

# Self-efficacy of Filipino Physicians Towards Research and Research Utilization: A Single-Center Quantitative Descriptive Survey



Mary Joeline D. Arada, MD, John Armand E. Aquino, MD,  
Redmond Benigno S. Aquino, MD, Miguel Luis O. Arkoncel, MD,  
Belisarius Arandia, Ida Marie Tabangay-Lim, MD

## ABSTRACT

**Research Question:** What is the current status of self-efficacy beliefs towards research and research utilization (RU) of University of Santo Tomas Faculty of Medicine and Surgery (UST-FMS) graduates who had Clinical Epidemiology in their basic medical education curriculum?

**Significance of the Study:** There is an increase in research and RU trends globally as adherence to practice based on evidence results in improved patient outcomes. Limited studies are available in describing research and RU of Filipino physicians and there is no study available specific for UST-FMS graduates.

**Objectives:** The study aims to describe self-efficacy beliefs towards research and RU of UST-FMS graduates' batches 2012-2016 who had Clinical Epidemiology in their basic medical education.

**Study Design:** A single-center, quantitative descriptive survey design was used.

**Methodology:** Participants were graduates of UST-FMS batches 2012-2016, currently working at the University of Santo Tomas Hospital. Evidence-based Practice Confidence Scale (EPIC scale) and Edmonton Research Orientation Survey (EROS)

were used to assess the research and RU of the participants gathered through snowball sampling.

**Statistical Analysis:** Descriptive statistics such as means and standard deviations were used to analyze the EPIC and EROS scores.

**Results:** The UST-FMS graduates value research and are generally confident in their ability to participate in evidence-based medicine. However, they rarely conduct research and have a low understanding of statistics.

**Conclusion:** The self-efficacy beliefs of UST-FMS graduates towards research and RU may be attributed to several factors. Clinical epidemiology as a subject may be improved by adding more lectures on statistics while hospitals should create avenues to support the conduct of research.

**Keywords:** self-efficacy belief, research and research utilization, Clinical Epidemiology, medical education curriculum

## INTRODUCTION

Evidence-based clinical decision-making has become an expectation for all healthcare providers. [1] Evidence-based Practice (EBP) has become increasingly widespread in medicine over the past decades.[2] Modern medical documents such as clinical practice guidelines have been developed through the use of these current evidences to have

✉ Mary Joeline D. Arada, MD.  
maryjoelinearada@gmail.com

Faculty of Medicine and Surgery, University of Santo Tomas

better methods in diagnosis, management and treatment. Knowledge, attitude, experience and barriers to research are major factors that influence evidence-based medicine (EBM).[3]

Self-efficacy is considered an essential construct affecting the EBP of various health professionals.[4] According to the self-efficacy theory by Bandura[5], there is a positive correlation between self-efficacy, knowledge and practice. Self-efficacy may influence a person's motivation, decision and actions in participating in certain activities.[5] Thus, if the self-efficacy of physicians is increased, they may participate more in EBM leading to increased knowledge, attitudes and practices (KAP).

Research knowledge is also an important aspect of RU for it to be applied in practice.[6] Clinical epidemiology is a course that is often associated with public health but also deals with research to integrate it into useful clinical practice. In the Asia-Pacific region, clinical epidemiology and EBM have grown drastically due to rising costs, patient safety concerns and evidence-based health care.[7] However, the region has also faced several challenges which are mainly: linking evidence to practice and policy, developing a strong collaborative network across countries of the Asia-Pacific region and globally, and a need for human resources, infrastructure, funding and technical expertise to produce evidence.

There is a lack of data on the level of knowledge medical students have regarding EBM.[8] Among resident doctors, academic emergency medicine programs have attempted to develop training in EBM, however, there were perceived barriers on the lack of trained facility, time and funding for this program.[9] Moreover, the use of evidence from clinical research is not always applied in decision-making by practicing physicians, and there remains a significant delay in the incorporation of new methods and therapies into clinical practice. Retaining and refreshing knowledge to support patient care and professional development across such a broad discipline poses special challenges.[10] To address the lack of EBP competence, a study of the effectiveness of an EBP course was determined among undergraduate nursing students in an academic institution in Spain. After a specific 15-week educational intervention, there was a significant improvement compared to baseline scores in knowledge, attitude and skills.[11]

