

Respiratory therapists' role in research: results of a national survey

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Abstract

Background: While research is essential to respiratory therapy, little attention has been given to the role of respiratory therapists (RTs) in conducting research. To better understand the prevalence and spectrum of roles of RTs in research, a survey of RTs was designed and administered. **Methods:** The study was deemed exempt by the Cleveland Clinic Institutional Review Board. An invitation to participate in the survey was sent electronically to members of the American Association for Respiratory Care (AARC) via 'AARConnect' (the AARC's social and professional networking site) on May 21, 2012 and the survey remained open until August 16, 2012. A second, similar survey was sent via 'Listserve' to 6,431 RTs in the state of Ohio and remained open from May 31, 2012 to August 16, 2012. **Results:** Response rates to the national and state-wide surveys were 0.16% and 13%, respectively. Eighty two individuals responded to the AARConnect survey, while the Ohio survey attracted 849 respondents. Of the 81 active AARConnect RT respondents, 31 (38%) reported being currently involved in research activity: 29 (36%) had been involved in research in the past but not currently, and 21 (26%) reported never being involved in any research activity. In contrast, fewer of the Ohio survey respondents reported research experience or involvement. **Conclusions:** To our knowledge, this represents the first survey of RTs to assess research roles. Limitations of this study include possible biases related to small sample size, self-selection of respondents, and self-reported data. Overall, these results both suggest that a minority of RTs have research experience and that additional study is needed to better characterise the prevalence and level of research experience of RTs.

Keywords: Research, respiratory therapists, survey.

Introduction

Research in respiratory care confers many benefits, *i.e.*, by helping define the field as a profession, establishing credibility and respectability for respiratory care,¹ helping to advance the science of respiratory care, and ensuring future therapies to enhance patient care. Furthermore, research in respiratory care is increasing in quantity and quality. As one metric of this growth, the number of original research articles published in the journal *Respiratory*

Care has more than doubled between 2008 (N = 39) and November 2012 (N = 100) (*Figure 1*).² While respiratory care research may be conducted by various types of investigators (*e.g.*, physicians, PhD investigators, nurses and respiratory therapists), research regarding respiratory care devices and the delivery of respiratory care often involves and may require the participation of respiratory therapists, at least in the United States. Indeed, respiratory therapists (RTs) have made important contributions to advancing respiratory care research in a variety of roles, *e.g.*, as principal investigators, as co-investigators and as technicians facilitating the research.

In response to this growth trend of respiratory care research,^{3,4} the perceived need to foster the research

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How to cite this article: Rice R, Stoller JK. Respiratory therapists' role in research: results of a national survey. *Ind J Resp Care* 2013; 2:339-45.

skills among RTs has spurred the development of advanced training programs such as masters of respiratory therapy programs and symposia devoted to research methods at international respiratory therapy conferences.^{4,5} Yet, in the face of the need for and impetus to develop more research capability among RTs, little attention has been given to assessing the research roles or capabilities within the respiratory care community. More specifically, to our knowledge, no systematic survey has yet been undertaken to address the frequency with which RTs have participated in research and the specific roles they have played. Indeed, a search of Medline between 1966 and March 2013 and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) using the search terms *respiratory therapist*, *respiratory care practitioner* and *research* yielded 35 citations, of which none systematically addressed research roles conducted by RTs. Five papers reported individual interviews with RT investigators,^{1,6-9} a book chapter described two research roles and three research settings,¹⁰ and one paper reported a single Canadian institutional experience with research.¹¹

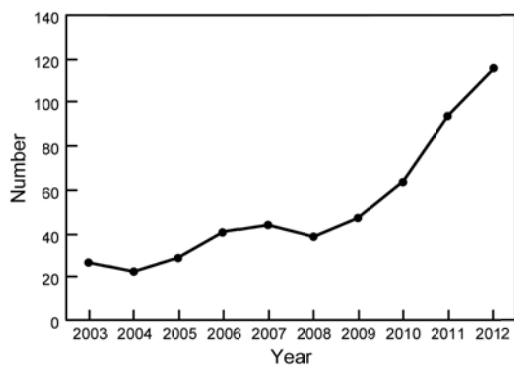


Figure 1: Number of original research articles published in the journal Respiratory Care

To address this gap, the current survey-based research was undertaken. Specifically, through a survey that was distributed to national RT managers and practitioners and to RT managers and practitioners in Ohio, we sought to assess RT respondents' experience in research and the specific research roles they played. More specifically, this pilot study sought to assess RTs' self-reported roles in research including the types of roles played, the setting in which the research was conducted and the amount of time devoted to the research role.

