Research capacity of respiratory therapists: A survey of views, opinions and barriers

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BACKGROUND: Evidence-based practice (EBP) is increasing in health care services. This means that respiratory therapists (RTs) should be effective consumers, users and producers of scientific research pertaining to respiratory therapy technology and respiratory physiology. However, little is known about RT opinions and attitudes toward research. Survey instruments to measure them are also uncommon.

OBJECTIVE: The present article presents the results of a survey of RTs regarding research attitudes including interest, self-perceived skill and barriers.

METHODS: A survey was developed in consultation with practicing RTs and education researchers. It was fielded in six academic hospitals in Toronto, Ontario. Surveys were completed and returned anonymously. Descriptive statistics and associations were examined. Subgroup differences were tested using ANOVA methods.

RESULTS: Surveys were completed by 112 RTs (response rate 26.9%). The majority (approximately 80%) of respondents agreed that respiratory therapy research is important, that research can advance the profession and that RTs are suited to performing respiratory therapy research. More than 70% were interested in performing research as long as barriers were eliminated. Among eight potential barriers, lack of time was ranked as the top barrier 59% of the time. Lack of interest in performing research was the least relevant barrier. RTs’ educational attainment was positively associated with willingness to perform research and belief in having the skills needed for research.

CONCLUSION: Many RTs want to conduct research. They would need substantial support, including increased research exposure during respiratory therapy training, more time and support from trained researchers.

Key Words: Evidence-based practice; Opinions; Research barriers; Research capacity; Respiratory therapist; Survey

Evidence-based practice (EBP) in health care settings has significantly increased. EBP is important because, in combination with experience and expertise, it is a tool that guides clinical decisions to provide the best care possible (1-3). With specialized fields advancing rapidly, scientific inquiry has become more relevant to ensuring that current and new treatment modalities are used appropriately. As the roles of the respiratory therapist (RT) and other allied health care professionals evolve, and the scope of practice increases, responsibility for establishing EBP increasingly lies with disciplinary clinicians. In fact, many experts assert that the future success of allied health professionals, including respiratory therapy, depends on EBP (4-7).

Despite knowing the benefits, using EBP and research findings is challenging for many, if not all, health professionals (2,8-15). These challenges involve the ability to process the tremendous amount of available information and use it in practice (8,10,12-14). At the same time, it appears imperative that clinicians not only become efficient at using research to support clinical decisions, but that they also develop the skills to contribute their knowledge to the medical realm by conducting their own research (3,4,5,7,16,17). Clinicians are in an ideal position to do this because they work intimately within their disciplines. For example, RTs assess the patient condition, make appropriate adjustments to mechanical ventilation, and monitor and reassess the patient’s response. Thus, through experiential knowledge, RTs are uniquely qualified to think critically and identify gaps within their own area of practice. Although many RTs and other allied health members become successful clinicians in academic teaching hospitals, it does not automatically mean that they are willing and able to engage in the scholarship of their own profession (17). In the years since EBP emerged, many scholars have presented findings on the opinions, experiences and barriers to research initiation, participation and implementation among allied health professionals (2,3,9-12,14,18-24). To date, there are no studies that have examined the perspectives of RTs.

The present article reports the attitudes about research held by RTs practicing at academic teaching hospitals in Toronto, Ontario. The study had two main objectives: first, to identify RTs’ views and opinions about general research, and respiratory therapy research in particular; and second, to identify RT-perceived barriers to conducting research.

METHODS

The St Michael’s Hospital (Toronto, Ontario) Research Ethics Board approved the study. An extensive literature search for RT-appropriate measurement surveys and opinion questionnaires was conducted.
PubMed, Medline, CINAHL and ProQuest Nursing and Allied Health databases were searched using the terms "respiratory therapist", "views", "attitudes", "opinions", "interest", "experience", "research" and "survey". The search did not find an instrument suitable for RTs; therefore, a paper-based survey was developed. The survey was pilot-tested for clarity and content with a small RT subgroup from one of the participating sites. The survey underwent minor revisions based on the feedback received and results from the pilot group were excluded from the final results. The survey had eight sections. Three sections had five-point Likert responses that ranged from 'strongly agree' to 'strongly disagree' or 'false' to 'very true'. One section included a forced-rank-order question in which respondents ranked a set of eight barriers. Another section asked respondents to select the best response from a list of five statements characterizing their belief about research when training to become an RT and the type of involvement they expected to have postlicensure. Finally, there were sections for demographic characteristics and open-ended comments. The demographic section did not request specification of practice areas and, thus, the results represent RTs in various roles within the academic centres.