Predictors of attitude towards utilization of EBP have also been determined. According to Brown et al.[12], knowledge, attitudes, use and future use of EBP generally increased with academic advancing class level in bivariate correlational analysis. However, in multivariate analysis, the academic class level was not a significant predictor of knowledge, attitudes, use and future use of EBP. Instead, the confidence in clinical decision-making and preparedness for clinical experience were found to be statistically significant positive predictors of knowledge, use and future use of EBP. In addition to predictors, factors associated with practicing evidence-based medicine have been explored. In a study by Paulsen and Al Achkar[13], results showed that previous research experience was associated with stronger EBM habits, more self-efficacy in applying EBM and greater ability in using EBM skills. The participants who had previous EBM training spent more hours reading literature and had higher EBM skill test scores.

Data have suggested that research training programs show increase in the confidence of physicians toward EBP. A mixed-method study by Black et al.[14] showed that a research training intervention has, through a 3-time point KAP survey, increased the participants' (nurses and doctors) confidence and excitement in conducting research. However, the participants' willingness to conduct research has not improved. This may be due to factors such as lack of time and their realization of challenges faced during research. Qualitatively, the training program has been shown to enhance their commitment and motivate them to promote practice change. It also allowed them to gain new resources and skills to be taken seriously by their colleagues. The study, however, is limited by its capability to be generalized due to the characteristics of its population. A favorable attitude toward EBM has also been echoed by other studies.[15,16]

In another randomized control study conducted by Kortekaas et al.[17], which measured the primary and secondary outcomes of integrating EBM training to general practice specialty training on third-year medical students, no significant difference in attitudes was detected between the control and intervention groups. Also, less than half (44%) of the subjects in the intervention group were compliant with the EBM training elements. Although, the authors noted

that variability in the delivery of components of the intervention to primary care settings may have diluted the potential effect of the intervention.

The effect of incorporating EBM in the medical curriculum on the attitudes of students has also been documented. Cserto, Berenyi, Decsi and Lohner[18] have documented that perceived EBM-related knowledge and skills are higher among students who had EBM training as compared to those who did not.

Interestingly, Gavvani and Mohan[16] have noted that a majority of its respondents (81.6%) believed that legislation on EBM be enacted in their country to provide clinical practice guidelines and for protection of patients from medical malpractice. Furthermore, lack of time has also been noted by various researchers as one of the major barriers to EBM.[16,19]

EBP has evolved through the years to be defined as the integration of the physician's expertise with the most relevant and advanced available clinical evidence gained from systematic research.[20] The best patient care can be guaranteed when clinical expertise is used in combination with the best research evidence available. Literature about EBP utilization in the clinical practice of physicians is scarce, but there is more evidence about non-utilization of EBP in the medical field in well-developed as well as developing countries.

Some studies have shown that the best available evidence, which was found to be the result of excellent clinical trials and meta-analyses, is not being translated into EBP.[21,22] Despite EBP being an established process in the medical field, it was noted that even doctors in the United Kingdom are found to be unable to utilize relevant results of clinical trials in their practice. Through the analysis of medical guidelines and surveys, the paper concluded that doctors were indeed not practicing according to the results of clinical trials.

Dizon et al.[23] conducted a one-day face-to-face EBP training in the Philippines in 2014. Pre- and post-tests of EBP knowledge and skills were taken before and immediately after the 1-day training using the Fresno Test of Evidence-Based Medicine for medical doctors and the Adapted Fresno Test for allied health professionals. Using the said tests, they found out that both knowledge and skills of doctors and allied health professionals improved after taking the 1-day

course.[23] Pertinent information about improvement of knowledge and skills was presented in the study, but there was no follow-up with the subjects in terms of how they fared in actual practice. Although the results of their Fresno tests were good, there was no significant evidence that the subjects' clinical practices improved. The utilization of EBM in the clinics of physicians, especially in the Philippines remains to be under-documented.

RU is the process of implementing research knowledge into clinical practice.[6] The Stetler Model of Research Utilization describes prerequisite research steps that when appropriately implemented result in EBP.[6,24] EBP or EBM is the conscientious, explicit and judicious use of current best available evidence in patient care.[20] Improved client outcomes [23,25] by reducing harm due to inadequate knowledge [26] is associated with adherence to practices based on research evidence.

