

Full Length Research Paper

A comparative assessment of attitudes, knowledge and self-perceived barrier to the practice of evidence based medicine in Japan and Indonesia

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Evidence-based medicine (EBM) is the process of systematically reviewing, appraising and using clinical research findings to aid the delivery of optimum clinical care to the patients. EBM plays a crucial role for physicians as a tool to integrate best research evidence into clinical practices, but there has been little information about its application in daily practices among resident physicians in Japan and Indonesia. The purpose of this study was to assess and compare the attitude towards and knowledge of EBM among resident physicians in two teaching hospitals and their self-perceived barrier to its implementation. A cross-sectional study, self-administered anonymous questionnaire was distributed to 60 resident staff at Saga University Hospital, Japan and 183 staffs at Cipto Mangunkusumo teaching hospital, Indonesia. Significant findings from this study are each respondent have individual tendencies when selecting suitable sources of information during clinical problem solving; there was an overall positive attitude towards EBM; Knowledge and skills are fairly sufficient though they reported the two factors as barrier to implement EBM. Other barriers in implementing EBM are lack of time and resources in native language. Several factors influencing each group's responses were noted and differing attitudes towards EBM application identified.

Keywords: Attitudes, barrier, evidence based medicine, knowledge, resident physicians.

INTRODUCTION

Medical sciences are continuously evolving. As a result,

List of Abbreviations

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EBM; Evidence Based Medicine, BMJ; British Medical Journal, BMJ is the flagship journal of the BMJ Group.

and to ensure that their skills remain in line with the needs of their patients, it is important that physicians keep themselves updated with recent progressions in medical knowledge and health care. A previous study showed that the longer since graduation from medical school the lower the accuracy in knowledge and quality of medical care given to patients (Choudry et al., 2005). Physicians are therefore required to continuously adjust their skills in line with developments in medical science to prevent a gap in knowledge occurring between the theories taught while they were in university and those used in clinical practice at present. Doctors need to be able to address clinical problems in a manner that allows them to reach appropriate clinical decisions in accordance with the latest developments in medical science.

Physicians need to update their knowledge and their skill so they can follow the latest development in medical science. Identification of preferred resources utilized by doctors during clinical decision making is therefore an important health care research area. Analyses of such preferences and the way in which physicians use each resource may also indicate opportunities for improvements in clinical education. That is, by determining how clinical problems arising from daily encounters are solved based on scientific sources.

Evidence-based medicine (EBM) is a relatively newly developed paradigm for medical practice. The aim of EBM is not only to help with clinical decision making but also to add to other components of clinical practice. It is also hoped that EBM will help prevent unsafe practices lacking empirical support, thus reducing unacceptable individual variance and ultimately increasing efficiency and health care quality (Knops et al., 2009). In reality, however, research shows that not all health professionals use EBM in daily practice. In general medicine, for example, it was revealed that only about half of all medical treatments are evidence-based (Amin et al., 2007). Barriers to EBM practice therefore still exist (Beasley B.W, et al., 2002; Al-Baghlie and Al-Almaie 2004; Kljakovic 2006), complicating its implementation. The main problems to practice EBM are related to time and skills constraints.

A number of reports have discussed responses to EBM across various disciplines in different countries (McAlister et al., 2001; Beasley B.W, et al 2002; Al-Baghlie and Al-Almaie 2004; Kljakovic 2006; Hadley et al., 2007; Shabi et al., 2008). The aim of this study was to determine preferred information sources used during clinical decision making, responses and attitudes towards EBM, and the level of knowledge about EBM in two teaching hospitals in Japan and Indonesia, respectively.

METHODS

Study Setting, Questionnaire Development and Data Collection

This cross-sectional study involved resident physicians working in Saga University Hospital, Japan, and Cipto Mangunkusumo Teaching Hospital, Indonesia. It is currently the epicenter of medical science development in Indonesia. Its counterpart, Saga University Hospital, is the main medical education center in Saga prefecture, Japan.

A cross-sectional, anonymous questionnaire was distributed to 60 resident physicians at Saga University Hospital and 183 resident physicians at Cipto Mangunkusumo Teaching Hospital. Physicians covered various departments; namely, internal medicine, general medicine, middle care, emergency, dermatology, radiology, psychiatry, pediatric, otolaryngology, obstetric gynecology, neurosurgery, and surgery. Respondents were further classified into two major groups, a surgical and non-surgical group.

The questionnaire was derived from previous studies conducted in other countries (McAlister 2001; Oliveri et al., 2004; Al-Baghlie and Al-Almaie 2004; Callen et al., 2006; Kljakovic 2006; Shabi et al., 2008). The package delivered to the respondents contained a questionnaire, informed consent, and respondent's data. Incentive for respondent was not available. Reminder was sent by e-mail, in some cases verbal reminder was also given. Table 1 presents the structure of the questionnaire. Question 1 was derived from a previous study by Emura (2006, Saga University Graduate School of Medicine, unpublished report); question 2 was a modification of Al-Baghlie (2004) and the survey sample; questions 3 and 4 were adapted from Oliveri et al., 2004; Callen et al., 2006; and Kljakovic 2006; and questions 5 and 6 were adapted from McAlister's study (2001). The resulting questionnaire consisted of three main areas: questions concerning attitudes toward EBM, knowledge of EBM, and perceived barriers to its implementation, respectively.

