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Attitudes, Practice and Educational Preferences Towards Evidence-Based Medicine among Physicians in a Large Teaching Hospital

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Abstract - Evidence-based medicine (EBM) is an emerging must-know topic for today's physicians. The present literature is inadequate in identifying the attitudes, practice, and educational needs and preferred interventions of EBM. The objectives of this survey were to identify a) the attitude toward and practice of EBM among physicians, b) perceived benefits of EBM in daily practice, c) barriers to EBM practice, and d) preferred educational interventions.
Methods: This was a questionnaire-based cross-sectional survey of physicians in a single large teaching hospital.
Results: Overall, 56% of the physician respondents described the attitude towards EBM in their institution as positive. A similar number of physicians also reported the attitude of their colleagues towards EBM as favourable. 67% of the physicians believed EBM was useful in daily management of patients. In contrast, only 45% of the physicians actually practiced EBM in their daily patient management. The factors that discouraged them from actual practice include a lack of time, lack of exposure to EBM during their undergraduate curriculum, lack of endorsement, and fear of criticism by seniors. Physicians preferred less time consuming and less rigorous educational interventions such as clinical practice guidelines, journal club, and case review and discussion for teaching and learning EBM.
Interpretation: There are disconnects between belief and actual practice and between preferred and ideal educational interventions of EBM among physicians surveyed.

Keywords: Evidence-Based Medicine, Faculty's Perception, Singapore

Evidence-based medicine (EBM) is a new and emerging area of expertise that all physicians are increasingly required to acquire in order to remain relevant in the contemporary practice environment. [1, 2] Formal introduction of EBM in medical school curricula is a relatively recent phenomenon, [3] and many practising physicians of today did not have formal training in EBM during their medical school years. [4] Therefore, for the vast majority of physicians the primary method of building up the requisite expertise in EBM depends on educational activities carried out during practice years.

Evidence for the effectiveness of educational interventions during practice years is unsatisfactory. In a critical appraisal of the literature, it was concluded that the effect of EBM-related educational interventions in improving knowledge among physicians is relatively insignificant. [5] Several studies shed some light on this apparent lack of effectiveness of educational interventions. Physicians might not believe EBM improves patient-related outcomes and hence might be unmotivated to learn and practice. [6] There might be unrecognised barriers operating in their milieu that prohibit physicians from practising EBM.[7, 8] Finally, the educational interventions that are generally adopted to teach EBM might not be the ones preferred by the physicians. This may further influence their learning negatively, as we know that physicians, as adult learners, need different educational approaches and interventions for their learning. [9, 10]

We, under the umbrella of the Evidence-Based Medicine Committee of National University Hospital (NUH), undertook an exploratory survey among the physicians to test these hypotheses. The specific objectives of the study were to determine: a) the attitude towards and practice of EBM among physicians, b) perceived benefits of EBM in daily practice, c) barriers to EBM practice, and d) preferred educational interventions. The term 'attitude', as used in this context, denotes perception and belief among the respondents. The notion is similar to other studies in

EBM published before. [7,11,12]

We hope to better understand the relationship between attitudes and beliefs towards EBM and its actual practice and to identify participants' educational preferences for learning EBM. Our situation is not unique; many other teaching hospitals would find similarities to our contexts and, hopefully, benefit from the survey findings.

Methods

Contexts - The survey was conducted in NUH, a large tertiary care teaching hospital affiliated with the National University of Singapore (NUS). The NUH EBM Committee is in charge of spearheading EBM-related educational activities among the physicians. The Committee conducts workshops, symposia, seminars, and an annual conference. It publishes web- and print-based educational materials and occasionally conducts Critically Appraised Topics (CAT) contests. For many physicians in the hospitals, these could be their first formal exposure to organised educational activities that specifically target EBM.

Study participants - We conducted the survey among all grades of physicians at NUH. In our context, house officers are junior doctors immediately after their graduation year and equivalent to the Pre-Registration House Officers (PHRO) or Interns. Medical officers are junior doctors who follow the house officer year. Fellow denotes overseas-trained physicians on temporary training attachment.

Instrument development - We developed a custom-designed survey instrument. We identified the key items from the published literature on EBM. [11, 12, 13] We also conducted in-depth interviews with a selected number of target participants to identify additional issues that were worth including. After an internal review, we pilot-tested the draft for further refinement and improvement of clarity. We have taken a judgmental approach for establishing the instruments' validity by combining issues identified through published literature,[11,12,13] in-depth interviews, and our own experience as practioners of evidence-based medicine in our context.