There has been an increase in research and RU trends worldwide recently. To keep pace, the Faculty of Medicine and Surgery of the Pontifical and Royal University of Santo Tomas (UST-FMS) aims to produce graduates that are competent, committed and compassionate in the fields of direct health care provision and research among others.[27] To achieve this goal, the faculty revised its curriculum to incorporate Clinical Epidemiology in basic medical education starting in the academic year 2008-2009.

Clinical Epidemiology aims to provide students with proper knowledge and skills on EBM. The course involves lectures and group activities on four years of basic medical education. Students are tasked to develop research proposals in their first year of studying and implement them in their second and third years of studying. Actual research paper writing and research presentation are done before graduation.[28]

Currently, there is no available study to describe the effectiveness of the course with regard to self-efficacy beliefs of its graduates towards research and RU. It is important to study these to understand how well the objectives of the course and faculty are being implemented in clinical practice.

The results of the study can contribute to the limited knowledge base of research and RU in the country as well as serve as a reference for practice settings to evaluate opportunities for research and RU. The results can also serve as a reference for future

curriculum reviews and increase the professional credibility of Thomasian doctors.

Hence, the study aims to describe the self-efficacy beliefs toward research and RU of UST-FMS graduates' batches 2012-2016 who had Clinical Epidemiology in their basic medical education curricula.

## METHODOLOGY

As a preliminary study, a single-center, quantitative descriptive survey design was used to determine the self-efficacy beliefs of UST-FMS graduates toward research and RU in clinical practice. The study was approved for implementation by the University of Santo Tomas Institutional Review Board (IRB).

In order to understand the tools to be used, the researchers defined self-efficacy first. Self-efficacy is defined as the "judgment of one's ability to organize and execute given types of performances." [29] Self-efficacy beliefs are psychological constructs important in evaluating EBP as these are subjective. They may be altered by experiences. [29] A positive experience is believed to increase a person's confidence. Bandura [5] stated that practitioners who are confident in their clinical abilities practice them more frequently. Thus, evaluation of self-efficacy beliefs could help in understanding the factors contributing to EBP. [29]

The primary tool used to assess self-efficacy in the study is the Evidence-based Practice Confidence Scale (EPIC Scale, 30). The EPIC scale is an 11-item self-report questionnaire using an 11-point scale that assesses the relationship between education in EBP and self-efficacy toward EBP. [29] Items include descriptions of acquiring, appraising and applying evidence in clinical practice. The total score is computed using the mean of the scores of each item. [29]

The EPIC scale has excellent test-retest reliability (intraclass correlation coefficient = 0.89, confidence interval [0.85, 0.91]) and internal consistency (Cronbach's alpha = 0.89, 95%CI). [31] The scale has acceptable construct validity measured in terms of mean difference at 95%CI; 8.4 ( $p < 0.001$ ) for highest degree obtained, 9.0 ( $p < 0.001$ ) for searching research literature, 4.1 ( $p = 0.025$ ) for reading research literature and 5.1 ( $p = 0.0027$ ) for using research literature. [29]

To supplement the data collected from the EPIC scale, the researchers, likewise, utilized the EROS.

[32] It is a 38-item questionnaire used to measure perceived research participation and orientation. [32] The EROS is composed of four factors namely: (1) valuing research; (2) research involvement; (3) being at the leading edge; and (4) EBP. [32]

The EROS has high internal consistency for total score (Cronbach's alpha = 0.94), as well as for its two subscales: Valuing Research and EBP. [33] The study by McLeary and Brown [33] has also found adequate construct validity of the total EROS scale and its subscales.

The study population consisted of graduates of the Doctor of Medicine program of the University of Santo Tomas Faculty of Medicine and Surgery. Key inclusion criteria include: 1) Must be a graduate of batch 2012 or later, 2) must have passed the physician's licensure examination in February 2014 or later, 3) must be a practicing physician working either full-time ( $\geq 20$  hours per week involvement in patient care) or part-time ( $< 20$  hours per week) in the University of Santo Tomas Hospital (USTH). Participants were excluded if employed as 1) part of the academe of any medical school and 2) a researcher in any clinical research organization in the country.