Two main questions are asked to explore respondents' views and attitudes toward Evidence-based medicine. First question asked about respondent's preferences towards use of different information sources during clinical decision making, second question asked about their respond to EBM.

Three questions are asked to explore respondents' knowledge about EBM. The questions are familiarity and use of EBM resources, knowledge of terminology rele-

Table 1. Structure of the questionnaire

Aspect of assessment	Questionnaire Content
Attitude	Question 1. Preference to information sources during clinical decision making Question 2. Opinion and attitude towards EBM
Knowledge	Question 3. Familiarity and use of electronic EBM sources Question 4. Knowledge of methodological terminology Question 5. Self-rated confidence in EBM skills
Self-perceived barrier	Question 6. Self-perceived barriers to EBM application

Table 2. Characteristics of Respondents

Characteristic	Description	Japanese n=40(%)	Indonesian n=133 (%)
sex	Male	21 (52.5)	61 (45.9)
	Female	19 (47.5)	72 (54.2)
Age	21-25	23 (57.5)	14 (10.5)
	26-30	16 (40)	80 (60)
	31-35	1(2.5)	28 (21)
	36-40	0	6 (4.5)
	41-45	0	1 (0.8)
Department	Surgery group	9 (22.5)	46 (34.6)
	Non surgery group	31 (77.5)	87 (65.4)
Work hours	< 40	4 (10)	11 (8.3)
	40-80	30 (75)	28 (21.1)
	>81 hours	4 (10)	94 (70.7)
Internet access in office	Yes	30 (75)	117 (88)

vant to EBM, and confidence with EBM Skills.

A visual analogue scale (Likert's scale) was used to determine respondents' preferences. By dichotomizing the responses, a list of favorable answers was used as parameter to compare two groups.

The Statistical Package for Social Science (SPSS) version 17 was used for data entry and analysis. Statistic test relevant to each data were performed to compare and know the relationship among variables.

The research was approved by the institutional review boards of Cipto Mangunkusumo Hospital and Saga University Hospital.

RESULTS

Of the 60 Japanese residents enrolled in the study, 40 returned the completed questionnaire, giving a response rate of 66.7%. Similarly, of the 183 Indonesian residents, 133 returned completed questionnaires, giving a response rate of 72.7%. The composition of male and female respondents was also similar. The proportion of residents in the surgical group did not differ significantly between the Japanese (22.5%) and Indonesian groups (34.6%).

However, the data showed that the work style of the two groups was quite different. Up to 75% of Japanese respondents indicated a workload of between 40-80 hours per week, while in the Indonesian group 70.7% of respondents indicated working more than 81 hours per week. Seventy-five percent of respondents in the Japanese group indicated having internet access in their office, while the number of respondents in the Indonesian group with internet connection in their office was 88%. Table 2 presents the characteristics of the respondents.

Statistic test was conducted to compare respondents who have internet connection and those who do not have internet connection in their office. In Indonesian group there are significant different between respondents who have internet connection in office comparing to they who do not have internet access (Mann Whitney U test 0.028) in utilizing EBM sources; while in Japanese group there are no significant difference (independent sample T test 0.228). There are no significant differences in both groups in understanding of terminology related to EBM (Independent sample T test 0.11 for Japanese group and Mann Whitney U test 0.052 for Indonesian group). Both group's skills are not different significantly (Mann Whitney U test 0.489 for Japanese group and Mann Whitney U test 0.728 for Indonesian group).

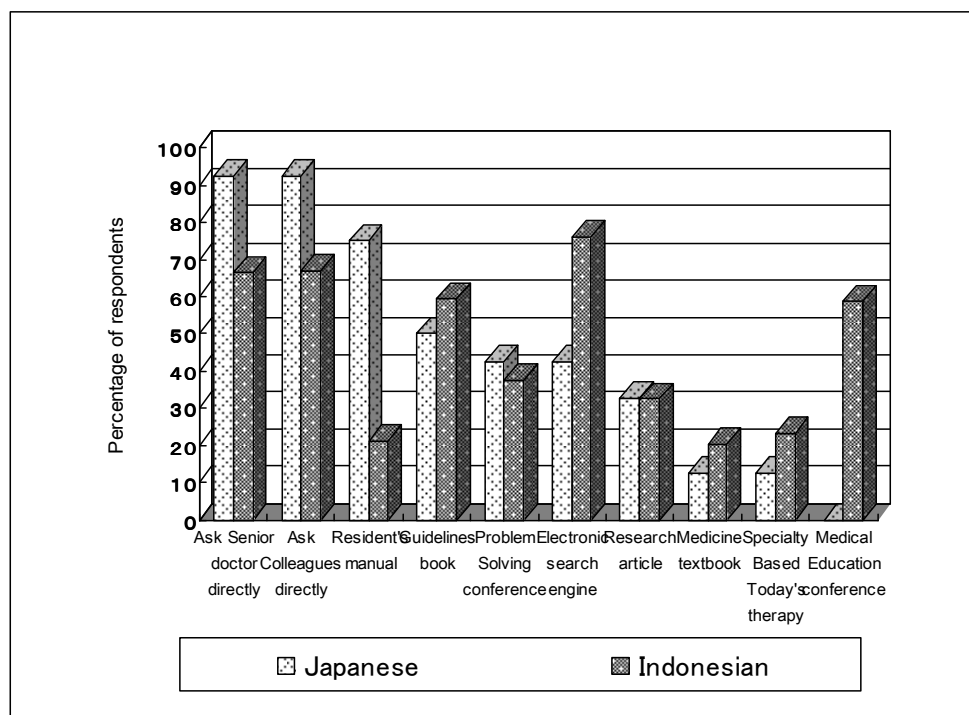


Figure 1. Preference to different information sources during clinical decision making

Views and Attitudes towards EBM

“Ask a senior doctor” was the most favored way of obtaining information among the Japanese group, with 92.5% of respondents indicating that they frequently do so. This was compared to the Indonesian group in which 66.4% of respondents admitted frequently referring to a senior doctor. Utilization of the manual booklet for residents was also more popular in the Japanese group than the Indonesian group.

