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Evidence-Based Practice among health professionals in hospitals of Northwest Ethiopia: A cross-sectional study

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Abstract

Background: Evidence-based practice (EBP) is a problem-solving approach to patient care based on the best available and valid evidence. It is accentuated to increase the quality of care and patient safety. Evidence-Based Practice in clinical service is low in developing countries including Ethiopia. This study aimed at assessing Evidence-Based Practice and associated factors among health professionals in North Gondar Administrative Zone hospitals, Northwest Ethiopia.

Methods: Institution-based cross-sectional study was carried out from March to May 2015 in three hospitals in North Gondar Zone. A stratified simple random sampling technique was used to select 438 respondents. Trained data collectors collected data using a pre-tested, structured and self-administered questionnaire. The questionnaire included socio-demographic characteristics, level of knowledge, attitude and organizational factors. Data were entered using Epi Info version 7.0 and analyzed using SPSS version 20.0. Bivariate and multivariable logistic regression analyses were undertaken to identify the associated factors.

Results: In total, 431 returned questionnaires were valid for the analysis making a response rate of 98.4%. Almost half, 53% (228) of study participants utilized EBP. EBP utilization was significantly associated with knowledge [AOR: 1.612, 95% CI= (1.06-2.45)], internet access [AOR: 1.831, 95%CI = (1.191-2.816)], training [AOR: 1.906, 95%CI (1.223-2.97)], and availability of enough time to apply EBP [AOR: 1.698, 95%CI= (1.122-2.57)].

Conclusion: This study depicts EBP Utilization was insufficient. We observed that Knowledge of EBP, training, internet access and availability of time were significantly associated with utilizing EBP. Improving facilities internet access, giving more time for EBP, and training health professionals about search strategies would improve EBP.

Key words: Evidence-Based Practice, Evidence-Based Medicine, Evidence-Based Healthcare, Medical practice and research

Background

David Sacket defined Evidence-Based Practice as ‘the integration of the best research evidence with clinical expertise, patient values and the use of current best evidence in making decisions about the care of individual patient’ ¹.

For many years, the integration of up-to-date and available evidence with the medical practice has been limited. In major clinical areas, such as hospitals, it has long been acknowledged that the findings of research studies are not often translated into actual clinical practice. As a result, many patients receive suboptimal care, and some of them suffer from serious and avoidable harm to their health. To date, a large gap remains between the best evidence and its implementation in clinical practice. Therefore, several surveys concluded that clinical decisions are rarely based on the best available evidence ^{2 3}.

The current shape of the Evidence-Based Practice is highly influenced by the multi-institutional collaboration group, Evidence-Based Clinical Practice Working Group (EBCP), led by Gord Guyatt, Deborah Cook and colleagues at McMaster University. This initiative has contributed several evidence based practice guidelines to facilitate the use of scientific literature in the daily medical practice ⁴. This working group has inspired North American medical practice, the promotion of educational innovation and the use of scientific literature for patient care.

Evidence-Based Practice, from the time when the Evidence-Based working group first established the concept, nowadays is a global approach to improve healthcare ⁵. In order to meet the changing needs of both consumers and providers of healthcare, healthcare providers need to shift from traditional practices to evidence-driven healthcare services ⁶. The demand for maximum quality of care combined with the need for prudent use of resources has increased the pressure on healthcare professionals to ensure that clinical practice is based on sound evidence. With longer life expectancies, an exponentially increasing volume of

research information, availability of sophisticated medical care, increasing expectations from clients to provide the best possible care and compounded by the rising healthcare expenditures compel the governments around the globe to embrace Evidence-Based Practice as an essential tool to deliver quality healthcare ⁵.

Evidence-Based Practice is most prominent in the United Kingdom, Canada, and the United States, where outcomes measurement and effectiveness in public services are increasingly seen as important by governments and citizens ⁷. Other similar findings from the developed world implies that integrating Evidence-Based Practice into routine primary care practice is practical and attainable ⁸.

Conversely, Evidence-Based Practice in healthcare has been challenging in developing countries due to lack of resources, nature of the healthcare workforce and the limitation of available interventions ⁵. There is a view that EBP approaches have the potential to have even greater impact on outcomes in developing countries, where better use of evidence in healthcare system could dramatically help improve healthcare delivery performance. This is because EBP tends to be less well established in developing countries than in developed ones, and healthcare is often not based on evidence ^{7,9}.

Health sector of many developing countries including Ethiopia face a host of challenges due to their complicated health problems, unavailability of adequate medical tools and low score proven interventions. Hence, Evidence-Based healthcare faces obstacles though there is the need to implement it. In most African countries, local health systems are inadequate in terms of infrastructure and facilities available. The healthcare service of many of these countries suffer from not only a scarcity of healthcare research but also from a low utilization of evidence in clinical service.