The study population involved a total of 1,897 UST-FMS graduates from batch 2012-2016 currently working in the USTH. Snowball sampling was done by distributing hard copies of survey packets with control numbers to representatives from various clinical departments in the USTH. These representatives then asked their colleagues to answer the survey packets which contained a cover letter, informed consent agreement, demographic questionnaire, EPIC scale and the EROS. Participants were given 5 days to fill out the survey packets before they were collected. Data were analyzed through means and standard deviations.

Demographic data of the participants, such as gender, age, years of clinical experience, etc., were presented in tables. In particular, they were summarized as percentages and means (with the corresponding standard deviations obtained). The use of percentages was utilized for nominal demographic categories such as gender, employment status, etc., while means was used for qualitative demographic categories such as age, years of clinical experience, etc.

The EPIC scale and EROS scores were summarized as means and the standard deviations were also

obtained. The use of mean was selected because the type of data to be summarized - the survey scores - are quantitative, ratio data. The standard deviation was also selected in order to determine the degree of variability of their scores.

## RESULTS

### Participants

Out of the 100 questionnaires distributed to the residents and fellows of UST, 50 replied to confirm participation, and all of them were included in the data analysis. Hence, the response rate is 50%.

For the demographics, the majority of participants were females (52%), aged 27-29 years (56%), and currently taking up residency (70%). Most of them are also working full-time (86%). Most of the participants are not engaging in further research studies (80%) even though 94% of them are required to conduct research. Other socio-demographic data are found in Table 1.

### EROS Results

The mean for the total EROS scores indicated that participants had a 'moderate level' of research orientation. Subscales ranked from highest to lowest: *valuing research* ( $3.86 \pm 0.51$ ), *EBP* ( $3.42 \pm 0.53$ ), *being at the leading edge* ( $3.78 \pm 0.52$ ), *research involvement* ( $3.80 \pm 0.46$ ). This is supported by individual mean scores in *EBP* and *valuing research* still has the highest scores while *research involvement* and *being at the leading edge* the lowest. Thus, the participants could be considered consumers rather than producers of research. Participants are also knowledgeable of most research-related concepts except for statistics.

### EPIC Scale Results

Participants are moderately confident in their ability to identify knowledge gaps and formulate questions to guide the literature search. They are also quite confident in deciding on the appropriate course of action for their patients based on the integration of research evidence, clinical judgment and client preferences as well as on the continuous evaluation of the provided intervention. On the other hand, participants have low confidence in critically appraising the strengths and weaknesses of study

methods, reliability and validity of the study, as well as sensitivity and specificity of study results. Similar to the EROS results, participants also reported the least confidence in areas involving statistics such as interpreting study results obtained using statistical tests and procedures.

## DISCUSSION

### Research Attitudes and Values

Of the 50 participants, majority of the respondents showed moderate confidence towards research. They believed that research is an important part of their practice and pursuit of higher learning. Research serves as the cornerstone of EBM; therefore, the participants believe in its importance in practice.

EROS assesses the participants' involvement and beliefs about research, specifically on areas of *valuing research*, *research involvement*, *being at the leading edge*, and *EBP*. Responses show that the highest rank subscale is valuing research while research involvement is the lowest rank. This reveals that the participants perceive that EBM is a more reliable source of information than clinical practice but are then unable to be involved in them because of insufficient knowledge and inability to perform statistical tests and procedures, which is similar to the results of a study by Lyons et al.[32] Moreover, perceptions about new ideas in both researches in clinical practice are rated highly. This can be attributed to the research done by residents, which is a requirement in their continuing medical education.

The EPIC scale measures the confidence of participants in their level of ability in research and research utilization. Confidence in clinical practice and decision making based on research evidence was also taken into consideration. Results show that the majority of participants have a relatively moderate self-efficacy when it comes to research – in both theory and practice. The participants rated high confidence in identifying gaps in knowledge as well as constructing research questions for literature search. This is mirrored by the study of Brown et al.[12] which mentioned that a positive predictor of self-efficacy is the implementation of research findings into clinical practice since medical trainees are often required to manage patients using EBM. This correlates well with the idea that the participants are more inclined to be consumers rather than producers of research.



