

Profile of Evidence-Based Practice Among Respiratory Therapists in Taiwan

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BACKGROUND: Evidence-based practice (EBP) has been proposed as a core competence to improve healthcare quality. The profile of EBP among respiratory therapists (RTs) has not been explored. We investigated how RTs in Taiwan perceive the implementation of EBP. **METHODS:** We surveyed RTs in Taiwan's regional hospitals during a 4-month period in 2011. **RESULTS:** A majority of RTs were aware of EBP (88.0%). Although most RTs held a favorable impression of EBP, their knowledge of and skill in EBP implementation were deficient. Only half of the RTs had implemented EBP. Insufficient convenient kits (59.1%), deficient designated personnel (50.0%), and lack of time (45.5%) were major barriers to implementing EBP. RTs rated MEDLINE as the most commonly used evidence-based retrieval database, followed by UpToDate, the Cochrane Library, MD Consult, ProQuest, CINAHL, DynaMed, and Micromedex. Multivariate regression analyses demonstrated sufficient skill in EBP and use of online databases as favorable factors for implementing EBP. In contrast, barriers of time constraint and insufficient knowledge were unfavorable factors for the implementation of EBP. **CONCLUSIONS:** EBP is not widespread among RTs in Taiwan. We have identified important factors in the implementation of EBP. The data provide valuable evidence for plotting strategies for disseminating EBP implementation. *Key words:* evidence-based practice; respiratory therapist; online database. [Respir Care 2014;59(2):281–287. © 2014 Daedalus Enterprises]

Introduction

Evidence-based practice (EBP) means clinical practice that is consistent with the current best evidence. EBP integrates clinical epidemiology, biostatistics, research meth-

ods, and informatics into healthcare.^{1,2} The process of EBP mainly involves 4 steps: framing a clear question based on a clinical problem; finding relevant evidence in the literature; critically appraising the validity of the research; and applying the findings to clinical decision-making.³

Respiratory care is increasingly utilized, with the associated respiratory therapists (RTs) playing an important role in supporting related clinical services.⁴⁻⁷ EBP has been

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proposed as a useful means to improve healthcare outcomes for RTs.⁸⁻¹¹ Therefore it is essential to assess how RTs implement EBP in clinical decision-making. A number of studies have illustrated that, although a majority of medical, nursing, pharmacologic, and allied health professions hold positive attitudes toward EBP, their knowledge and skill pertaining to EBP implementation are relatively insufficient.¹²⁻¹⁸ Whether or not RTs practice with evidence, and, if so, how, has been unclear.¹⁹

RTs have to deal with a broad range of medical problems in clinical practice.²⁰ RTs play an important role in the prevention and management of respiratory diseases.²¹ Timely acquired relevant information is important for their clinical practice. Access to evidence-based information can help facilitate effective management. Therefore, how to obtain current evidence-based knowledge is a critical skill. Nevertheless, only a few studies surveyed the behavior of RTs in searching for evidence-based information.

We surveyed RTs in Taiwan regarding their awareness of EBP related to beliefs, attitudes, knowledge, skills, and implementation.

Methods

The ethical review board of the Taiwan National Health Research Institutes approved the study protocol. The survey was accompanied by an introductory letter stating the purpose of this study and promising confidentiality. Return of the completed questionnaire was considered consent for participation.

Design

A structured questionnaire was developed by the Taiwan National Health Research Institutes, using questions based on our previously reported questionnaires.^{13,22} This study was conducted in the 4-month period January through April 2011.

Subjects

We targeted RTs working in Taiwan's regional hospitals. A regional hospital is defined as a secondary-care hospital, as appraised by Taiwan's Joint Commission of Hospital Accreditation. We used cluster sampling: the regional hospitals were divided into 4 clusters (northern, western, eastern, and southern Taiwan), and a random sample of each cluster was selected. Since there are more hospitals in northern and western Taiwan, we selected more hospitals in these areas. We randomly selected 11 of the 65 regional hospitals in Taiwan: 3 in northern Taiwan, 4 in western Taiwan, and 2 each in eastern and southern Taiwan. The questionnaires were distributed by mail to all RTs at the selected hospitals.

QUICK LOOK

Current knowledge

Evidence-based medicine drives clinical practice, is a core competency of all members of the health care team, and improves outcomes.

What this paper contributes to our knowledge

Among respiratory therapists in Taiwan this survey found deficiencies in the knowledge and skill to implement evidence-based practice. The major barriers were lack of time, insufficient materials, and lack of personnel tasked with implementation.