In Ethiopia, the Federal Ministry of Health lacks skilled health professionals who could help synthesize evidence for policy-making. At all levels of the health systems there is little culture of trusting or using evidence for decision making. Hence, it has been challenging for policy makers which evidence they should use to develop policies and strengthen health systems ¹⁰.

According to the World Health Organization (WHO), most research activities in Africa are linked to educational or academic institutions. Additionally, it is not known how much health

related research is being utilized to improve healthcare practice in order to ensure high quality healthcare delivery and improve standards and quality of life ¹¹. Hence, this study aimed at determining the level of Evidence-Based Practice utilization and identify associated factors among health professionals in North Gondar Administrative Zone hospitals, Northwest Ethiopia.

Methods

An institution based cross-sectional study was carried out from March 20 to May 29, 2015 in North Gondar Zone, Northwest Ethiopia. North Gondar Zone has two district hospitals and one referral hospital. During the study period, university of Gondar Referral Hospital had 764 health professionals including 40 medical doctors, 428 nurses, and 296 other health professionals, while Debark and Metema Hospital had 83 and 114 health professionals respectively.

Private health institutions were excluded from the study to avoid double counting since government health workers possibly be part-timers in the private institutions. Participants who were ill and unable to respond were also excluded from the study.

The sample for this study was calculated by using a single population proportion formula, 95% confidence interval (CI) and a proportion of the magnitude of Evidence-Based Practice of 19% ¹², absolute precision to be 5%, and 10% non-response rate. Accordingly, the total sample size was calculated to be 438.

Proportionate stratified simple random sampling technique was deployed to select study participants from all public hospitals in North Gondar Zone (Figure 1). The Human Resource list of health professionals in each hospital was used as a sampling frame to identify potential study participants. We assumed that all healthcare providers working in the same hospital were homogenous regarding EBP. Study participants were then selected randomly using record identification numbers retrieved from the sampling frame. Lottery method was used to randomly select set of healthcare providers as respondents of our study.

Data were collected by trained data collectors using a pre-tested, structured and self-administered questionnaire which was adopted from the existing literature ¹³⁻¹⁵. The questionnaire was translated into local language (Amharic) from its English version then back to English with the help of two language experts. One day training was provided for the data collectors on how the data should be obtained and recorded. Pre-test was conducted on a similar setting before the actual data collection time on 5% of the sample size in order to check the reliability of the instrument, to estimate the time needed to collect data, and to

modify the questionnaire accordingly. Using the data obtained from the pre-test, the questionnaire was checked for reliability (internal consistency) using the Cronbach alpha-test. The reliability for knowledge questions had a Cronbach's Alpha value of 0.853, and attitude had a Cronbach's alpha value of 0.731, and practice (Cronbach's Alpha=0.878). These values indicate that the questionnaire has very good reliability.

Data collectors were supervised while collecting the data by four data collection supervisors and the principal investigator. Data were checked daily for completeness and consistency throughout the data collection period.

Data were coded and entered into Epi Info version 7.0 and then exported to statistical package for social sciences (SPSS) version 20.0 program for analysis. Descriptive summaries using frequencies, proportions, graphs and cross tabs were used to present study results. Odds ratios (OR) with 95% confidence intervals were used to determine the strength of association between independent and dependent variables. Those variables with p value of less than 0.2 in the binary logistic regression analysis were selected for further analysis. Multivariable logistic analysis was finally used to control the effect of confounding. Variables with a p-value of less than 0.05 in the multivariable analysis were considered as having statistically significant association.

In total, 6 self-reported questions were asked to measure EBP utilization. These are self-reported responses to questions that measure the respondent's capacity of formulating questions, skills of evidence searching, appraising evidence using existing critical appraisal tools, integrating and implementing evidence with medical expertise considering patient preferences, evaluation and sharing of the outcome. Each question had a four-point response scale (never, monthly or more, weekly, daily). These categories were coded as numerical values from 1 to 4 (Never "1", Monthly "2", Weekly "3", Daily "4"). Therefore, each respondent had a total EBP utilization score (from minimum 6 to a possible maximum of 24). The average of each question can be calculated as $(1+2+3+4)/4 = 10/4 = 2.5$. Those answering above this point are considered as desirable responses to the EBP questions. EBP utilization was assessed by using the average score for of the six questions. Hence, $2.5*6=15$ is used as the cutoff point. Respondents having a total EBP utilization score above the cut point (average =15) are considered as having "good EBP" while those below were labeled as having "poor EBP".