**Table 1:** Socio-demographic characteristics of participants and their practice (N=50)

Characteristics	Frequency	%
<b>Sex</b>		
Male	24	48
Female	26	52
<b>Age</b>		
24-26	3	6
27-29	28	56
30-32	14	28
33-35	5	10
<b>Year Graduated</b>		
2012	2	4
2013	8	16
2014	13	26
2015	13	26
2016	14	18
<b>Highest Level of Education/Training</b>		
General medical education	8	16
Residency	35	70
Fellowship	5	10
Master's degree	0	0
Doctorate	2	4
<b>Further studies</b>		
Yes	25	50
No	21	42
No answer	4	8
<b>Research studies</b>		
Yes	6	12
No	40	80
Unanswered	4	8
<b>Full-time or Part-time</b>		
Full-Time	43	86
Part-time	0	0
Unanswered	7	14
<b>Required to conduct research</b>		
Yes	47	94
No	3	6
<b>Required to undergo further training in research</b>		
Yes	32	64
No	14	34
Unanswered	1	2
<b>Required to conduct evidence-based medicine</b>		
Yes	47	94
No	3	6

**Table 2:** EROS statements with the highest and lowest mean scores (N=50)

EROS Item (N)	Mean $\pm$ SD	Factor
<b>Top 3 Highest Scoring Items Ranked from Highest to Lowest Mean Scores</b>		
EROS 1 When there is information available, clinical practice should be based on research findings (N=50)	4.26 $\pm$ 0.63	Factor 4
EROS 2 Research can improve the cost-effectiveness of patient care (N=50)	4.24 $\pm$ 0.77	Factor 1
EROS 31 Research can improve patient care (N=50)	4.06 $\pm$ 0.84	Factor 1
<b>Bottom 3 Lowest Scoring Items Ranked from Lowest to Highest Mean Scores</b>		
EROS 27 I am an excellent researcher (N=50)	3.18 $\pm$ 0.77	Factor 2
EROS 21 I am actively involved in doing clinical research (N=50)	3.28 $\pm$ 0.93	Factor 2
EROS 30 I am capable of developing new or revised treatments which will help clients (N=48)	3.28 $\pm$ 1.09	Factor 3

**Table 3:** Mean scores of participants' understanding of some research-related concepts (N=49)

Research-related concepts	Mean $\pm$ SD
Research design	3.64 $\pm$ 0.92
Statistics	2.74 $\pm$ 1.01
Research articles in journals	3.64 $\pm$ 0.92
Grant application procedures	3.02 $\pm$ 0.96
Ethical review procedures	3.50 $\pm$ 0.99

## Research and Research Utilization

The UST graduates are no strangers to EBM. As students, they are exposed to research tools and guides that will help them properly interpret research results and integrate their knowledge into future practice (2016). While some studies have shown that the best available evidence is not being translated into EBP[21,22], this is not the case for residents sampled in the study.

The EROS serves to measure how participants valued research and their EBP. The current survey showed that residents utilize more research when compared to how much they produce. This may be because of multiple factors that demand the use of EBP in medical practice.[7]

The conduct of research is tied integrally with its interpretation; thus it is also important to evaluate the participants' self-efficacy in interpreting research data and incorporating it into their practice.[6]

Results also show that there is a trend in the participants being primarily consumers of research rather than contributors to the body of knowledge in their field. This can be attributed to the busy schedule of residents in training and intrinsic personal factors. [16,19] The disparity in number might be the reason

why they value EBP highly so that they can apply it in their practice, but only a few do actual research in their field. Barriers to EBM implementation have been explored before,[6,9] and they remain to be important hindrances in research utilization. Limited knowledge about statistics has also been mentioned as a factor affecting their use of research in their generation.

## Limitations of the Study

The very nature of this study being a preliminary study is an important limitation because it only explores the EBM practices of young graduates who experienced having clinical epidemiology as part of their curriculum. Aside from this, the relatively low response rate from the questionnaires given affects the study's power to correlate having a clinical epidemiology course and self-efficacy towards research and RU. The percentage of respondents gathered, as compared to the total number of students who had clinical epidemiology does not adequately represent the total population. Because of this, the generalizability of the study is markedly decreased.

The respondents considered for the study are UST-FMS graduates between the years 2011 and 2016. This excludes an important population – one that did not have clinical epidemiology in their curriculum. This limitation prevents researchers from doing a comparison between the two groups.