Questionnaire

The survey used a 5-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree) for the following questions:

1. Awareness: Have you heard of evidence-based practice (EBP) or related terms, such as evidence-based medicine, evidence-based nursing or evidence-based health-care?
2. Belief: Do you believe EBP is important for the improvement of patient care quality?
3. Attitude: Are you willing to support the promotion of EBP implementation?
4. Knowledge: Do you have sufficient knowledge to implement EBP principles?
5. Skill: Do you possess enough skill to implement EBP principles?
6. Implementation: Have you searched relevant evidence from the literature to solve your clinical question, and then applied the findings into clinical decision-making after critical appraisal in the past year?

The survey also requested sex, age, faculty position, administrative position, work experience, and academic degree.

The survey used a 5-point Likert scale (always, often, sometimes, seldom, and never) to ask which of the following 8 resources the RTs use to search for professional information: web portals (eg, Google, Yahoo), electronic textbooks, online databases, electronic journals, printed journals, colleague consultations, textbooks, and continuing education (such as conferences).

The survey also asked about the respondents' use of 8 online databases: the Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Library, MD Consult, MEDLINE, ProQuest, UpToDate, Micro-medex, and DynaMed. These 8 databases were selected because of their popularity. MEDLINE is freely accessi-

ble, while the other databases require payment from individuals or their organizations. Since 2007 the Taiwan National Health Research Institutes has provided free access to the Cochrane Library for enrolled regional hospitals.

Validity and Reliability

Content validity was examined by 10 experts, each with more than 15 years of clinical experience. The internal consistency of all the indexes was estimated with the Cronbach alpha coefficient. In this survey the content validity index was 0.96 and the Cronbach alpha coefficient was 0.88, which indicate sufficient validity and reliability of the parameters in the questionnaire.

Statistical Analyses

The 5-point Likert scale was dichotomized for further analyses. A self-rating report of either strongly agree or agree was regarded as a favorable answer and the other 3 (neutral, disagree, and strongly disagree) were viewed as unfavorable answers. Similarly, a self-rating report of either always or often was regarded as a favorable answer and the other 3 (sometimes, seldom, and never) were viewed as unfavorable answers. Analyses were conducted with statistics software (SPSS 12.0, SPSS, Chicago, Illinois). Categorical variables were analyzed using the chi-square or Fisher exact test. Significance was defined as $P < .05$.

Results

A total of 86 questionnaires were distributed to RTs, and 50 returned surveys were valid for analysis (valid return rate 58.1%, Table 1). The average age and working period were 32.8 years \pm 6.0 years and 4.8 years \pm 4.7 years, respectively. Three RTs had a master’s degree (6.0%), while 34 had a bachelor’s degree (68.0%), 10 had a degree from a junior college (20.0%), and the rest had a degree from a technical school (6.0%). Furthermore, 13 RTs were faculty members (26.0%) and 5 were directors (10.0%).

Awareness, Beliefs, Attitudes, Knowledge, Skills, and Training Related to EBP

Forty-four RTs (88.0%) were aware of EBP. Their belief in, attitude toward, knowledge of, and skill in EBP are shown in Figure 1. Thirty-eight RTs believed that EBP is important for the improvement of patient-care quality (86.4%). In addition, 27 RTs stated that they were willing to support the implementation of EBP (61.4%). However, their knowledge of implementing EBP principles (29.5%)

Table 1. Demographics of the 50 Respondent Respiratory Therapists

	No.	%
Male	5	10
Female	45	90
Age range, y		
20–30	16	32
31–40	28	56
41–50	6	12
Work experience range, y		
< 5	31	62
5–10	15	30
> 10	4	8
Academic degree		
Technical school	3	6
Junior college	10	20
Bachelor’s	34	68
Master’s	3	6
Faculty member, %		
Yes	13	26
No	37	74
Director, %		
Yes	5	10
No	45	90

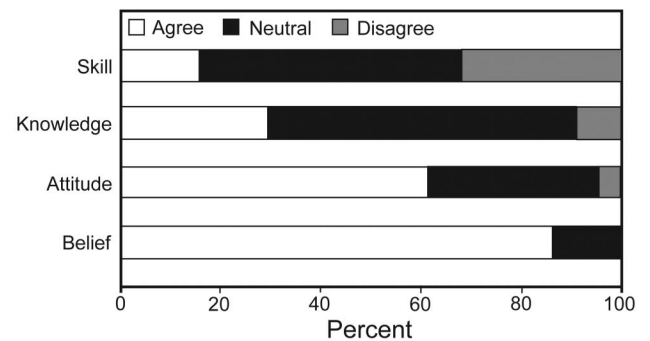


Fig. 1. Belief in, attitude toward, knowledge of, and skill in evidence-based practice among 44 respiratory therapists in regional hospitals in Taiwan.

and skill in implementing EBP principles (15.9%) were relatively insufficient. Of the 44 RTs who were aware of EBP, 11 RTs (25.0%) had participated in a training course for EBP implementation.

