more education on TB because it is not likely that it will be needed in their chosen career. Nine out of 40 (22.5%) of pre-TB education surveyed and 7/35 (20%) of post-TB education surveyed strongly agreed that the current emphasis on TB in their academic program was adequate. Ninety percent pre-TB education surveyed and 91.4% post-TB education surveyed disagreed to some degree that the career path they had chosen will not require them to know about TB.

General questions about TB were the focused of questions 14 through 18 (Table 3). Thirty-three out of 40 (82.5%) students correctly answered the question regarding how TB

Table 3
General Questions about Tuberculosis

Question number	Pre Survey (40)	Post Survey (35)
14. Tuberculosis organisms are most commonly transmitted from person-to-person in which one of the following ways?	33/40 correct 82.5% 7/40 incorrect 7.5%	32/35 correct 91.4 % 3/35 incorrect 8.6 %
15. What is the currently recommended method for administering tuberculin?	15/40 correct 37.5% 25/40incorrect 62.5%	31/35 correct 88.5% 4/35 incorrect 11.5%
16. Which of the following is a contraindication to TB skin testing?	8/40 correct 20% 32/40 incorrect 80%	18/35 correct 51.4% 17 /35incorrect 48.6%
17. Generally, what percentage of people in the United States who have latent TB infection (LTBI) and a normal immune system, will go on to develop TB disease at some point in their lives?	26/40 correct 65% 14/40 incorrect 35%	22/35 correct 62.8% 13/35 incorrect 37.2%
18. Why is BCG NOT PART of the routine vaccination program in the United States?	31/40 correct 77.5% 9/40 incorrect 22.5%	26/35 correct 74.3% 9/35 incorrect 25.7%

is most commonly transmitted from person-to-person with 32/35 (91.4%) of the post-TB education surveyed answering correctly.

Questions 19 though 35 were specific to RT students. The pre-TB education survey established that only 3/40 students had been involved in any aspect of care of a patient with latent TB infection, active TB disease, or both while 13/35 students had in the post-TB education surveyed (Table 4). Survey questions 21 through 27 and 31 though 35 were graded collectively. They related specifically to the student’s TB knowledge (Table 5). The pre-TB education surveyed student’s average grade was 44.5% and the post-TB education surveyed students demonstrated improvement in knowledge about TB (72.4%).

A case study requiring the student to read a passage and answer questions is displayed in Table 6. Students showed minor improvement from pre to post-TB education survey collectively

Table 4
TB Patient Contact

Question number	Pre Survey (40)	Post Survey (35)
19. Have you been involved in any aspect of the care of a patient with latent tuberculosis infection (LTBI) and/oractive TB disease?	3/40 yes 7.5% 37/40 no 92.5%	13/35 yes 37.1% 22/35 no 62.9%
20. Indicate the number of tuberculosis patients you havehelped care for:	37/40 0 patients 92.5% 2/40 1-3patients 5% 1/40 4-6 patients 2.5% 0/40 > 6patients 0 %	22/35 0 patients 62.9% 11/35 1-3 patients 31.4% 1/35 4-6 patients 2.85% 1/35 > 6 patients 2.85%

Table 5
TB Knowledge

Question number	Pre Survey (40)	Post Survey (35)
21. What additional tests should be done on all specimens regardless of AFB smear results?	22/40 correct 55%	32/35 correct 91.4%
	18/40 incorrect 45%	3/35 incorrect 8.6%
22. Which of the following is NOT a risk factor for progression of TB from infection to disease?	30/40 correct 75%	26/35 correct 74.3%
	10/40 incorrect 25%	9/35 incorrect 25.7%
23. Which of the following describes best practice for directly observed therapy (DOT)?	23/40 correct 57.5%	17/40 incorrect 42.5%
	26/35 correct 74.3%	9/35 incorrect 25.7%
24. Which of the following groups should NOT be given high priority for treatment of latent TB infection (LTBI)?	24/40 correct 60%	28/35 correct 80%
	16/40 incorrect 40%	7/35 incorrect 20%
25. Peripheral neuropathy is most commonly associated with the use of which of the following?	12/40 correct 30%	15/35 correct 42.9%
	28/40 incorrect 70%	20/35 incorrect 57.1%
26. Characteristics of cases of TB likely to be infectious include ALL EXCEPT which of the following:	19/40 correct 47.5%	29/35 correct 82.9%
	21/40 incorrect 52.5%	6/35 incorrect 17.1%
27. Which of the following statements regarding BCG is true?	16/40 correct 40%	20/35 correct 57.1%
	24/40 incorrect 60%	15/35 incorrect 42.9%
31. The recommended initial drug combination for the treatment of active TB in HIV-negative individuals is:	7/40 correct 17.5%	17/35 correct 48.6%
	33/40 incorrect 82.5%	18/35 incorrect 51.4%
32. Respiratory precautions (airborne precautions) should be considered for all patients admitted to the hospital with:	16/40 correct 40%	28/35 correct 80%
	24/40 incorrect 0%	7/35 incorrect 20%
33. The correct technique for sputum induction in patients with suspected TB is	13/40 correct 32.5%	21/35 correct 60%
	27/40 incorrect 67.5%	14/35 incorrect 40%
34. What environmental controls should be in place in locations where induced sputum is collected?	29/40 correct 72.5%	28/35 correct 80%
	11/40 incorrect 27.5%	7/35 incorrect 20%
35. What personal protective equipment (PPE) should you use when collecting induced sputum samples?	21/40 correct 52.5%	33/35 correct 94.3%
	19/40 incorrect 47.5%	2/35 incorrect 5.7%

(44.3% to 59.9%, respectively). In questions 28 and 29, there was a decrease in scores. Fifty percent of the pre-TB education survey and 37.1% of the post-TB education surveyed could correctly identify which tests the physician should recommended first. The only improvement from pre to post-TB education survey was demonstrated in question 30 which asked which factor would increase the patient's risk of developing TB disease (17.5% correct to 94.3%).