## Recommendations

Further research is needed to have a more generalizable result. The sample size used in this

**Table 4: Means of participants' confidence scores on the EPIC scale (N=50)**

Question	Mean (%) $\pm$ SD
Question 1: Identify a gap in your knowledge	76.4 $\pm$ 11.4
Question 2: Formulate a question to guide a literature search	72.0 $\pm$ 9.90
Question 3: Effectively conduct an online literature search	71.6 $\pm$ 18.5
Question 4: Critically appraise the strengths and weaknesses of study methods	69.8 $\pm$ 11.9
Question 5: Critically appraise the measurement properties of standardized tests	69.2 $\pm$ 13.0
Question 6: Interpret statistical tests such as t-test or chi-square tests	61.0 $\pm$ 20.3
Question 7: Interpret statistical procedures such as linear or logistic regression	61.0 $\pm$ 19.7
Question 8: Determine if evidence applies to your patient/client	70.6 $\pm$ 16.1
Question 9: Ask about needs, values and treatment preferences	73.0 $\pm$ 16.9
Question 10: Decide on a course of action	73.0 $\pm$ 12.2

Possible scores range from 0% (not confident) to 100% (completely confident).

preliminary study may not adequately represent the different batches of UST-FMS graduates being studied. A bigger sample size that is representative of the population being studied is recommended. There are a lot of research opportunities that this preliminary study has opened. One of these is the possibility of comparing the self-efficacy of UST-FMS graduates who had and those who did not have clinical epidemiology in their general medical curriculum. This paves the way for a study that can evaluate the effectiveness of clinical epidemiology in equipping the university's graduates to become scholars and researchers in the future. UST-FMS graduates are honed to become 5-star physicians; one aspect of this is becoming an effective researcher.

Another aspect that can be explored is the barriers to effective research and RU that physicians face in their practice. This is important because they already have access to more resources, but they may be facing unique challenges in the process of retrieval, interpretation, or application of study results and guidelines.

Clinical epidemiology has earned its place in the basic medical education curriculum because it teaches the physician to become a good researcher. The results show that many doctors rate their knowledge of statistics as poor, so lessons about

it can be improved. Hospitals may also choose to emphasize on the literature that their medical researchers do. They can dedicate time for residents or fellows to be able to focus on their research and contribute to the academe.

EBM truly is the modern standard of care. Physicians must be able to appraise medical literature, apply theory into practice and contribute to the growing body of medical knowledge.

### Conclusion

This preliminary study investigated the self-efficacy beliefs towards research and RU of UST-FMS graduates who had clinical epidemiology in their basic medical education curriculum. In conclusion, the graduates value research and see EBM as an integral part of clinical practice. However, they are less inclined in performing research themselves. This may be attributed to the physician's busy schedule and other intrinsic factors such as the reported limited knowledge of statistics. The clinical epidemiology subject may be improved by adding more lectures on statistical design and interpretation. Hospitals should also create avenues to support the research conduct of their physicians.