We also asked respondents whether they attend medical education conferences as a form of clinical decision making. A total of 58.6% of respondents from Indonesia stated frequently using medical education conferences as a guide in clinical decisions making. However, in contrast, 92.5% of Japanese respondents admitted to rarely attending medical education conferences.

Both groups showed similar tendencies with regards to utilization of sources of information for “case presentations”; that is, “clinical practice guideline books”, “research articles”, and “medical textbooks”, with “Today’s therapy” being a particularly popular resource. Overall, the above findings did not reveal significant differences in preferred methods of gaining information during clinical decision making. Other sources of information were employed in a similar way. Figure 1 presents the results for major comparisons between the two groups.

Overall, all respondents indicated positive views

towards EBM (Figure 2). Only one item obtained a positive response of less than 50% among the Indonesian respondents; namely, difficulties in applying EBM in daily practice. On the Japanese side, however, four items scored a positive response of less than 50%. The items are statement that EBM equal to research activity; EBM difficult to be applied in daily practices; EBM practice can reduce healthcare cost; and EBM practices focused on patients’ value.

These findings suggest that the Indonesian respondents have a more positive attitude towards EBM compared to the Japanese respondents.

Knowledge Aspects

Familiarity and Use of Electronic EBM Resources

The most popular EBM electronic resources accessed by both groups, with responses of “Read” and “Use during decision making”, were Pubmed from of MEDLINE Journal and “Evidence-based medical journals” published by BMJ. In addition, the Japanese group also referred to “I-Chuu-shi”, a Japanese-based online resource, but this was used less frequently with only 5% of respondents indicating that they “Often access” and “Carry it around as a reference” and 7.5% indicating that they “Keep up to date” with this source. Overall, however, the Japanese and Indonesian groups’ awareness and use of electronic