Methods

The study was reviewed and approved by the Institutional Review Board of the Cleveland Clinic as exempt research.

A single survey was prepared by the authors, who share extensive research experience, and was reviewed and modified based on input from survey experts in the Cleveland Clinic Market Research Group. The survey instrument was designed to capture self-reported data regarding the types of research roles played, the amount of time devoted to research, and the setting in which research was conducted.

The survey was administered *via* the internet to two groups of potential respondents – one a national audience through the American Association for Respiratory Care (AARC) and the other a state-wide RT audience in Ohio.

With the permission of the leadership of the AARC, the national survey involved posting a survey (Appendix 1) on AARConnect, a site developed and hosted by the AARC for RTs. Subscribers to the AARConnect Help Line (N=50,018), the Management Specialty Section (N=1,847), and the Research Roundtable (N=78) were invited as of May 21, 2012 to complete a survey on the discussion board for each respective section. The survey consisted of 14 questions that asked respondents to describe themselves (*e.g.*, demographic features, years of RT experience, *etc*), whether they had experience in any research studies, and if so, what type of role they played in the research. The survey remained active until August 16, 2012.

After an e-mail list of Ohio RT licensed and limited permit holders was obtained from the Ohio Respiratory Care Board, a survey that was almost identical (except for two modified questions [Appendix 2]) was sent on May 31, 2012 within Ohio to 6,431 individuals by way of a mass e-mail. The Ohio survey remained active until August 16, 2012.

Survey results were collected and analysed using SAS 9.2 (Cary, NC). Values of $p < 0.05$ were deemed

statistically significant. The two groups of RTs (Ohio and AARC) were also compared on the survey results using the Chi-square test or Fisher's exact test when expected cell counts were less than 5.

Results

Response rates to the national and state-wide surveys were 0.16% and 13%, respectively. Eighty two individuals responded to the AARConnect survey, of whom 29 (35%) completed the entire survey. Respondents practiced respiratory therapy in 25 unique states; 5 reported practicing in Ohio. One respondent indicated that (s)he practiced respiratory therapy outside of the United States. The Ohio survey attracted 849 respondents, of whom 199 (23%) responded to all questions. Since 5 respondents indicated they practice respiratory therapy in the state of Ohio, it is possible (but by no means certain) that they participated in both surveys. Data were reported for all completed questions, resulting in different numbers for each question because some respondents completed some but not all questions.

Thirty three (77%) of the national respondents were between the ages of 46 and 65, and 25 (57%) reported having >25 years of experience as an RT. In comparison, 94 (47%) of the Ohio survey respondents were between the ages of 46 and 65, and 60 (30%) reported having >25 years of experience as an RT.

Of the 81 active AARConnect RT respondents, 31 (38%) reported being currently involved in research activity: 29 (36%) had been involved in research in the past but not currently, and 21 (26%) reported never being involved in any research activity. In contrast, fewer of the Ohio survey respondents reported research experience or involvement. Specifically, of 785 respondents to the question regarding when the role in research occurred, 79 (10%) reported being currently involved in a research activity, 249 (32%) had been involved in research in the past but not currently, and 457 (58%) reported never being involved in any research activity (Figure 2, $p < 0.001$).

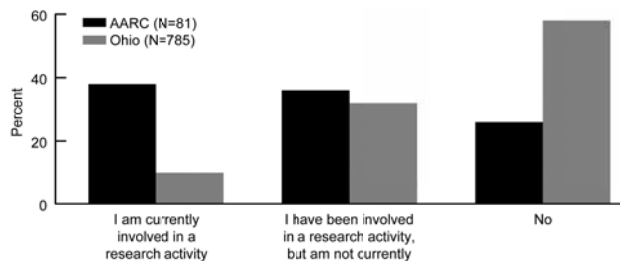


Figure 2: Percentage of respondents involved in research activity

Regarding specific research roles, 37 (80%) of the national survey respondents played a role in research as an RT, 30 (65%) as a co-investigator, 20 (43%) as a principal investigator, and 19 (41%) as a research coordinator. Thirty eight (83%) conducted research in a hospital inpatient setting and 10 (22%) conducted outpatient research. Of 46 respondents, 21 (46%) dedicated less than 10% of their time to a research activity in a typical month.