The respiratory therapy students' confidence regarding TB was covered in questions 36 through 40. Six choices ranging from no confidence to high confidence (A through F, respectively) were rated by each student (Table 7). The respondents in the pre-TB education survey were generally confident (D 27.5%, E 10%, F 15%) that they could identify the need for airborne infection isolation precautions to prevent transmission of suspected of identified TB. The post-TB survey answers to the same question showed improved confidence (D 11.4%, E 28.6%, F 17.1%).

Table 6

Case Study

A 27-year old woman is seen in your facility for a positive tuberculin skin test (TST) of 28 mm that was administered and read by the health department. She has a history of recent contact with an infectious case of TB. She feels well and has a normal physical exam.

Question number	Pre Survey (40)	Post Survey (35)
28.The physician should recommend which of the following tests FIRST?	20/40 correct 50% 20/40 incorrect 50%	13/35 correct 37.1% 22/35 incorrect 62.9%
29. You later learn that the index case has TB that is resistant to isoniazid (INH). Assuming the patient (27 year old woman) described above has latent TB infection (LTBI), what drug regimen should the physician prescribe?	25/40 correct 62.5% 15/40 incorrect 37.5%	17/35 correct 48.5% 18/35 incorrect 51.5%
30.Which of the following factors would increase this patient’s risk of developing TB disease?	7/40 correct 17.5% 33/40 incorrect 82.5%	33/35 correct 94.3% 2/35 incorrect 5.7%

Discussion

Observations

After analyzing the pre and post-TB education surveys, several observations were noted. Lecture format seemed to be the most common format the RT students were receiving their TB education. They rarely were proactive in regards to extracurricular TB knowledge beyond program requirements. RT students answered general questions about TB correctly with an average score of 76.4% in the post-TB education survey. Improvements were seen in the student’s ability to correctly answer questions relating to characteristics of cases of TB likely to be infectious and what personal protective equipment should be used when collecting induced sputum samples. This improvement suggests the students’ ability to identify possible TB cases and how to protect themselves from infection improved following formal program TB education. However, deficiencies were noted in the evaluation of the case study portion of the surveys with an overall score improvement of 43.3% to 59.9% observed. The addition of case study material and patient scenarios may help remedy this insufficiency.

Limitations

The surveys were administered to a small number of RT students at one particular university. Also, the surveys were anonymous and there was no way of tracking the before and after scores of a particular student. Perhaps a confidential survey with the ability to track each student’s before and after performance would be useful. Lastly, a student’s contact with TB and the education they receive clinically can be dramatically different based on the hospital at which their clinicals were completed.

Conclusions

Despite effective treatment regimens TB still causes or contributes to death in 10% of all reported cases⁸. The RT student’s overall level of knowledge regarding TB increased from

Table 7

Assessing RT Confidence Regarding TB

A=no confidence-----F=high confidence

Question number	Pre Survey (40)		Post Survey (35)	
	Frequency	Percent	Frequency	Percent
36. Identify the need for airborne infection isolation precautions to prevent transmission of suspected or identified TB	A	3	A	1
		7.5		2.9
	B	6	B	2
		15.0		5.7
	C	10	C	12
		25.0		34.3
	D	11	D	4
	27.5		11.4	
37. Implement appropriate airborne infection isolation precautions	E	4	E	10
		10.0		28.6
	F	6	F	6
		15.0		17.1
	Frequency		Frequency	
	A	4	A	0
		10.0		0
38. Properly clean, disinfect, and sterilize RT equipment used in the care of patients with active pulmonary TB	B	6	B	1
		15.0		2.9
	C	11	C	8
		27.5		22.9
	D	9	D	8
		22.5		22.9
	E	5	E	13
	12.5		37.1	
39. Obtain a relevant history from a patient with suspected TB	F	5	F	5
		12.5		14.3
	Frequency		Frequency	
	A	4	A	3
		10.0		8.6
	B	5	B	4
		12.5		11.4
40. Educate patients and families about issues related to TB using language that is understandable and reflects cultural awareness	C	13	C	12
		32.5		34.3
	D	5	D	6
		12.5		17.1
	E	6	E	6
		15.0		17.1
	F	7	F	4
	17.5		11.4	
39. Obtain a relevant history from a patient with suspected TB	Frequency		Frequency	
	A	5	A	1
		12.5		2.9
	B	4	B	3
		10.0		8.6
	C	9	C	10
		22.5		28.6
40. Educate patients and families about issues related to TB using language that is understandable and reflects cultural awareness	D	6	D	10
		15.0		28.6
	E	7	E	5
		17.5		14.3
	F	9	F	6
		22.5		17.1
	Frequency		Frequency	
A	10	A	1	
	25.0		2.9	
40. Educate patients and families about issues related to TB using language that is understandable and reflects cultural awareness	B	7	B	7
		17.5		20.0
	C	5	C	11
		12.5		31.4
	D	4	D	5
		10.0		14.3
	E	9	E	7
	22.5		20.0	
40. Educate patients and families about issues related to TB using language that is understandable and reflects cultural awareness	F	5	F	4
		12.5		11.4

44.5% in the pre-TB education survey to 72.4% in the post-TB education survey. However, the knowledge evaluation based on the case study was disappointing. This could be interpreted as a clinical deficiency in the academic program. With a lack of published literature

regarding the evaluation of teaching methods RT programs utilize and their inability to evaluate their students' knowledge and confidence regarding TB, ways to improve a student's knowledge and confidence regarding TB may not progress.

Further research on a broad scale is needed. Perhaps United State RT programs can administer an identical survey prior to and following instruction related to TB education can help determine the effectiveness of TB instruction a program offers. Hospital site identification by the students may allow for analysis of practical learning skills and how clinical experience plays into a student's knowledge and confidence. With effective data analysis, recommendations can be developed and may help direct TB education. This could lead to practical guidelines that may possibly be implemented in respiratory therapy programs as well as other health profession programs to ensure adequate tuberculosis education.