Barriers to Implementing EBP

The barriers to implementing EBP are illustrated in Figure 2. The most common barrier was insufficient convenient kits (such as personal digital assistants, software, sketches, diagrams, fly sheets, manuals, guidebooks, molds, and brochures) (59.1%). Common barriers included deficient capable designated personnel (50.0%), time constraints (45.5%), deficient skill in critical appraisal

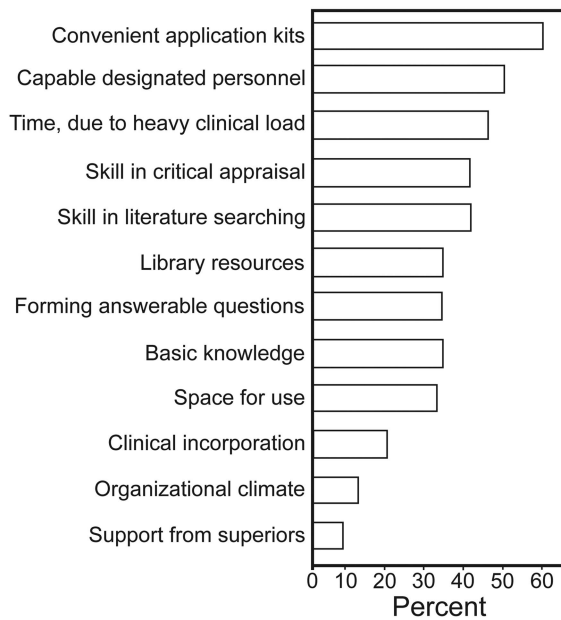


Fig. 2. Perceived barriers to the implementation of evidence-based practice.

(40.9%), deficient skill in literature searching (40.9%), insufficient library resources (34.1%), difficulty in forming answerable questions (34.1%), deficient basic knowledge (34.1%), deficient space for use (31.8%), lack of incorporation with clinical practice (20.5%), lack of organizational climate (13.6%), and lack of support from superiors (9.1%).

Implementation of EBP

Among the 44 RTs who were aware of EBP, 25 reported that they had implemented EBP in the past year (56.8%), including 2 RTs who had implemented EBP daily (4.6%), 1 weekly (2.3%), 4 monthly (9.1%), 9 quarterly (20.5%), and 9 yearly (20.5%). The remaining 19 RTs had not implemented EBP for clinical decision-making in the past year (43.2%).

Search for Evidence-Based Information

The 50 RTs' information-searching behavior is shown in Figure 3. Of the 8 resources, RTs most often searched for professional information via Web portals (84.0%), followed by colleague consultations (72.0%), continuing education (66.0%), evidence-based retrieval databases (58.0%), textbooks (56.0%), electronic journals (46.0%), electronic books (28.0%), and printed journals (22.0%).

The frequency of access to 8 commonly used online evidence-based retrieval databases is given in Figure 4.

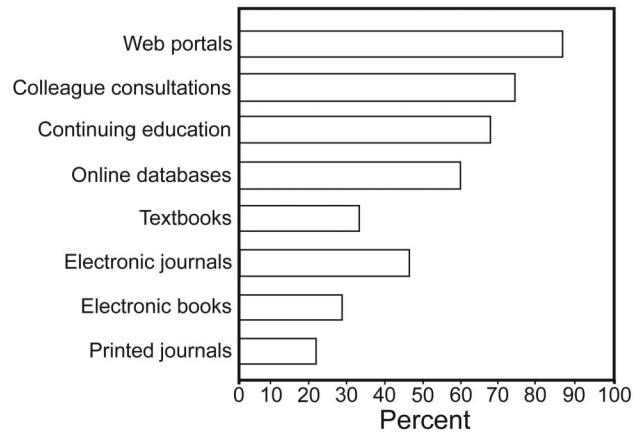


Fig. 3. Behavior of searching for professional information.