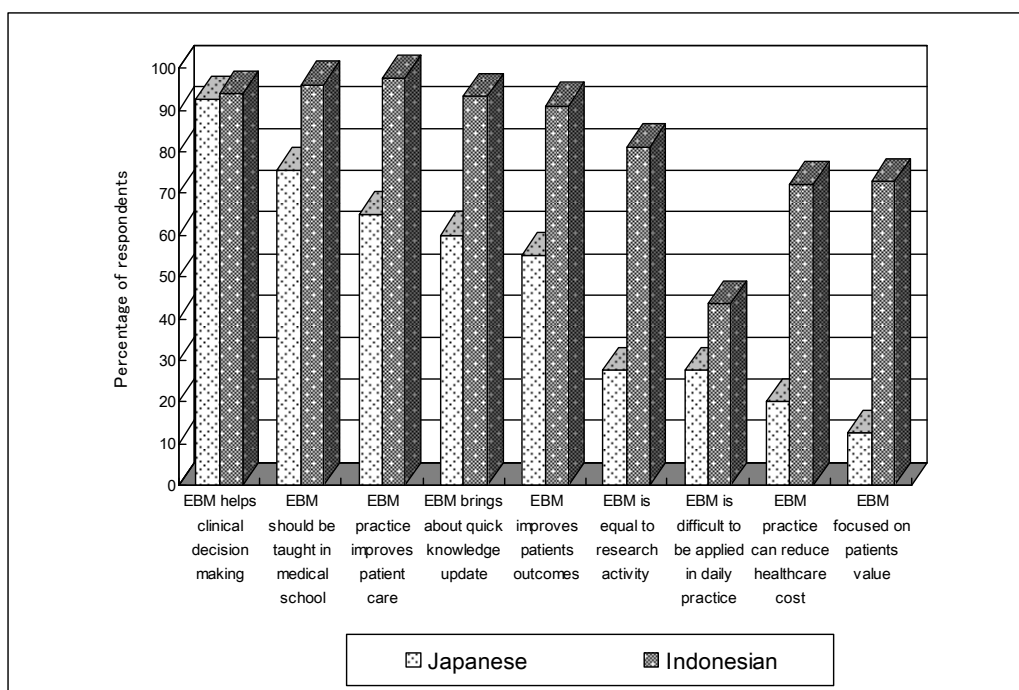


Figure 2. Respondents' response and attitudes toward evidence-based medicine

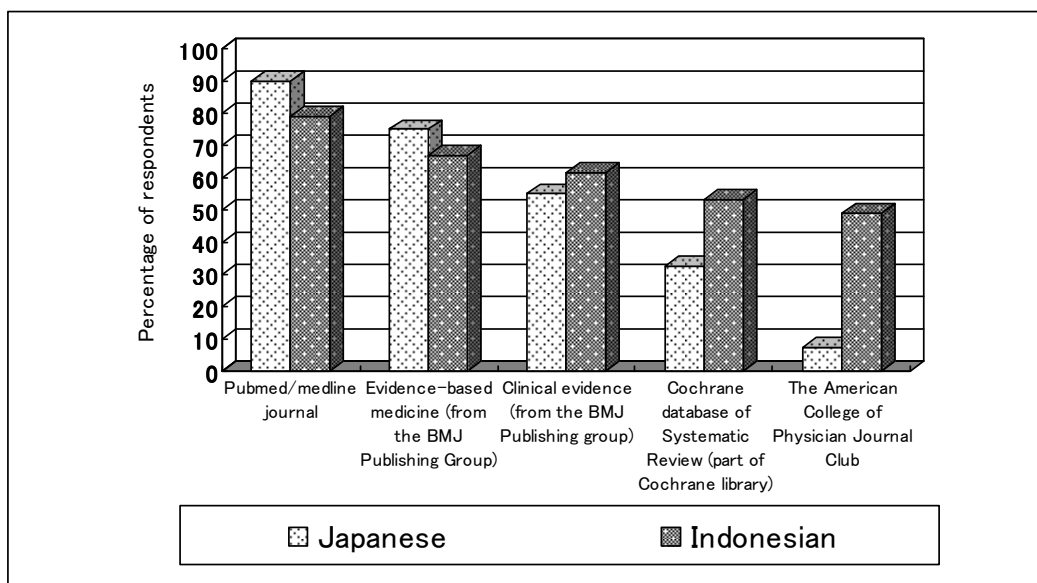


Figure 3. Familiarity and use of electronic EBM sources

EBM resources was similar (Figure 3).

Knowledge of Methodological Terminology Relevant to EBM

Of the terms examined, more than 75% of Indonesian respondents claimed to "Have some understanding" and to "Understand and be able to explain to others". Moreover, the Indonesian respondents

expressed more confidence in understanding methodological terminology often used in journals (Figure 4). Eleven Indonesian respondents stated that they understand and could explain to others all the terminology presented, while more than 75% expressed having good knowledge of the terminology. Participants on both sides expressed highest understanding of the terms 'odds ratio', 'confidence interval', and 'sensitivity and specificity' (Figure 4). Overall, however, the Indonesian respondents expressed a higher level of understanding. The Japanese

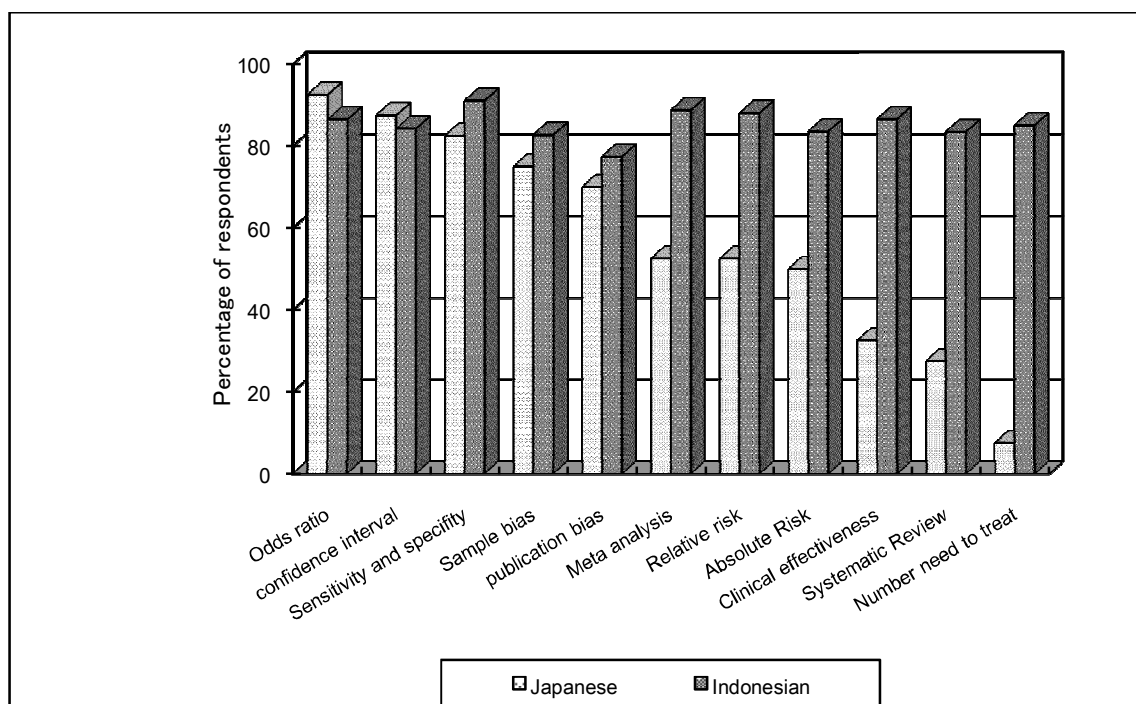


Figure 4. Respondents' knowledge of methodological terminology

respondents were least confidence about the terms 'systematic review' and 'number needed to treat'.