As long as tuberculosis continues to be a world-wide problem, respiratory therapists must be knowledgeable and confident that they can control transmission and protect themselves from infection while caring for a patient's respiratory needs. Educational programs must implement successful teaching strategies and curriculum evaluation to ensure the student's educational requirements on the subject of TB are achieved. The potential benefits of these strategies could contribute to the suppression of tuberculosis globally.

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APPENDIX A

NTCC Student Tuberculosis Survey, 2008
Respiratory Therapy (RT) Students

- Please respond on the answer sheet to ALL questions using a #2 pencil. Do not fold, bend, staple, or put stray marks on the answer sheet.
- **DO NOT PUT YOUR NAME ON THE ANSWER SHEET.**
- An anonymous special coded number is provided in the upper left corner of the answer sheet. This information is required for machine scoring and does not identify you personally.
- There is only ONE answer for each question, unless otherwise instructed
- Questions 1-18 are applicable to all health professions students.
- Questions 19-42 are specifically for respiratory therapy students.

Part I: General Information.

1. In which of the following academic programs are you currently enrolled?
 - A. Medical School (MD or DO)
 - B. Nurse Practitioner/Advanced Practice Nursing (NP/APN)
 - C. Baccalaureate Nursing (BSN)
 - D. Respiratory Therapy (RT)
 - E. Clinical Laboratory Science/Medical Technology (CLS/MT)
 - F. Pharmacy (PharmD)
 - G. Physician Assistant (PA)
 - H. Public Health (MPH)
 - I. Combined program – MD/MPH
 - J. Other
2. During your academic program to date, have you attended at least one lecture where tuberculosis (TB) was a primary focus?
 - A. Yes
 - B. No
3. Approximately how many hours of lecture/instruction on TB have you attended?
 - A. None
 - B. 1-2 hours
 - C. 3-4 hours
 - D. 5-6 hours
 - E. More than 6 hours

4. From which of the following teaching modalities have you received TB education?

MARK ANSWER SHEET FOR ALL THAT APPLY

- A. None
- B. Lecture
- C. Case discussion at conference or case study
- D. Seminar
- E. Standardized patient
- F. Game show format (e.g., Millionaire or Jeopardy)
- G. Computer Simulation
- H. Completion of a module on a computer, followed by a series of questions answered on-line (computer based learning)
- I. Other

5. Have you sought out and independently reviewed additional information about TB beyond requirements for a class or seminar?

- A. Yes
- B. No

6. Approximately how much total time have you spent outside of class learning about TB?

- A. None
- B. 1-2 hours
- C. 3-4 hours
- D. 5-6 hours
- E. More than 6 hours

7. Beyond what you have noted above, have you also learned about TB in any of the following ways? MARK ANSWER SHEET FOR ALL THAT APPLY.

- A. Personal interest
- B. Friend or family member diagnosed with latent tuberculosis infection (LTBI or “positive PPD” or “positive skin test” or “positive TST”)
- C. Friend or family member treated for LTBI
- D. Friend or family member diagnosed and treated for active tuberculosis disease
- E. You have been diagnosed with latent tuberculosis infection (LTBI or “positive PPD” or “positive skin test” or “positive TST”)
- F. You have been treated for LTBI
- G. You have been diagnosed and treated for active tuberculosis disease
- H. You have received BCG
- I. Other

8. Were you born OUTSIDE the United States or Canada (are you foreign born)?

- A. Yes
- B. No

Part II: General Beliefs about Tuberculosis Education.

For each statement below, please mark the answer sheet with the ONE letter that most closely represents your opinion about each item.

	Strongly Disagree	Disagree	Agree	Strongly Agree
9. There is only minimal need for more education on tuberculosis because it is not likely that I will need it in my chosen career.	A	B	C	D
10. TB education is very important to my academic program.	A	B	C	D
11. The current emphasis on TB in my academic program is adequate.	A	B	C	D
12. The career path I have chosen will not require me to know much about TB.	A	B	C	D
13. In my future plans as a health professional, I am confident that the level of TB knowledge I have attained is adequate to prepare me for my career needs.	A	B	C	D

Part III: General Questions about Tuberculosis.

Mark ONLY ONE BEST ANSWER for each question.

14. Tuberculosis organisms are most commonly transmitted from person-to-person in which one of the following ways?

- A. Blood and body fluids
- B. Aerosol
- C. Food
- D. Fomites

15. What is the currently recommended method for administering tuberculin?

- A. Intradermal injection (Mantoux method)
- B. Multi-prong method (Tine)
- C. Subcutaneous injection
- D. Inhalation

16. Which of the following is a contraindication to TB skin testing?

- A. BCG vaccination
- B. TB disease
- C. Malnutrition
- D. None of the above

17. Generally, what percentage of people in the United States who have latent TB infection (LTBI) and a normal immune system, will go on to develop TB disease at some point in their lives?

- A. 1%
- B. 10%
- C. 50%
- D. 90%

18. Why is BCG NOT PART of the routine vaccination program in the United States?

- A. The side effects are too severe
- B. BCG is only effective for preventing adult pulmonary TB
- C. BCG vaccination complicates surveillance for new TB infection (LTBI)
- D. There is limited experience with BCG use in children

Part IV. Questions Specifically for Respiratory Therapy Students.

19. Have you been involved in any aspect of the care of a patient with latent tuberculosis infection (LTBI) and/or active TB disease?