## REFERENCES

- Greiner A, Knebel E. Health professions education: A bridge to quality. Washington, D.C., DC: National Academies Press; 2003. [cited 2016 November 6]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK221528/>.
- Smith R, Rennie D. Evidence based medicine—an oral history. *BMJ*. 2014;348(jan21 34):g371. Available from: <http://dx.doi.org/10.1136/bmj.g371>
- Basavareddy A, Pallamparthy S. Knowledge, Attitude, Practice, And Barriers Toward Research Among Medical Students: A Cross-Sectional Questionnaire-Based Survey. *Perspect Clin Res*. 2019;10(2):73. Available from: [http://dx.doi.org/10.4103/picr.picr\\_1\\_18](http://dx.doi.org/10.4103/picr.picr_1_18)
- Cane J, O'Connor D, Michie S. Validation of the Theoretical Domains Framework for Use in Behaviour Change and Implementation Research. *Implement Sci*. 2012;7(1):37. Available from: <http://dx.doi.org/10.1186/1748-5908-7-37>
- Bandura A. Self-efficacy: The Exercise of Control. New York, NY: W.H. Freeman; 1997.
- Stetler CB. Updating the Stetler Model of Research Utilization to Facilitate Evidence-Based Practice. *Nurs Outlook*. 2001;49(6):272–9. Available from: <http://dx.doi.org/10.1067/mno.2001.120517>
- Su TT, Bulgiba AM, Sampatanukul P, Sastroasmoro S, Chang P, Tharyan P, et al. Clinical Epidemiology (CE) and Evidence-Based Medicine (EBM) in the Asia Pacific Region (round table forum). *Prev Med*. 2013;57 Suppl:S5-7. Available from: <http://dx.doi.org/10.1016/j.ypmed.2013.04.009>
- Smith AB, Semler L, Rehman EA, Haddad ZG, Ahmadzadeh KL, Crellin SJ, et al. A Cross-Sectional Study of Medical Student Knowledge of Evidence-Based Medicine as Measured by the Fresno Test of Evidence-Based Medicine. *J Emerg Med*. 2016;50(5):759–64. Available from: <http://dx.doi.org/10.1016/j.jemermed.2016.02.006>
- Kuhn GJ, Wyer PC, Cordell WH, Rowe BH. A Survey to Determine the Prevalence and Characteristics of Training in Evidence-Based Medicine in Emergency Medicine Residency Programs. *J Emerg Med*. 2005;28(3):353–9. Available from: <http://dx.doi.org/10.1016/j.jemermed.2004.09.015>
- Swinglehurst DA. Information Needs of United Kingdom Primary Care Clinicians: Information Needs of UK Primary Care Clinicians, Deborah A. Swinglehurst. *Health Info Libr J*. 2005;22(3):196–204. Available from: <http://dx.doi.org/10.1111/j.1471-1842.2005.00579.x>
- Ruzafa-Martínez M, López-Iborra L, Armero Barranco D, Ramos-Morcillo AJ. Effectiveness of an Evidence-Based Practice (EBP) Course on the EBP Competence of Undergraduate Nursing Students: A Quasi-Experimental Study. *Nurse Educ Today*. 2016;38:82–7. Available from: <http://dx.doi.org/10.1016/j.nedt.2015.12.012>
- Brown CE, Kim SC, Stichler JF, Fields W. Predictors of Knowledge, Attitudes, Use and Future Use of Evidence-Based Practice Among Baccalaureate Nursing Students at Two Universities. *Nurse Educ Today*. 2010;30(6):521–7. Available from: <http://dx.doi.org/10.1016/j.nedt.2009.10.021>
- Paulsen J, Al Achkar M. Factors Associated With Practicing Evidence-Based Medicine: a Study of Family Medicine Residents. *Adv Med Educ Pract*. 2018;9:287–93. Available from: <http://dx.doi.org/10.2147/amep.s157792>
- Black AT, Balneaves LG, Garossino C, Puyat JH, Qian H. Promoting Evidence-Based Practice Through a Research Training Program for Point-of-Care Clinicians. *J Nurs Adm*. 2015;45(1):14–20. Available from: <http://dx.doi.org/10.1097/NNA.0000000000000151>
- Khoja TA, Al-Ansary LA. Attitudes to Evidence-Based Medicine of Primary Care Physicians in Asir Region, Saudi Arabia. *East Mediterr Health J*. 2007;13(2):408–19.
- Gavvani VZ, Mohan VV. Physicians' Attitude Towards Evidence-Based Medical Practice and Health Science Library Services. *Library and Information Science Research Electronic Journal*. 2008;18(1):1–10.
- Kortekaas MF, Bartelink MEL, Zuithoff NPA, van der Heijden GJMG, de Wit NJ, Hoes AW. Does Integrated Training in Evidence-Based Medicine (EBM) in the General Practice (GP) Specialty Training Improve EBM Behaviour in Daily Clinical Practice? A Cluster Randomised Controlled Trial. *BMJ Open*. 2016;6(9):e010537. Available from: <http://dx.doi.org/10.1136/bmjopen-2015-010537>
- Csertő M, Berényi K, Decsi T, Lohner S. Self-Reported Attitudes, Knowledge and Skills of Using Evidence-Based Medicine in Daily Health Care Practice: A National Survey Among Students of Medicine and Health Sciences in Hungary. *PLoS One*. 2019;14(12):e0225641. Available from: <http://dx.doi.org/10.1371/journal.pone.0225641>
- Khalid A. Al-Motairy HMA-M. Primary Health Care Physicians' Perceptions, Attitude and Educational Needs Towards? Evidence Based Medicine. *Biomedical Research*. 2013;24(2):257–62.
- Sackett D, Rosenberg W, Gray J, Haynes R, Richardson S. Evidence-based medicine: What It Is And What It Isn't. *British Medical Journal*. 1996;312:71–2.
- Julian DG. Translation of Clinical Trials Into Clinical Practice. *J Intern Med*. 2004;255(3):309–16. Available from: <http://dx.doi.org/10.1046/j.1365-2796.2003.01282.x>
- Sullivan KJ, Wayne C, Patey AM, Nasr A. Barriers and facilitators to the implementation of evidence-based practice by pediatric surgeons. *J Pediatr Surg*. 2017;52(10):1666–73. Available from: <http://dx.doi.org/10.1016/j.jpedsurg.2017.02.001>
- Dizon JM, Dizon RJ, Regino J, Gabriel A. Evidence-Based Practice Training for Health Professionals in the Philippines. *Adv Med Educ Pract*. 2014;5:89–94. Available from: <http://dx.doi.org/10.2147/AMEP.S54459>
- Asselin ME. Knowledge Utilization Among Experienced Staff Nurses. *J Nurses Staff Dev*. 2001;17(3):115–22; quiz 123–4. Available from: <http://dx.doi.org/10.1097/00124645-200105000-00003>
- Brangan J, Quinn S, Spirtos M. Impact of an Evidence-Based Practice Course on Occupational Therapist's Confidence Levels and Goals. *Occup Ther Health Care*. 2015;29(1):27–38. Available from: <http://dx.doi.org/10.3109/07380577.2014.968943>
- Heiwe S, Kajermo K, Tyni-Lenne R, Guidetti S, Samuelsson M, Andersson IL, et al. Evidence-Based Practice: Attitudes, Knowledge and Behaviors Among Allied Health Care Professionals. *International Journal for Quality in Health Care*. 2010;23(2):198–209.
- UST Faculty of Medicine and Surgery. (2016). Graduate Attributes. [cited 2016 November 3]. Available from: <http://medicine.ust.edu.ph/about-us-copy.html#gradatts>.
- UST Faculty of Medicine and Surgery. (2016). Clinical Epidemiology. [cited 2016 November 6]. Available from: <http://medicine.ust.edu.ph/education.html#cliep>.
- Salbach NM, Jaglal SB, Williams JI. Reliability and Validity of the Evidence-Based Practice Confidence (EPIC) Scale.