In total, 26 questions assessing EBP knowledge were asked to indicate the level of EBP knowledge, with each of them having a Yes/No response. These questions range from basic questions such as knowledge of main source of evidence (MEDLINE, PubMed) to self-reported level of knowledge on statistical and epidemiological terms important to understand medical literature such as relative risk, odds ratios, systematic reviews, meta-analysis, etc. The average score for each question was used to determine knowledge. Yes answers were coded as “1” and “no” answers as “0”. A total EBP knowledge score (from minimum 0 to a possible maximum 26) was calculated for all respondents. After checking for normal distribution, the mean knowledge score was calculated because knowledge score was normally distributed. Normal distribution was checked using Shapiro-Wilk test (W statistic .98 with a p value of 0.23). Skewness was 0.74 and kurtosis 0.65. The mean knowledge score was 16.37(SD 5.05). Respondents having knowledge score above the mean value, 16.37, were labeled as having “good knowledge” otherwise as “poor knowledge”.

Similarly, 9 questions were asked to determine the level of attitude towards EBP. Each attitude question has a five-point Likert scale (strongly agree coded as 5, agree coded as 4, neutral coded as 3, disagree coded as 2, and strongly disagree coded as 1). Each respondent had a total attitude score of from a minimum 9 to a possible maximum level of 45 points.

Using the Shapiro-Wilk test, attitude towards EBP score was checked for normal distribution. Hence, attitude towards EBP was not normally distributed (W statistic .896, p value less than .001). Skewness was -1.48 and kurtosis 4.73. The median of the attitude towards EBP was 34.0 (Inter quartile Range = 5.0). Respondents with attitude towards EBP score above the median, 34.0, were categorized as having “favorable attitude” and those below as having “unfavorable attitude”.

This study was conducted after receiving official permission from Ethical review committee of the University of Gondar, Institute of Public Health. Permission letter was also received from the North Gondar Zone Health Office. Informed verbal consent was obtained from each respondent. Each respondent was informed about the objective of the study and privacy during the interview was secured.

Results

Socio-demographic characteristics of participants

A total of 431 Health Professionals returned the questionnaire, which yields a response rate of 98.4%. Two hundred seventy-four (63.6%) of the respondents participants were male. Three hundred thirty-six (78%) were in the age group 20 - 29 years. The mean age of the respondents was 27.5(SD+ 4.97) years. Concerning educational status, 324 (74.9%) of the

respondents were Bachelor's degree holders, 89 (20.4%) and 16 (3.7%) of the participants have Diploma and Master Degree, respectively. (Table 1).

Knowledge about Evidence-Based practice

The level of good knowledge was found to be 64%. Most participants (57.8%) were aware that practice guidelines are available online. Sixty-five percent (282) of the respondents stated evidence from all published articles in scientific journals can be used for medical practice and 74% health professionals were familiar with medical literature and search engines. The self-reported knowledge of respondents on statistical and epidemiological concepts relevant to understand medical literature vary across the terms. More than half of the respondents, 54.1% (233), mentioned that they understand relative risk. Only one-third, 32% (138), 44.1% (190), 33.2% (143) and 17.6% (76) of the respondents mentioned they fully understand odds ratio, confidence interval, systematic reviews and meta-analysis respectively (Table 2).

Attitude towards Evidence-Based practice

Sixty five percent of the respondents had favorable attitude towards Evidence-Based Practice. Based on the findings, (48.5%) of the respondents strongly agreed that Evidence-Based Practice improves the quality of healthcare while 53.1% of the respondents agreed that their reimbursement rate will increase if they incorporate EBP into their practice (Figure 2).

Magnitude of Evidence-Based practice utilization

Fifty-three percent (53%) participants have previously used Evidence-Based Practice. About 39% of the respondents formulated questions daily. Furthermore, 38.7% of the respondents integrate EBP in to their medical practice. However, only 26.5% of the participants appraise the literature daily and 12.3% of the respondents never evaluated the outcome of their practice (Figure 3).

Environmental and organizational factors

Fifty-five percent of respondents reported that they have enough time to use EBP and from the total respondent, 141 (32.7%) had formal training on EBP. More than half, 249(57.8%), of the respondents reported that they do not have access to online databases when they are away from work (Table 3).

Factors associated with Evidence-Based practice

Bivariate logistic regression analysis identified sex, perceived availability of strong evidence in the health facility, knowledge about EBP, attitude, training about search strategies for finding research, having enough time to apply EBP and internet access as significantly associated with the utilization of EBP (P-value <0.05). These variables were included in multivariate analysis considering the cut-off point as p value <0.2.

In the multivariable analysis, knowledge, training about search strategies for finding research, having enough time and internet access were factors significantly associated with utilization of Evidence-Based Practice.

