

## FACTORS RELATED TO DOCTORS' AND NURSES' PERCEPTIONS OF EVIDENCE-BASED PRACTICE AND INFORMATION - COMMUNICATION TECHNOLOGY

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### Abstract

Evidence-based practice (EBP) that is supported by the availability of the best literature can improve the quality of health services. Information and communication technology (ICT) usage may provide the evidence in timely-manner. However, literature on the factors related to EBP and ICT of doctors and nurses in Indonesia is scant. This study aimed to describe the factors related to the doctors' and nurses' EBP perception and ICT. This survey was conducted in November 2017–January 2018 at one general hospital, five private hospitals, eleven public health centers, and five private clinics. A total of 85 doctors and 271 nurses selected by proportional probability sampling were given online questionnaires. Each questionnaire consisted of 12 items about access to information and 24 items about perception of EBP adopted from the evidence-based practice questionnaire Upton & Upton. Pearson correlation, independent t-test analysis, and one-way ANOVA results found education and role were related to the doctors' EBP. Education, role, age, and experience were related to the doctors' ICT. There was a relationship between age and education with the nurses EBP. These two factors and working experience were related to the nurses' ICT. EBP intervention through ICT may take into account the nature of experienced senior doctors and young inexperienced nurses with higher education in the ICT platform. Advocacy is needed to increase the use of ICTs for EBP and professional development. Further research related to the need of knowledge translation through ICT should be conducted.

**Keywords:** doctors, evidence-based practice, information communications technology, nurses, perception

### Abstrak

*Faktor-faktor yang Berhubungan dengan Persepsi Dokter dan Perawat terhadap Praktik Klinis Berbasis Bukti dan Teknologi Informasi dan Komunikasi. Praktik klinis berbasis bukti (PKBB) yang ditunjang dengan ketersediaan literatur terbaik dapat meningkatkan kualitas pelayanan kesehatan. Penggunaan Teknologi Informasi dan Komunikasi (TIK) menyediakan bukti ilmiah dalam waktu yang singkat. Namun, literature tentang faktor-faktor yang berhubungan dengan PKBB dan TIK dokter dan perawat di Indonesia masih sedikit. Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor yang berhubungan dengan persepsi PKBB dan TIK dokter dan perawat. Survei ini dilaksanakan pada November 2017–Januari 2018 di satu rumah sakit umum, lima rumah sakit swasta, sebelas puskesmas, dan lima klinik swasta. Sebanyak 85 dokter dan 271 perawat yang dipilih dengan sampel proportional probability diberikan kuesioner daring. Kuesioner terdiri dari 12 pertanyaan tentang akses informasi dan 24 pernyataan tentang persepsi PKBB yang diadopsi dari evidence-based practice questionnaire Upton & Upton. Hasil analisis Pearson correlation, independent T-test dan one-way ANOVA menemukan hubungan antara pendidikan dan peran dengan PKBB dokter, serta pendidikan, peran, usia dan pengalaman kerja berhubungan dengan TIK dokter. Ada hubungan antara umur dan pendidikan dengan PPKB perawat. Kedua faktor dan pengalaman kerja ini terkait dengan TIK perawat. Intervensi PPKB melalui TIK dapat mempertimbangkan karakter dokter senior berpengalaman dan perawat muda yang pendidikan tinggi namun belum berpengalaman dengan platform TIK. Advokasi diperlukan untuk meningkatkan pemanfaatan TIK untuk PPKB dan pengembangan profesional. Penelitian lebih lanjut terkait kebutuhan penerjemahan pengetahuan melalui TIK harus dilakukan.*

**Kata Kunci:** dokter, perawat, persepsi, praktik klinis berbasis ilmiah, teknologi informasi komunikasi

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## Introduction

The quality of health service is determined by a comprehensive initiative in its delivery. The World Health Organization, Organisation for Economic Cooperation and Development, and The World Bank (2018) acknowledged that health care workers should use “current professional knowledge” which emphasizes the implementation of Evidence-based Practice (EBP). EBP has been proven to improve patient outcomes (Moreno-Poyato et al., 2020), to decrease financial expenditure (Staffileno et al., 2013), to accelerate knowledge into practice (Rushmer et al., 2019), and to assist decision-making (Rushmer et al., 2019; WHO) 2015). However, EBP faced challenges to its application in clinical practice.