The distribution differed among respondents to the state survey, where 163 respondents (77%) reported playing a role in research as an RT, 59 (28%) as a co-investigator, 31 (15%) as a principal investigator, and 26 (12%) as a research coordinator (Figure 3). One hundred forty five (69%) conducted research in a hospital inpatient setting and 28 (13%) conducted outpatient research. Of 211 respondents to the question regarding time devoted to research, 146 (69%) dedicated less than 10% of their time to a research activity in a typical month.

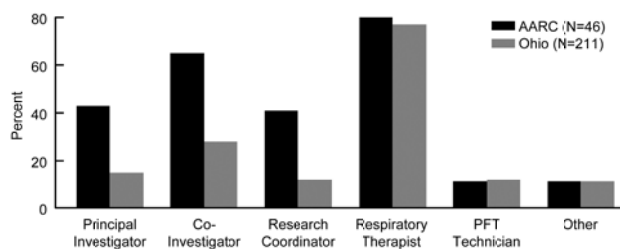


Figure 3: Role of RT in research

Figures 4a and 4b present the responses regarding sources of research funding. For both surveys, the most prevalent source of funding was internal, with relatively few reporting government (e.g., National Institutes of Health) funding sources.

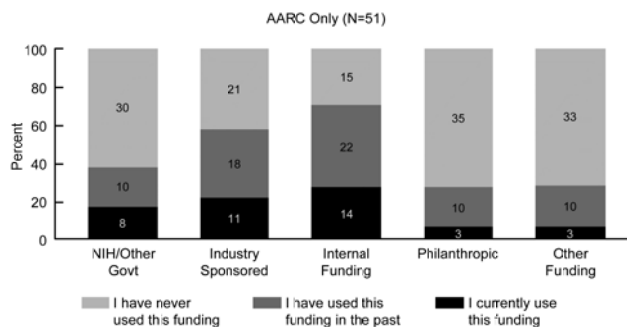


Figure 4a: Source of research funding (AARC only)

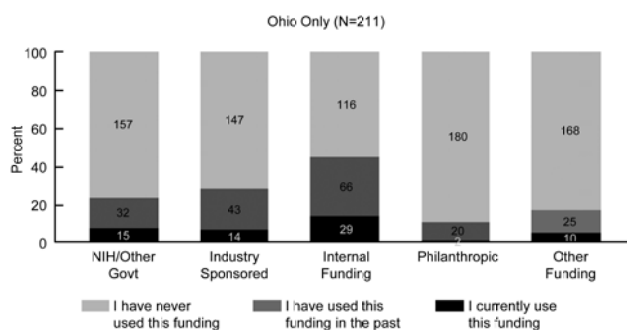


Figure 4b: Source of funding (OHIO)

To assess the rate of participation in published research by RTs over time, *Figure 5* presents the percentage of all authors of Original Investigations in the journal *Respiratory Care* who were RTs between the years 2003 and 2012. The number of published Original Investigations has quadrupled between 2003 and 2012 while the percentage of RT co-authors has fallen three-fold (from a zenith value of ~30% in 2005–2006 to a current nadir value of ~10% RT co-authors).

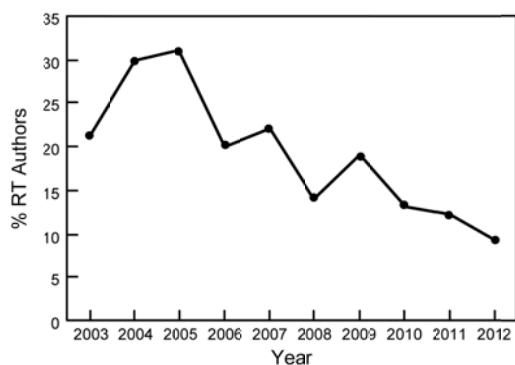


Figure 5: Percentage of RT's among all authors of Original Investigations in the journal *Respiratory Care* between the years 2003 and 2012.

Discussion

The results of this survey sent to two RT groups – one a national audience of RTs and the other all licensed RTs in the State of Ohio – show that a varying minority (38% and 10%, respectively) were currently involved in respiratory care research in some way. Respondents reported research involvement in a variety of roles, including as principal investigators, research coordinators, and as RTs administering respiratory care to study participants. In addition, research involvement of RTs spanned a variety of clinical venues, including both inpatient and outpatient settings.

In the context that both the need for respiratory care research and research activity in respiratory care appear to be increasing, describing the pool of research experience and research roles played by RTs seems important. Yet, to our knowledge, no systematic attention has been given to this issue previously, and the current study – despite its limitation of low response rates, potential sample bias, and the pilot nature of the study instrument – therefore addresses a gap in current knowledge by characterising this pool of experience. The results are both reassuring in demonstrating that at least a minority of RTs report prior research experience and concerning in suggesting that the amount of time devoted to research by RTs weekly is generally low (<10% of their time).