In Japanese group there are no significant correlation (Pearson correlation 0.729) between familiarity of EBM sources and understanding of methodological terminology, while in Indonesian group there are positive and moderate correlation between familiarity of EBM sources and understanding to methodological terminology (Pearson correlation 0.000 and coefficient 0.338).

Confidence with EBM Skills

Results concerning respondents' confidence with EBM skills were divided into 5 levels ranging from very poor to very good. Data are presented here after the data are classified into two main categories namely high performance and low performance. In this study, the high performance category combined "good" and "very good" ratings. Data presented in figure 3 is high performance category in both groups.

In both groups, the ability to formulate questions and search for literature scored the highest, while skills related to evaluation of EBM scored the lowest. Overall, the Indonesian respondents expressed more confidence in their self-rated evaluation of EBM skills (Figure 5).

We found that there are significant and positive correlation between familiarity of EBM sources and skills both in Japanese group (Spearman correlation 0.002 and coefficient 0.482) and Indonesian group (Spearman

correlation coefficient 0.005 and coefficient 0.243). While, there are no significant correlation between understanding of methodological terminology and skills (Spearman correlation 0.389) in Japanese group, while for Indonesian group there are significant correlation (Spearman correlation 0.01) but in negative direction (coefficient correlation -0.224).

Barriers to Practicing EBM

The most significant barriers to practicing EBM identified here were a 'Lack of EBM in the native language', 'Insufficiency of basic EBM skills', and 'Lack of time to access EBM sources'. 'The EBM concept', which is considered a relatively new concept and 'Inadequacy of evidence to guide practice', were also considered barriers by the Indonesian respondents but to a lesser degree. 'EBM de-emphasizes history taking and physical examination skills' was not considered a barrier to application of EBM by the Japanese respondents, but 'EBM practice devalues clinical experience and institutions' and 'in most areas of medicine, there is little or no evidence to guide practice' were considered as barrier to practice EBM by Indonesian group.

DISCUSSION

Preferences towards information sources in this study were similar to those obtained previously. For ex-