Training about search strategies for finding research was important predictor to the utilization of Evidence-Based Practice. Health professionals who attended training about search strategies were 1.91 times more likely to use EBP compared to those who did not attend training about search strategies [AOR: 1.91, 95% CI=(1.22-2.97)]. Health professionals who had good EBP knowledge were 1.61 times more likely to use EBP compared to those who had poor EBP knowledge [AOR: 1.61, 95% CI= (1.06-2.45)]. Similarly, Health professionals who had enough time to apply EBP were 1.70 times more likely to use EBP compared to those who did not have enough time to apply EBP [AOR: 1.70, 95% CI=(1.12-2.57)] (Table 4). Health professionals who had internet access were 1.83 times more likely to utilize Evidence-Based Practice compared to those who did not have internet access [AOR: 1.83, 95% CI= (1.19-2.85)] (Table 4).

Discussion

This study aimed to determine the level of EBP utilization and identify factors associated with EBP utilization. In this study, EBP among health professionals of the North Gondar Administrative Zone was found to be 53%. EBP knowledge, access to internet, training on search strategies for finding journal articles, and self-reported availability of enough time were significantly associated with improved utilization of EBP.

Nearly half, (53 %) of health professionals used EBP at a daily and weekly basis. Comparable results of EBP utilization when ordering test or treatment were reported among Jordanian healthcare providers¹⁶. Conversely, our finding was higher than a study conducted among healthcare professionals working in regional hospitals of Taiwan, Iran and Uganda, which was 41.9%, 41% and 19%, respectively^{12 17 18}. This might be due to poor knowledge

about EBP and qualification of professionals ^{5 9} . However, it was less than the study conducted among primary healthcare professionals from Scotland. This is possibly due to higher internet access in Scotland, access to up-to-date sources and databases in their clinical practice, better EBP knowledge and favorable attitudes towards EBP ¹⁹. In addition, it might also be due to the reason that health professionals who graduated from improved medical and health science curriculums that included EBP courses have improved level of EBP ²⁰.

In this study, more than two-thirds of the respondents had good knowledge of EBP. Similar studies supported this finding in showing that a majority of the respondents who had heard of EBP had some knowledge of EBP particularly with regard to the concept and process involved ²¹. This finding is essential and echoes a vigorous quality of contemporary health professionals in which individual professionals need to incorporate the latest evidence into their daily practice to bridge the gap between scientific evidence and patient care for best practice and clinical decision-making.

The present study illustrates 65% of the respondents had positive attitude towards EBP. Such finding is consistent with the results of previous studies conducted in many countries which reported that healthcare professionals have positive attitudes towards Evidence-Based Practice ^{5 22-24}. Recent studies also reported largely positive attitude towards EBP among nurses ²⁵ and US herbal medicine providers ²⁶. However, this finding is lower than a study from Nigeria ²⁷ and Canada (75%) ²⁸. This might be due to the difference in the qualification level of health professionals, experience and training which have the potential to significantly improve beliefs and attitudes about EBP ^{9 24 28 29}. The study from Canada was conducted among medical doctors ³⁰. Health and medical professionals with higher level of qualification have better knowledge which improves their attitude towards EBP.

Furthermore, this study demonstrated that nearly half (48.5%) of the study participants indicated practicing EBP improves patients care. This result is consistent with other similar studies ^{13 19 31 32}. In contrast, two-third of chiropractors from US believed that EBP improves patient care ³³. The difference is due to the level and experience of the respondents included in the studies. Professionals with higher level of qualification are better equipped with knowledge and skills to retrieve, appraise and utilize the available evidence.

Knowledge, access to internet, training on search strategies for finding journal articles, and self-reported availability of enough time were the factors identified by the multivariable logistic regression analysis. Health professionals who have good EBP knowledge are more likely to use EBP compared to those health professionals who had poor knowledge. The results of this study are similar to findings in other countries ^{5 12 34}. In addition, knowledge

towards EBP was reported as a significant predictor of readiness to implement EBP in a study conducted to identify the social cognitive predictors of EBP utilization³⁵. This is due to the observed association that good knowledge improves the confidence and readiness of health professionals to carry out routine medical tasks, appraise, integrate and manage the available evidence^{9 35}. Confidence in utilizing EBP was also directly correlated with level of education in a study from Norway⁹. Higher level of education enhances basic research knowledge which help health professionals to understand the standard terminologies in scientific articles such as odds ratios, risk ratios, systematic reviews and meta-analysis. Basic research experience was also reported to be significantly correlated with both knowledge and attitude of nurses towards EBP³⁶. Knowledge of EBP improves the skills important for applying EBP which leads to adoption and utilization of EBP in a clinical service. However, the quality and level of EBP skills need to be further investigated with qualitative observational studies.