Our findings also frame and help explain a paradox regarding respiratory therapy research. On the one hand, the total volume of respiratory care research papers has increased dramatically over the last decade. On the other hand, only a minority of RTs have participated in research as co-authors. Indeed, our analysis shows that as the number of published *Respiratory Care* Original Investigations has grown, the percentage of RTs who have participated as co-authors of these papers has progressively decreased. While alternative explanations of this trend are possible, the observation is consistent with a persistently small pool of research-avid or research-prepared RTs to participate in the research. The small percentage of RTs reporting research experience in both surveys and the decreasing percentage of RT authors underscore the need to enhance the pool of research-ready RTs.

To help address this growing need, there are currently six advanced master's degree programs in respiratory care.⁵ It seems likely that programs such as these will continue to be needed to prepare the RT for new roles within the profession.¹²

Despite characterising the experience and roles of RTs in research for the first time, several important limitations of this research warrant mention. First, the small response rates to the survey invitations raise the specter of selection bias, which we believe is likely to overestimate the prevalence of research involvement by RTs. Specifically, to the extent that RTs without any research involvement or experience were less likely to respond to the survey than those with experience, these results will overestimate the true prevalence and extent of research involvement by RTs. The response bias was potentially greater in the national than the state survey, leaving uncertainty about how well the state-based data reflected a national RT group. A second potential limitation of the study is that it is at least possible that some RT respondents to the Ohio survey also participated in the national AARConnect survey. However, even if so, this number is small as only 5 of the 82 respondents to the AARConnect survey (6.0%) reported practicing in Ohio, suggesting that any bias related to 'double counting' RTs is small. A third limitation is that the responses to the surveys were self-reported, leaving open the possibility that the reported results misrepresent actual experience. Finally, although the survey instrument was designed by experienced investigators, the fact of it being newly designed for this first-of-a-kind study requires that these findings be considered a pilot study.

Overall, these results both suggest that a minority of RTs have research experience and that additional study is needed to better characterise the prevalence and level of research experience of RTs. Further inquiry might inform decisions about how to best enhance the research skills and experience of RTs and inform the demand and need for more masters-level training programs in RT to develop a pipeline of research-prepared RTs. Furthermore, these results prompt consideration of developing a registry of research-prepared and research-

experienced RTs which could conceivably connect RTs with positions with investigators needing experienced collaborators.

References

1. On the cover. Respiratory care researcher Robert Kacmarek knows the thrill of scientific discovery. *AARC Times* 2006; **30**:6.
2. American Association for Respiratory Care. Respir Care – archives of issue by date. <http://rc.rcjournal.com/content/by/year>. Accessed November 21, 2012.
3. Barnes TA, Gale DD, Kacmarek RM, Kageler WV. Competencies needed by graduate respiratory therapists in 2015 and beyond. *Respir Care* 2010; **55**:610-6.
4. American Association for Respiratory Care. AARC Congress 2012. <http://www.aarc.org/education/meetings/congress>. Accessed November 21, 2012.
5. Coalition for Baccalaureate and Graduate Respiratory Therapy Education. <http://www.cobgrte.org/graduateprograms.html>. Accessed December 17, 2012.
6. Bunch D. Respiratory research: How respiratory care research moves the profession forward. *AARC Times* 2011; **35**:30-41.
7. Bunch D. VA Researchers use respiratory therapists for COPD disease management study. *AARC Times* 2010; **34**:160-3.
8. Bunch D. Respiratory care researcher receives association's highest honor. *AARC Times* 2011; **35**:48-54.
9. On the Cover. Brian K. Walsh impacting respiratory care. *AARC Times* 2007; **31**:6-8.
10. Merendino D, Wissing, DR. New roles for respiratory therapists: Expanding the scope of practice. *Respir Care Clin N Am* 2005; **11**:554.
11. Seaman T. Canada's first research practice council. *Can J Respir Ther* 2008; **44**:18-9.
12. Commission on Accreditation for Respiratory Care. Career Entry Pathways and Academic Progression in Respiratory Care Education. July 23, 2012. <http://www.coarc.com>. Accessed December 17, 2012.

Appendix 1. National AARC Survey (AARConnect)

1. Are you an active (not retired) respiratory therapist?
 - Yes
 - No [TERMINATE]
2. Are you currently involved or have you ever been involved in any research activity?
 - I am currently involved in research activity
 - I have been involved in research activity, but am not currently
 - No [TERMINATE]

Question below is asked only of those who have previously been involved in research activity, but not currently.