Extensive reports on barriers to the implementation of EBP were reported. Globally and in low-middle income countries, both doctors and nurses agreed on common barriers which are the lack of time, research or EBP skills and knowledge, and interprofessional collaboration (Sadeghi-Bazargani et al., 2014; Shayan et al., 2019; Swennen et al., 2013). Although, interprofessional collaboration problems were no longer experienced by the doctors in recent years (Barzkar et al., 2018). They also reported other barriers such as inadequate facilities, access, fund, and organizational support. Evidence-related skills difficulties, from finding to translating evidence were reported as well. Several countries such as China, Ghaza, Iran, and Saudi Arabia confirmed the same barriers (Albarqouni & Elessi, 2017; Alqahtani et al., 2020; Fu et al., 2020; Nader-khah et al., 2016). Language was also noted as a problem to understand evidence (Sadeghi-Bazargani et al., 2014; Shayan et al., 2019; Turner & Short, 2013). Indonesia is a middle income country, therefore, similar barriers were also noted (Novrianda & Hermalinda, 2019).

Barriers in facilitation of EBP was elaborated further. The world organizations recommended

more extensive access to health care information to enhance EBP (United Nations, 2015; WHO-SEARO, 2016). However, it is still insufficient (United Nations, 2015), and retrieving information through information and communications technology (ICT) is difficult for the majority of doctors and nurses in South East Asia (Turner & Short, 2013). A national survey proved the majority of Indonesian people use the internet (64.8%) with West Java people ranked first (Asosiasi Penyelenggara Jasa Internet Indonesia, 2018). However, only a small number of people use it for work-related information (11.5%). This number is similar to the global survey result held in the Asia Pacific region (CIGI-Ipsos, 2017).

Despite the challenges faced by nurses and doctors, their EBP perception was positive and the factors influencing their EBP were recognized. Nurses have positive EBP perception, especially their attitude in most studies (AbuRuz et al., 2017; Al-Busaidi et al., 2019; Alqahtani et al., 2020; Kalhor et al., 2017; Naderkhah et al., 2016; Novrianda & Hermalinda, 2019; Zhou et al., 2016). Some of these studies reported various relationships or influencing factors such as age, gender, education, working experience, and role. However, the results vary from no relationship to significant relationship. Furthermore, there is a scarcity in the EBP and ICT literature of nurses in Indonesia. Various instruments were also used in studies exploring evidence-based medicine (EBM), and most found attitude ranked first. However, literature on the relationship between the doctors characteristics with their EBP and ICT is still scant (Al-barqouni & Elessi, 2017; Barzkar et al., 2018).

Little is known about the relationship between Indonesian nurses' and doctors' characteristics with their EBP perception and ICT, especially in Depok West Java. This data may contribute to the development of EBP and to overcome its barriers in Indonesia. Therefore, this paper aimed to reports the relationship between the perception of doctors and nurses on EBP and ICT.

## Methods

A quantitative research method with correlational study design was used in this study. It was conducted between November 2017 and January 2018. Population in this study were doctors and nurses work in Depok City, West Java, Indonesia. Proportional probability sampling was assigned to select the health care providers based on the number of doctor and nurses worked in the research settings including five private hospitals, five private clinics, and eleven public health centers. Thus, each respondent who were selected randomly had the same opportunity to involved in this study according to the number of proportions for each setting. The government city hospital was purposely selected because it was the only government hospital in Depok City. The inclusion criteria were doctors and nurses who worked in Depok City, and had 1 year working experience. Accordingly, 85 doctors and 271 nurses with minimum 1 year working experience were determined proportionally and randomly for each provider and unit. The more nurses or doctors worked in a unit, the higher number of nurses or doctors would be selected to participate in the study.