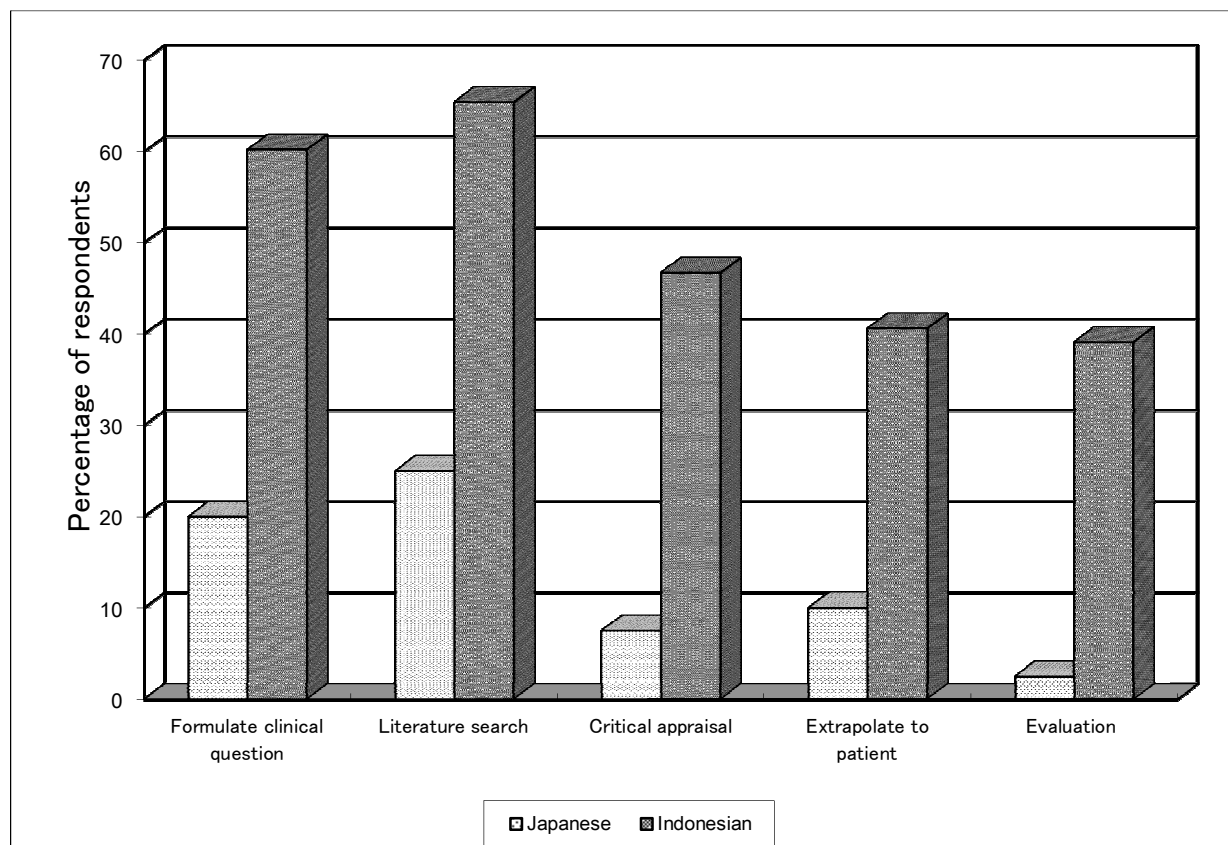


Figure 5. Respondents' Self-rated understanding of their skills

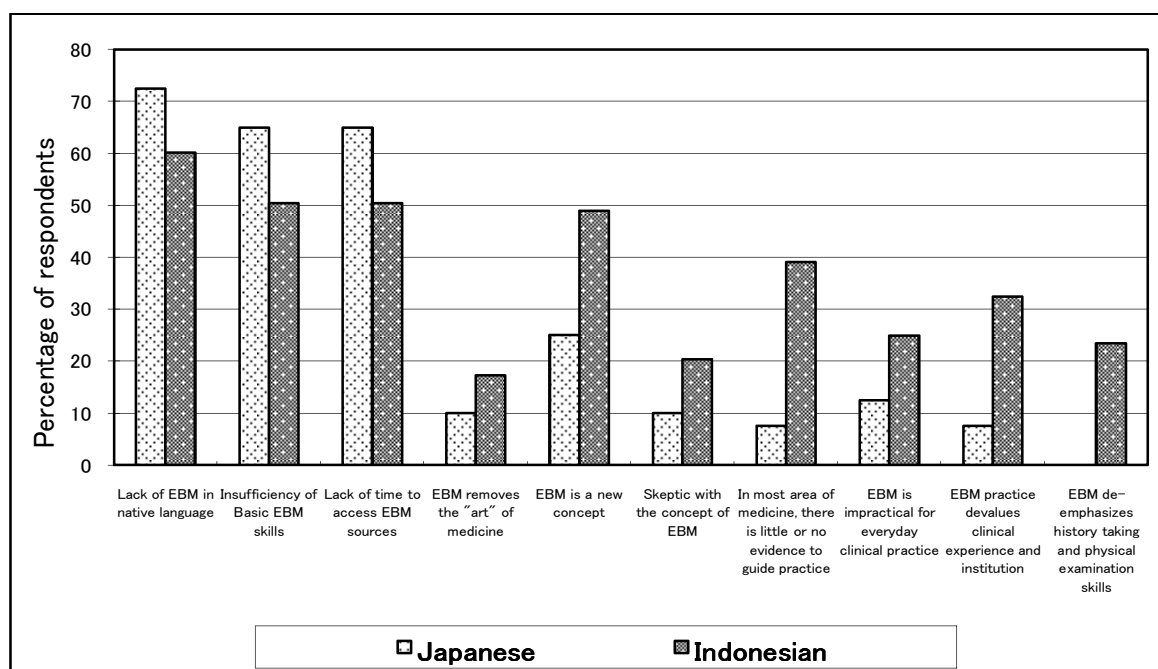


Figure 6. Possible barrier of EBM application in Daily Practices

ample, Verhoeven et al. obtained the following frequency of results: colleagues, books and journals, libraries, and

printed or online bibliographies (Verhoeven et al., 1995). A similar study conducted in Nigeria also showed that

colleagues were ranked as the reference source of choice during clinical decision making. This was followed by medical textbooks, medical internet databases, printed journals, courses and conferences, library reference services and the CD room (Shabi et al., 2008).

Despite the fact that internet access is more advanced in Japan compared to Indonesia, interesting differences were apparent in the use of electronic search engines.

For practical reasons, it is easy to understand why the Japanese respondents ranked colleagues as the most accessed source of information. However, it is also important that knowledge is gained through other forms of information gathering. Personal sources of information and research-based information sources both have limitations. For example, personal sources can lack evidence while research sources can be impractical as well as rarely matching the patient in case.

Overall, this study revealed a positive response towards EBM in both groups. However, the Indonesian responses were more uniform than those of the Japanese group. That is, the Indonesian respondents expressed more confidence in their understanding of EBM. Despite this, overall familiarity and utilization of electronic EBM sources were similar in both groups.

Previous studies using a similar questionnaire (Amin et al., 2007; Callen et al., 2006; McColl et al., 1998; Oliveri et al., 2004; Yokota et al., 2005; Young and Ward 2001) reported that the most popular EBM resources are the Cochrane collaboration (Callen et al., 2006) and effective healthcare bulletins (Universities of Leeds and York) (Oliveri et al., 2004) while Pubmed was the most accessed, though still less used than textbooks or scientific journals (Oliveri et al., 2004).

It is also interesting that the average level of knowledge on the Indonesian side was higher than that on the Japanese side, but the latter were better able to express items acting as barriers, and moreover, these items turned out to be more forthright. That is, although the Japanese group claimed to have a lower level of knowledge, they reported only the three main constraints mentioned above as significant barriers.

The main constraint faced by both groups was the lack of sources in their native languages. However, looking at local EBM sources, it is interesting that in both Indonesia and Japan, there are in fact has adequate resources in the online library. In Indonesia, there is more access to English language journals compared with native-language sources, but on the Japanese side, sources are comparably available in both Japanese and English.

Previous studies reported a lack of skills as a major obstacle in implementation of EBM. EBM skills are comprised of five steps, those are formulate clinical question, literature search, critical appraisal, extrapolate to the patients, and evaluation of all steps. Each of which has its own specific difficulties (Agarwal et al., 2008). For

example, when formulating clinical questions, difficulties are faced when too many questions arise and the available time is limited or due to troubles in articulating a question (Agarwal et al., 2008). In addition, the opinion that EBM is a purview of academics rather than practicing clinicians (JAMA 1992; McAlister et al., 2001) as well as a lack of time to focus on EBM are also frequently reported as important obstacles affecting the application of EBM (Jette et al., 2003; Knops et al., 2009; Yokota et al., 2005; Young and Ward 2001).