- A. Yes
- B. No

20. Indicate the number of tuberculosis patients you have helped care for:

- A. None
- B. 1-3 patients
- C. 4-6 patients
- D. More than 6 patients

21. What additional tests should be done on all specimens regardless of AFB smear results?

- A. Nucleic acid amplification (e.g. PCR)
- B. Anaerobic culture
- C. Mycobacterial culture
- D. DNA fingerprinting

22. Which of the following is NOT a risk factor for progression of TB from infection to disease?
- A. High blood pressure
 - B. Injection of illicit drugs
 - C. HIV infection
 - D. Diabetes mellitus
23. Which of the following describes best practice for directly observed therapy (DOT)?
- A. A public health worker gives the patient a bottle of pills monthly
 - B. A public health worker watches the patient swallow every dose of the prescribed medication
 - C. A public health worker counts the remaining pills in the medication bottles
 - D. A public health worker delivers a day's dose of TB medication daily to the patient's home
24. Which of the following groups should NOT be given high priority for treatment of latent TB infection (LTBI)?
- A. Patients with organ transplants and other immuno-suppressed patients
 - B. HIV-positive persons
 - C. Recent contacts of a TB case
 - D. A 45 year old architect with a positive TB skin test for 20 years
25. Peripheral neuropathy is most commonly associated with the use of which of the following?
- A. Pyrazinamide
 - B. Isoniazid
 - C. Rifampin
 - D. Ethambutol
26. Characteristics of cases of TB likely to be infectious include ALL EXCEPT which of the following:
- A. Positive smear
 - B. Cavitory chest x-ray (CXR)
 - C. Productive cough
 - D. Weight loss
27. Which of the following statements regarding BCG is true?
- A. BCG is very rarely used in the United States for TB prevention
 - B. BCG vaccination is contraindicated for a patient receiving measles vaccine
 - C. Tuberculosis skin tests due to BCG remain positive for life
 - D. BCG is used to prevent TB in HIV-positive patients

Questions 28-30 use this Case Study. A 27-year old woman is seen in your facility for a positive tuberculin skin test (TST) of 28 mm that was administered and read by the health department. She has a history of recent contact with an infectious case of TB. She feels well and has a normal physical exam.

28. The physician should recommend which of the following tests FIRST?

- A. Three sputums for AFB smear and culture
- B. CD4 count
- C. Chest x-ray
- D. Liver function test

29. You later learn that the index case has TB that is resistant to isoniazid (INH). Assuming the patient (27 year old woman) described above has latent TB infection (LTBI), what drug regimen should the physician prescribe?

- A. Rifampin
- B. Isoniazid
- C. Isoniazid & Rifampin
- D. Pyrazinimide

30. Which of the following factors would increase this patient's risk of developing TB disease?

- A. Mild asthma
- B. HIV infection
- C. Gastro esophageal reflux disease (GERD)
- D. Chronic obstructive pulmonary disease (COPD)

31. The recommended initial drug combination for the treatment of active TB in HIV-negative individuals is:

- A. Isoniazid and rifampin
- B. Isoniazid, rifampin, pyrazinamide, and ethambutol or streptomycin
- C. Isoniazid, rifabutin, ethambutol
- D. Isoniazid, rifabutin, streptomycin, ethionamide

32. Respiratory precautions (airborne precautions) should be considered for all patients admitted to the hospital with:

- A. Asthma exacerbation
- B. HIV infection and cough
- C. COPD exacerbation requiring non-invasive positive pressure ventilation
- D. Cystic fibrosis requiring aerosolized tobramycin

33. The correct technique for sputum induction in patients with suspected TB is

- A. Nebulized normal saline (NS) only
- B. Nebulized mucolytic (e.g., n-acetylcysteine)
- C. Nebulized distilled water
- D. Nebulized hypotonic saline

34. What environmental controls should be in place in locations where induced sputum is collected?
- A. The patient should be behind a drawn curtain
 - B. The patient should be in a room with negative pressure ventilation and at least 6 air exchanges per hour
 - C. The patient should be in a room with negative pressure ventilation, at least 6 air exchanges per hour, and HEPA filtration
 - D. The patient should be in a room with negative pressure ventilation, at least 6 air exchanges per hour, and ultraviolet germicidal irradiation
35. What personal protective equipment (PPE) should you use when collecting induced sputum samples?
- A. Gown and gloves only
 - B. Gown, gloves, and a surgical mask
 - C. Surgical mask only
 - D. Gown, gloves, and a N95 respirator

Part V: Assessing Your Confidence

Using a scale of A to F, where A represents no confidence and F represents a very high level of confidence, please assess your level of confidence in your skill in the following areas. Mark answer sheet with ONE response per question.

Questions 36-38: Formulate and implement respiratory management plans for patients infected with TB, specifically:

	No confidence ————— High confidence					
	A	B	C	D	E	F
36. Identify the need for airborne infection isolation precautions to prevent transmission of suspected or identified TB						
37. Implement appropriate airborne infection isolation precautions						
38. Properly clean, disinfect, and sterilize RT equipment used in the care of patients with active pulmonary TB						

Questions 39-40. Communicate effectively with patients with TB and their families, specifically:

	No confidence ————— High confidence					
39. Obtain a relevant history from a patient with suspected TB	A	B	C	D	E	F
40. Educate patients and families about issues related to TB using language that is understandable and reflects cultural awareness	A	B	C	D	E	F

41. In which type of Respiratory Therapy academic program are you currently enrolled?

- A. Associate degree program
- B. Baccalaureate degree program
- C. Master's degree program

42. What RT school year are you in now?

- A. Associate Degree Program: 1st year, 1st semester
- B. Associate Degree Program: 1st year, 2nd semester
- C. Associate Degree Program: 2nd year, 1st semester
- D. Associate Degree Program: 2nd year, 2nd semester
- E. Baccalaureate Degree Program: 3rd year, 1st semester
- F. Baccalaureate Degree Program: 3rd year, 2nd semester
- G. Baccalaureate Degree Program: 4th year, 1st semester
- H. Baccalaureate Degree Program: 4th year, 2nd semester
- I. Master's degree program, 2nd year

THANK YOU FOR PARTICIPATING IN THIS SURVEY. Please check your answer sheet one last time to be certain you have answered **all 42 questions**.