The survey was distributed to all 416 RTs practicing in six University of Toronto-affiliated teaching hospitals (Toronto, Ontario). Distribution occurred via departmental mailboxes, handouts by departmental leaders or managers, or by leaving the survey in a common area used frequently by RTs. An initial contact e-mail message accompanied the survey distribution as a formal invitation and explanation of the project. A reminder e-mail was sent after one week. The responses were anonymous and collected using deposit boxes in the hospitals. The deposit boxes were retrieved two weeks after the reminder e-mail.

The survey broadly operationalized facets of RT research capacity and motivation using several question and response formats. The analysis was exploratory-descriptive, did not have classical test theory measurement objectives, and did not analyze validity and reliability of constructs. Responses were analyzed using SPSS (IBM Corporation, USA) in consultation with a statistician. Descriptive statistics and frequency tables were produced and associations were examined using cross-tabulations and the $\chi^2$ statistic. The Kruskal-Wallis ANOVA was used to test equality of group locations. Subgroup analyses were performed on educational attainment and years of work experience as an RT using the least significant difference post hoc test. The four education categories were: diploma; diploma plus advanced training (diploma+); diploma plus Bachelor's degree; and Master's degree. The five work experience categories were 0 to 5, 6 to 10, 11 to 15, 16 to 20 and >20 years. Alpha was set at 0.05 to declare associations and differences statistically significant.

**RESULTS**

Of 416 surveys, 112 were returned (response rate 26.9%). All (100%) respondents either strongly agreed (84.8%) or somewhat agreed (15.2%) with the statement 'Respiratory therapy research is important' (Figure 1). The majority of the respondents either strongly agreed (78.6%) or somewhat agreed (20.5%) that 'Respiratory therapy research is important.' 'Research plays an important role in advancing respiratory therapy as a profession' was answered 'strongly agree' by 56.8%, 'somewhat agree' by 39.6%, and

![Figure 1](image1.png)

**Figure 1** Respiratory therapist (RT) views about research

![Figure 2](image2.png)

**Figure 2** Respiratory therapist (RT) opinions regarding suitability of professions to investigate respiratory therapy topics. MD Medical doctor; RN Registered nurse

'these data is not available' by 3.6%. For the statement, 'Research plays an important role in my day-to-day practice as an RT,' the responses were 33.9% strongly agree, 45.5% somewhat agree, 17.0% neither agree nor disagree, and 3.6% somewhat disagree.

Three statements were used to identify RTs' opinions as to who they believe is best suited to conduct respiratory therapy research (Figure 2). The statement 'RTs are best suited to research respiratory therapy-related topics' was answered as strongly agree by 50.9% and somewhat agree by 39.3%. For 'RNs are best suited to investigate respiratory therapy-related topics', 52.7% strongly disagreed, 31.3% somewhat disagreed, and 12.5% neither agreed nor disagreed. The third statement was, 'MD and other scientists are best suited to investigate respiratory therapy-related topics'. These responses had some variability: 4.5% strongly agreed, 20.5% somewhat agreed, 25.0% neither agreed nor disagreed, 44.6% somewhat disagreed and 5.4% strongly disagreed.

To differentiate between who should perform respiratory therapy research and how RTs feel about their day-to-day practice, the statement, 'If I had dedicated time away from clinical responsibilities, I would be interested in pursuing a respiratory therapy research project' was believed to be true by 71.8% and somewhat true by 28.2%. Thirteen percent of respondents ranked 'interest' the least significant barrier (it had the largest mean $[M]=4.1$). Lack of interest was the least significant barrier (ie, it had the largest mean $[M]$=1.9), lack of incentive ($M=4.0$) and lack of skill ($M=4.1$). Lack of interest was the least significant barrier (it had the largest mean $[M]=5.8$). A large majority (71.8%) said that if barriers were eliminated they would be interested in pursuing a respiratory therapy research project and 17.3% said maybe (Table 2).