The final questionnaire had four sections: a) attitude and belief, b) practice of EBM, c) educational needs, and d) personal particulars. For most of the items, we used a five-point Likert scale ranging from, for example, extremely welcoming to extremely unwelcoming. We categorised 'extremely welcoming' and 'welcoming' or similar responses as representing a favourable or positive attitude, and 'unwelcoming' and 'extremely unwelcoming' or similar responses as an unfavourable or negative attitude. For selected items, respondents chose the top 3 issues (e.g., the top 3 obstacles in practising EBM).

The survey instrument also contained a statement of purpose and confidentiality and a section for open-ended response. Consent was assumed by completion of the survey.

The questionnaire contained two pre-designed items addressing similar themes (lack of time and additional burden on busy schedule) to determine the internal consistency of responses.

Survey administration, data collection, and analysis - We carried out the survey from October 2003 to December 2003 in a single round. A printed copy of the survey instrument was given to all practising NUH physicians in an anonymous fashion. We used machine-readable Optical Mark Reading (OMR) technology, with built-in quality control mechanism, to capture survey responses. We calculated the response rates and proportions using descriptive statistics.

Results

Demographics - The total number of respondents was 348 (51.5%). The breakdown of respondents by their level of grades and specialties is shown in Table 1 in the Appendix. No definite pattern emerges from the response rate. 54% of respondents did not participate in EBM-related educational activities beyond attending the occasional lectures. The rest (46%) participated in EBM-related educational activities such as workshops, seminars, and conferences. 64% of respondents were of senior grades (registrar, associate consultant, consultant and senior consultant). The remaining respondents (36%) were of junior grades (house officers, medical officers, and fellows).

Attitudes and beliefs - The overall participants' response towards EBM was positive. 56% of respondents described the attitude towards EBM in NUH as welcoming. Only 6% of respondents believed that the attitude towards EBM in NUH was unwelcoming. Similarly, 56% of the respondents believed that the attitude of their colleagues towards EBM was favourable, and only 7% of respondents described their colleagues' attitude towards EBM as unfavourable. The findings were consistent across all grades of physicians.

Participants believed in the usefulness of EBM in the daily management of patients. 67% of respondents

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reported that research findings were useful in the daily management of their patients, whereas only 7% believed that research findings were of little value. Similarly, 75% of the respondents believed EBM improves patient care; conversely, 7% respondents did not believe EBM improves patient care. In contrast to other groups of physicians, 33% of the house officers believed research findings were useful in daily management of their patients.

When the respondents were asked what proportion of their daily practice was actually evidence-based, the response was less salutary. Overall, 45% reported that a high proportion of their current practice was evidence-based, compared to 15% who reported that only a small proportion of their current practice was evidence-based. These data, summarized in Table 2 in the Appendix, indicate that there is a dissociation between participants' beliefs and actual practice.

Barriers to practice - Despite their overall positive outlook toward EBM in the home institution, 61% of respondents reported that they faced obstacles while practising EBM. In our instrument development phase, we identified 6 important perceived obstacles to EBM practice. They were a) lack of endorsement or fear of criticism by senior staff, b) lack of time, c) lack of computer access, d) lack of library access, e) lack of emphasis on EBM in undergraduate curriculum, and f) insufficient reward and recognition to practice EBM. In the survey, respondents were asked to choose the top 3 obstacles. The top 3 perceived obstacles, in descending order, were a) lack of time, b) lack of emphasis on EBM in undergraduate curriculum, and c) lack of endorsement or fear of criticism by senior staff. Of these, lack of time was identified as one of the top 3 obstacles by 55% of the respondents. In answering a similar question 53% of respondents believed that practice of EBM placed further workload on their schedule. These two responses, designed a priori to be somewhat redundant, provide some evidence of corroborated in part about the consistency and reliability of participants' responses.

The free-text portion of the survey instrument generated useful remarks. These can be organised into 3 major themes: a) lack of clear evidence for many patient/clinical scenarios, b) lack of general acceptance of EBM, and c) difficulty in accessing information quickly and in an efficient manner. Some of the comments highlighted the perceived barriers coherently: 'lack of institutional framework/ approach to EBM in daily work practice', 'resistance to change', '"other institutions do this" attitudes', 'requires a resource which is easily available and able to give EBM summaries', and 'lack of peer review'.