Assessment for a Better Understanding of Tobacco use by LGBT Atlantans

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Abstract

Background: Data on cigarette smoking prevalence among lesbian, gay, bisexual, and transgender (LGBT) populations in the United States have recently been reported by a small number of sources. The American Lung Association recently created a document to assist researchers by providing a variety of historical and statistical data. LGBT smoking rates are disproportionately higher than the general population. Recent smoking rates range from 38% to 59% among LGBT youth and from 11% to 50% among adults, while the national smoking rates range from 28% to 35% for youth. Overall, LGBT people smoke at rates 40-60% higher than the general population. **Methods:** Qualitative data were used to determine reasons for the high rates of tobacco use among LGBT populations in metropolitan Atlanta. Focus groups with former smokers, nonsmokers, and current smokers were conducted to assess group members' knowledge, attitudes, and behavior about smoking. A focus group guide with interview questions related to smoking in the LGBT community and strategies to counter the influence of tobacco on the LGBT community was used. Data were analyzed using thematic analysis until a point of saturation was reached. **Results:** Since smoking is viewed as a deviant behavior and the LGBT lifestyle is also viewed as deviant, focus group participants saw smoking as an opportunity to thumb their noses at society. They associated smoking with freedom and rebellion, analogous to the freedom and rebellion of 'coming out' of the closet. Study participants also addressed the impact of peer influence on their smoking behavior. **Conclusions:** While it is difficult to generalize from study findings, most participants clearly agreed that it is absolutely necessary to develop cessation strategies that are specifically tailored toward the LGBT community. Further, it appears that LGBT current smokers were most supportive of measures which they thought would enable them to quit, such as developing LGBT-specific cessation programs and smoke-free spaces. **Key Words:** Tobacco control, Focus groups, Smoking cessation, Smoking prevention, Cessation strategies, LGBT.

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Assessment for a Better Understanding of Tobacco use by LGBT Atlantans

Introduction

Data on cigarette smoking prevalence among lesbian, gay, bisexual, and transgender (LGBT) populations in the United States have recently been reported by a small number of sources. The American Lung Association's publication, "*Smoking Out A Deadly Threat*," provides a variety of historical and recent data on the smoking disparity which adversely affects the gay community.¹ In addition to offering a compelling look at smoking rates among LGBT persons in the United States, the report provides strategies for "*Taking Action*" to promote cessation among this disproportionately affected community. Recent smoking rates range from 38% to 59% among LGBT youth and from 11% to 50% among adults, while the national smoking rates range from 28% to 35% for youth. A 2001 review of available literature reported that LGBT people smoke at rates 40-60% higher than the general population.²⁻⁶ It is estimated that the lesbian smoking rate may be twice that found among straight women nationally.² These smoking rates directly impact LGBT health in terms of diseases such as lung cancer and chronic obstructive lung disease.^{1,7}

Why are LGBT smoking rates so high in comparison to the general population? The research literature does not fully explain the disparity. One reason may be a lack of targeted cessation efforts: high rates of tobacco use should make LGBT populations a priority for anti-smoking programs and funding, but historically this has not occurred.^{1,2} In addition, research reveals that the tobacco industry strategically targets and markets to the LGBT community while privately ridiculing and deriding LGBT individuals.⁸ For example, between 1995 and 1997, R. J. Reynolds planned to engage in a campaign called "Project SCUM" targeting the young LGBT community.⁸ In "Project SCUM," R. J. Reynolds tried to market Camel and Red Kamel cigarettes to San Francisco area "consumer subcultures" of "alternative life style." R. J. Reynolds's special targets were gay people in the Castro district, where the company noted, the opportunity exists for a cigarette manufacturer to dominate. The gay Castro targets were described as "rebellious, Generation X-ers," and "street people." Both the coded labeling of targets as Generation X-ers in the mid-1990s and as "rebellious" indicates their youth. Project SCUM also planned to exploit the high rates of drug use in the "subculture" target group by saturating nontraditional retail outlets with the Camel brand. In one copy of the plan, "the word "SCUM" was crossed out and the word "Sourdough" substituted by a cautious executive. After such careful sanitizing, the final document was to emerge as Project Sourdough with no clear written evidence that young LGBT participants had even been targeted."⁸

According to the American Lung Association (ALA), an in-depth understanding of higher smoking rates among LGBT populations will require the same levels of extensive research and attention as have been devoted to other populations.¹ Here, we take a first step by examining the tobacco-related attitudes, behaviors and opinions of LGBT individuals living in metropolitan Atlanta. Additionally, we identify factors that contribute to the initiation and continuation of tobacco use and strategies that promote cessation. The city of Atlanta makes a good setting for this study because it has many diverse communities and has the third highest proportion of LGBT residents in the United States.^{9,10} However, data on smoking rates and tobacco use among LGBT metropolitan Atlantans are nonexistent.¹

Purpose

The purpose of this study was to determine why the smoking rates among LGBT Atlantans are higher in comparison to the general population, and what can be done to counter the influence of tobacco in the LGBT community. The current report is the result of a one-year project funded by the Georgia State Tobacco Use Prevention Program through the DeKalb County Board of Health, and contracted with a local LGBT community service organization. A southern university assistant professor in a respiratory therapy department served as principal investigator (PI) on the project. A Research Advisory Board, led by the project PI, was created to include the expertise of a local university and the Centers for Disease Control (CDC), and to promote LGBT smoking as an important health issue. The Research Advisory Board assisted in strategic planning, developing research methods, validating data collection instruments, and data analysis.