3. Approximately, how long has it been since you have been involved in research activity?
 - Within the past year
 - 1 to 2 years
 - 3 to 5 years
 - Over 5 years
4. Approximately how many years in total have you been involved in research activity?
 - 1 to 5 years
 - 6 to 10 years
 - 11 to 15 years
 - 16 to 25 years
 - More than 25 years

Question below is asked only of those currently involved in research.

5. In a typical month, approximately what percentage of your time is dedicated to research activity?
 - Less than 10%
 - 10% to 25%
 - 26% to 50%
 - 51% to 75%
 - 76% to 99%
 - 100%
6. What role(s) have you played in research? *Select all that apply.*
 - Principal Investigator
 - Co-Investigator
 - Research Coordinator
 - Respiratory Therapist
 - PFT Technician
 - Other, please specify: _____

7. In what setting(s) have you conducted research? *Select all that apply.*

- Outpatient Clinic
- Physician Office
- Hospital Inpatient
- PFT Lab
- LTACH Rehab Facility
- Homecare
- Other, please specify: _____

8. Have you ever led any research efforts?
 - Yes
 - No
9. Do you have the ability to obtain independent funding for research?
 - Yes
 - No
10. What source(s) of research funding have you ever or currently used? *Select all that apply per row.*

	I currently use this funding	I have used this funding in the past	I have never used this funding
NIH / Other Government			
Industry Sponsored			
Internal Funding			
Philanthropic			
Other Funding			

Ask only if selected used "Other Funding" currently or in the past.

11. Please specify what "other funding" you currently use or have previously used for research.
OPEN ENDED TEXT BOX
12. How many years of experience do you have as a respiratory therapist?
 - 1 to 5 years
 - 6 to 10 years
 - 11 to 15 years
 - 16 to 25 years
 - More than 25 years
13. In what state do you practice respiratory therapy?
 - STATE LIST
 - Outside of the United States
 - Other US location or territory
14. What is your age?
 - Under 30
 - 31 to 45
 - 46 to 65
 - Over 65

Appendix 2. Ohio Survey

1. Are you an active (not retired) respiratory therapist?
 - Yes
 - No [TERMINATE]
2. Are you currently involved or have you ever been involved in any research activity?
 - I am currently involved in research activity
 - I have been involved in research activity, but am not currently
 - No [TERMINATE]

Question below is asked only of those who have previously been involved in research activity, but not currently.

3. Approximately, how long has it been since you have been involved in research activity?
 - Within the past year
 - 1 to 2 years
 - 3 to 5 years
 - Over 5 years
4. Approximately how many years in total have you been involved in research activity?
 - 1 to 5 years
 - 6 to 10 years
 - 11 to 15 years
 - 16 to 25 years
 - More than 25 years

Question below is asked only of those currently involved in research.

5. In a typical month, approximately what percentage of your time is dedicated to research activity?
 - Less than 10%
 - 10% to 25%
 - 26% to 50%
 - 51% to 75%
 - 76% to 99%
 - 100%
6. What role(s) have you played in research?*Select all that apply.*
 - Principal Investigator
 - Co-Investigator
 - Research Coordinator
 - Respiratory Therapist
 - PFT Technician
 - Other, please specify: _____
7. Do you feel you have the skills to obtain independent funding for research?

- Yes
- No
- I have no opportunity to seek independent funding

8. What source(s) of research funding have you ever or currently used? *Select all that apply per row.*

	I currently use this funding	I have used this funding in the past	I have never used this funding
NIH / Other Government			
Industry Sponsored			
Internal Funding			
Philanthropic			
Other Funding			

Ask only if selected used "Other Funding" currently or in the past.

9. Please specify what "other funding" you currently use or have previously used for research.

OPEN ENDED TEXT BOX

10. How many years of experience do you have as a respiratory therapist?
 - 1 to 5 years
 - 6 to 10 years
 - 11 to 15 years
 - 16 to 25 years
 - More than 25 years
11. In what state do you practice respiratory therapy?
 - STATE LIST
 - Outside of the United States'
 - Other US location or territory
12. What is your age?
 - Under 30
 - 31 to 45
 - 46 to 65
 - Over 65
13. In what setting(s) have you conducted research? *Select all that apply.*
 - Outpatient Clinic
 - Physician Office
 - Hospital Inpatient
 - PFT Lab
 - LTACH Rehab Facility
 - Homecare
 - Other, please specify: _____