Educational Preferences - The questions on EBM-related educational preferences were focused on 3 areas: a) information gap, b) preferred activities for teaching and learning EBM, and c) EBM-related educational activities that individuals actually carry out in their clinical practice.

Overall, 37% of the respondents reported that they frequently or very frequently encountered an information gap during their clinical practice, whereas 17% indicated that they did not encounter an information gap. Almost 48% of respondents reported that they searched for journal articles when they encountered clinical problems. The pattern of response was similar across all groups (Table 3 in the Appendix).

Use of statistical analysis during clinical practice, however, was limited to only a handful of respondents. Overall, only 28% respondents regularly used statistical analysis in evaluating data. House officers used statistics rarely.

We asked respondents to choose the top 3 educational activities that they would find most useful for teaching and learning EBM. In the instrument development phase, we identified 6 categories of educational activities that were relevant and applicable to target participants. These were a) lecture, b) journal club, c) small group session, d) case review and discussion, e) workshops, and f) clinical practice guidelines. The top 3 preferred educational activities chosen by the respondents were, in descending order, clinical practice guidelines, journal club, and case review and discussion.

Our next question was to determine the most frequent activities that respondent carried out in their clinical practice when there was a need for information. The majority of respondents (56%) reported that they searched PubMed. This was followed by 'consult senior colleagues' (11%), 'read pre-appraised article' (8%), 'use Google™ or similar search engine' (7%) 'read journals' (6%), and 'refer to textbook' (4%).

Discussion

Major Findings - Our study highlights several important points. Generally, there was a positive atmosphere towards EBM in the institution and physicians believed EBM was useful. Lack of endorsement by peers or doubts about the effectiveness of EBM did not seem to be a major de-motivating factor among respondents. Despite these positive and encouraging findings, fewer physicians actually reported practicing EBM.

One aspect of this disconnect between belief and

practice is the perceived barrier(s) to the carrying out of EBM. Lack of time was one of the major barriers to EBM teaching and learning in our survey. This finding is similar to that of other studies. [7, 14] Lack of emphasis on EBM in previous undergraduate curricula was also cited as a major barrier. Most physicians in this era did not have the benefit of EBM in the undergraduate curriculum; hence, lack of familiarity with EBM might act as a de-motivating factor to practice. However, there are physicians who managed to overcome these barriers and reported practicing EBM. It could be postulated that overcoming the barrier requires reprioritising EBM over other activities and positioning EBM as a core component of one's daily practice.

The top 3 preferred educational activities in this group were clinical practice guidelines, journal club, and case review and discussion. The respondent preferred these to workshops and small group sessions. We may speculate on several plausible explanations: the cited preferred educational activities are less time consuming (e.g., consulting a clinical practice guideline), do not require performing the critical appraisal exercise, are familiar to respondents (e.g., journal club), and relevant to clinical cases (e.g., case review and discussion). Other possible reasons include lack of familiarity with EBM tools and the critical appraisal process. Several other studies among EBM-practicing physicians and nurses also documented comparable results.[7, 10, 1, 13, 15] Participants' general preference for less demanding educational activities, once again, highlights the fact that the true spirit of EBM needs to be inculcated genuinely in our value system. Teaching and learning of EBM needs substantial efforts. Participants' preferred educational activities, although less time-consuming and less rigorous, might not be as effective as more strenuous and intellectually demanding educational activities such as workshops and critical appraisal of literature. EBM has become an archetype response to questions about the basis of medical practice, but reprioritisation of EBM as the core of clinical practice requires a substantial effort in which many practicing doctors may not be willing to invest.

Limitations and Strengths of the Study - This is a self-reported study of perceptions, beliefs, perceived benefits and barriers. As with other similar surveys, the statements in the survey are prone to varied interpretations. The response rate was a modest 51.5%. As this was an anonymous survey, we could not compare detailed demographics such as educational level, and country of graduation between the respondents and non-respondents, and response bias can not be discounted. A significant proportion of the respondents chose the "neutral" response, perhaps related to their tendency towards taking a neutral stance.

We believe there are several strengths of the study that are worthy of note. We adopted a systematic approach to instrument development including literature review, focus group, and pilot testing. The current situation with regards to teaching, learning, and practice of EBM in our hospital and in its affiliated medical school is somewhat similar to many other medical schools, so the data from the survey might be applicable to other institutions.