Methods

This study utilized a qualitative methodological approach to capture the essence of the “smoking experience” directly from LGBT individuals.¹¹ The data comes from focus groups conducted with targeted LGBT participants in metropolitan Atlanta. Focus groups are widely used for assessing health education messages and in exploring the public’s understanding of medical issues such as tobacco related illness.^{11,12} Effective focus groups consist of about 8 to 12 people, use a pre-constructed discussion guide, and are generally moderated by 2 or more professionally trained participants.¹³⁻¹⁹ For the present study, 4 focus groups were conducted to glean insight into LGBT behaviors, attitudes, and opinions regarding tobacco use.¹⁴ Participants were recruited via an advertising campaign (using flyers and posters) which targeted LGBT community-based organizations (CBOs). The flyers and posters made it clear that participants must self-identify as LGBT and live in metropolitan Atlanta. Participants received a \$25 stipend for participating in the focus groups.¹⁴

Four focus groups were held in October 2010: one group with participants who identified as former smokers, one with participants who identified as non-smokers, and two with participants who identified as current smokers. Two group sessions were held for current smokers because the research team was particularly interested in analyzing factors that support the continuation of smoking in the LGBT community.

A total of 36 participants participated in the focus groups. Table 1 summarizes the gender and race of each group. The project PI was responsible for facilitating discussion and cap-

Table 1

Demographics of Focus group participants

Focus Group	Black Gay Males	White Gay Males	Black Lesbians	White Lesbians	Transgendered
Former Smokers (10)	3	2	2	2	1 (White/M2F)
Current Smokers (8)	4	2	—	1	1 (Black/M2F)
Current Smokers (8)	1	4	—	3	—
Non Smokers (10)	3	2	1	4	—

turing the focus group data, using a focus group guide developed and triangulated by the Research Advisory Board (RAB) to ensure that each group was asked the same questions.¹²⁻¹⁴ An additional person observed and documented group dynamics as well as non-verbal interactions.¹⁴ The focus group discussions were audio recorded and later transcribed verbatim. Additionally, the group leader used a flip chart to capture the essence of the group's discussion and kept field notes. The RAB helped analyze and code the transcripts, using thematic analysis to identify both common themes and differences across the four groups.¹⁸⁻¹⁹ Data was analyzed using qualitative software (NVivo) until a point of saturation was reached.¹⁹

The focus group facilitator posed questions on a variety of topics, including: smoking and the LGBT community; social norms; initiation of tobacco use; smoking as a learned behavior; activating the LGBT community around tobacco use; perspectives on tobacco use disparities; environmental smoke; smoking ordinances; and cessation strategies.

Results

Focus Group Results

The major findings from this research fall within 3 broad areas that were probed during the focus group sessions. These areas include smoking and LGBT social norms, environmental smoke, and cessation strategies.

Smoking and LGBT social norms

LGBT social norms seem to support smoking behavior within the LGBT community. First, although smoking is common among LGBT individuals, there is a lack of awareness of the extent of tobacco use within the community. Most focus group participants were not familiar with the disparity between the LGBT smoking rate and that in the non-LGBT community. Many were surprised, like the following non-smoker:

I find it very surprising ... This is total news to me ... I've been to Europe and ... almost everybody, seemed to me, smoked there and I just never really separated it out like sexual identity ... I had no idea that you know, that our community is such, such, you know such heavy smokers. We really do need to pause – Non-smoker

Current smokers were somewhat more reserved in their reactions:

I'm really not surprised at all. I think something about what someone said earlier about how you know you go to the bars and that is where everyone smokes. That is where a lot of like our culture happens at least for young people, it's in the bars that young people smoke and it's not surprising to me so ... – Current smoker

Former smokers seemed to have the greatest degree of awareness. Like the current smokers, they often gave explanations for why people smoked rather than simply expressing surprise:

... I think a lot of people use smoking as kind of a crutch or a way to fit into that group; so I wasn't, it doesn't really surprise me. I think a lot of gay people smoke at one point or another you know, kind of use it as a crutch as you're coming out and figuring out who you are. – Former smoker

Participant comments on why people—including themselves—began smoking suggest that social norms in both the LGBT community and the larger society have been conducive to tobacco use. Regarding the wider (non-LGBT) society, several current and former smokers noted that their parents or other family members smoked while they were growing up; one participant noted that he had come from a “family of smokers.” Current smokers also claimed that they’d grown up with “a lot of peer pressure,” with advertising images that made smoking look “cool” and with smoking embedded in everyday life:

I think we learned how to smoke in front of the images we see off of movies, our surroundings, peer pressure, our everyday environment... I mean, we grew up with it ... Everybody in any part of our generation there is someone always smoking, it has always been there – Current Smoker

Non-smokers generally agreed with these claims, surmising that LGBT participants learn to smoke by what’s around them, such as “advertisements” and “watching movies,” which glamorized smoking.

Comments from all groups suggest that within the LGBT community, social norms surrounding smoking are even more tolerant than in the larger society. Many current and former smokers noted that the influence of peers, especially in the LGBT night life culture, had shaped their own smoking behavior. Some current smokers claimed that they did not start smoking until they came out and started going to gay bars, as was noted by this current smoker:

I guess for me it’s mostly peer pressure, you know trying to fit in, especially when I go out to bars. Because in the beginning I would see all these cool guys puffing on a cigarette having a cocktail and I’m just sitting there with my cocktail and I’m like man, you know, I wanna look like them, I wanna fit in ... Peer pressure... that’s how it started for me – Current Smoker

Again, non-smokers concurred. Several indicated that cigarette manufacturers often distribute free packs of cigarettes in the gay bars, and one noted that the gay nightlife culture “reinforces” smoking. Overall, they emphasized the role of peer pressure and the motivation to smoke just to “fit in.”