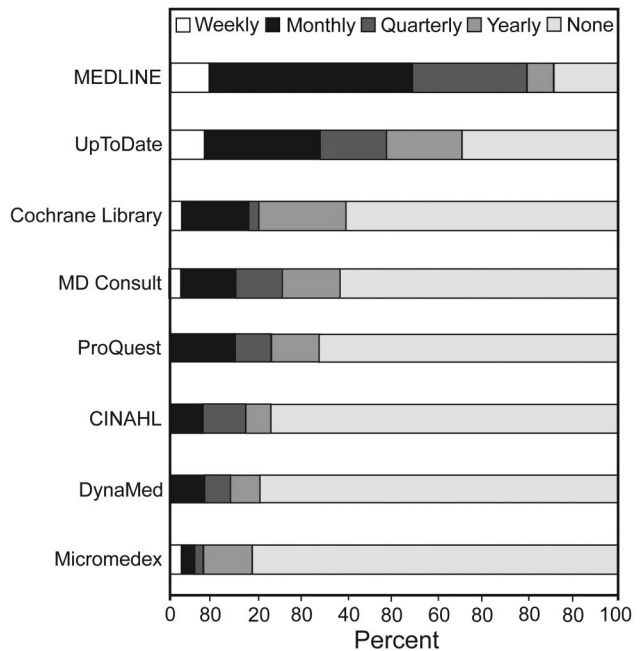


Fig. 4. Frequency of access to 8 commonly used online evidence-based retrieval databases.

The most commonly used database was MEDLINE, followed by UpToDate, the Cochrane Library, MD Consult, ProQuest, CINAHL, DynaMed, and Micromedex.

Among the 44 RTs who were aware of EBP, 29 had accessed online evidence-based retrieval databases. Their motivations for accessing such databases are shown in Table 2. The most common motivation was self-learning (100%), followed by clinical practice (89.7%), class assignment (72.4%), positional promotion (62.1%), instruction preparation (48.3%), research (37.9%), medical accreditation (31.0%), and insurance issue (6.9%).

Table 2. Motivations for Accessing the Evidence-Based Retrieval Database Among Taiwanese Respiratory Therapists

Rank	Motivation	No.	%
1	Self-learning	29	100
2	Clinical practice	26	89.7
3	Class assignment	21	72.4
4	Positional promotion	18	62.1
5	Instruction preparation	14	48.3
6	Research	11	37.9
7	Medical accreditation	9	31.0
8	Insurance issue	2	6.9

Factors Associated With EBP Implementation

Factors in relation to the implementation of EBP are shown in Table 3. Compared with RTs without EBP implementation in clinical practice, RTs with EBP implementation were more likely to have sufficient skill in EBP ($P = .01$) and more often have accessed relevant online evidence-based retrieval databases ($P = .046$). In addition, RTs who listed time constraint ($P = .040$) and lack of basic knowledge ($P = .02$) as barriers were less likely to implement EBP than those who did not perceive these barriers. The behavior of information searching and demographic characteristics, including sex, position, working experience, age, and academic degree, carried no significant difference.

Discussion

A majority of Taiwanese RT survey respondents had a favorable perception of EBP. However, their knowledge of EBP and skill pertaining to implementing it in clinical decision-making were relatively insufficient. The findings are in accordance with reports about physicians, nurses, and the other allied health professionals.¹²⁻¹⁸ To our knowledge, this study is the first to explore the EBP profile of registered RTs.

There have been numerous efforts to determine the barriers to implementing EBP.^{13,23} Our results indicate that RTs encounter a number of impedances. Overall, lack of convenient kits and insufficient numbers of capable designated personnel were the most common barriers. Unlike medical centers, most regional hospitals are understaffed because of budget restraints. Since EBP is to a large extent a working framework, RTs need to find help from designated staff to overcome obstacles. Like the other health professionals, RTs lack sufficient time to search information in a pile of textbooks or journals. Thus, they require useful information that they can acquire at their own convenience. With the help of application kits and capable designated personnel, they could save time and overcome