Training about search strategies was also one of the factors associated with utilization of EBP in this study. Health professionals who attended training about search strategies are 1.9 times more likely to use Evidence-Based Practice compared to those who did not attend training about search strategies (Table 3). Findings from other studies support the idea that training in EBP enables health professionals to implement evidence-based practice in their daily clinical service^{29 30 37 38}. Training was proved to be significant predictor to improve EBP competence, knowledge, attitude and utilization of EBP in studies from Spain and Finland^{39 40}.

In this study, internet access and availability of time were also associated factors to utilize Evidence-Based Practice. Previous studies conducted in other countries revealed that lack of time and internet access are significant factors to implement EBP^{7 19 20}. A scoping review reported that work load is the most frequently mentioned barrier of utilizing EBP. Health and medical professionals work under extreme degree of pressure. Staffs are continually asked to deal with more accurately ill patients quickly. In such situations providers will not have time to utilize EBP⁴¹.

Our study has limitations. First: even though this quantitative study identified the factors associated with EBP utilization, we believe that qualitative study could have supplemented the results. Qualitative studies aimed at exploring the organizational culture, actual behaviors, as well as identifying the perceived barriers and enablers of EBP need to be further investigated.

Secondly, as most of survey designs our results rely on self-reported responses which has inherent limitations. The Responses of respondents to measure attitude, knowledge and

practice scores might have been affected by the social desirability biases. Third: the study was conducted in hospitals setup. The organization structure, human resource dynamics, level and quality of medical service provided in hospitals in contrast to lower level facilities is more advanced. Hence, the results of our study need to be interpreted with caution.

Conclusion

Our study revealed that health professionals have good knowledge about EBP, but the utilization of EBP is insufficient even if they intend to use it. There was a positive association between training about search strategies, internet access, sufficient time and utilization of EBP. Improving the internet access of hospitals, giving more time for EBP, and training about search strategies are essential to improve EBP.

Abbreviations

CINAHL: Cumulative Index to Nursing and Allied Health Literature;

EBM: Evidence-Based Medicine;

EBP: Evidence-Based Practice;

GP: General Practitioner;

LHCC: Level of local Health Care Cooperatives;

MEDLINE: Medical Literature Analysis and Retrieval System Online;

RN: Registered Nurse.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

MA made substantial contributions to conception and design, or acquisition of data, data collection supervision, data analysis, interpretation of data and drafting of the manuscript.

SA agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

MK supervised the study, involved in drafting the manuscript or revising it critically for important intellectual content and had given final approval of the version to be published.

All authors read and approved the final manuscript.

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References

1. Sackett DL, Rosenberg WMC, Gray JAM, et al. Evidence based medicine. *BMJ : British Medical Journal* 1996;**313**(7050):170-71.
2. Kristensen N, Nymann C, Konradsen H. Implementing research results in clinical practice- the experiences of healthcare professionals. *BMC Health Serv Res* 2016;**16**:48.
3. Peabody JW, Taguiwalo MM, Robalino DA, et al. Improving the Quality of Care in Developing Countries. In: Jamison DT, Breman JG, Measham AR, et al., eds. *Disease Control Priorities in Developing Countries*. 2nd ed. Washington (DC), 2006.
4. McGinn TG, Guyatt GH, Wyer PC, et al. Users' guides to the medical literature: XXII: how to use articles about clinical decision rules. Evidence-Based Medicine Working Group. *JAMA* 2000;**284**(1):79-84.
5. Majid S, Foo S, Luyt B, et al. Adopting evidence-based practice in clinical decision making: nurses' perceptions, knowledge, and barriers. *J Med Libr Assoc* 2011;**99**(3):229-36.
6. Titler MG. The Evidence for Evidence-Based Practice Implementation. In: Hughes RG, ed. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville (MD), 2008.
7. Pearson A, Jordan Z. Evidence-based healthcare in developing countries. *Int J Evid Based Healthc* 2010;**8**(2):97-100.
8. Chatterjee S, Chowdhary N, Pednekar S, et al. Integrating evidence-based treatments for common mental disorders in routine primary care: feasibility and acceptability of the MANAS intervention in Goa, India. *World Psychiatry* 2008;**7**(1):39-46.
9. Dalheim A, Harthug S, Nilsen RM, et al. Factors influencing the development of evidence-based practice among nurses: a self-report survey. *BMC Health Serv Res* 2012;**12**:367.
10. Gautham M, Berhanu D, Umar N, et al. Panel discussion: The challenges of translating evidence into policy and practice for maternal and newborn health in Ethiopia, Nigeria and India. *BMC Health Serv Res* 2014;**14**(2).
11. Kyalo Mutisya A, KagureKarani A, Kigundu C. Research Utilization among Nurses at a Teaching Hospital in Kenya. *J Caring Sci* 2015;**4**(2):95-104.
12. Ntaganira J. Knowledge, attitudes and practice of evidence-based medicine in doctors and nurses in Rwanda and Uganda. 6th EDCTP Forum: Strengthening Research Partnerships for Better Health and Sustainable Development. Addis Ababa, Ethiopia: Tropical Medicine and International Health Volume 17, Issue Supplement s1, pp 69, 2012.
13. Weng YH, Kuo KN, Yang CY, et al. Implementation of evidence-based practice across medical, nursing, pharmacological and allied healthcare professionals: a questionnaire survey in nationwide hospital settings. *Implement Sci* 2013;**8**:112.
14. Upton D, Upton P. Development of an evidence-based practice questionnaire for nurses. *J Adv Nurs* 2006;**53**(4):454-8.
15. Ramirez-Velez R, Correa-Bautista JE, Munoz-Rodriguez DI, et al. Evidence-based practice: beliefs, attitudes, knowledge, and skills among Colombian physical therapists. *Colomb Med (Cali)* 2015;**46**(1):33-40.
16. Al Omari M, Khader Y, Jadallah K, et al. Awareness, attitude and practice of evidence-based medicine among primary health care doctors in Jordan. *J Eval Clin Pract* 2009;**15**(6):1131-6.
17. Weng YH, Chen C, Kuo KN, et al. Implementation of evidence-based practice in relation to a clinical nursing ladder system: a national survey in Taiwan. *Worldviews Evid Based Nurs* 2015;**12**(1):22-30.
18. Mozafarpour S, Sadeghizadeh A, Kabiri P, et al. Evidence-based medical practice in developing countries: the case study of Iran. *J Eval Clin Pract* 2011;**17**(4):651-6.
19. O'Donnell CA. Attitudes and knowledge of primary care professionals towards evidence-based practice: a postal survey. *J Eval Clin Pract* 2004;**10**(2):197-205.
20. Mehrdad N, Joolaei S, Joolaei A, et al. Nursing faculties' knowledge and attitude on evidence-based practice. *Iran J Nurs Midwifery Res* 2012;**17**(7):506-11.