Further, several participants noted that they associated smoking with qualities and characteristics consistent with their LGBT lives. Surprisingly, many associated smoking with freedom. A current smoker echoed others in noting that smoking is associated with rebellion, similar to and continuous with the rebellion experienced in coming out of the closet:

There is definitely this advertising gimmick that smoking is [a] rebellious kinda thing that just doesn’t seem to really hold any weight with the mainstream population any more ... But, for us, I think it still makes a difference because ... oftentimes we feel like we are rebellious just by our own identity. So, why not do this rebellious thing to emphasize that. – Current Smoker

Another former smoker noted the following: “smoking is a coping mechanism for a lot of gays and lesbians. That’s how they managed to cope, to calm down from their anxieties, from all of

the pressure.” Thus, many saw smoking as an integral part of the LGBT culture. As one current smoker put it, “there’s a lot more tolerance for smokers in our community just because everyone is used to being around it.” As an interesting contrast, former smokers’ decisions to quit smoking were often motivated by individual and deeply personal experiences, such as watching a relative die from a smoking-related illness or becoming sick themselves. While learning to smoke was a social experience, the decision to quit was more related to strong personal self-will

Finally, when asked about techniques that could be employed to activate the LGBT community to limit the use and impact of tobacco, the former smokers noted that it would help to make it a “health issue.” They believed that it would be effective to communicate the message that LGBT individuals would live longer if they stopped smoking. Other groups agreed that education and campaigns designed to raise awareness about the smoking disparity would be effective. One current smoker noted that when he became “aware that the rates were significantly higher,” “it sort of pissed me off . . . that’s when I started trying to quit.”

Environmental smoke

Most study participants were aware of the negative consequences of environmental smoke, and many wanted to see public and community spaces (bars, restaurants) become smoke-free. However, focus group participants were often skeptical that gay bars would actually take this step. For instance:

I don’t know, it just doesn’t seem like it’s gonna happen anytime . . . I mean especially in this city . . . But the first thing to doing it is making people more aware of what’s going on . . . — Current smoker

This combination of awareness and skepticism led many participants to express a sense of frustrated resignation about environmental smoke:

I think we know it’s bad and we notice it cuz it’s everywhere, but at the same time it’s just accepted, it’s . . . just a part of what you expect when you go to the gay bar. You gotta walk through a lot of smoke, might as well just add to it . . . Because I know we all know it’s not good, but at the same time you don’t wanna give up your social life because it’s unhealthy, just because that’s really the only place you can really be yourself and so you just put up with it. — Current Smoker

Further, several participants felt that smoking ordinances infringed on their right to smoke:

As a smoker, I mean I can’t smoke in places where I want to smoke, you know. I don’t necessarily have a problem with that because I smoke there, but people that don’t smoke come to the places where they smoke and then they complain. What I’m trying to say is that they shouldn’t come to places where smoking is allowed.— Current smoker

Some participants, however, were more optimistic about the potential for limiting environmental smoke:

I think it may be a lot easier in the women’s bars to get that to happen than in the men’s bars . . . I think a higher population of gay men smoke than the women. There are a good number of the women at [a smoke-free women’s bar], they never go outside and never smoke or anything. That is just it - Current smoker

Cessation strategies

All focus group participants were asked to comment on a number of strategies for encouraging and aiding smoking cessation in the LGBT community. Suggestions included: (1) establishing LGBT-specific or culturally-competent cessation programs; (2) raising awareness about the LGBT smoking disparity; (3) getting LGBT bars and other community spaces to become smoke-free; (4) getting bar owners and community leaders to take leadership around tobacco and to refuse tobacco industry money; (5) providing funding for community cessation programs; and (6) raising tobacco taxes.

The strategy receiving the most supportive comments from group participants was the establishment of LGBT-specific cessation programs and making existing cessation programs more culturally competent for LGBT participants. Typical comments included the following:

The healthcare system needs to be more sensitive in everything towards LGBT people, and, in particular, towards Trans people ... Working with a doctor should not be a traumatic thing and if they don't want you to smoke, if they want to help you to stop smoking, well don't treat us like shit then— Ex-Smoker

Another strongly supported strategy was raising community awareness about the LGBT smoking disparity. Comments included:

I think it's important that information [about the disparity] is disseminated because I mean I've read it here ... but I've never...you don't see this all the time. This information is not out. – Current Smoker

I think it is absolutely essential. I mean, as old as I am, I'm just now learning this, that there's a lot of people that need to ... not just my age, older and younger could be better educated on what is happening here. Not just on a community level but on a personal level- Non-Smoker

However, some participants felt that raising awareness was not enough. One ex-smoker commented that “hitting [people] in the face” with media messages might not be as effective in encouraging cessation as other, more aggressive strategies:

Sometimes I just think you need either more restrictive laws, such as taxation and/or places that you can smoke, or you need people to support your decision to quit. Because if there was a huge billboard that talked about the statistical differences between the two populations and the fact that LGBT population smokes more, I don't know that necessarily does anything ... – Ex-Smoker

A non-smoker said “education is great” but “a large part of why people smoke and continue to smoke is, I mean, it's addictive”; she mentioned that she knew people who had quit and then gone back to smoking “because there's something else about it that is not being addressed by them quitting for them to be able to stay quit.”