Table 3. Factors Related to Implementation of Evidence-Based Practice

	Yes (n = 25)	No (n = 19)	P
Belief	22 (88.0)	16 (84.2)	> .99
Attitude	17 (68.0)	10 (52.6)	.30
Knowledge	8 (32.0)	5 (26.3)	.68
Skill	7 (28.0)	0 (0.0)	.01
Training	9 (36.0)	2 (10.5)	.08
Barrier/difficulty			
Convenient application kits	16 (64.0)	10 (52.6)	.45
Capable designated personnel	13 (52.0)	9 (47.4)	.76
Time, due to heavy clinical load	8 (32.0)	12 (63.2)	.040
Skill in critical appraisal	8 (32.0)	10 (52.6)	.17
Skill in literature searching	8 (32.0)	10 (52.6)	.17
Library resources	7 (28.0)	8 (42.1)	.33
Forming answerable questions	6 (24.0)	9 (47.4)	.11
Basic knowledge	5 (20.0)	10 (52.6)	.02
Space for use	8 (32.0)	6 (31.6)	.98
Clinical incorporation	3 (12.0)	6 (31.6)	.14
Organizational climate	5 (20.0)	1 (5.3)	.21
Support from superiors	3 (12.0)	1 (5.3)	.62
Information searching			
Skill in literature searching	22 (88.0)	10 (52.6)	.009
Resource of information			
Web portals	22 (88.0)	15 (78.9)	.44
Colleague consultations	18 (72.0)	13 (68.4)	.80
Continuing education	19 (76.0)	11 (57.9)	.20
Online databases	18 (72.0)	8 (42.1)	.046
Textbooks	12 (48.0)	11 (57.9)	.52
Electronic journals	13 (52.0)	7 (36.8)	.32
Electronic books	6 (24.0)	6 (31.6)	.58
Printed journals	4 (16.0)	5 (26.3)	.47
Demographic characteristics			
Female	24 (96.0)	17 (89.5)	.57
Director	4 (16.0)	4 (5.3)	.37
Faculty	8 (32.0)	5 (26.3)	.68
Work experience range, y			.98
< 5	14 (56.0)	11 (57.9)	
5-10	9 (36.0)	6 (31.6)	
> 10	2 (8.0)	2 (10.5)	
Age range, y			.40
20-30	6 (24.0)	8 (42.1)	
31-40	17 (68.0)	9 (47.4)	
41-50	2 (8.0)	2 (10.5)	
Academic degree			.67
Technical school	2 (8.0)	1 (5.3)	
Junior college	3 (12.0)	5 (26.2)	
Bachelor's	18 (72.0)	12 (63.2)	
Master's	2 (8.0)	1 (5.3)	

Values are number (%).

the constraints of insufficient knowledge and skill. In addition, RTs rated insufficient knowledge and skill as significant barriers to the practice with evidence. Only a

minority of RTs had received EBP-related training. These findings can provide information for policymakers to plot strategies to disseminate the implementation of EBP for RTs. For example, education to enhance RTs' knowledge of EBP and their skill in its implementation may be helpful.

Our study has verified several factors in relation to the implementation of EBP. First, self-efficacy in the skill of EBP is the primary influence on its implementation. The finding is similar to previous reports indicating that health professionals who often implemented EBP had more sufficient skill.²⁴⁻²⁷ Second, lacking knowledge and time serve as 2 negative predictors. Taken together, our data support the importance of providing training courses to facilitate the implementation of EBP. The data concur with other available studies showing that teaching programs can change the behavior of EBP implementation.^{3,28}

The respondent RTs use a wide variety of approaches to look for professional information. We found that Web portals were the most popular resource, possibly because access to Web portals is instantaneous. However, information found via Web portals is not always accurate. On the other hand, online databases can offer evidence-based and summarized recommendations for clinical services to facilitate the integration of evidence into practice.²⁹ A high proportion of the respondent RTs used online databases for self-learning and clinical service. They accessed MEDLINE the most, which is not surprising because it provides more information than the other databases. Our study is the first to identify the patterns of RTs' preferences in information searching. The data can help refine strategies to promote the accessing of evidence-based information.

When compared with physicians in Taiwan,¹³ the knowledge and skills of EBP among Taiwanese RTs is relatively low. The likely explanation is that physicians have been persuaded to follow EBP longer than RTs have. In Taiwan the respiratory therapy profession is still in the developing stage. In the past, RTs relied mainly on clear direction from physicians rather than their own decision-making. The regulatory standards for clinical practice and the process for attaining credentials were not well established until recently.

There are limitations to our study. First, this was a self-administered survey: not an audit of actual practice. The results may not reflect the realities of practice under routine clinical care. Second, the survey-return rate was only 58.1%, though that rate is similar to other RTs surveys in Taiwan on different subjects.³⁰ To optimize the response rate we used a cluster sampling, which improves response rate, compared to random sampling.³¹ Third, our sample size was small. Nevertheless, our study is the pioneer in evaluating the EBP profile of RTs. Despite these limitations, our survey presents several potentially useful findings. Our study differs from previous ones

on information-searching patterns, in that we examined the EBP-related behaviors in the context of clinical decision-making.

Conclusions

This cross-sectional survey provides baseline data about the perceptions of EBP among registered RTs in regional hospitals in Taiwan. Although RTs recognize the value of EBP, few have acquired the ability to implement its principles. Thus, RTs in Taiwan are not ready for EBP, because of insufficient knowledge and skills. The findings have important implication for educational and clinical issues to disseminate the EBP implementation into RTs. We suggest that RTs in the regional hospitals of Taiwan require more EBP-related training courses to improve their knowledge and skills.

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