21. Yusof ZY, Han LJ, San PP, et al. Evidence-based practice among a group of Malaysian dental practitioners. *J Dent Educ* 2008;**72**(11):1333-42.
22. Hadgu G, S. A, S. T. Assessment of Nurses' Perceptions and Barriers on Evidence Based Practice in Tikur Anbessa Specialized Hospital Addis Ababa Ethiopia. *American Journal of Nursing Science* 2015;**4**(3).
23. Jette DU, Bacon K, Batty C, et al. Evidence-based practice: beliefs, attitudes, knowledge, and behaviors of physical therapists. *Phys Ther* 2003;**83**(9):786-805.
24. Stokke K, Olsen NR, Espehaug B, et al. Evidence based practice beliefs and implementation among nurses: a cross-sectional study. *BMC Nurs* 2014;**13**(1):8.
25. Stavor DC, Zedreck-Gonzalez J, Hoffmann RL. Improving the Use of Evidence-Based Practice and Research Utilization Through the Identification of Barriers to Implementation in a Critical Access Hospital. *J Nurs Adm* 2017;**47**(1):56-61.
26. Snow JE, Leach MJ, Clare BA. Attitudes, skill and use of evidence-based practice among US Western herbal medicine providers: a national survey. *J Complement Integr Med* 2017.
27. Akinbo SRA, Odebiyi DO, Okunola TE, et al. Evidence-Based Practice: Knowledge, Attitudes And Beliefs Of Physiotherapists In Nigeria. *The Internet Journal of Medical Informatics* 2008;**4**(2).
28. Bussieres AE, Terhorst L, Leach M, et al. Self-reported attitudes, skills and use of evidence-based practice among Canadian doctors of chiropractic: a national survey. *J Can Chiropr Assoc* 2015;**59**(4):332-48.
29. McEvoy MP, Williams MT, Olds TS. Evidence based practice profiles: differences among allied health professions. *BMC Med Educ* 2010;**10**:69.
30. Melnyk BM, Fineout-Overholt E. Putting research into practice. *Reflect Nurs Leadersh* 2002;**28**(2):22-5, 45.
31. Upton D, Upton P. Knowledge and use of evidence-based practice of GPs and hospital doctors. *J Eval Clin Pract* 2006;**12**(3):376-84.
32. Egerod I, Hansen GM. Evidence-based practice among Danish cardiac nurses: a national survey. *J Adv Nurs* 2005;**51**(5):465-73.
33. Alcantara J, Leach MJ. Chiropractic Attitudes and Utilization of Evidence-Based Practice: The Use of the EBASE Questionnaire. *Explore (NY)* 2015;**11**(5):367-76.
34. Zwolsman S, te Pas E, Hooft L, et al. Barriers to GPs' use of evidence-based medicine: a systematic review. *Br J Gen Pract* 2012;**62**(600):e511-21.
35. Pfaller JS, Tu W, Morrison B, et al. Social-Cognitive Predictors of Readiness to Use Evidence-Based Practice of Community-Based Rehabilitation Practitioners. *Rehabil Couns Bull* October 2016;**60**:7-15.
36. Zhou F, Hao Y, Guo H, et al. Attitude, Knowledge, and Practice on Evidence-Based Nursing among Registered Nurses in Traditional Chinese Medicine Hospitals: A Multiple Center Cross-Sectional Survey in China. *Evid Based Complement Alternat Med* 2016;**2016**:5478086.
37. Fielding JE, Briss PA. Promoting Evidence-Based Public Health Policy: Can We Have Better Evidence And More Action? *Health Aff (Millwood)* 2006;**25**(4):969-78.
38. Polit DF, Beck CT. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. 9th edition ed. Philadelphia Wolters Kluwer Health/Lippincott Williams & Wilkins, 2012.
39. Ruzafa-Martinez M, Lopez-Iborra L, Armero Barranco D, et al. 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.
40. Saunders H, Vehvilainen-Julkunen K, Stevens KR. Effectiveness of an education intervention to strengthen nurses' readiness for evidence-based practice: A single-blind randomized controlled study. *Appl Nurs Res* 2016;**31**:175-85.
41. Williams B, Perillo S, Brown T. What are the factors of organisational culture in health care settings that act as barriers to the implementation of evidence-based practice? A scoping review. *Nurse Educ Today* 2015;**35**(2):e34-41.