Cross-tabulations and the $\chi^2$ statistic were used to identify demographic characteristics associated with RT willingness and self-perceived ability to conduct research. Willingness was assessed by the statement 'If I had dedicated time away from clinical responsibilities, I would be willing to work on a research project.' The five-point response scale ranged from strongly disagree ($1$) to strongly agree ($5$). Educational attainment and willingness to work on a research project were
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TABLE 1
Frequency distribution of responses to respiratory therapists’ (RTs) opinion and attitude items

| Item                                                                 | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|----------------------------------------------------------------------|----------------|----------------|---------------------------|-------------------|------------------|
| I trust in the staff MDs to keep respiratory care practices in the ICU up-to-date and current | 9.8            | 42.0           | 17.9                      | 21.4              | 8.9              |
| There is a general lack of interest by the department’s RTs to do research | 1.8            | 18.8           | 25.9                      | 46.4              | 7.1              |
| Respiratory therapy research would not be valued by anyone else other than RTs themselves | 18.9           | 36.0           | 28.8                      | 15.3              | 0.9              |

Data presented as %. MD Medical doctor

TABLE 2
Frequency table of barrier ranks and frequency of responses for research interest

| Barrier                                                                 | Per cent ranking the barrier number | Sum | Mean rank |
|------------------------------------------------------------------------|-------------------------------------|-----|-----------|
| Lack of time and dedicated work hours                                 | 59.0 18.1 8.6 8.6 5.7 1.0 1.0 0.0 | 100.0 | 1.9       |
| Lack of incentive (monetary, other)                                    | 7.8 22.6 17.6 15.7 8.8 10.8 11.8 4.9 | 100.0 | 4.0       |
| Lack of skill and knowledge                                           | 5.8 21.4 18.4 14.6 10.7 12.6 12.6 3.9 | 100.0 | 4.1       |
| Lack of access to resources (guidance, networks)                      | 6.9 14.9 22.7 12.9 13.8 11.9 12.9 4.0 | 100.0 | 4.2       |
| Other personal commitments                                            | 12.7 14.7 11.8 16.6 10.8 11.8 9.8 11.8 | 100.0 | 4.3       |
| Lack of peer and colleague support                                     | 1.1 8.8 8.8 13.7 23.5 23.5 14.7 5.9 | 100.0 | 5.1       |
| Lack of recognition                                                    | 5.1 5.1 11.1 7.1 14.1 11.1 19.2 27.2 | 100.0 | 5.7       |
| Lack of interest                                                       | 9.9 2.0 5.9 8.9 8.9 14.9 12.9 36.6 | 100.0 | 5.8       |
| Other                                                                  | 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | 100.0 |           |

If barriers were eliminated, would you be interested in pursuing a respiratory therapy research project? Yes, Maybe, No

Data presented as % unless otherwise indicated

Figure 3) Willingness to work on a research project according to educational attainment. Diploma+ Diploma plus advanced training

Figure 4) Have the required skills to perform research according to educational attainment. Diploma+ Diploma plus advanced training

associated (P=0.009). RTs with more education were more willing to work on a research project (P=0.003) (Figure 3). RTs with a Bachelor’s degree had a higher mean (M=4.3) than diploma respondents (M=3.5) and the difference was statistically significant (P=0.001). RTs with a Master’s degree were more willing to conduct research (M=5.0) than those with a diploma (M=3.5; P=0.001).

The belief in having research skills (‘I have skills required to do research’) was also associated with educational attainment (P=0.006). RTs with Master’s and Bachelor’s degrees were more likely to believe they had research skills than those with a diploma (P=0.006) (Figure 4).

Willingness to learn skills required to do research (‘I want to learn the skills required to do research’) was associated with years of experience as an RT (Pearson $\chi^2$; P=0.048; Kruskal-Wallis $\chi^2$; P=0.01). Respondents with 11 to 15 years were more willing to learn than others (M=4.4; 0 to five M=4.0; six to 10 M=3.9; 16 to 20 M=4.2; >20 M=3.3).

Furthermore, in response to the statement ‘I want to be left to do my job, fulfill my clinical responsibilities and nothing else’, those with six to 10 (M=1.8) and 11 to 15 (M=1.8) years of experience expressed more disagreement (Pearson $\chi^2$; P<0.001; Kruskal-Wallis $\chi^2$; P=0.03) than those with 0 to five (M=2.0), 16 to 20 (M=2.4) and >20 (M=2.9) years of experience.