- J Contin Educ Health Prof.* 2013 Winter;33(1):33–40. Available from: <http://dx.doi.org/10.1002/chp.21164>
30. Salbach NM, Jaglal SB. Creation and Validation of the Evidence-Based Practice Confidence Scale for Health Care Professionals: Evidence-Based Practice Confidence Scale. *J Eval Clin Pract.* 2011;17(4):794–800. Available from: <http://dx.doi.org/10.1111/j.1365-2753.2010.01478.x>
  31. Clyde JH, Brooks D, Cameron JI, Salbach NM. Validation of the Evidence-Based Practice Confidence (EPIC) Scale Among Occupational Therapists. *American Journal of Occupational Therapy.* 2016;
  32. Lyons C, Brown T, Tseng MH, Casey J, McDonald R. Evidence-Based Practice and Research Utilisation: Perceived Research Knowledge, Attitudes, Practices and Barriers Among Australian Paediatric Occupational Therapists: EVIDENCE-BASED PRACTICE AND RESEARCH UTILISATION. *Aust Occup Ther J.* 2011;58(3):178–86. Available from: <http://dx.doi.org/10.1111/j.1440-1630.2010.00900.x>
  33. McCleary L, Brown GT. Use of the Edmonton Research Orientation Scale with Nurses. *J Nurs Meas.* 2002 Winter;10(3):263–75. Available from: <http://dx.doi.org/10.1891/jnum.10.3.263.52559>



**Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License, which permits use, share — copy and redistribute the material in any medium or format, adapt — remix, transform, and build upon the material, as long as you give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. You may not use the material for commercial purposes. If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-sa/4.0/>.