Our study offers a snapshot of EBM-related attitudes, educational preferences, and practice of EBM among NUH physicians. While such surveys provide useful information, the relationship between genuine attitude and belief and real outcome requires further evaluation.

Application of the Study Findings - Based on this survey, we have revamped our EBM-related educational activities. We are providing more mixed-learning opportunities to practicing physicians. We are in the process of acquiring more internet- and computer-based EBM tools. We have a plan to evaluate patient-related outcomes after implementation of EBM-related educational activities.

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Table 1: Breakdown of respondents by Specialty and Grades (number of respondents vs. total possible)

	Fellow			House Officer			Medical/ Dental Officer			Registrar			Associate Consultant			Consultant & Above			Un-known	Total		
Department	No. of Res	Total	%	No. of Res	Total	%	No. of Res	Total	%	No. of Res	Total	%	No. of Res	Total	%	No. of Res	Total	%	No. of Res	No. of Res	Total	%
Anesthesia	2	2	100%	0	0	0%	12	19	63%	9	15	60%	1	6	17%	5	15	33%	0	29	57	51%
Cardiac	2	2	100%	0	0	0%	2	6	33%	10	10	100%	1	3	33%	7	9	78%	0	22	30	73%
Cardiac, Thoracic & Vascular Surgery	1	3	33%	0	0	0%	1	1	100%	1	4	25%	1	1	100%	2	4	50%	0	6	13	46%
Diagnostic Imaging	2	2	100%	0	0	0%	4	10	40%	5	5	100%	1	4	25%	8	11	73%	0	20	32	63%
Emergency	0	1	0%	0	0	0%	12	16	75%	4	8	50%	0	0	0%	2	5	40%	2	20	30	67%
Hematology-Oncology	1	1	100%	0	0	0%	2	5	40%	6	9	67%	3	3	100%	7	9	78%	0	19	27	70%
Hand & Recons Microsurgery	1	1	100%	0	0	0%	3	6	50%	3	5	60%	1	2	50%	2	4	50%	0	10	18	56%
Laboratory Medicine	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	5	5	100%	0	5	5	100%
Medicine	3	7	43%	5	9	56%	10	23	43%	7	19	37%	4	11	36%	10	32	31%	0	39	101	39%
Neonatology	0	0	0%	0	0	0%	4	5	80%	2	2	100%	1	1	100%	2	3	67%	0	9	11	82%
Obstetrics & Gynecology	1	2	50%	5	5	100%	7	7	100%	4	5	80%	3	4	75%	18	18	100%	1	39	41	95%
Ophthalmology	0	1	0%	0	0	0%	2	6	33%	2	12	17%	0	1	0%	1	6	17%	0	5	26	19%
Orthopedic Surgery	0	4	0%	0	6	0%	2	8	25%	2	11	18%	0	3	0%	3	11	27%	2	9	43	21%
Otolaryngology	1	1	100%	0	0	0%	4	4	100%	1	3	33%	2	3	67%	3	3	100%	0	11	14	79%
Pediatrics	1	1	100%	2	6	33%	5	12	42%	8	12	67%	4	8	50%	9	14	64%	0	29	53	55%
Pediatric Surgery	0	0	0%	0	0	0%	2	2	100%	0	0	0%	1	1	100%	1	1	100%	0	4	4	100%
Pathology	3	3	100%	0	0	0%	1	4	25%	0	2	0%	0	0	0%	4	7	57%	2	10	16	63%
Psychological Medicine	0	0	0%	0	0	0%	5	6	83%	1	3	33%	1	1	100%	4	5	80%	0	11	15	73%
Radiation Oncology	1	1	100%	0	0	0%	1	1	100%	2	2	100%	0	0	0%	5	5	100%	0	9	9	100%
Surgery	0	3	0%	0	10	0%	3	13	23%	2	12	17%	1	2	50%	4	12	33%	0	10	52	19%
Urology	2	2	100%	0	0	0%	0	0	0%	3	4	75%	0	2	0%	3	3	100%	0	8	11	73%
Oral & Maxillofacial Surgery	0	0	0%	0	0	0%	2	11	18%	0	1	0%	0	0	0%	4	4	100%	0	6	16	38%
Preventive Dentistry	0	0	0%	0	0	0%	6	17	35%	0	1	0%	1	3	33%	1	6	17%	0	8	27	30%
Restorative Dentistry	0	0	0%	0	0	0%	3	14	21%	1	1	100%	0	1	0%	5	8	63%	0	9	24	38%
Unknown	0	0	-	0	0	-	0	0	-	0	0	-	0	0	-	1	1	-	0	1	1	100%
	21	37	57%	12	36	33%	93	196	47%	73	146	50%	26	60	43%	116	201	58%	7	348	676	51%