The strategy with the third highest level of support overall was getting LGBT bars, restaurants, events, and other community spaces to become smoke-free. This is illustrated in fa-

vorable comments from a current smoker and a non-smoker:

I have no issue with not smoking inside. I go places where you can't smoke inside because I hate the smell ... I'm used to going outside everywhere I go; even if people are smoking inside, I'm going to go outside. So, I mean I don't see that as being an issue for anybody, even people who you know smoke inside ... I don't think they would have an issue with going outside – Current Smoker

If there's some way to show [bars] that it might not adversely affect [their revenue], it might even improve things because people that don't smoke would actually be more inclined to go there ... Maybe that would help them too because otherwise they're not really going ... to go to do something that's going to negatively impact their bottom line. – Non-Smoker

While some participants did express doubts about its feasibility, the strategy of creating smoke-free LGBT spaces received little direct disagreement. However, group participants appear to define “smoke-free” in different ways: while some discussed creating 100% smoke-free spaces, others interpreted “smoke-free” to include outdoor or even indoor designated smoking areas. One strategy which received moderate support was getting bar owners and community leaders to refrain from accepting money from tobacco companies. While participants favored it in theory, many said they weren't aware that bars and groups were taking tobacco money and questioned the feasibility of getting them to stop. A selection of comments:

I didn't know that there were people out there taking tobacco money either. But, if there is, that's definitely a target to go after them. To go after them, the ones who are taking it ... there's a lot of strength in our community, in the gay community and ... when we stand up, people notice – Current Smoker

Good luck with that one. Do you know how much money tobacco gives to them!? That's going to be a big pill for them to not swallow – Ex-Smoker

The strategy of raising tobacco taxes also received moderate support—and, notably, it was the most controversial of all the cessation strategies suggested. Eight participants (all former- and non-smokers) supported it, though half of them expressed doubt that raising taxes would effectively result in cessation. Seven participants (five current smokers and two non-smokers) expressed similar doubts and did not support the strategy. The following passages illustrate the diversity of opinions:

*I say keep going up on the price and sales tax.
– Non-Smoker*

I think that the money could probably have an impact on some people; me, it wouldn't. You could have raised it to high hell; I was addicted! I was not going to give ... So it may impact some people; it may, I don't know. – Ex-Smoker

The strategy that received the least support was providing funding for cessation programs

in the LGBT community. While statements on this strategy were generally supportive, they were few in number.

Focus group participants also offered strategies for encouraging cessation that were not suggested by the facilitator. Of these, the 2 which were mentioned in more than one group were providing financial assistance for the purchase of cessation products, and the creation of LGBT smoking-cessation spokesperson or role models:

I definitely think that if there was more financial assistance ... there's a disparaging percentage of LGBT participants that may not have adequate insurance compared to heterosexual counterparts, whether it'd be because they don't have spousal benefits ... I think that if some of the pharmaceutical companies would offer maybe a lower price, if you went through a support group that was targeted to LGBT people or whatever ... I used Wellbutrin once when I quit, and for me, it was a miracle drug ... But it was really expensive. It was cheaper to just keep smoking – Ex-Smoker

The people that I look up to in my community, if I were getting this information from them ... I would see it as being a little bit more important than, and would listen to them more than, I would listen to somebody outside of my community. – Current Smoker

Finally, while group participants supported many strategies for reducing LGBT tobacco use, there were some differences among current, former-, and non-smokers. The strategy of offering LGBT-specific or -competent cessation programs received the highest number of supportive comments among current and ex-smokers; for non-smokers, this strategy received less support than any other except providing funding for cessation programs. By contrast, the strategy of raising tobacco taxes received high support among non- and ex-smokers, but no direct support among smokers, who typically claimed that it would not get people to stop smoking. Raising awareness of the LGBT smoking disparity and getting community leadership on tobacco and not taking tobacco money both received the highest support from non-smokers, followed by ex-smokers, with current smokers offering less support. Perhaps most surprisingly, the strategy of creating smoke-free spaces received relatively high and almost equal levels of support from non-smokers and current smokers, but no direct support from ex-smokers.

It is difficult to generalize from these findings, but it appears that current smokers were most supportive of measures which they thought would enable them to quit (cessation programs, smoke-free spaces), while non-smokers supported measures that might distance them from the health and financial consequences of smoking (raising awareness, higher taxes, smoke-free spaces, refusing tobacco money), and ex-smokers supported a combination of strategies.

Conclusion

Prior research has established a disparity between the smoking rates of the LGBT population and the general population, but has been relatively silent on the question of why this difference exists. The present study addresses this gap by providing new insights based on

qualitative research with current smokers, former smokers, and non-smokers within Atlanta's LGBT community. Findings suggest, first, that the social norms of the LGBT community are somewhat more tolerant of smoking than the norms of American culture in general. In particular, smoking was identified with the freedom and positive rebellion of "coming out," and seen as a common coping mechanism among LGBT individuals. Further, study participants saw smoking as an important way to "fit in" within the LGBT bar culture, which one identified as "the only place you can really be yourself." This suggests that high LGBT smoking rates are fueled in part by the prevalence of environmental smoke in LGBT nightlife establishments. Here, it is notable that although study participants were aware of the health risks associated with environmental smoke, they were also skeptical about supporting public policies and laws to force LGBT nightlife establishments to become smoke-free. This resignation is problematic and seems to suggest some degree of continuing acceptance of smoking. It is also problematic that some participants saw efforts to ban smoking in their individual rights and freedoms. Finally, findings suggest that LGBT smoking rates may be caused in part by the lack of LGBT-specific cessation programs and by a general lack of LGBT community awareness of smoking as an important health issue. On this note, it is encouraging that most study participants did support strategies to raise awareness and to establish smoking cessation programs that are sensitive to the needs of LGBT participants.

There are undoubtedly many additional contributors to the continuing high rates of smoking within the LGBT community. For instance, socio-economic factors are thought to explain higher smoking rates among the economically disadvantaged and among certain other minority groups.²⁰ Unfortunately the present study did not include the data necessary to take these factors into account; hence, we do not know how socio-economic differences shape LGBT smoking patterns. Future research should begin to examine this issue, as well as engaging in comparative analysis of the smoking disparities found in various minority groups defined by race, economic disadvantage, and LGBT status.

Meanwhile, the present study strongly suggests that educational campaigns and other efforts to decrease smoking in the general population must take into account the unique needs and cultures of specific sub-populations, notably those of the LGBT community. Smoking cessation programs targeted at LGBT participants must be culturally sensitive, and policy makers must understand the factors which encourage and maintain smoking among LGBT individuals.

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