Factors Influencing the Result

A) Communication with Colleagues

Despite the fact that in Japan information technology is more advanced than in Indonesia and access to digital libraries is more widespread, it is interesting that the internet was listed as the first-order source of information among the Indonesian residents. This is probably related to different teaching patterns and differences in medical education. Residents in Japan tend to accept and follow the methods employed by older more experienced clinicians (Yokota et al., 2005). During their medical education, however, Indonesian physicians are trained to work independently as well as part of a team, unlike Japan where working as a team is considered more important. Accordingly, the Japanese residents demonstrated a very strong level of communication with colleagues, both those at the same level and seniors levels. In Indonesia, on the other hand, residents are encouraged to explore the answer first independently and then with the help of colleagues or more senior doctors.

B) The Working Environment

The Indonesian respondents consisted of residents working in a national education center and center of excellence, while the Japanese group included residents working at a non national referral hospital. One weakness of Cipto Mangunkusumo Hospital therefore may be the lack of generalizability with other teaching hospitals. The conditions at Saga University Hospital, however, are likely to be similar to those of other teaching hospitals in Japan, since the standardization of medical education is more widespread.

C) Previous EBM Training

It is worth noting that most of the Indonesian residents underwent EBM training prior to entering the residency program. Moreover, in some departments, EBM training is

obligatory. In Japan, residents undergo weekly meetings and case discussions designed to incorporate EBM-based topics.

Study Limitations

Despite the findings, the present study has a number of limitations. The sample size was too small for the findings to be generalized. In Japan, it can be assumed that the research subjects were representative of residents throughout Japan since the medical education system has been standardized. However, in Indonesia, the subjects came from a center of excellence, probably less representative of the overall education system. In addition, exploration of the preferred sources of information did not describe what influence each source had on clinical decision making. Moreover, since responses were self-judged the results are perhaps not truly reflective of the actual situation.

Future Work

As a next step, validation tests are now necessary to determine the actual knowledge and skills levels of the respondents. Since this study was a self-assessment, it is possible, for example, that answers tended to be modest. Analysis of the learning needs of respondents from different countries is also necessary to determine an appropriate method of EBM implementation if physicians' knowledge and skills are to be continuously improved upon.

CONCLUSIONS

Residents in each country have individual and collective tendencies when selecting suitable sources of information during clinical problem solving. Here, while Japanese physicians preferred to obtain information from colleagues and resident manuals, the Indonesian residents preferred to use electronic search engines.

Many cultural patterns are similar between Japan and Indonesian, especially with regards learning from experienced senior doctors and colleagues; however, the Indonesian residents seem more expressive showing their attitudes. The reason for this is likely related to the emphasis on independent work in Indonesia, while in Japan residents are more inclined to cooperate in groups. In addition, the Indonesian residents were more expressive than their Japanese counterparts. Thus, several factors influencing each group's responses were noted and differing attitudes towards EBM application identified.

Competing interest

The author(s) declare that they have no competing interests.

REFERENCES

- Agarwal R, Kalita J, Misra UK (2008). Barriers to evidence-based medicine practice in South Asia and Possible solutions. *Neurology Asia*; 13: 87-94.
- Al-Baghli N, Al-Almaie SM (2004). Physician attitude towards evidence-based medicine in eastern Saudi Arabia. *Annals Saudi Med*. 24(6) November-December.
- Amin M, Saunders JA, Fenton JE (2007). Pilot study of the knowledge and attitude towards evidence based medicine of otolaryngology higher surgical trainees. *Clinical Otolaryngology*, 32:120-135.
- Beasley BW, Wooley DC (2002). Evidence-based medicine Knowledge, attitudes, and skills of community faculty. *J. general and Internal med*. 17:632-640.
- Callen JL, Fennell K, McIntosh JH (2006). Attitudes to, and Use of, Evidence-based Medicine in two Sydney Divisions of General Practice. *Austr. J. Primary Health*; 12 (1) 40 – 46.
- Choudry NK, Fletcher RH, Soumerai SB (2005). Systematic Review: The relationship between clinical experience and quality of health care. *Annals of Internal medicine*; 142:260-73-94.
- Evidence-based medicine working group (1992). Evidence-based medicine. A new approach to teaching the practice of medicine. *JAMA*; 268 (17) 2420-2425.
- Hadley JA, Wall D, Khan KS (2007). Learning needs analysis to guide teaching evidence-based medicine: knowledge and beliefs amongst trainees from various specialties. *Biomed central medical education*; 7:11.
- Jette DU, Bacon K, Batty C, Carlson M, Ferland A, Hemingway RD, Hill JC, Ogilvie L, Volk D (2003). Evidence-based Practice: Beliefs, Attitudes, Knowledge, and Behaviors of Physical Therapist. *Physical Therapy* September 2003 Vol. 83no. 9 786-805.
- Kljakovic M (2006). Practicing GPs teaching medical students evidence-based medicine, a questionnaire survey. *Australian Family Physician*; Vol 35, (12) 929-1024.
- Knops AM, Vermeulen H, Legemate DA, Ubbink DT (2008). Attitudes, Awareness, and Barriers Regarding Evidence-based Surgery among Surgeons and Surgical Nurses. *World J. Surg*. 2009 July; 33(7): 1348–1355.
- McAlister FA, Graham I, Karr GW, Laupacis A (2001). Evidence-based medicine and the practicing clinician. *J. general and Internal. med*. 14:236-242.
- McColl A, Smith H, White P, Field J (1998). General practitioners' perceptions of the route to evidence based medicine: a questionnaire survey. *BMJ*; 316: 361 ; 7128.
- Oliveri RS, Gluud C, Willie Jorgensen PA (2004). Hospital doctor's self-rated skills in and use of evidence-based medicine-a questionnaire survey. *J. Eval. Clin. Pract.* 10(2):219-226.
- Rao RH (2006). Perspectives in Medical Education 1. Reflections on the state of Medical Education in Japan. *Keio J. Med*. 55(2): 41-51.
- Rao RH (2007). Perspectives in medical Education 1. Reflections on the state of Clinical training for Residents in Japan. *Keio J. Med*. Dec; 56(4):111-23.
- Shabi OM, Kuteyi EA, Odewale MA, Shabi IN (2008). Information needs of family physicians in Nigeria. *SA Fam Pract* vol 50 no 5.
- Survey example available from: <http://www.columbia.edu/~mvp19/RMC/M4/SurveyExample.doc>
- Yokota T, Kojima S, Yamauchi H, Hattori M (2005). Evidence-based