RTs were asked to share their expectations pertaining to research when they were training to become an RT by selecting one of five qualitative response options (Figure 5). ‘Research could be a part of the job if you were interested’ was selected by 47.6% of respondents. ‘Research was not part of the job and not discussed’ was selected by 27.6%. ‘Research was discussed as something people in other professions did’ was selected by 18.1%. ‘Research would be encouraged’ was selected by 3.8% and ‘Research would be an expected part of our job and duty’ was selected by 2.9%. The associations between these expectations and educational attainment (P=0.93) and years of experience (P=0.13) were not statistically significant.
DISCUSSION

Respiratory therapy practice has thrived on change and innovation. What was once a job that involved hauling tanks and titrating oxygen is now a skilled career in which professionals manage life support devices for critically ill patients. RTs now create recommendations for respiratory care plans and are valued members of the multidisciplinary team (4-6). They are bedside specialists who combine a technological understanding of machinery with an advanced knowledge of respiratory physiology and particular training to assess this interaction (4-6). It appears consistent that the group best suited to critically question and analyze respiratory therapy practice is the very group of people responsible for respiratory interventions. Without continuous critical assessment through research, any health profession could render itself obsolete (4). However, few RTs have time to perform the research that establishes EBP (17). Although many RTs are competent clinicians in academic hospitals, research barriers are numerous.

By participating in the present study, RTs in several academic hospital roles have established their opinions about research. The most relevant result is that RTs believe that research is generally important and that respiratory therapy research is particularly important. RTs also believe that research is necessary in their day-to-day practice and for advancing the profession. However, the level of agreement decreased the more specific the survey statements became about research in relation to respiratory therapy. For example, 84.8% of RTs strongly agreed that ‘Research is important’, while 78.6% strongly agreed that ‘Respiratory therapy research is important’. It is unclear why the strength of agreement decreased when respiratory therapy research was specified, or why RTs believe that respiratory therapy-related research is slightly less important. The level of agreement continues to decrease with each successive statement and suggests that there is a sense of uncertainty within the profession regarding the association between respiratory therapy and research. The reason for the progressive change in response is speculative without further investigation. Despite this observation, RTs believe that research is important. Had the opposite been true, a starting approach to respiratory therapy research would require a shift in motivation. This is not the case; RTs are motivated. Consequently, academic hospital leaders should be aware that RTs’ values with respect to research are similar to the organization’s values. Academic hospitals should support RTs who want to pursue research that is in accord with the institution’s mission.

RTs often facilitate other investigators’ research. However, to develop independent research capacity, RTs must display professional responsibility toward research within their area of practice (2-5,12,14,16,19,25). RTs expressed a sense of ownership over respiratory therapy research; they believed that RTs are best suited to conduct respiratory therapy research. RTs do not believe that registered nurses (RNs) are best equipped to investigate respiratory therapy topics. They disagree with the statement about RNs with the same frequency that they agreed with RTs’ suitability. In addition to the small percentage of respondents that disagreed with the statement that RTs are best suited to investigate respiratory therapy topics, there was a small percentage that believed that RNs are best suited to perform respiratory therapy research. It is unclear why they had this opinion. Perhaps they believe that RTs lack the time or skill. Few RTs have Master’s degrees and some respondents may perceive RTs to be academically unprepared for research. This also may reflect a belief that respiratory therapy research should be multidisciplinary. The role RTs believe RNs should or should not have in respiratory therapy research requires further investigation to fully comprehend the ensuing dynamic. It may relate to complex interprofessional relationships. It may also relate to how comparatively new respiratory therapy is as a discipline that has not secured as many academic avenues and research supports as nursing.

Although many RTs believed that physicians are best suited for respiratory therapy research, a near majority disagreed. This result further exemplifies RTs’ sense of professional responsibility and it provides a small glimpse of how health care is changing. With the evolution of specialties, such as respiratory therapy, these respondents believe that medical doctors (MDs) or scientists, despite having the skill to conduct research, are not necessarily best suited to research respiratory therapy topics. RTs are the end user of the technology or therapeutic modality. They work with the intricacies of the processes and procedures of patient care within their daily practice. They have clearly identified themselves as respiratory specialists and the candidates best suited to generate questions and add to the information base in this area of expertise.

Although RTs believe that they themselves should be asking questions and contributing to research, their views do not suggest a strong desire to perform it all themselves. Moreover, it does not imply that MDs and other scientists should not research respiratory therapy topics. When asked whether they ‘trust the staff MDs to keep respiratory care practices in the intensive care unit [ICU] up to date and current’ the majority of RTs agreed with the statement. Clearly, these respondents believe that MDs still play an important role in the process of establishing and implementing practice guidelines. At first glance, the responses to the statements about MDs conducting research on respiratory therapy topics (MDs are not best suited for it) and MDs updating intensive respiratory care practices (they are trusted to do so) appeared to be contradictory. However, this indecisiveness as to what role RTs believe the MDs should have in respiratory practice is more likely a reflection of the professional responsibility that RTs carry. As illustrated by the responses, there is a demarcation on what RTs believe the role of the RT should be as it pertains to research. They have distinguished themselves as having a role in generating knowledge more so than implementing practices.