Captions

Figure 1: Sampling Procedure for the study of Evidence Based Practice and associated factors among health professionals in North Gondar Zone Hospitals, Ethiopia 2015

Figure 2: Self-reported attitude towards EBP among health professionals in North Gondar Zone Hospitals, Ethiopia 2015

Figure 3: Evidence Based Practice among health professionals in North Gondar Zone Hospitals, Ethiopia 2015.

Keys

- A=Application of EBP is necessary
- B=Literature and research findings are useful
- C= I need to increase the use of evidence
- D=The adoption of EBP places unreasonable demand
- E=I am interested in improving EBP skills
- F=EBP improves quality of patient care
- G=EBP does not take into account the limitations
- H=My reimbursement rate will increase if I use EBP
- I=EBP helps in decision making

Table 1: Socio demographic characteristics of health professionals, North Gondar Zone Hospitals, Ethiopia 2015(n=431)

Variable		Frequency (431)	Percent (%)
Age	20-29	336	77.9
	30-39	80	18.6
	>39	15	3.5
Sex	Male	274	63.6
	Female	157	36.4
Educational status	Diploma	89	20.6
	Degree	324	75.2
	Masters	16	3.7
	Others	2	0.5
Year of experience	<5	325	75.4
	5-10	89	20.6
	>10	17	4.0
Type of profession	Physician	51	11.8
	Nurse	224	52
	General Practitioner	37	8.6
	Midwifery	23	5.3
	Laboratory Technician	49	11.4
	Health Officer	10	2.3
	Others*	37	8.6
Salary per month (Ethiopian Birr)	<1500	10	2.3
	1500-2500	78	18.1
	2500-3500	224	52
	>3500	119	27.6

Job position	Over all department head	3	0.7
	Involve in different department	66	15.3
	Head in my department	36	8.3
	Have no position other than their job	314	72.9
	Description		
	Other Position	12	2.8
Total		431	100

Others*=Psychiatrists, Radiologists, physiotherapist and pharmacists

Table 2: Knowledge about EBP among health professionals in North Gondar Zone Hospitals, Ethiopia 2015(n=431)

Variable		Frequency(431)	Percent (%)
Are practice guidelines available over the internet?	Yes	249	57.8
	No	41	9.5
	Do not know	141	32.7
Did you learn the foundations for EBP as part of your academic preparation?	Yes	303	70.3
	No	110	25.5
	Do not know	18	4.2
Are you familiar with the medical search engines (eg, MEDLINE, HINARI)?	Yes	320	74.2
	No	96	22.3
	Do not know	15	3.5
Do you have the ability to find relevant research to answer your clinical questions?	Yes	279	64.7
	No	129	30
	Do not know	23	5.3
Evidence from all published articles in scientific journals can be used in EBP.	Yes	282	65.5
	No	110	25.5
	Do not know	39	9