- medicine in Japan. *Lancet*, July 9.
- Young JM, Ward JE (2001). Evidence-based medicine in general practice: beliefs and barriers among Australian GPs. *J. Evaluation in Clin. Practice*, 7: 201–210.
- Young JM, Glasziou P, Ward JE (2002). General practitioners' self ratings of skills in evidence based medicine: validation study. *BMJ*;324:950-951.
- Verhoeven AAH, Boerma EJ, Jong BM (1995). Use of information sources by family physician: a literature survey. *Bull. med. Libr. Assoc* 1995; 83(1):85-89.

APPENDIX

Question1. This section of the questionnaire inquires about residents physicians' preferences of information sources to make clinical decision

There are varieties of information sources to guide clinical decision making. Among the entire sources listed below, please give an X mark which describes your interaction with the entire possible source.

Statement	Always	Often	Sometimes	Seldom	Never
Consult senior doctor directly					
Consult colleagues directly					
Present the case at a problem solving conference to obtain opinion from other doctor/teacher experienced in similar problem					
Consult clinical practice guidelines					
Consult resident's manual					
Attend continual medical education conferences and present your case					
Read research article					
Read medical textbook					
Read Today's therapy in particular specialty					
Find out the answer using electronic search engine (Google, yahoo, AltaVista, etc)					

Appendix continues**Question 2. This section of the questionnaire inquires about opinion and attitudes towards EBM^{13,17}**

We would like to ask you some questions about your current opinion towards Evidence based Medicine, please mark an X on the boxes corresponding to your responses or opinion

Statement	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
EBM practice improves patient care					
EBM improves patient outcomes					
EBM helps clinical decision making					
EBM practice can reduce healthcare costs					
EBM brings about quick knowledge update					
EBM focused on patients value					
EBM should be taught in medical school					
EBM is equal to research activity					
EBM application is difficult in daily practice					

Question 3. This section of the questionnaire inquires about familiarity and use of electronic EBM sources¹⁷

There are some publication relevant to EBM, please indicates those which you have used or aware of.

EBM Resource	Unaware	Aware but not use	Read	Used to help in clinical Decision making
Evidence based medicine (from the BMJ Publishing Group)				
Cochrane database of Systematic Review (part of Cochrane library)				
The American College of Physician Journal Club				
Pubmed/medline journal				
Clinical evidence (from the BMJ Publishing group)				

Appendix continues**Question 4. This section of the questionnaire inquires about knowledge of methodological terminology^{13,17}**

There are some terms used in EBM paper, please indicate your interaction to them by giving an X mark.

Terminology used in EBM paper	It would not be helpful for me to understand	Don't understand but would like to	Some understanding	Understand and could explain to others
Relative risk				
Absolute risk				
Systematic review				
Clinical effectiveness				
Meta analysis				
Number need to treat				
Odds ratio				
Sensitivity and specificity				
Confidence interval				
Publication bias				
Sample bias				

Question 5. This section of the questionnaire inquires about self-rated confidence in EBM skill¹⁷

Among all the basic EBM skill please describe your confidence of understanding for each skill:

Statement	Very good	Good	Barely acceptable	Poor	Very poor
Formulate clinical question					
Literature search					
Critical appraisal					
Extrapolate to patient					
Evaluation					

Appendix continues**Question 6. This section of the questionnaire inquires about opinion about barrier to implement EBM¹⁷**

There are some possible barrier of EBM application, among all the statement listed below please give an X correspond to your interaction with each statement.

Statement	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
EBM is a new concept					
EBM practice devalues clinical experience and institutions					
EBM is impractical for everyday clinical practice					
EBM removes the “art” of medicine					
EBM de-emphasizes history taking and physical examination skills					
In most areas of medicine, there is little or no evidence to guide practice					
Lack of time to access EBM sources					
Lack of EBM source in native language					
Insufficiency of basic EBM skill					
Skepticism over the concept of EBM					