Table 2: Breakdown of response by different grades of physicians*

	Fellows N = 18	House Officer N = 12	Medical Officer N = 95	Registrar N = 74	Associate Consultant N = 26	Consultant &Above N = 116
How would you describe the attitude of EBM in your institute?						
Welcoming	14 (78%)	6 (50%)	54 (57%)	46 (62%)	12 (46%)	61 (53%)
Neutral	4 (22%)	4 (33%)	36 (38%)	22 (30%)	13 (50%)	47 (41%)
Unwelcoming	0	2 (17%)	4 (4%)	6 (8%)	1 (4%)	7 (6%)
How would you describe the attitude of most of your colleagues to EBM?						
Welcoming	13 (72%)	6 (50%)	57 (60%)	43 (58%)	11 (42%)	62 (53%)
Neutral	5 (28%)	4 (33%)	30 (32%)	26 (35%)	14 (54%)	44 (38%)
Unwelcoming	0	2 (17%)	7 (7%)	5 (7%)	1 (4%)	9 (8%)
How useful are research findings in the daily management of your patients?						
Useful	13 (72%)	4 (33%)	65 (68%)	52 (70%)	15 (58%)	81 (70%)
Neutral	4 (22%)	8 (67%)	21 (22%)	14 (19%)	8 (31%)	30 (26%)
Not useful	1 (6%)	0	6 (6%)	8 (11%)	3 (12%)	4 (3%)
In your opinion, what proportion of your daily practice is currently evidence-based?						
High proportion	9 (50%)	5 (42%)	34 (36%)	33 (45%)	8 (31%)	65 (56%)
Neutral	7 (39%)	4 (33%)	45 (47%)	30 (40%)	12 (46%)	37 (32%)
Low proportion	2 (11%)	3 (25%)	16 (17%)	11 (15%)	6 (23%)	14 (12%)
Do you believe practice of EBM improves patient outcome?						
Agree	17 (94%)	9 (75%)	69 (73%)	54 (73%)	16 (62%)	92 (79%)
Neutral	1 (6%)	3 (25%)	22 (23%)	14 (19%)	6 (23%)	16 (14%)
Disagree	0	0	4 (4%)	6 (8%)	4 (15%)	8 (7%)
Does practice of EBM places further workload on your work demands?						
Agree	11 (61%)	7 (58%)	52 (55%)	44 (59%)	6 (23%)	63 (54%)
Neutral	3 (17%)	3 (25%)	25 (26%)	13 (18%)	15 (28%)	30 (26%)
Disagree	4 (22%)	2 (17%)	18 (19%)	17 (23%)	5 (19%)	22 (19%)

*The positions of 7 physicians were unknown and hence not shown in the table above

Table 3: Breakdown of responses from section on need*

	Fellows N = 18	House Officer N = 12	Medical Officer N = 95	Registrar N =74	Associate Consultant N = 26	Consultant & Above N = 116
How frequently do you encounter information gaps in your clinical practice?						
Frequently	6 (33%)	4 (33%)	34 (36%)	31 (42%)	9 (35%)	46 (40%)
Sometimes	3 (44%0	5 (42%)	51 (53%)	31 (42%)	12 (46%)	46 (40%)
Infrequently	4 (22%)	3 (25%)	10 (11%)	12 (16%)	5 (19%)	23 (20%)
How frequently do you need to search for journal articles for clinical problems that you encounter?						
Frequently	12 (67%)	3 (25%)	41 (43%)	36 (49%)	10 (38%)	65 (56%)
Sometimes	6 (33%)	3 (25%)	43 (45%)	27 (36%)	11 (42%)	34 (29%)
Infrequently	0	6 (50%)	11 (12%)	11 (15%)	6 (19%)	16 (14%)
How frequently do you use statistics in analyzing or evaluating data?						
Frequently	6 (33%)	0	15 (16%)	23 (31%)	11 (42%)	45 (39%)
Sometimes	7 (39%)	6 (50%)	36 (38%)	27 (37%)	5 (19%)	37 (32%)
Infrequently	5 (28%)	6 (50%)	43 (45%)	23 (31%)	10 (38%)	31 (27%)

*The positions of 7 physicians were unknown and hence not shown in the table above