The best and quickest way to find evidence is by reading textbooks or asking experienced colleagues.	Yes	314	72.9
	No	94	21.8
	Do not know	23	5.3
EBP is a process of making decisions based on scientifically proven evidence.	Yes	357	82.8
	No	47	10.9
	Do not know	27	6.3
EBP involves a series of steps from identifying the clinical question, finding the answer/evidence, assessing the validity of evidence, to applying it if clinically suitable.	Yes	373	86.5
	No	36	8.4
	Do not know	22	5.1
Do you have the ability to Convert information needs into a question?	Yes	322	74.7
	No	85	19.7
	Do not know	24	5.6
Do you have the ability to determine the validity of material?	Yes	298	69.1
	No	112	26
	Do not know	21	4.9
Are you able to review your own practice?	Yes	334	77.5
	No	85	19.7
	Do not know	12	2.8
Are you able to identify gaps in your own practice?	Yes	380	88.2
	No	85	9.7
	Do not know	12	2.1
Do you have the ability to apply information to individual cases?	Yes	299	69.3
	No	104	24.1
	Do not know	28	6.5
Do you know how to determine the relevance of evidence you find from the internet?	Yes	400	92.8
	No	22	5.1
	Do not know	9	2.1
Do you know search evidence using key words?	Yes	286	66.4
	No	119	27.6
	Do not know	26	6.0
Do you feel that you have research knowledge?	Yes	296	68.7
	No	111	25.8
	Do not know	24	5.6
Do you share ideas and information with colleagues?	Yes	379	87.9
	No	40	9.3
	Do not know	12	2.8
Do you have the ability to Monitor and review your practice?	Yes	352	81.7
	No	65	15.1
	Do not know	14	3.2

Relative risk	Understand Completely	233	54.1
	Understand Somewhat	166	38.5
	Do Not Understand	32	7.4
Odds ratio	Understand Completely	138	32.0
	Understand Somewhat	201	46.6
	Do Not Understand	92	21.3
Absolute risk	Understand Completely	189	43.9
	Understand Somewhat	197	45.7
	Do Not Understand	45	10.4
Confidence interval	Understand Completely	190	44.1
	Understand Somewhat	191	44.3
	Do Not Understand	50	11.6
Systematic review	Understand Completely	143	33.2
	Understand Somewhat	219	50.8
	Do Not Understand	69	16.0
Meta-analysis	Understand Completely	76	17.6
	Understand Somewhat	205	47.6
	Do Not Understand	150	34.8
Heterogeneity	Understand Completely	106	24.6
	Understand Somewhat	200	46.4
	Do Not Understand	125	29.0
Publication bias	Understand Completely	157	36.4
	Understand Somewhat	186	43.2
	Do Not Understand	88	20.4
Total		431	100

Table 3: Environmental and organizational factors of EBP among health professionals in North Gondar Zone Hospitals, Ethiopia 2015(n=431)

Variable	Frequency(431)	Percent (%)
Availability of guidelines		
Yes	318	73.8
No	113	26.2
Formal Search Strategies Training		
Yes	141	32.7
No	290	67.3
Workload		
<20 hours per week	22	5.1
20-30 hours per week	94	21.8
31-40 hours per week	126	29.2
>40 hours per week	189	43.9
Facility Supports use of		

current research	261	60.6
Yes	170	39.4
No		
Access to practice guidelines online		
Yes	235	54.5
No	196	45.5
Computers loaded with different reference materials		
Yes	215	49.9
No	216	50.1
Access to online databases away from work		
Yes	182	42.2
No	249	57.8
Total	431	100

Table 4: Bivarait and multivariate analysis of EBP among health professionals in North Gondar Zone Hospitals, Ethiopia 2015 (n=431).

Variables	Evidence Based Practice		OR (95% CI)		P-value
	Good	Poor	Crude	Adjusted	
Sex					
Male	155	119	1.499(1.01-2.22)	1.443(0.951-2.188)	
Female	73	84	1	1	
Knowledge About EBP					
Good	161	113	1.893(1.271-2.818)	1.612(1.06-2.452)*	0.025
Poor	67	89	1	1	

Attitude towards EBP

Favorable	159	119	1.626(1.093-2.42)	1.522(0.999-2.319)
Unfavorable	69	84	1	1

Internet Access

Yes	90	59	1.592(1.064-2.381)	1.831(1.191-2.816)*	0.006
No	138	144	1	1	

Training about search strategies for finding research

Yes	90	51	1.944(1.285-2.94)	1.906(1.223-2.97)*	0.004
No	138	152	1	1	

Self-reported availability of enough time to

Apply EBP	145	97	1.909(1.298-2.807)	1.698(1.122-2.57)*	0.012
Yes	83	106	1	1	
No					

Perceived availability of strong evidence in the health facility

Yes	125	90	1.524(1.042-2.23)	1.474(0.983-2.212)
No	103	113	1	1

*statically significant variable to EBP which p- value <0.05