The questionnaires employed were developed from the WHO's building blocks of health systems (WHO, 2010, 2017). Five WHO health system components were set as a framework for this study: service delivery, health workforce, health information, fund, and leadership and governance in the context of ICT and EBP. Covering this framework, a self-designed ICT-based health information access and an adoption from the Upton and Upton's EBP Questionnaire (EBPQ) (Upton et al., 2017) were assigned. Twelve questions about information and ICT's availability and access were asked in the ICT questionnaire (Table 1). ICT questionnaire used Gutman's scale "Yes" and "No" for question number 1 to 9, four points Likert scale from "Never" to "Always" for question number 11 and 12, and especially for question number 10 used the answer option. Twenty-four statements were included to identify the doctors and nurses'

practice (6 items), attitude (4 items), and knowledge (14 items) on their EBP. EBP Questionnaire also used Likert scale. The Content Validity Index (CVI) of three experts in health rated mean Item CVI (I-CVI) as 1.00 and Scale-CVI (S-CVI) Average 1.00, which indicate that the EBPQ is acceptable. Internal consistency was also secured with Cronbach's alpha (0.92), which means the questionnaire is reliable.

Online self-completed questionnaires were shared to all nurses and doctors. The nurses in three hospitals were gathered by the nurse and hospital managers in a room at the same time for the survey. Participants were given verbal explanation about the study and an informed consent was obtained prior to the data collection. Then, the questionnaire links were given and completed by the nurses. For doctors, the data were collected face to face in the wards. All questionnaires were completed and analyzed. Ethical approval was obtained from Faculty of Nursing, Universitas Indonesia. Privacy was ensured with anonymity of the response.

Frequency distribution with mean, standard deviation, and percentage was applied to describe univariate data. Subsequently, Pearson's correlation analysis, independent t-test analysis and oneway ANOVA was assigned to determine the relationship between numerical data and ICT and each EBP subscale (practice, attitude, and knowledge). The relationship's strength and direction were determined by correlation coefficient  $r$  at its critical values (Plichta & Kelvin, 2013).

## Results

**Characteristics of Participants.** The participants were 85 doctors and 271 nurses. As illustrated in table 1, the average age of doctors was 36 years old and with 7 years of experience, mostly female (78.8%), having bachelor degree (72.9%), and working as a general doctor (75.3%). The average age of nurses was 31 years old and with 8 years of experience, mostly female (90.0%), having diploma degree (84.1%), and working as nurse associate (77.1%).

Table 1. Characteristics of doctors and nurses in Depok City, Indonesia

Variables	Doctors (85) M ± SD or N (%)	Nurses (271) M ± SD or N (%)
Age	36.40 ± 8.34	30.76 ± 6.46
Working experience	7.09 ± 6.48	7.75 ± 6.02
Gender		
Male	18 (21.2%)	27 (10%)
Female	67 (78.8%)	244 (90%)
Education degree		
Diploma	-	228 (84.1%)
Bachelor	62 (72.9%)	42 (15.5%)
Specialist	23 (27.1%)	1 (0.4%)
Role		
Nurse associate	-	209 (77.1%)
Team leader	-	17 (6.3%)
Head nurse	-	45 (16.6%)
General doctor	64 (75.3%)	
Medical doctor in charge	19 (22.4%)	
Consultant Doctor	1 (1.2%)	
Chief doctor	1 (1.2%)	

Table 2. Associated Variables with Evidence-based Practice (EBP) Among Nurses in Depok City, Indonesia (n= 271)