We found that RTs do have a sense of self-worth in relation to research. The majority believed that respiratory therapy research would be valued by others. However, they also expressed apathy. One-half of the respondents perceived a general lack of interest among their department colleagues to conduct research. Although this is a rather negative opinion about their colleagues’ motivation for research, the perception may not match reality because, for example, lack of interest in research was self-ranked as the least significant barrier to research. Furthermore, nearly three-quarters said that they would be interested in conducting a research project related to respiratory therapy if barriers were eliminated.

Approximately one-quarter of RTs did not know whether their colleagues lacked interest in research and did not know whether respiratory therapy research would be valued by non-RTs. These figures are reasons for concern because they suggest that some RTs are substantially unaware of local norms in relation to research.

We are concerned by the results regarding RTs’ beliefs about research while training to become RTs. Very few respondents reported impressions that research was encouraged or that it was an expected part of the job. These impressions were consistent regardless of educational attainment and experience. For example, new RTs and those with 20 years of experience shared the same belief about research when training to become an RT. Similarly, regardless of educational attainment, research exposure, encouragement and support during training were uncommon. The belief about research when training to become an RT was the same.
Three main barriers to conducting research that RTs encounter in standard practice were identified: lack of time, lack of incentives and lack of skill. RTs are busy clinicians and the foundation of the profession remains at the bedside (17). For this reason, RTs need to have time available for research – whether it be dedicated hours away from bedside, higher RT-patient ratios or a supported research program. Other incentives, such as flexibility in hours and scheduling, could be alternatives to monetary offerings. Research requires advanced skills that exist in abundance in most academic hospitals. Lack of skill is a factor that employers, professional organizations and academic hospitals could jointly remediate by making resources available to RTs who do not have formal training necessary to conduct their own research. 

The study identified two associations with educational attainment: first, a willingness to work on a research project; and, second, a belief in having the skills necessary for research. Respondents with more education were more willing to conduct research and assert that they have the necessary skills. Willingness to learn the skills required to conduct research was greatest in the 11 to 15 years’ experience range. Groups with moderate experience (e.g., six to 15 years) were more willing to pursue activities in addition to clinical practice. It appears that these RTs have become proficient in their bedside responsibilities and wish to have a greater impact on the profession in which they have become so adept. Less experienced RTs were not as willing to conduct disciplinary research and are perhaps focused on developing their clinical bedside skills. The most experienced RTs (>16 years) were the least willing to learn research skills. Most clinicians in this group also do not want to take on additional duties outside of their clinical responsibilities. It is possible that this group lacks confidence to work in novel areas. For departments that want an active respiratory therapy research program, it may be helpful to recruit RTs with higher educational attainment and moderate levels of work experience.

The present study had some limitations. The obtained sample size was low and there may have been a response bias favouring research. RTs who completed the survey may have had stronger research interests than nonrespondents. Most respondents held a Bachelor’s degree, and the survey should be fielded at community hospitals to assess the generalizability of our results. The items in some scale sections should be analyzed with statistical methods to judge the data’s validity and reliability with a larger sample size and when formal measurement constructs are developed.

**CONCLUSION**

The broadest challenges to respiratory therapy research are the lack of systematic exposure to research during respiratory therapy training. If RTs intend to conduct research, respiratory therapy curricula should be modified to convey research as a valuable activity. This will help foster a culture of inquiry through which new graduates, regardless of whether from an academic centre, can enter the profession with a view on research as an expectation rather than simply an afterthought.

Administrative leaders of academic centres should acknowledge that their bedside clinicians share similar organizational values. With this knowledge, resources can be allocated to eliminate barriers and support the willingness and urgency of RTs to conduct research. RTs could then perform at a level that is expected of them and which they desire.

**AUTHORSHIP:** CM conceived the research idea and its design, acquired and analyzed the data, wrote the first draft of the manuscript and contributed to revisions. CK contributed to research design, data analysis and results interpretation, and revised the first draft of the manuscript for important intellectual content.

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