Characteristics	Evidence-based Practice (EBP)						Information and Communication Technology (ICT)	
	Practice Mean±SD	p	Attitude Mean±SD	p	Knowledge Mean±SD	p	Mean±SD	p
Age		r= -0.02 p= 0.69		r= -0.01 p= 0.92		r= -0.13 p= 0.04*		r= -0.15 p= 0.02*
Working Experience		r= 0.01 p= 0.88		r= 0.01 p= 0.90		r= -0.11** p= 0.06		r= -0.14 p= 0.02*
Gender								
Male	8.19 ± 2.60	t= -1.48	6.88 ± 1.18	t= -1.08	19.11 ± 5.31	t= -0.56	1.52 ± 1.60	t= -1.31
Female	8.99 ± 2.68	p= 0.14	7.12 ± 1.12	p= 0.28	19.85 ± 6.61	p= 0.57	2.03 ± 1.95	p= 0.19
Education								
Diploma	8.84 ± 2.46	F= 3.78	6.99 ± 1.01	F= 6.51	19.90 ± 6.14	F= 0.26	2.10 ± 1.99	F= 2.99
Bachelor	9.12 ± 3.53	p= 0.02*	7.64 ± 1.30	p= 0.00*	19.17 ± 8.25	p= 0.77	1.33 ± 1.14	p= 0.05*
Master	16.00 ± 0.00		8.00 ± 0.00		18.00 ± 0.00		1.00 ± 0.00	
Role								
Nurse Associate	8.99 ± 2.67	F= 0.46	7.09 ± 1.16	F= 0.13	19.96 ± 6.45	F= 0.77	1.94 ± 1.93	F= 0.17
Team Leader	8.65 ± 2.81	p= 0.63	7.24 ± 1.09	p= 0.88	17.94 ± 5.26	p= 0.46	2.18 ± 1.88	p= 0.84
Head Nurse	8.61 ± 2.70		7.09 ± 0.97		19.62 ± 7.06		2.07 ± 1.97	

Note: Pearson's correlations, independent t-test, ANOVA  
\*p < 0.05

**Associated Variables with Evidence-based Practice (EBP) and Information Communication and Technology (ICT) of Nurses.** Several factors related to the nurses' EBP and ICT

(Table 2). The nurses' practice and attitude was related to education (p< 0.05), while knowledge was related to their age also at p< 0.05. The nurses' ICT was related to the nurses' age, working

experience, and education at  $p < 0.05$ .

**Associated Variables with Evidence-based Practice (EBP) and Information Communication and Technology (ICT) of Doctors.** The Pearson's correlation analysis showed that several factors related to EBP and ICT. There was a relationship between the doctors' age and working experience with ICT but none with EBP. Education and role of doctors were related to their EBP and ICT, both at  $p < 0.00$  (Table 3). ICT was related to age, and working experience at  $p < 0.01$ .

## Discussion

This study aimed to measure factors associated with the nurses' and doctors' EBP and ICT. Our findings confirm those relationships with the nurses' and doctors' characteristics. Three cha-

racteristics are related to the nurses' EBP, as well as ICT. They were age, working experience, and education. Meanwhile, there were two factors related to the doctors' EBP and four factors related to ICT.

Several characteristics were related to the nurses' EBP. This study showed that younger nurses tend to have better EBP knowledge. On the other hand, nurses in Saudi Arabia and Iran reported no relationship between EBP and the nurses' age (Alqahtani et al., 2020; Kalhor et al., 2017). However, in terms of gender, Alqahtani et al. (2020), Kalhor et al. (2017), and this study agreed that it has no relationship with EBP. Interestingly, male nurses in Jordan have more positive EBP than female nurses (AbuRuz et al., 2017). Also, the higher education the nurses' hold, the better their attitude and practice towards EBP. This result corresponds with nurses

Table 3. Associated Variables with Evidence-based Practice (EBP) and *Information Communication and Technology (ICT)* Among Doctors in Depok City, Indonesia (n= 85)

Characteristics	Evidence-based Practice (EBP)						Information and Communication Technology (ICT)	
	Practice Mean±SD	p	Attitude Mean±SD	p	Knowledge Mean±SD	p	Mean±SD	p
Age		r= 0.14 p= 0.20		r= 0.15 p= 0.17		r= -0.12 p= 0.28		r= 0.50 p= 0.00**
Working Experience		r= 0.07 p= 0.52		r= 0.01 p= 0.96		r= -0.11 p= 0.31		r= 0.53 p= 0.00**
Gender								
Male	10.50 ± 3.60	t= 0.04	7.39 ± 1.04	t= -0.77	22.61 ± 5.32	t= 0.95	2.06 ± 1.89	t= 1.45
Female	10.46 ± 3.28	p= 0.97	7.61 ± 1.10	p= 0.44	20.81 ± 7.58	p= 0.35	1.40 ± 1.64	p= 0.15
Education								
Bachelor	9.50 ± 2.93	t = -5.01	7.45 ± 1.00	t = -1.59	20.34 ± 6.69	t = -1.82	1.15 ± 1.29	t = -3.78
Master	13.09 ± 2.94	p= 0.00*	7.87 ± 1.25	p= 0.12	23.48 ± 8.05	p= 0.07	2.61 ± 2.21	p= 0.00**
Role								
General Practitioner	9.53 ± 2.90	F= 9.97 p= 0.00*	7.47 ± 1.023	F= 0.89 p= 0.45	20.25 ± 6.88	F= 1.77 p= 0.16	1.19 ± 1.32	F= 5.46 p= 0.00**
Medical Doctor in Charge	13.47 ± 2.88		7.89 ± 1.29		23.74 ± 7.80		2.68 ± 2.29	
Consultant Doctor	15.00 ± 0.00		8.00 ± 0.00		30.00 ± 0.00		4.00 ± 0.00	
Chief doctor	9.00 ± 0.00		7.00 ± 0.00		24.00 ± 0.00		0.00 ± 0.00	

Note: Pearson's correlations, independent t-test, ANOVA  
\* $p < 0.05$ ; \*\* $p < 0.01$

in Jordan (AbuRuz et al., 2017) but in contrast with nurses in Saudi Arabia (Al-qahtani et al., 2020). Working experience and role have no relationship to EBP. Similar results found in Iran and Saudi Arabia (Alqahtani et al., 2020; Kalhor et al., 2017) but differ from in China and Oman where nurses with better working experience have a better attitude towards EBP (Al-Busaidi et al., 2019; Zhou et al., 2016).

Age, working experience, and education were related to the nurses' ICT. These data show that the younger and the less experienced the nurses, the more likely they will use ICT for evidence purposes. This is in accordance with the national survey where younger people used the internet more than older people (Asosiasi Penyelenggara Jasa Internet Indonesia, 2018). Education was related to ICT, as well. Higher degree nurses tend to utilize ICT more than others.

Given that ICT facilities for evidence are available and accessible through most providers, their usage to maximize EBP and meet the UN and WHO's recommendation is highly potential. Measures to improve EBP knowledge should target young and less experienced but with higher degree nurses in the ICT platform. Professional development in higher degree education should also be supported to improve both EBP and ICT usage.

There is a relationship between the doctors' education and role with EBP. This study showed doctors with a higher degree of education tend to practice less EBP. There has not been a recent study result similar to this finding. However, inadequate training was one of the reasons EBP was not well implemented (Sadeghi-Bazargani et al., 2014). Swennen et al. (2013) implied that role was an advantage in EBP, although also become a barrier in transferring knowledge because they relied on their seniors to obtain and applying evidence. This was also confirmed by Barzkar et al. (2018). Moreover, Albarqouni and Elessi (2017) found that EBP was unwelcomed among senior doctors.

Education, role, age, and working experience were also related to doctors' ICT. The relationship between ICT and both age, working experience, and role were substantial and positively inline. The more age, experience, and role gained, the more likely ICT was used and potentially used for evidence purposes. Enhancing EBP through ICT may target older and experienced with important role doctors as their juniors rely on them for information.

## Conclusion

The doctors' education and role were related to their EBP perception. Adding to these factors, age and years of experience also related to their ICT skill. Similarly, education and age were related to the nurses EBP. Age, working experience, and education were related to the nurses' ICT, as well. EBP intervention through ICT may take into account experienced senior doctors and young inexperience with higher education nurses generation in the platform. Future research and efforts to improve information systems to maximize EBP practices through user-friendly ICT and education need to be conducted.

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